

The unlearning of school attendance: Ideas for change

Edited by

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The unlearning of school attendance: Ideas for change

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Editorial: The unlearning of school attendance: ideas for change

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unlearning, MTSS, attendance, absenteeism, health conditions, future studies, missing school

Editorial on the Research Topic

[The unlearning of school attendance: ideas for change](#)

Introduction

Unlearning attendance is an interrogation of the field and proposed blueprint for future studies on attendance and absenteeism.

Since the invention of schools (Elliott et al., 1993), work on attendance has centered on benefits and harm (Ceci and Williams, 1997), both within and outside of educational settings (Hanushek et al., 2008). The focus has largely been on understanding the links between attendance and learning outcomes (Elliott et al., 1993) as opposed to the people, their health conditions, their racial and ethnic disparities, interventions across school types, and the data for reconfigurations at systemic and analytic levels.

Despite existing efforts, high rates of absenteeism continue to influence adolescents (LeBoeuf et al.) and concerns have been raised among preschool students as well (Purtell and Ansari). We may learn a lot from Kearney et al.'s primer on the field's past and future trajectory to help us to evaluate our present.

We must critically reflect on our own practices if we are to be knowledge stewards and carers of our students, our schools, and those working within and around them. Using an umbrella systematic review (Jay et al.), machine learning (Bowen et al.), quasi-experimental evaluation (Arbour et al.), and conceptual and trend analysis, 44 researchers involved in this Research Topic assessed the field's current status. The scholars pointed to glaring reasons for a needed reflective pause. They examined the status of students from preschool to college (Korotchenko and Dobbs) and from early childhood (Purtell and Ansari) to adulthood and shared a threaded story of what is happening and why we are now at a critical juncture (Heyne et al.).

Our Frontiers special topic aimed to provide a "pause" to allow for critical assessment of current knowledge in the field of attendance and absenteeism, including ideas for change from the world's leading experts and trailblazers. These 44 scholars studying in 21 fields of study, ranging from Education, Psychology, Social Work, and Sociology to Early Childhood, Health, Mental Health, Medicine, Business, Criminal Justice, and Data Analytics, via 13 manuscripts and across 10 countries (USA and the UK to Chile, Norway, Spain, and Finland), offered thoughtful and calibrated directions for the future science and practice of school attendance. We invite your own careful reading of the papers, but here follow the main ideas:

Ideas for change

1. Apply MD-Multi-tiered Systems of Support (MTSS) frameworks across geographical regions. While promising, these frameworks remain a work in progress. More data and innovative and sometimes radical reconfigurations at both systemic and analytic levels are sorely needed (Kearney and Graczyk).
 - a. Conduct cross-discipline research using mixed methods allowing for (a) dissemination and use of broad findings and (b) establishment of common language and terminology (Heyne et al.).
2. Identify interventions to support children with chronic health conditions who participate in education. Begin with use of administrative data to address evidence gaps, compare interventions between authorities in schools and/or healthcare, and conduct randomized-controlled trials of interventions, developed with the input of children, young people, and their families (Jay et al.).
3. Further examine the differential effects of the pandemic on educational programs offering school administrators and policymakers ways to manage change (Korotchenko and Dobbs).
4. Validate models by incorporating additional external factors and exploring novel research questions about academic performance (Bowen et al.).
5. Use team science to discover innovative ways to promote attendance and prevent problematic absences. Outcomes could change with universal and targeted strategies and data platforms (Arbour et al.).
6. Dig deeper into underlying predictors of non-attendance within demographic groups to develop more effective interventions (Purtell and Ansari).
7. Compare racial and ethnic disparities in chronic absenteeism across school types or levels of intervention (LeBoeuf et al.).
8. Examine and record the effects of protective actions to prevent absenteeism and additive diagnoses and differences between adolescents with different combinations of neuroatypicalities (e.g., ADHD and autism spectrum disorder) (Niemi et al.).
9. Replicate studies on families with children with neurodevelopmental conditions who choose to de-register from school because of unmet needs (Paulauskaite et al.).
10. Employ new visions and theories of change brought on by advancements in human functioning (Kearney et al.).
11. Conduct studies on teachers' experiences after school re-openings, examining what did or did not work and why (Havik and Ingul).
12. Seek more inclusive paradigms for this postmodern era in favor of broad visions to fully unlearn calcified historical approaches (Kearney and González).

Conclusions

Addressing the ideas for change requires removing old categorizations and processes and using modern approaches

(Kearney and González), like machine learning, multi-tiered systems of support (Kearney and Graczyk), and data tracking to expose hidden factors influencing attendance. Using a tried but true cliché: it is a call to think outside the box!

When taken together, the findings from this Research Topic suggest we needed to recalibrate (Heyne et al.), especially after the COVID-19 pandemic (Havik and Ingul). We need assessment to shore up broken systems and support all students irrespective of how they accessed learning (e.g., homeschooling, special education, Montessori, or other), but we need to include teachers too (Havik and Ingul).

Unlearning has two parts. The first, “un”, is to undo, to stop, to pause. The second, the verb, learn. To gain, revise, or realign knowledge. We have tried to do both in this Research Topic of articles offering guidance for future exploration in the study of attendance and absenteeism.

As editors, we have brought to light the core of the work on school attendance and absenteeism and why it remains central. The numerous analyses presented here reflect the basic premise that schooling and attendance remain critical for belonging, emotional stability, and engagement in the learning process inside the school context. Missing school disrupts this continuity, leading to gaps. A void that is unreplaceable in any other environment.

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References

Ceci, S. J., and Williams, W. M. (1997). Schooling, intelligence, and income. *Am. Psychol.* 52, 1051–1058. doi: 10.1037/0003-066X.52.10.1051

Elliott, E. J., Ravitch, D., Grant, W. V., Snyder, T. D., and Sonnenberg, W. C. (1993). *120 Years of American Education: A Statistical Portrait*. U.S Department of Education. Available from: <https://nces.ed.gov/pubs93/93442.pdf> (accessed March 3, 2024).

Hanushek, E. A., Jamison, D. T., Jamison, E. A., and Woessmann, L. (2008). *Education and Economic Growth: It's Not Just Going to School, But Learning Something While There That Matters*. Education Next. Available from: <http://educationnext.org/education-and-economic-growth/> (accessed March 3, 2024).



Remote Education/Homeschooling During the COVID-19 Pandemic, School Attendance Problems, and School Return—Teachers' Experiences and Reflections

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According to Norway's Educational Act (§2-1), all children and youths from age 6 to 16 have a right and an obligation to attend free and inclusive education, and most of them attend public schools. Attending school is important for students' social and academic development and learning; however, some children do not attend school caused by a myriad of possible reasons. Interventions for students with school attendance problems (SAPs) must be individually adopted for each student based on a careful assessment of the difficulties and strengths of individuals and in the student's environment. Homeschooling might be one intervention for students with SAPs; however, researchers and stakeholders do not agree that this is an optimal intervention. Schools that were closed from the middle of March 2020 due to the COVID-19 pandemic provided an opportunity to investigate remote education more closely. An explorative study was conducted that analyzed 248 teachers' in-depth perspectives on how to use and integrate experiences from the period of remote education for students with SAPs when schools reopen. Moreover, teachers' perspectives on whether school return would be harder or easier for SAP students following remote education were investigated. The teachers' experiences might be useful when planning school return for students who have been absent for prolonged periods.

Keywords: school attendance problems, teachers' experiences, remote education, homeschooling, COVID-19 pandemic, school return

INTRODUCTION

School attendance problems (SAPs) are a concern in many countries because attending school is important for students' academic, emotional, and social learning (e.g., Kearney, 2008). Home education or homeschooling is an intervention for some students who have been absent for a prolonged period, as a part of a gradual return that connects the student to school and to schoolwork at home. However, this is a controversial topic in the literature (Kearney, 2016). Some researchers (e.g., McShane et al., 2004; Melvin and Tonge, 2012) claim that students should not

do schoolwork at home because it is believed to prolong absence. Others (e.g., Kearney, 2016) argue that doing schoolwork at home might reduce the anxiety of falling behind academically and ultimately make school return easier. When schools in many countries closed in the middle of March 2020 due to the COVID-19 pandemic, teachers had to immediately provide education at home to teach their students using various digital solutions, tools, and skills. The concept “emergency remote education” clearly separate the practice during the period of closed schools from planned practices such as distance education, e-learning, online education, homeschooling, or other concepts being used in different countries, and (Bozkurt et al., 2020).¹ No national guidelines existed in Norway about how to do remote education; however, the curriculum and the Education Act were still applicable. The main aim of this study was to investigate teachers’ perspectives on how to integrate their experiences of remote education during the pandemic for students with SAPs when schools reopen and to investigate their perceptions of how the experiences from remote education could impact school return.

School Attendance Problems

Attending school is important for students’ behavioral, social, economic, and educational learning (e.g., Kearney, 2008; Ansari et al., 2020), in addition to the fact that in Norway, education is a right and an obligation from age 6 to 16 (grade level 1–10). However, SAPs are a concern in many countries, and research in this area is increasing. SAPs are usually seen as unauthorized absences, which are absences not recorded as illnesses or with permission from the school (Dalziel and Henthorne, 2005). Many types of SAPs exist, such as truancy, school refusal, school withdrawal, and school exclusion (e.g., Heyne et al., 2019). In this study, all types of unauthorized/undocumented SAPs are included based on criteria adapted from Kearney (2008). The reasons for SAPs are multiple and often complex (Egger et al., 2003; Heyne et al., 2011; Ingul and Nordahl, 2013; Havik et al., 2014, 2015; Blöte et al., 2015).

Thambirajah et al. (2008) proposed a vicious cycle to describe how absence might be maintained for students with anxiety-based school refusal. This cycle visualizes how an absent student might lose opportunities to improve peer relationships and social functioning and therefore experience social isolation. These students may also fall behind in schoolwork, making school return difficult because they fear school failure. Together, these factors might increase students’ levels of anxiety as anxiety-provoking situations at school are avoided. Although this circle mainly explains anxiety-based school refusal, it is also relevant to understand other types of SAPs.

¹In this article we use “remote education” about the education given at home during school closure caused by the pandemic. It is important to note that the teachers themselves used “homeschooling” when they answered, as this is the term being used in Norway. Moreover, “homeschooling” was used in all the information about this study for the participating teachers. The use of “remote education” is in line with Bozkurt et al. (2020), who use “emergency remote education,” because the practice differs from planned practices (e.g., distance education, e-learning, online education, homeschooling). Moreover, homeschooling and home education as planned practice are being used as synonymous in the article for the readability.

Traditional Homeschooling

According to the Educational Act in Norway, parents can decide to provide education at home for their children. They might do this for several reasons, such as long-term illness, concern about and dissatisfaction with the educational system, school environment, or available academic instruction, failure to meet their child’s needs, inadequate responses to bullying or well-being, and the provision of religious or moral instruction (e.g., Medlin, 2000; NCES, 2009; Mitchell, 2021). Moreover, some parents of SAP students might fear harmful situations in school or be critical of the school, teacher, or education (e.g., Kearney, 2008; Thambirajah et al., 2008) and want their child to be educated at home. In traditional homeschooling, parents administer the education and the educational goals. The quality should be the same as in public education as explained in the Educational Act, and municipalities are required to evaluate the education provided.

Home education or homeschooling is controversial in general and for students with SAPs (Kearney, 2016). One concern is the lack of socialization (Romanowski, 2006; Ray, 2013) and some researchers are critical of homeschooling movements and fear that it might lead to social isolation from other children (e.g., Mayberry et al., 1995; Lubienski, 2000; Monk, 2004). However, previous research indicates that parents are aware of the importance of children’s socialization when they are homeschooled, and they often encourage socialization for their children (e.g., Nelson, 2014; Neuman and Guterman, 2017; Fensham-Smith, 2021). A study by de Carvalho and Skipper (2019) provides insight into the social lives of three United Kingdom home-educated adolescent girls and their mothers. The findings indicate that the parents encouraged their children to socialize by organizing social activities and groups. Home educating networks had an important role in bringing families together and serving as a supportive network for parents and children that offered a variety of social interactions, and these adolescents participated in a range of social experiences (de Carvalho and Skipper, 2019). Therefore, there is no agreement on how homeschooling affects socialization, and more research is needed. In addition, this issue is part of a larger discussion because some students find socialization in school to be problematic (Mitchell, 2021).

Homeschooling and School Attendance Problems

Homeschooling might be an intervention in addition to partial school attendance for SAP students to prepare for gradual school return (e.g., Carroll, 1996; Thambirajah et al., 2008). However, when students with SAPs do schoolwork at home, they might believe this could be a lasting solution, leading to a vicious cycle that is difficult to break (Thambirajah et al., 2008; Wijetunge and Lakmini, 2011). When students’ complete schoolwork at home, they might not experience anxiety or worries related to school and might have better general well-being. In this way, homeschooling might be a good intervention to fill academic gaps and reduce students’ anxiety caused by school situations, which might make school return easier. However, findings from

a recent study indicate that some students do not do schoolwork during emergency remote education, and 20% do not participate at all (Havik and Ingul, 2021a). This indicates that school at home during the pandemic may not fill academic gaps for all SAP students. These students fall behind academically, which potentially increases their anxiety about school return. School at home is therefore not a good solution for all SAP students (Havik and Ingul, 2021a).

Moreover, when students have school at home, SAP students might miss social experiences with peers and teachers, which is a concern about home education in general (e.g., Ray, 2013). For students who experience negative interactions in school, such as bullying (e.g., Havik et al., 2014, 2015), doing schoolwork at home might be liberating; but in the long-term school return might be even harder because they are socially isolated.

Some studies recommend homeschooling for students with school refusal who dislike and avoid school (Stroobant and Jones, 2006; Stroobant, 2008), arguing that students and their families might be in a stressful situation and that stressors are reduced when the student stays at home. Furthermore, this situation may lead to less unrest and disturbance at home, making everyday life easier for the whole family. However, others do not recommend homeschooling because it might promote avoidance (Melvin and Tonge, 2012). Moreover, homeschooling might increase students' anxiety and thereby maintain avoidance (e.g., Thambirajah et al., 2008; Ek and Eriksson, 2013; Heyne and Sauter, 2013).

Developmental processes might slow or stop during homeschooling, even if it leads to sufficient academic learning. A study of parents of students with school refusal in the United Kingdom found that most of them wanted to continue home education because their children thrived academically and socially (Wray and Thomas, 2013). Findings from this study indicated that symptoms associated with school refusal mostly disappeared or were reduced during home education, which is in line with findings indicating that home education "virtually eliminates any mental illness" (Knox, 1989, p. 150) and that symptoms "either disappear completely with no aftereffects or decline considerably" (Fortune-Wood, 2007, p. 137). Wray and Thomas (2013) concluded that home education should be an alternative to school return from the parental perspective. However, although symptoms of mental illness disappear or decrease when stressors are removed, they may increase when stressors such as school return are reintroduced.

Remote Education During the Pandemic

Remote education for all students during a pandemic is different than traditional homeschooling for a few students. During the pandemic, digital/distance lessons were provided without any national guidelines to inform practice. Teachers were asked to immediately provide all teaching from home. Teachers used a variety of digital tools, and the majority gave live lessons daily by video communication (Fjørtoft, 2020).

Remote education may be provided differently between schools and teachers and Norwegian teachers reported using "trial and error" and guidance from colleagues/advisors at

school as their main resource to increase competence in their digital practice during the pandemic (Fjørtoft, 2020). Fjørtoft's study indicates that teachers believed they had mastered digital teaching without any major challenges, but some felt that digital teaching/tools required more preparation and better classroom management. Moreover, a key finding from a national survey of parents was that remote education during the pandemic largely consisted of students doing individual tasks with limited support from teachers (Blikstad-Balas et al., 2022).

In a study from the United States, most parents (64%) were concerned that their children had fallen behind academically due to school closure during the pandemic (Horowitz, 2020). Another United States study indicated that students may have fallen substantially behind academically, especially in mathematics, and that students were likely to enter school with greater variability in academic skills than during normal circumstances (Kuhfeld et al., 2020). In the Netherlands, where schools were closed for only 8 weeks, school closure was associated with academic learning losses (Engzell et al., 2020).

School Return

According to most researchers, early identification and interventions for SAPs are of great importance (e.g., Kearney and Graczyk, 2014; Keppens et al., 2019). Research indicates that every day of attendance counts and contributes to students' learning and that academic outcomes are enhanced by maximizing attendance in school without a "safe" threshold (e.g., Hancock et al., 2013). Moreover, Simon et al. (2020) found that individual students tend to stabilize their rates of absence after third grade and noted the importance of early interventions in a student's school career.

When students have been absent from school, a gradual return as quickly as reasonably possible is often recommended because it increases the likelihood of successful outcomes (e.g., Elliott and Place, 2012; Kearney and Graczyk, 2014). A gradual return and introduction to school for anxiety-based school refusal is included in most cognitive behavior therapy-based manuals (Blagg and Yule, 1984; King et al., 2000; Heyne et al., 2015). In a study from Japan, a rapid return approach was effective for adolescents with school refusal who were unwilling to attend individual therapy (Maeda and Heyne, 2019).

However, after the pandemic, all students need to be reintegrated and reengaged in school, and gradual school return is important for SAP students. Reengagement is one important aspect of the Alternative Educational Program in the Netherlands (Link) for school refusers (Brouwer-Borghuis et al., 2019). Teachers in Link help students prepare for reintegration to school, which includes gradually facing school-related fears and working together on steps in a fear hierarchy. Some of these activities might be helpful for some SAP students when gradually reengaging and returning to school after the pandemic. Examples are "to participate in a game, ask question in class, take a test, observe cooking lessons, and sit in on group discussions, and then gradually increase the amount and type of participation in such activities" (Brouwer-Borghuis et al., 2019, p. 81).

Cooperation

Cooperation within a team with students, staff in school, parents, peers, and health personnel is strongly encouraged for SAPs (Brand and O’Conner, 2004; Nuttall and Woods, 2013; Kearney and Graczyk, 2014; Gren-Landell et al., 2015; Brouwer-Borghuis et al., 2019). Findings from an in-depth interview study examining the current systems of collaboration between schools, children, and mental health services indicated deep-seated barriers to good collaboration (Rothi and Leavey, 2006). These teachers experienced frustration because they were excluded from mental health care management even though they were affected professionally by the decisions that were made there; moreover, they experienced delays in intervention and poor communication (Rothi and Leavey, 2006). Nuttall and Woods (2013) interviewed youths, parents, school staff, and other professionals and noted the importance of close collaboration with the professionals involved. In a qualitative study with parents of children with school refusal, the parents emphasized a need for a coordinated team approach (Havik et al., 2014). Moreover, parental support and involvement, positive school–parent relationships, and good communication are essential for good interventions for attendance problems (Havik et al., 2014; Kearney and Graczyk, 2014; Finning et al., 2018). From teachers’ perspectives cooperation between school and home is more important during remote education than regular schooling because structure and help at home vary greatly and is important for how students handle to do schoolwork at home (Havik and Ingul, 2021a).

Tailored Interventions and a Safe Learning Environment

In an ideal world, schools should be a place where all students feel safe, are engaged, and connected, and interact positively with teachers and peers. SAPs are a diverse issue for individual reasons, meaning that “one size doesn’t fit all” (e.g., Kearney and Graczyk, 2014, 2020; Finning et al., 2018; Heyne, 2019). The similarity is that students do not attend school, but their reasons for not attending school are diverse. Therefore, interventions must be adapted and tailored for each student based on an assessment of the student’s parent/family, peers, school, and community regarding the difficulties and strengths (Kearney, 2008; Ingul et al., 2019).

Students need a safe learning environment with good relations and support from teachers and peers as well as structure, routines, and quiet surroundings during the school day to help them feel that the school day is predictable, which is important for SAP students (Nuttall and Woods, 2013; Havik et al., 2014). They also need support in their learning process, to be connected to learning and schoolwork and to be engaged. Nuttall and Woods (2013) claim that these students need an individualized approach, and that schoolwork should be linked to personal interests for them to be able to achieve their educational goals.

The Present Study

The main aim of this study was to investigate teachers’ experiences of remote education during the pandemic for SAP

students and how these experiences could be used when schools reopen. We also wanted to investigate whether teachers believe that school return will be harder or easier following remote education at home. The research questions were as follows. RQ1: How can experiences from remote education be used and integrated when schools reopen? RQ2: Do teachers think that school return will be harder or easier for SAP students following remote education during the pandemic?

MATERIALS AND METHODS

Participants

The final sample for this study consisted of 248 teachers from all municipalities in Norway; 75% of the sample were female teachers, reflecting gender in primary and lower secondary schools in Norway (SBSS, 2019). The sample consisted of teachers from all 11 counties of Norway, varying between 8 and 45 teachers in each county. We had no other information about the teachers than gender, county they work, and whether they were the main or subject teacher for the SAP student. Thus, we cannot claim that the sample is random, or generalize and draw conclusions for all teachers in Norway. For more information about the sample, see Havik and Ingul (2021a).

Design

Because this was an explorative study, most of the questions were open-ended, and teachers were asked to write their answers briefly and concisely in their own words. When answering the survey, we asked the teachers to choose and think about one student with SAPs in their class based on adapted criteria from Kearney (2008): (1) absent from school more than 2 days in the last 2 weeks before schools closed with no documented absence and/or (2) more than 15% undocumented absences since Christmas (10 weeks).

Procedure

All schools in Norway received an e-mail about the study on 24th April 2020. They were asked to distribute the e-mail to the teachers in their school who had students with SAPs in grade levels 5–10 because these grade levels still had remote education. We asked the teachers to answer a web-based questionnaire within 2 weeks.

The questionnaire did not link the teachers’ answers to their computers’ IP addresses, in line with requirements for anonymity from the Norwegian Centre for Research Data. This research project was not subject to notification since no sensitive personal data were collected. The participants gave their consent to participate by answering the questionnaire. They were given instructions in the e-mail, which also contained information about the aim of the study and stated that participation was voluntary. Those who chose to participate completed a questionnaire with three topics: the first part included general questions concerning all students and remote education a, the second part was related to one student with SAPs in the teacher’s class, and the third part was about other students with SAPs in the teacher’s class. The current study used qualitative data from the

second part and included the following questions: (1) How can you use experiences with remote education when schools reopen? (2) Describe whether the situation with remote education will make it easier or more difficult for SAP students to return to school. Because the questions were open-ended, the teachers wrote their own answers. Some wrote in-depth answers (up to 130 words), while others wrote only short answers.

Analyzing Qualitative Data

In this study a deductive approach was used, reading relevant theory related to the research questions, and testing its implications with the collected data. Deductive thematic analysis was chosen because it facilitates the interpretation of identifiable themes and patterns of teachers’ perspectives and experiences. A “theoretical” or deductive thematic analysis is more driven by the researcher’s theoretical interest and a detailed analysis of some aspect of the data, which affects how we coded the data, where we coded for specific research questions (Braun and Clarke, 2006, 2019). The data were analyzed using deductive thematic analysis, which is flexible, offers an accessible way to analyze qualitative data (Aronson, 1995; Braun and Clarke, 2006, 2019; Lambert and O’Halloran, 2008) and is well suited when generating (initial) themes or patterns of shared meaning in the data. The analysis is more descriptive than interpretive, inspired by Moustakas’ (1994) transcendental or psychological phenomenology. Six steps are suggested to be followed (Braun and Clarke, 2006): (1) familiarizing with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report/article. The data, which comprised the teachers’ in-depth answers, were carefully discussed, analyzed, and categorized by both researchers.

The process of analyzes involved several stages based on guidelines from different sources (Aronson, 1995; Braun and Clarke, 2006). First the data was read several times and organized in two documents, one for each research questions. The initial thoughts were noted in a separate column in each document, related to the concepts we considered interesting or significant for the research questions. Then the data set was re-read several times and the initial notes were transformed into specific subthemes, representing the meaning within the data set. Third, main themes were identified consisting of a varying number of identified subthemes. The frequency of occurrence of each theme and subtheme was recorded to establish the strength of each theme (mentioned in the tables). Some of the illustrations from the raw data were extracted to provide evidence of each theme and subtheme. Then the final analysis was related back to the research questions and the previous literature, before writing out the results.

RESULTS

The main aim of the current study was to explore teachers’ perspectives based on an approximately 2-month period of remote education for SAP students. The results are presented based on the research questions: RQ1: How can experiences from remote education be used and integrated when schools reopen?

and RQ2: Did the teachers think school return would be harder or easier for SAP students following remote education during the pandemic?

Use of the Experiences From Remote Education When Schools Reopen

Most of the teachers in this study were concerned with the importance of SAP students attending or partly attending school immediately when schools reopened to motivate and plan for re-entry in close cooperation with the student and home/other services. This topic was incorporated into many of the other themes that emerged from the analyses. Other main themes that emerged from the data were as follows (Table 1 gives an overview of the themes).

Digital/Hybrid Solutions

Digital/hybrid solutions were mentioned by many of the teachers. These comments were about the importance of continuing to use digital solutions/lessons in addition to partial school attendance. Moreover, the teachers and students had learned more about digital solutions and had increased their digital skills to do schoolwork at home. Many of the teachers believed that these experiences could be used when schools reopened, such as using digital lessons when students did not attend school for lessons/days or as part of the adapted plan for the students. Some teachers expressed a need for a more flexible school and the integration of school at home as part of the SAP students’ plans and gradual reintegration. They believed this might reduce stress and engage the SAP student more, which would encourage the student to participate more. The quotations below illustrate this.

“Continue to teach digitally and incorporate and organize this in line with measures to achieve the goal to return to school.”

“These experiences show the possibility to set up assignments for the student to work from home if the student does not manage to attend school.”

“The expertise in the use of digital tools is useful for us teachers because we use the students’ preferred learning channel. They are used to gaining knowledge and orienting themselves on YouTube. When we share subjects in the same arena, the students’ motivation increases.”

TABLE 1 | Experiences that can be used in re-entry to school.

Digital/hybrid solutions (54)	Individual students’ needs	The importance of social interactions
	Individual adaptations and structure (50)	Relations with teacher and school (35)
	Know the students’ challenges/reasons for SAPs better (13)	Importance of peers (9)
	Cooperation and involvement with parents (17)	
	Cooperation with others (12)	

The number in parentheses is the number of teachers answering.

“We may need to consider greater flexibility in everyday school life. It is perhaps enough for many students who struggle in different arenas, academically or socially, and that they can sometimes choose homeschooling. We do not have to push everyone into the same shape. The school must be more flexible.”

Individual Adaptations and Structure

Many teachers expressed a need for individual adaptation and better follow-up for these adaptations. Some of the examples expressed by the teachers were working with tasks in which the students' experienced mastery and for which they were motivated and interested, lowering and setting more realistic requirements, and providing sufficient time and help. Another example was the importance of structuring their school day, lessons, and tasks with concrete working plans and the need for a safe and quiet learning environment. Some of the quotations illustrating these examples of tailored adaptations and structure are as follows:

“Use the feeling of mastery and joy she has felt during this period to motivate her to continue. Make the student aware that this is only for a shorter period until the schools reopen. Set specific goals with the student and do not skip routines.”

“Adapt as much as possible related to the student's interests. Offer help and support at the same time as helping the student to stay motivated (. . . I also think it is important to lower the requirements, as it is more important that something is done, and there is a need for close guidance.”

“It is extremely important to maintain a solid structure in all areas where it is possible. . . .”

In relation to individual adaptations/plans, a few teachers wrote that during remote education they learned more about the student, including the student's challenges, reasons, and strengths and who was involved in the student's schoolwork at home.

“We now see more clearly what the reason is for school refusal.”

“We know more about what the student likes academically, and which lessons the student is most engaged in.”

Some teachers commented on the importance and need for closer cooperation with others for examination and assessment of the student and treatment/help.

“It is clearer that the student is struggling with self-confidence and partial anxiety about something, so when we return to school, I will contact the health nurse (the parents have given permission for this).”

“We need to collaborate even more with other services to get the student to school.”

The need for close home-school cooperation and parental involvement was expressed by some teachers. Some of them experienced closer cooperation with the parents, and parents were more involved during remote education than before, while others experienced the opposite, including difficulties in cooperation and lack of involvement by parents. Moreover, some commented that they now knew more about how much or how little parents followed up and cared for their child's schooling.

“The home is now more included in the schoolwork and has better conditions to follow up. . . .”

“We need a much closer dialog with the home.”

“We had good dialog with the home, both before and during the COVID-19 situation, and we expect this will continue afterward as well. However, it did not help because absenteeism is increasing for this student.”

Relations With Teacher, School, and Peers

Many teachers experienced the importance of working more closely with the student, who needed to be seen more and required more help during the period of remote education. They also expressed the importance of a close relationship between the teacher and the student, such as having good dialog, smiling at the student, and being patient and caring. Moreover, a few teachers expressed the importance of meeting peers and friends for social interactions in school. Some quotations illustrating the importance of relations are as follows:

“. . . We have achieved a good relationship during this period, and therefore it might be easier for her to attend school.”

“The experiences with this student have shown us that it is necessary to have close follow-up/monitoring during regular school and homeschooling.”

“It is good for her to come back to school where she gets closer follow-up/monitoring by the teacher when the going gets tough.”

“The importance of relations *via* physical attendance is more obvious for me.”

“The student might get more motivation to attend school when meeting friends.”

“During the first days at school, it becomes important to work with the social part in the class again. This is probably what the students need most when they return, especially for this girl.”

Finally, some teachers did not answer the question about the use of their experiences, a few teachers wrote that there would be no change or that they would keep working as they did before, and two of the teachers commented that school at home did not work or was not useful for the SAP student. Moreover, many teachers did not know or were insecure about how to use their experiences when schools reopened. A few of them wrote that they did not yet know how to do this:

“Feels totally helpless for me as the subject teacher, but I trust that the system around does what is needed to be done, and I know they do.”

Returning to School—Easier or More Difficult

We also investigated whether teachers believed that the situation with remote education would make it easier or more difficult for SAP students to return when schools reopened. Some of the teachers described their experiences and meanings in detail, while others gave shorter descriptions. Some teachers did not answer, a few teachers believed there would be no difference, and many teachers wrote that they were uncertain or did not know

TABLE 2 | Easier or more difficult to return to school.

Both easier and more difficult (30)	More difficult (106)	Easier (50)
Explained by the variation of students and different individual challenges	Lack of structure and routines at home, attractive and pleasant to stay home, difficult transitions (59)	Miss social parts of school or the school itself (23)
	Lost social interactions and academic learning (23)	Get a new start after the period of homeschooling (16)
	Other (7)	Use of digital solutions at home combined with attending school (9)
	No further explanation (11)	Other (1)
		No further explanation (17)

The number in parentheses is the number of teachers answering.

without explaining why. Moreover, many teachers commented that school return could be *both* more difficult and easier depending on individual students’ reasons for SAPs:

“For students who worry about attending school, it will be harder to return to school. At the same time, all students have experienced the same (homeschooling), and they can meet with a ‘clean slate’ and academically they get a new start, in a way.”

“I think this will vary. Some students with high absenteeism and who have worked well at home may fall into the same pattern as before since physical attendance is a challenge, not an academic challenge. When you have been at home and this is safe, the threshold for returning can be even greater, especially with school refusers. If the student is absent due to lack of motivation, it may be easier to return to school, especially if they miss their peers.”

“This will probably vary based on the reasons for SAPs. I think for many students, it is good to return to more normality. However, they can also feel this transition is hard because they have to meet physically at school.”

“Both. The student probably misses the social part of school; at the same time, the students’ well-being is better at home.”

Most of the teachers wrote that school return could be *either* easier *or* more difficult for the student: half as many teachers stated that return would be easier, than those who thought it would be more difficult (Table 2 gives an overview of the themes).

Easier to Return

Three main themes emerged from the data: (a) missing the social part of school (like to be with peers at school); (b) getting a new start and more structure for their school day; and (c) the use of digital platforms (based on positive experiences during homeschooling, digital solutions could be used in addition to attending school). Some quotations are as follows:

“For the student I described, it will be easier to attend school. She expresses that she misses school, schoolwork, and her peers.”

“What might make it easier is that peers do not know what she has been involved in and not and thus have a more ‘clean slate’ when school opens.”

“I think during homeschooling we realize that it is possible to maintain a certain contact with the student *via* digital channels, also academically when schools reopen. During almost the entire school year, the school has not been able to maintain an academic education for the student because she has not attended school.”

Some teachers did not comment more than “it will be easier for the student,” and one teacher commented about less physical discomfort that might make return easier.

More Difficult to Return

Most of the teachers believed that school return would be more difficult when schools reopened. Some teachers did not state why, but most of them explained this in their own words, and two main themes emerged from the data. The first theme was routines and transition (lack of routines and structure at home, students finding it pleasant and attractive to stay at home, difficult to transition after school breaks, and a wish to still have homeschooling).

“It will probably be harder. The student is on a negative track. To get back to their normal routines might be challenging.”

“I think it will be harder. The student has slipped into a life where night has become day. Social media and playing games control most of the hours she is awake.”

The second theme was social and/or academic barriers; the students lost academic learning and/or social interactions during the period of remote education.

“Acclimatization socially and academically. It is negative to start with many academic holes, negative self-image.”

“I think it might be more difficult for this group of students to rebuild social relationships.”

In addition, a few teachers’ comments were more general and related to difficulties of school return. For example, there may be greater difficulty for students with anxiety and school refusal, a gradual return when schools reopened, and two school “breaks” (caused by the pandemic and the summer vacation) that made a gradual return harder. One of the teachers said:

“Worse for the students with school refusal. Now we know they can have school at home as well; thus, the student might think; why it is necessary to be at school?”

Summary of the Results

Most of the teachers reported experiences they wanted to use when schools reopened for SAP students. The most frequently mentioned experiences were as follows:

1. Use more digital/hybrid solutions (partly attending school and partly attending digitally), especially on days the student is not attending school. This is related to the teachers’ and students’ increased confidence in using digital tools in schoolwork, which provide a better opportunity for more flexible solutions.

2. Increasing individual tailored adaptations based on the students' challenges, strengths, and interests. The need for structure and routines was indicated as important. Moreover, parents should be involved, and good cooperation should be established between the home and school and with other services. This topic is related to teachers who learned more about their students during the remote education period and were now more aware of the specifics of the students' problems.
3. Focusing on relations between teachers and students and between students, for instance, following up or monitoring the student more closely, providing extra time/attention, and including them in the school community, which the teachers were in a better position to do when the SAP students returned to school.

Most of the teachers believed that school return would be harder for SAP students, mainly because return is difficult after a "break," there is a lack of structure/routines during the period of remote education, and students fell behind socially and academically in this period. However, other teachers (half as many as those who believed that return would be harder) believed that school return might be easier because the students missed their peers and school, there was a possibility for a new start, and they knew how to use digital/hybrid solutions when the schools reopened.

DISCUSSION

Teachers were asked how to use their experiences from remote education for SAP students during the pandemic when the schools reopened and whether they believed that school return would be harder or easier for the students. The answers indicated variety in the teachers' experiences.

Digital/Hybrid Solutions When Schools Reopen

One of the most frequently mentioned themes was teachers' greater possibility of using digital/hybrid solutions (i.e., having students partly attend school in person and partly attend digitally), particularly on days the SAP student could not attend school or was not attending for planned reasons. Because digital lessons had to be given from the first day that the schools closed with no national guidelines, variation in teachers' and students' digital skills, practices, and digital learning was expected, which led to a "trial and error" approach (Fjørtoft, 2020). A study of Norwegian teachers found that they mastered digital teaching without any major challenges, but the quality, content, and length of the lessons were unknown (Fjørtoft, 2020). This finding is in line with the current study, which found that the teachers wanted to use more digital or hybrid solutions for SAP students when schools reopened, which might be related to teachers gaining competence and being more confident in digital teaching. Moreover, the findings indicated that digital lessons are a good intervention for SAP students' academic learning, especially

on days the students do not attend school. Some teachers recognized the need for more flexible solutions for SAP students, which might be easier to accommodate after the experiences during the pandemic.

Tailored Interventions When Schools Reopen

The teachers also frequently mentioned the need for individual tailored adaptations based on the students' challenges, strengths, and interests. This is related to previous research; one intervention does not fit all SAP students (e.g., Kearney and Graczyk, 2014; Finning et al., 2018). Some of the teachers stated that they learned more about their SAP students' challenges and reasons for SAPs during this period. This indicates that teachers need to have enough individual time with SAP students to know them better. This might also influence the relations between teachers and students, which is important for the prospect of school return. It is important to support students' learning processes and to connect them to learning, peers, and school, which might be related to school alienation theory (Morinaj et al., 2020; Havik and Ingul, 2021b). According to this theory, students might be alienated from school in general or from specific aspects of school, leading to a process of increased distancing from different aspects of school (Morinaj et al., 2020) and increased attendance problems. Giving teachers more individual time with SAP students, either face to face or online, might counteract this process. Teachers might use an individualized approach and link schoolwork to their students' personal interests (Nuttall and Woods, 2013), which might influence the students' motivation for schoolwork. Some of the teachers in the current study stated that they knew more about the students' challenges and interests after the period of remote education, which might make it easier to adapt and motivate the students when schools reopened.

Some teachers found that SAP students needed more structure, routines, and close monitoring than was possible during the period of remote education. Teachers might be better positioned to influence this when students attend school. The findings from a study of parents of children with school refusal indicate that students need structures and routines during a school day for them to feel that the environment is safe and predictable (Havik et al., 2014). Teachers found that some parents were not able to structure their child's schooldays at home; teachers might have a greater possibility to do this at school (Havik and Ingul, 2021a). However, this requires the teachers to have time to do so. This is related to the fact that many teachers were concerned about difficulties in school return because some of the SAP students had developed bad habits during this period, such as staying awake during the night and in bed during the day and not getting up in the morning (Havik and Ingul, 2021a).

Some teachers wanted to involve the home and parents more and to promote close home-school cooperation when the schools reopened. In addition, a few teachers mentioned the need for coordination and cooperation with other services (e.g., for assessment and/or treatment). Some experienced closer

cooperation with parents and found that some parents were more involved during the period with remote education, while others experienced difficulties in cooperation and a lack of parental involvement. Therefore, the teachers knew more about how these parents followed up and monitored their child's schooling and which parents would be more involved in their child's schooling when the schools reopened. At the same time, previous research indicates that teachers tend to blame the parent/student for problems, and parents tend to blame the school (e.g., Gregory and Purcell, 2014; Havik et al., 2014; Baker and Bishop, 2015; Gren-Landell et al., 2015; Havik and Ingul, 2021a).

Previous research on intervention for SAPs indicates the importance of parental involvement and cooperation within a team, including school–parent cooperation (e.g., Kearney and Graczyk, 2014; Gren-Landell et al., 2015; Finning et al., 2018), and parents emphasize the need for a coordinated team approach (Havik et al., 2014). Moreover, homeschooling is often not recommended as a regular intervention for students with SAPs because some might expect this as a regular intervention and fall into a negative cycle (Thambirajah et al., 2008; Wijetunge and Lakmini, 2011). Therefore, involving and cooperating with parents about the pros and cons of homeschooling is important.

Social Interactions When Schools Reopen

Some teachers stated that social interactions were important upon school return. Some of them believed that school return might be easier because the students missed their peers and school and that interacting with others might be easier upon school return than during the period of remote education. Moreover, the teachers noted the importance of closer monitoring of the students and giving them extra time and attention upon school return. The findings from a study of Norwegian teachers indicated that students mainly performed individual tasks with limited support from teachers during the pandemic (Blikstad-Balas et al., 2022). The study examined students in general but might also be applicable to SAP students. Some of the teachers in the current study learned more about their students' challenges and interests during this period, but some students required more support for schoolwork, which was less available during school at home than regular school when they met the students physically. This might indicate the need for more teacher support for schoolwork.

Teachers in the current study commented on the importance of good relations between teachers and students and between students and for SAP students to be part of the school community. Teacher support is of great importance for SAP students (Wilkins, 2008; Nuttall and Woods, 2013; Havik et al., 2014, 2015; Hendron and Kearney, 2016), and monitoring and supporting all students might be more difficult during digital lessons, particularly for those who do not participate at all (Havik and Ingul, 2021a). Moreover, social isolation might be a consequence of the pandemic for many students

and may be even more difficult for SAP students, who are more vulnerable to social isolation and who had fewer friends at school or conflictual relations before the pandemic (e.g., Heyne et al., 2011; Ingul and Nordahl, 2013; Blöte et al., 2015). Therefore, SAP students might struggle even more upon school return.

School Return

Because most of the teachers believed that school return would be harder for their SAP students, planning for a gradual return was important. Teachers commented on the lack of structure and routines at home and noted that all “breaks” from school make school return more difficult. In addition, some students' social and academic learning decreased during the period of remote education. This might be related to a negative circle in which students fall into patterns of bad habits and become more isolated and fall behind in their schoolwork (Thambirajah et al., 2008; Wijetunge and Lakmini, 2011). A gradual return to school as quickly as possible is often recommended (e.g., Elliott and Place, 2012; Kearney and Graczyk, 2014). Therefore, when schools reopen, a gradual return for some SAP students might be necessary to reconnect and reengage them with school, peers, and teachers. This should be a main goal for all schools when reopening and is particularly important for SAP students. Some of the preparation activities from the Link program might be useful (Brouwer-Borghuis et al., 2019) to help and prepare the student to gradually face school-related fears and to reengage to the school setting (even the Link program is developed for school refusers). Some of the activities might be to encourage the student to participate in a game or to ask a question in class, moreover, to act as an observer in lessons and group discussions, and then gradually increase the amount and type of participation in school activities they experience as fearful. Such activities must be individually adopted to the student, based on what is fearful in school. In addition, the school should after a closure period start to plan a re-entry program for the whole school, which is carefully described by Capurso et al. (2020). They present some important activities: “facilitate classroom discussions about the event, be open to feelings and uncertainty, provide opportunities for students to reconnect socially and with the environment, shift attention from the stressful memory to an awareness of coping and present facts and provide information gradually increasing the amount of time spent there” (Capurso et al., 2020, pp. 66–68). One example is to reconnect the student to their teachers and peers, which is important after long-term absence (for any reasons). These activities might be helpful for all students, however, in particular for students who are fearful for different school activities. Moreover, Kearney and Childs (2021) recommend a framework serving as a roadmap. This is a multi-tiered systems of support (MTSS) model addressing four main domains of functioning (adjustment, traumatic stress, academic status, health and safety) across three tiers of support (universal, targeted, and intensive intervention). For adjustment, they mention routines, social-emotional learning components and classroom management at universal interventions for all students (Kearney and Childs, 2021). This is potential an

important model when reintegrating students with SAP after prolonged absence.

Most of the teachers believed that attending school was important for the students, and some even explained that they planned the transition to school in advance with additional tools that might be advantageous.

Some of the teachers who thought that school return might be easier stated that this might be because their student missed their peers and school; moreover, their students' opportunity for a new start. Social interactions in school are important for all students; therefore, a concern about school at home is the lack of socialization for students who stay at home (e.g., Ray, 2013). However, students with positive social interactions before and during school closure might be inspired by this and want to return to school to be with their peers and teachers. It might also be easier to return if students experience a safe school climate, which is important for SAP students in general (Havik et al., 2014; Hendron and Kearney, 2016), including safe relations, being connected to school, and experiencing a safe learning environment. Some of the teachers noted the importance of closer relations with the SAP student and for students to meet their peers in school.

CONCLUSION

Homeschooling is controversial for all students, including students with SAPs. The findings from the current study show a variety in teachers' experiences of remote education during the pandemic, however, most teachers believed that school return would be more difficult for SAP students. The teachers' experiences might be helpful when planning school return after a prolonged period of absence for any reasons. Interventions for SAP students might be more varied and flexible by using digital solutions to a greater extent, either as part of the students' plan for gradual return and/or when students do not attend school. The enhanced flexibility and the possibility of varying interventions for SAP students seem to be related to teachers' increased experiences, skills, and confidence in using digital lessons and digital tools. Furthermore, the teachers were more aware of the importance of tailored adaptations based on the students' challenges, strengths, and interests in addition to the need to structure and closely monitoring of the students. Some teachers mentioned the importance of involving the home and parents and promoting close home-school cooperation. Another main theme was close relations and social interactions between students and teachers and between peers when schools reopened because the students needed to receive more help than teachers could provide during the remote education period.

REFERENCES

- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Absenteeism in the first decade of education forecasts civic engagement and educational and socioeconomic prospects in young adulthood. *J. Youth Adolesc.* 49, 1835–1848. doi: 10.1007/s10964-020-01272-4
- Aronson, J. (1995). A pragmatic view of thematic analysis. *Qual. Rep.* 2, 1–3.

Limitations of the Study and Future Research

This study was conducted when all schools had been closed for only 2 months. Experiences might change after a longer period of closure because the pandemic is still a concern for society and schools. Therefore, a study after a longer school closure could provide information on other experiences. Teachers' experiences after schools' reopening should also be explored, such as how many of these ideas were used, what worked or did not work and why.

A limitation of this study is that these experiences are based only on teachers' perspectives because of the lack of previous research on homeschooling. However, other perspectives, such as the perspectives of SAP students, should be investigated.

Remote education during the pandemic differs from regular home education for a few students with SAPs. During the pandemic, remote education at home was provided to all students and was not motivated by parents' or students' individual problems. Therefore, a comparison of the current results with traditional homeschooling might be inaccurate.

Another limitation is that this study focused on SAPs in general, even though several types of SAPs exist. It is possible that differentiating between types would have yielded different patterns and experiences, and there might be different effects for different types of SAPs. This might impact how teachers use their experiences for different students and whether school return is harder or easier.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

AUTHOR CONTRIBUTIONS

TH and JI wrote the first draft of the manuscript and contributed to the feedback and comments in the whole process. TH analyzed the data. Both authors read and approved the final manuscript.

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- Baker, M., and Bishop, F. L. (2015). Out of school: a phenomenological exploration of extended non-attendance. *Educ. Psychol. Pract.* 31, 354–368.
- Blagg, N. R., and Yule, W. (1984). The behavioural treatment of school refusal—a comparative study. *Behav. Res. Ther.* 22, 119–127. doi: 10.1016/0005-7967(84)90100-1
- Blikstad-Balas, M., Roe, A., Dalland, C. P., and Klette, K. (2022). "Homeschooling in Norway during the pandemic-digital learning with unequal access to

- qualified help at home and unequal learning opportunities provided by the school,” in *During a Pandemic Primary and Secondary Education During COVID-19. Disruptions to Educational Opportunity*, ed. F. M. Reimers (Cham, Switzerland: Springer), 177–201.
- Blöte, A. W., Miers, A. C., Heyne, D. A., and Westenberg, P. M. (2015). “Social anxiety and the school environment of adolescents,” in *Social Anxiety and Phobia in Adolescents. Development, Manifestation and Intervention Strategies*, eds K. Ranta, A. L. Greca, L. J. Garcia-Lopez, and M. Marttunen (Cham: Springer), 151–181.
- Bozkurt, A., Jung, I., Xiao, J., Vladimircsi, V., Schuwer, R., Egorov, G., et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: navigating in a time of uncertainty and crisis. *Asian J. Distance Educ.* 15, 1–126. doi: 10.5281/zenodo.3878572
- Brand, C., and O’Conner, L. (2004). School refusal: it takes a team. *Child. Sch.* 26, 54–64. doi: 10.1093/cs/26.1.54
- Braun, V., and Clarke, V. (2006). Using thematic analysis in psychology. *Qual. Res. Psychol.* 3, 77–101. doi: 10.1191/1478088706qp063oa
- Braun, V., and Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qual. Res. Sport Exerc. Health* 11, 589–597. doi: 10.1080/2159676X.2019.1628806
- Brouwer-Borghuis, M. L., Heyne, D., Sauter, F. M., and Scholte, R. H. J. (2019). The link: an alternative educational program in the Netherlands to reengage school-refusing adolescents with schooling. *Cogn. Behav. Pract.* 26, 75–91. doi: 10.1016/j.cbpra.2018.08.001
- Capurso, M., Dennis, J. L., Salmi, L. P., Parrino, C., and Mazzeschi, C. (2020). Empowering Children Through School Re-Entry Activities After the COVID-19 Pandemic. *Contin. Educat.* 1, 64–82. doi: 10.5334/cie.17
- Carroll, H. C. M. (1996). “The role of the educational psychologist in dealing with pupil absenteeism,” in *Unwillingly to School*, eds I. Berg and J. P. Nursten (London: Gaskell), 228–241.
- Dalziel, D., and Henthorne, K. (2005). *Parents’/Carers’ Attitudes Towards School Attendance*. London: DfES Publications.
- de Carvalho, E., and Skipper, Y. (2019). “We’re not just sat at home in our pyjamas!”: a thematic analysis of the social lives of home educated adolescents in the UK. *Eur. J. Psychol. Educ.* 34, 501–516. doi: 10.1007/s10212-018-0398-5
- Egger, H. L., Costello, J. E., and Angold, A. (2003). School refusal and psychiatric disorders: a community study. *J. Am. Acad. Child Adolesc. Psychiatry* 42, 797–807. doi: 10.1097/01.chi.0000046865.56865.79
- Ek, H., and Eriksson, R. (2013). Psychological factors behind truancy, school phobia, and school refusal: a literature study. *Child Fam. Behav. Ther.* 35, 228–248. doi: 10.1080/07317107.2013.818899
- Elliott, J., and Place, M. (2012). *Children in Difficulty: A Guide to Understanding and Helping*. London: Routledge.
- Engzell, P., Frey, A., and Verhagen, M. D. (2020). *Learning inequality during the COVID-19 pandemic*. SocArXiv ve4z7. Charlottesville: Center for Open Science, doi: 10.31219/osf.io/ve4z7
- Fensham-Smith, A. J. (2021). Invisible pedagogies in home education: freedom, power and control. *J. Pedagogy* 12, 5–27. doi: 10.2478/jped-2021-0001
- Finning, K., Harvey, K., Moore, D., Ford, T., Davis, B., and Waite, P. (2018). Secondary school educational practitioners’ experiences of school attendance problems and interventions to address them: a qualitative study. *Emot. Behav. Diffic.* 23, 213–225. doi: 10.1080/13632752.2017.1414442
- Fjortoft, S. O. (2020). “Teaching in the time of corona crisis: a study of Norwegian teachers’ transition into digital teaching,” in *The Future of Education—10th International Conference (Virtual Edition)*. (Pixel), (Trondheim: SINTEF), 595–601.
- Fortune-Wood, M. (2007). *Can’t Go Won’t Go: An Alternative Approach to School Refusal*. Gwynedd: Cinnamon Press.
- Gregory, I. R., and Purcell, A. (2014). Extended school non-attenders’ views: developing best practice. *Educ. Psychol. Pract.* 30, 37–50. doi: 10.1080/02667363.2013.869489
- Gren-Landell, M., Ekerfelt Allvin, C., Bradley, M., Andersson, M., and Andersson, G. (2015). Teachers’ views on risk factors for problematic school absenteeism in Swedish primary school students. *Educ. Psychol. Pract.* 31, 412–423. doi: 10.1080/02667363.2015.1086726
- Hancock, K. J., Shepherd, C., Lawrence, D., and Zubrick, S. (2013). *Student attendance and educational outcomes: every day counts*. Perth: Telethon Institute for Child Health Research.
- Havik, T., Bru, E., and Ertesvåg, S. K. (2014). Parental perspectives of the role of school factors in school refusal. *Emot. Behav. Diffic.* 19, 131–153. doi: 10.1080/13632752.2013.816199
- Havik, T., Bru, E., and Ertesvåg, S. K. (2015). School factors associated with school refusal- and truancy-related reasons for school non-attendance. *Soc. Psychol. Educ.* 18, 221–240. doi: 10.1007/s11218-015-9293-y
- Havik, T., and Ingul, J. M. (2021a). Does homeschooling fit students with school attendance problems? Exploring teachers’ experiences during COVID-19. *Front. Educ.* 6:720014. doi: 10.3389/educ.2021.720014
- Havik, T., and Ingul, J. M. (2021b). How to understand school refusal. *Front. Educ.* 6:715177. doi: 10.3389/educ.2021.715177
- Hendron, M., and Kearney, C. A. (2016). School climate and student absenteeism and internalizing and externalizing behavioral problems. *Child. Sch.* 38, 109–116. doi: 10.1093/cs/cdw009
- Heyne, D. (2019). Developments in classification, identification, and intervention for school refusal and other attendance problems: introduction to the special series. *Cogn. Behav. Pract.* 26, 1–7. doi: 10.1016/j.cbpra.2018.12.003
- Heyne, D., Gren-Landell, M., Melvin, G., and Gentle-Genitty, C. (2019). Differentiation between school attendance problems: why and how? *Cogn. Behav. Pract.* 26, 8–34. doi: 10.1016/j.cbpra.2018.03.006
- Heyne, D., Sauter, F. M., Van Widenfelt, B. M., Vermeiren, R., and Westenberg, P. M. (2011). School refusal and anxiety in adolescence: non-randomized trial of a developmentally sensitive cognitive behavioral therapy. *J. Anxiety Disord.* 25, 870–878. doi: 10.1016/j.janxdis.2011.04.006
- Heyne, D. A., and Sauter, F. M. (2013). “School refusal,” in *The Wiley Blackwell Handbook of the Treatment of Childhood and Adolescent Anxiety*, eds C. Essau and T. H. Ollendick (Chichester: Wiley), 471–517.
- Heyne, D. A., Sauter, F. M., and Maynard, B. R. (2015). “Moderators and mediators of treatments for youth with school refusal or truancy,” in *Moderators and Mediators of Youth Treatment Outcomes*, eds M. Maric, P. J. M. Prins, and T. H. Ollendick (Oxford: Oxford University Press), 230–266.
- Horowitz, J. M. (2020). *Lower-income parents most concerned about their children falling behind amid COVID-19 school closures*. Washington, DC: Pew Research Center.
- Ingul, J. M., Havik, T., and Heyne, D. (2019). Emerging school refusal: a school-based framework for identifying early signs and risk factors. *Cogn. Behav. Pract.* 26, 46–62. doi: 10.1016/j.cbpra.2018.03.005
- Ingul, J. M., and Nordahl, H. M. (2013). Anxiety as a risk factor for school absenteeism: what differentiates anxious school attenders from non-attenders? *Ann. Gen. Psychiatry* 12:25. doi: 10.1186/1744-859X-12-25
- Kearney, C. (2008). School absenteeism and school refusal behavior in youth: a contemporary review. *Clin. Psychol. Rev.* 28, 451–471. doi: 10.1016/j.cpr.2007.07.012
- Kearney, C. A. (2016). *Managing School Absenteeism at Multiple Tiers: An Evidence-Based and Practical Guide for Professionals*. Oxford: Oxford University Press.
- Kearney, C. A., and Childs, J. (2021). A multi-tiered systems of support blueprint for re-opening schools following COVID-19 shutdown. *Child. Youth Serv. Rev.* 122:105919. doi: 10.1016/j.childyouth.2020.105919
- Kearney, C. A., and Graczyk, P. (2014). A response to intervention model to promote school attendance and decrease school absenteeism. *Child Youth Care Forum* 43, 1–25. doi: 10.1007/s10566-013-9222-1
- Kearney, C. A., and Graczyk, P. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Keppens, G., Spruyt, B., and Dockx, J. (2019). Measuring school absenteeism: administrative attendance data collected by schools differ from self-reports in systematic ways. *Front. Psychol.* 10:2623. doi: 10.3389/fpsyg.2019.02623
- King, N., Tonge, B. J., Heyne, D., and Ollendick, T. H. (2000). Research on the cognitive-behavioral treatment of school refusal: a review and recommendations. *Clin. Psychol. Rev.* 20, 495–507. doi: 10.1016/s0272-7358(99)00039-2
- Knox, P. (1989). Home-based education: an alternative approach to ‘school phobia’. *Educ. Rev.* 41, 143–151. doi: 10.1080/0013191890410206
- Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., and Liu, J. (2020). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educ. Res.* 49, 549–565. doi: 10.3102/0013189x20965918

- Lambert, S., and O'Halloran, E. (2008). Deductive thematic analysis of a female paedophilia website. *Psychiatry Psychol. Law* 15, 284–300. doi: 10.1080/13218710802014469
- Lubienski, C. (2000). Whither the common good? A critique of home schooling. *Peabody J. Educ.* 75, 207–232.
- Maeda, N., and Heyne, D. (2019). Rapid return for school refusal: a school-based approach applied with Japanese adolescents. *Front. Psychol.* 10:2862. doi: 10.3389/fpsyg.2019.02862
- Mayberry, M., Knowles, J. G., Ray, B., and Marlow, S. (1995). *Home Schooling: Parents as Educators*. Thousand Oaks: Corwin.
- McShane, G., Walter, G., and Rey, J. M. (2004). Functional outcome of adolescents with 'school refusal'. *Clin. Child Psychol. Psychiatry* 9, 53–60. doi: 10.1177/1359104504039172
- Medlin, R. (2000). Home schooling and the question of socialization. *Peabody J. Educ.* 75, 107–123.
- Melvin, G. A., and Tonge, B. J. (2012). "School refusal," in *Handbook of Evidence-Based Practice in Clinical Psychology: Child and Adolescent Disorders*, eds P. Sturmey and M. Hersen (Hoboken: John Wiley & Sons, Inc), 559–574.
- Mitchell, E. (2021). Why English parents choose home education – a study. *Educ. 3-13* 49, 545–557. doi: 10.1080/03004279.2020.1742185
- Monk, D. (2004). Problematising home education: challenging 'parental rights' and 'socialisation'. *Leg. Stud.* 24, 568–598. doi: 10.1111/j.1748-121x.2004.tb00263.x
- Morinaj, J., Hadjar, A., and Hascher, T. (2020). School alienation and academic achievement in Switzerland and Luxembourg: a longitudinal perspective. *Soc. Psychol. Educ.* 23, 279–314. doi: 10.1007/s11218-019-09540-3
- Moustakas, C. (1994). *Phenomenological Research Methods*. Thousand Oaks: Sage.
- NCES (2009). *1.5 million homeschooled students in the United States in 2007. Issue Brief from Institute of Education Sciences, U.S. Department of Education (NCES 2009-030)*. Washington, D.C: NCES.
- Nelson, J. (2014). *Home education: exploring the views of parents, children and young people*. Ph.D. thesis. Birmingham: University of Birmingham.
- Neuman, A., and Guterman, O. (2017). What are we educating towards? Socialization, acculturation, and individualization as reflected in home education. *Educ. Stud.* 43, 265–281. doi: 10.1080/03055698.2016.1273763
- Nuttall, C., and Woods, K. (2013). Effective intervention for school refusal behaviour. *Educ. Psychol. Pract.* 29, 347–366. doi: 10.1080/02667363.2013.846848
- Ray, B. D. (2013). Homeschooling associated with beneficial learner and societal outcomes but educators do not promote it. *Peabody J. Educ.* 88, 324–341. doi: 10.1080/0161956x.2013.798508
- Romanowski, M. H. (2006). Revisiting the common myths about homeschooling. *Clear. House* 79, 125–129. doi: 10.3200/tchs.79.3.125-129
- Rothi, D., and Leavey, G. (2006). Child and adolescent mental health services (CAMHS) and schools: inter-agency collaboration and communication. *J. Ment. Health Train. Educ. Pract.* 1, 32–40. doi: 10.1108/17556228200600022
- SBSS (2019). *Pupils in Primary School*. Oslo: Statistics Norway.
- Simon, O., Nylund-Gibson, K., Gottfried, M., and Mireles-Rios, R. (2020). Elementary absenteeism over time: a latent class growth analysis predicting fifth and eighth grade outcomes. *Learn. Individ. Differ.* 78:101822. doi: 10.1016/j.lindif.2020.101822
- Stroobant, E. (2008). *Dancing to the music of your heart: home schooling the school resistant child. A constructivist account of school refusal*. Ph.D. thesis. Auckland: The University of Auckland.
- Stroobant, E., and Jones, A. (2006). School refuser child identities. *Discourse Stud. Cult. Politics Educ.* 27, 209–223. doi: 10.1080/01596300600676169
- Thambirajah, M. S., Granduson, K. J., and De-Hayes, L. (2008). *Understanding School Refusal. A Handbook for Professionals in Education, Health and Social Care*. London: Jessica Kingsley.
- Wijetunge, G. S., and Lakmini, W. D. (2011). School refusal in children and adolescents. *Sri Lanka J. Child Health* 40, 128–131. doi: 10.4038/sljch.v40i3.3511
- Wilkins, J. (2008). School characteristics that influence student attendance: experiences of students in a school avoidance program. *High Sch. J.* 91, 12–24. doi: 10.1353/hsj.2008.0005
- Wray, A., and Thomas, A. (2013). School refusal and home education. *J. Unschooling Altern. Learn.* 7, 64–85.

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Unlearning school attendance and its problems: Moving from historical categories to postmodern dimensions

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School attendance and its problems have been a focus of myriad stakeholders for over a century, which has led both to important advancements in this area as well as compartmentalized categorical approaches to explain at least part of the vast ecology of these issues. Recent seismic events and changes, however, have provided a unique opportunity to unlearn calcified notions of school attendance and its problems and to consider more inclusive paradigms. This article focuses on several categorical approaches that have been historically a focus of research, health-based clinical work, and educational and social policy in this area: defining school attendance problems, demarcating school attendance problems, subtyping school attendance problems, risk and protective factors for school attendance/problems, interventions for school attendance problems, and school completion. For each area, alternative dimensional approaches are discussed that are emerging from different disciplines and that may provide additional flexibility and comprehensiveness for avenues of endeavor relevant to a postmodern era. The article concludes with a call to abandon historical, discipline-specific, categorical silos in favor of a spectrum of postmodern, multidisciplinary systemic-analytic collaborations and shared alliances to better conceptualize and manage the full ecology of school attendance and its problems.

KEYWORDS

school attendance, school absenteeism, chronic absenteeism, truancy, unlearning, categories, dimensions

Introduction

School attendance and school attendance problems have been a focus of research, health-based clinical work, and educational and social policy for over a century (e.g., Kline, 1897; Klein et al., 2022). Such extended historical focus is due in part to the fact that school attendance is associated with myriad positive effects

in key developmental domains (e.g., academic, social) for children and adolescents and that school attendance problems (absenteeism) are associated with myriad negative effects in these and other long-term (e.g., economic and health) domains (McFarland et al., 2018; Ansari et al., 2020). Such extended historical focus is also due in part to the fact that school attendance problems have long been recognized as highly complex and seemingly intractable phenomena (e.g., Broadwin, 1932; Eaton, 1979; Lenhoff and Pogodzinski, 2018).

Professionals from many different disciplines and perspectives have thus historically addressed school attendance/problems (SA/Ps) and adopted various frameworks to conceptualize these multifaceted issues. Key disciplines and perspectives include those from criminal justice, economics, education, medicine, policy, psychology, and social work, among many others. Key frameworks include those from *systemic* approaches, which tend to focus on overarching contexts and structural concerns, as well as *analytic* approaches, which tend to focus on specific contexts and individual concerns (Kearney, 2021). An important consequence of these varied approaches, however, has been gravitation toward compartmentalized efforts to try to best conceptualize and manage at least part of the vast ecology of SA/Ps. Such compartmentalization has been manifested most clearly, historically, by the use of discrete and sometimes calcified categorical styles regarding the conceptualization and management of SA/Ps (Kearney et al., 2019a).

Categorical approaches to conceptualizing and managing phenomena are often characterized by defined groups or entities that are distinguished from one another in specific, static, and qualitatively different ways (Coghill and Sonuga-Barke, 2012). These entities are ideally represented by clearly separate features and mechanisms (Owen, 2014). Natural scientific disciplines such as zoology often rely on well-defined categorical systems. Categorical approaches can have the advantages of clearly identifying the presence or absence of a phenomenon, communicating specific features of different subtypes, providing reliable means for potential evaluative measures, and facilitating practical decision-making processes (Esterberg and Compton, 2009). Categorical approaches can struggle to account for important sources of variance, however, and may apply less well to nebulous, heterogeneous, and asymmetrical phenomena (Hudziak et al., 2007). As mentioned, categorical systems have been historically applied in sundry though limited ways to help understand at least part of the vast ecology of SA/Ps, as is described in later sections.

Numerous seismic shifts in key human and societal elements and processes in recent years provide a unique opportunity to consider new paradigms with respect to SA/Ps. Health crises and advances in technology have compelled individuals and educational entities to communicate and share information differently, and across multiple settings (Huck and Zhang, 2021). In addition, changes in the nature and timeline of

child education worldwide, away from memorization and standardization and toward a more personalized skills-based approach, even into emerging adulthood, allow for greater flexibility with respect to school curricula and school completion decisions (World Economic Forum, 2020). Furthermore, a renewed and intense focus on racial equity within various educational institutions is leading to better recognition of the fact that historical and biased school-based processes such as exclusionary discipline (e.g., suspension, expulsion, and arrests) as well as broader community processes outside of school contribute to SA/Ps and that such processes can actually be specific targets for intervention (Childs and Grooms, 2018). As various stakeholders navigate and adapt to these dynamic and fluid evolutionary changes, the potential exists for exponentially expanding the synthesis of systemic and analytic approaches to SA/Ps and implementing more inclusive conceptualization and management strategies for this complex issue. In essence, a special opportunity has arisen to unlearn traditional notions surrounding school attendance and school absenteeism.

One potential avenue for this unlearning process is greater consideration of dimensional approaches with respect to SA/Ps. In contrast to categorical approaches, dimensional approaches to conceptualizing and managing phenomena are often characterized by components on spectra or continua (Kotov et al., 2017). These components are typically general, fluid, and quantitatively different from one another (De Boeck et al., 2005). Social scientific disciplines such as sociology often rely on dimensional systems. Dimensional approaches can have the advantages of introducing flexibility to the notion of presence or absence of a phenomenon, communicating a fuller range of essential information, providing valid means to generate evaluative profiles, and allowing greater stakeholder input into decision-making processes (Narrow and Kuhl, 2011). Dimensional approaches can have drawbacks, however, that could include an excessive number of components on a given spectrum or lack of consensus regarding the components across different theoretical perspectives (Widakowich et al., 2012). Still, the malleability of dimensional approaches may be appealing for an unlearning process regarding SA/Ps, phenomena that differ tremendously in scope and nature across jurisdictions and geographical regions (Kearney et al., 2019b).

Dimensional systems may be a particularly useful mechanism for unlearning, conceptualizing, and managing SA/Ps in a postmodern era that will continue to be marked by the seismic and rapid changes noted earlier. The purpose of this article is to outline and critique various historical categorical approaches to conceptualizing and managing SA/Ps and to provide alternative dimensional approaches that are emerging from different disciplines and that can be used to better inform categorical approaches. Categorical approaches include those more narrow (e.g., subtypes) as well as those more broad (e.g., school completion) in nature. Areas of emphasis include defining school attendance problems, demarcating school

attendance problems, subtyping school attendance problems, risk and protective factors for school attendance/problems, interventions for school attendance problems, and school completion. The article concludes with a call to abandon historical, discipline-specific, categorical silos in favor of a spectrum of postmodern, multidisciplinary systemic-analytic collaborations, and shared alliances.

Defining school attendance problems

Historical categories

Perhaps the most fundamental historical *categorical* distinction with respect to SA/Ps is definition *via* a student's physical presence or absence in a particular physical school building on a particular day (Gentle-Genitty et al., 2020). This dichotomous metric is itself commonly used to differentiate categories such as non-problematic versus problematic absenteeism and to differentiate categories such as problematic absenteeism versus chronic absenteeism (see also next section). This metric is also commonly used in many countries to inform educational policy, early warning systems, and school-based interventions with respect to non-attendance, and is commonly used by researchers with respect to investigations of risk factors, developmental trajectories, and clinical interventions regarding school absenteeism (e.g., Karlberg et al., 2022). Physical presence or absence in a school building as a metric has several advantages such as feasibility, practicality, comparability across settings, amenability to a centralized data collection system, and applicability for assessment/evaluation and treatment/intervention purposes (Moodley et al., 2020).

Researchers and other stakeholders, however, recognize important limitations of this traditional definitional metric. School attendance data suffer from problems of reliability, construct validity, and integrity (Kearney and Childs, 2022). The data often differ across informant sources, ignore the many multifaceted aspects of school non-attendance, and are easily subject to corruption from caregivers and schools (Keppens et al., 2019; Gentle-Genitty et al., 2020). Overreliance on presence/absence from school also neglects the fact that many students worldwide now receive education in hybrid, home-based, and virtual formats where attendance is difficult to track (e.g., Childs et al., 2022; Havik and Ingul, 2022). In addition, presence/absence from school has been used historically by many educational and other entities for punitive purposes, particularly for minoritized students, by excluding from school those with other challenges (e.g., behavioral, academic; Mireles-Rios et al., 2020), by applying legal and other sanctions for absenteeism disproportionately to vulnerable populations (Conry and Richards, 2018), and by penalizing students who are late to school or who miss school for reasons outside of

their control (Chang, 2018). Presence/absence from school is also commonly framed as part of a deficit narrative that places substantial burden and blame on families to remediate school attendance problems even in cases where the problems are beyond their control (Martin et al., 2020; Kearney et al., 2022).

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era would increase focus on (1) broader and more flexible definitions of SA/Ps as well as (2) a continuum of school attendance problems based on degree of severity. With respect to *definition*, for example, Patrick and Chambers (2020) redefined SA/Ps as time on task, participation or evidence of student work, and competency-based attainment with demonstrations of knowledge and skill-building. Kearney (2021) redefined SA/Ps as involvement in teaching and learning practices that augments or subverts the prospect of school completion. With respect to a *continuum of school attendance problems based on degree of severity*, key components could include not only full-day absences but also premature departures from a school campus, partial attendance, skipped classes, tardiness, morning misbehaviors designed to miss school, school-based distress that interferes with social and academic performance, and other school attendance problems (Kearney, 2019). Related spectra can include collecting attendance data at multiple points during the day (and year) and reconfiguring definitions of attendance, especially for virtual learning, with respect to log-ins, number of hours per day, student-teacher interactions, completed assignments and timelines, and measures of achievement, competency, and mastery of skills and knowledge (National Forum on Education Statistics, 2021).

These reconceptualizations move away from an historical emphasis on physical location and toward dimensions of school engagement such as behavioral, cognitive, and emotional investment in academic achievement that could be informed by impairment (next section; Estévez et al., 2021). These reconceptualizations also allow for greater emphasis on a spectrum of personalized instructional formats and techniques that are part of many new educational experiences outside of a physical building. This spectrum can include its own blend of dimensions with respect to (1) in person; hybrid/lab-based; virtual learning; (2) synchronous and asynchronous learning; (3) service/experiential-based and community-based learning; and (4) educational advances related to new learning paradigms that could include, for example, artificial intelligence or augmented reality (Maas and Hughes, 2020). In addition, dimensional reconceptualizations for defining SA/Ps allow school personnel, health-based practitioners, researchers, and other stakeholders to leverage opportunities to glean valuable nuanced information about patterns of student non-attendance on an individual and grander scale (Mahoney, 2015;

Warne et al., 2020). The reconceptualizations also facilitate expanded growth metrics (e.g., learning environment climate and quality; academic achievement) for school accountability purposes and help synthesize systemic and analytic perspectives to SA/Ps (Bauer et al., 2018; Kearney et al., 2019a).

Demarcating school attendance problems

Historical categories

Another fundamental historical *categorical* distinction with respect to SA/Ps involves the use of demarcations, often based on frequency of physical school absence, to define or differentiate levels of absenteeism. Most relevant to this section is use of a cutoff (e.g., percentage of days absent) to demarcate a qualitative difference between (1) non-problematic and initially problematic absenteeism as well as (2) initially problematic absenteeism and chronic absenteeism. Those from an analytic perspective often emphasize the former distinction, especially when deciding whether a particular case of absenteeism has become clinically significant and in need of treatment (Maynard et al., 2018). Researchers from an analytic perspective of SA/Ps often utilize school attendance (physical presence/absence) as a primary outcome variable as well (Heyne et al., 2020). Those from a systemic perspective often emphasize the latter distinction, most commonly defining chronic absenteeism as 10% of school days missed (U.S. Department of Education Office of Civil Rights, 2016). In addition, various jurisdictions use specific numbers of days missed from school to delineate illicit truancy and thus some administrative or legal sanction or other response (Conry and Richards, 2018). Many educational agencies utilize this cutoff as well to meet requirements for accountability expectations (Jordan and Miller, 2017).

Problems with demarcations based on frequency of physical school absence intersect, of course, with the reliability, construct validity, and integrity problems noted earlier with respect to school attendance data. More specific to demarcations is the fact that little if any empirical data support a particular cutoff (Kirksey, 2019). In fact, little consensus is evident across analytic and systemic research studies with respect to what constitutes a clear distinction to determine problematic absenteeism and to determine chronic absenteeism. Machine learning approaches for large data sets instead reveal a wide range of demographic, family, academic, symptom, and other variables predictive of different levels of absenteeism severity (e.g., Skedgell and Kearney, 2018; Fornander and Kearney, 2019; Bacon and Kearney, 2020). In addition, cutoffs tend to minimize key differences between student groups and ignore more subtle differences; a dominant student group at a school may be largely present (e.g., 95%) whereas a minoritized group may be less present (e.g., 70%), but the overall school attendance

rate (90%) could be considered non-problematic and not in need of intervention (Gee, 2018). Other nuanced variables are minimized as well, particularly circumstances beyond a family's control such as transportation vulnerability and lack of safe routes to and within schools, as well as situations where school absence is an *adaptive* choice for a student (e.g., to support a family economically) (Birioukov, 2016; Pyne et al., 2021). In related fashion, cutoffs are typically used for punitive purposes and are not generally linked to specific restorative interventions, particularly for vulnerable students who must overcome multiple daily challenges simply to maintain semi-regular attendance (Hutt, 2018). In addition, students below a particular cutoff but who are still struggling academically or otherwise may be neglected altogether. Demarcations also fail to consider the fact that many students miss school but still function well academically due to other support systems (Henderson and Fantuzzo, 2022).

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era would focus on a more well-informed approach for a given case of school absenteeism that considers relevant contextual factors. One avenue to pursue in this regard involves degree of *functional impairment*. Functional impairment refers to “ways in which symptoms interfere with and reduce adequate performance of important and desired aspects of a child's life” (Rapee et al., 2012, p. 455). School attendance problems (“symptoms” in this case) can cause different levels of impairment for students that may be unrelated to absenteeism severity. Kearney (2022) outlined recommendations for functional impairment guidelines for this population that emphasized school, social, and family domains of functioning. With respect to the *school domain*, impairment from school attendance problems can depend on the timing of absences (potentially more impairing earlier in a school year, during critical evaluation periods, or during a particular grade), interference in academic competence (potentially more impairing if grades or academic skills are significantly affected), and administrative or legal action that impedes future attendance (potentially more impairing if a school delays academic/transportation assistance or uses exclusionary discipline for absenteeism). With respect to the *social domain*, impairment from school attendance problems can depend on interference with social competence (potentially more impairing if communication or emotional regulation skills erode), interference with interpersonal relationships (potentially more impairing if peer or teacher avoidance occurs), and enhanced risk of harm to others (potentially more impairing if greater antisocial or risky behavior occurs). With respect to the *family domain*, impairment from school attendance problems can depend on interference with daily functioning (potentially more impairing if transportation and daily routines are

disrupted), significant maladaptive changes in family dynamics (potentially more impairing if greater conflict occurs), and substantial cost to family members (potentially more impairing if caregivers must miss work or pay for child care or sanctions).

Researchers have generally linked variables such as timing of absences, family environment (e.g., conflict), and exclusionary discipline to greater impairment for students with school attendance problems (Olson, 2014; Mallett, 2016; Fornander and Kearney, 2019). More specifically, González and colleagues (González et al., 2019b) found that various aspects of functioning (school performance, peer relationships, family relationships) were inversely related to several different kinds of school attendance problems. In addition, González and colleagues (González et al., 2019a) examined different profiles of students, finding that students with fewer school attendance problems scored higher in school performance, peer relationships, family relationships, and house duties/self-care than students with greater school attendance problems. A key advantage of utilizing dimensions of impairment is that assumptions regarding the *cause* of impairment are minimized or eschewed altogether, thus helping to negate a deficit narrative by considering the possibility that, in many cases, external forces contribute substantially to school absenteeism (Childs and Scanlon, 2022). In addition, use of dimensions of impairment requires a greater focus on *attendance* rather than on absenteeism as well as better recognition of the fact that many students who face considerable challenges getting to school are resilient and still function well (Gentle-Genitty et al., 2020). The practice of punishing children for attending school may thus be unlearned in a postmodern era.

Subtyping school attendance problems

Historical categories

A related fundamental historical *categorical* distinction with respect to SA/Ps involves subtypes of school attendance problems generated from both systemic and analytic perspectives. A common goal of developing subtypes is to explicate different causes of, or reasons for, school attendance problems, ideally for appropriate intervention responses. From a systemic perspective, broad categories of school absence have been proposed with respect to disciplinary action, family activity, family emergency/bereavement, illness, legal/judicial requirement, non-instructional activity, religious observation, skipping school, student employment, unavailable transportation, and unknown reasons (National Forum on Educational Statistics, 2018). Another commonly used category of school absence involves excused/unexcused absences. This dichotomy (also sometimes noted as involuntary/voluntary, authorized/unauthorized, or unavoidable/avoidable) generally

refers to (a) “legitimate” instances of school non-attendance (e.g., illness, weather, parent consent) not necessarily under child/family member control and (b) “illegitimate” instances of school non-attendance (e.g., unlawful, willful absences) that are not administratively excused (Birioukov, 2016; Rocque et al., 2017; Lee et al., 2020). Note that substantial variation exists in how this dichotomy is defined.

From an analytic perspective, numerous distinctions for SA/Ps based on clinical subtypes and psychiatric diagnoses have been developed historically (e.g., Coolidge et al., 1957; Finning et al., 2022). Common clinical subtypes for this population include school refusal (neurotic or anxiety-based absenteeism), truancy (delinquent-based absenteeism), school withdrawal (caregiver-instigated absenteeism), and school exclusion (school-instigated absenteeism), among many others (e.g., Havik et al., 2015). Common psychiatric diagnoses used to categorize different types of school attendance problems include phobic (fearfulness), mood (depression), anxiety (especially generalized, separation, social), and disruptive behavior (conduct, oppositional defiant) disorders, sometimes whether comorbid with one another or not (Bernstein and Garfinkel, 1986; Atkinson et al., 1989; Last and Strauss, 1990). Difficulties attending school remain ensconced as a core symptom of separation anxiety and conduct disorders in current psychiatric taxonomies (World Health Organization, 2019; American Psychiatric Association, 2022). Analytic categorical distinctions for SA/Ps are often supposedly marked by the presence of a key feature (e.g., anxiety, certain kind of comorbidity), the absence of a key feature (e.g., antisocial behavior), or a forced choice option (e.g., identified instigator of a school attendance problem) that makes each one, ostensibly, a unique entity amenable to a personalized treatment strategy (e.g., Berg et al., 1969; Heyne et al., 2019).

Systemic, clinical, and psychiatric subtypes for school attendance problems generally lack strong psychometric support with respect to reliability and validity and/or cover only limited percentages of SA/P cases (Kearney, 2001, 2021). This is primarily due to the heterogeneous nature of school attendance problems that are typically characterized by considerable fluidity, comorbidity, and opacity (Chen et al., 2016). Linking various categorical subtypes to differential, prescriptive, empirically-supported interventions or treatments remains an elusive task as well (Elliot and Place, 2019). In addition, categorical subtypes are not uniformly used across disciplines and can be confusing (e.g., school “refusal” as anxiety rather than oppositional based) for lay persons, school personnel, and other stakeholders (Mauro and Machell, 2019; Brault et al., 2022). Subtypes for school attendance problems can also generate pernicious and stigmatizing labels for students and their families. Martin et al. (2020) found that school officials often pejoratively viewed vulnerable absentee students as truant rather than pursue a more accurate mental health-based conceptualization and remediation process. This applies to

the use of the term “unexcused absences” as well, which can erroneously and disparagingly signal deviance and which is not always indicative of student achievement problems (Donat et al., 2018; Klein et al., 2022). Unexcused absences also tend to be disproportionately and unfairly assigned to vulnerable student groups (McNeely et al., 2021). Traditional categories of school attendance problems also convey little nuanced information and often fail to provide information about the complex root causes of school absenteeism in a given community (Patnode et al., 2018; Childs and Lofton, 2021).

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era would focus on empirically-based and nuanced *profiles* to better inform categories and allow for more localized and complete information that can be used optimally for targeted intervention purposes. At a systemic level, such profiles could be used for a root cause analysis of school absenteeism problems, particularly in communities with high levels of chronic absenteeism (Lenhoff et al., 2020). Algorithm-based modeling, for example, has been used to pinpoint a profile of factors (e.g., residential movement) closely related to chronic absenteeism in a given community to identify targets for immediate intervention (e.g., more timely school reassignments) (Deitrick et al., 2015). Others have utilized large-scale data analytic strategies to identify profiles of community-specific, absenteeism-related factors such as food insecurity, exclusionary discipline, and use of emergency medical services that can translate into interventions such as school-based meals, arrest and court diversion, and universal screening for mental health and substance use problems (Baldwin et al., 2015; Chu and Ready, 2018; Coughenour et al., 2021). Profiles more specific to certain schools, classrooms, and student groups can be generated as well. Ideally, these types of analyses would also allow for more stable early warning systems that are valid for particular student groups in a given community and thus lead to more immediate and targeted intervention as needed (Newman et al., 2019). Information to be fed into these derived profiles could be dimensional in nature as well, including continua components within existing categories (e.g., illness severity). Such information will also require a focus on *disaggregated* data from multiple agencies and systems to assess for individual variation and clarify underlying causes and disparities regarding school absenteeism (Dougherty and Childs, 2019; Teasley and Homer, 2020).

At an analytic level, dimensional clinical profiles may be useful for informing broad categories. González and colleagues have been a leader in this approach, having investigated numerous clinical profiles of school attendance problems based on social and school anxiety, self-efficacy, self-esteem, and negative affect, among other variables (e.g., González et al., 2019b, 2020, 2021). In addition, Kearney and colleagues have

developed functional-based clinical profiles of school attendance problems based on the relative strength of maintaining factors related to negative and positive reinforcement (e.g., Kearney, 2007, 2019). González and Kearney have combined these approaches as well, identifying profiles of clinical symptoms linked to different functional conditions (e.g., González et al., 2018). These profiles have the advantage of providing detailed information for clinicians and others that address this population *via* efficient assessment and prescriptive treatment practices (Maynard et al., 2018). In addition, the data analytic strategies used in these studies (e.g., latent class analysis, structural equation modeling) allow for similar examination of clinical data across different geographical regions to identify culture-specific profiles (e.g., Díaz-Herrero et al., 2018). Such clinical profiles can also reduce the negative effects of labeling, though care must be taken to fully consider possible broader contextual variables (e.g., transportation vulnerability) so as not to assign unwarranted blame and burden on students and their families with a particular school attendance problem. Clinical profiles must not contribute unfairly to a deficit narrative in this regard (Kearney and Childs, 2021). Clinical profiles must also be considered within a dimensional spectrum of self-corrective, acute, and chronic school attendance problems; such profiles tend to be more salient and appropriate for acute (i.e., less than one calendar year) school attendance problems (Kearney and Albano, 2018).

Risk and protective factors for school attendance/problems

Historical categories

Researchers from systemic and analytic perspectives have long investigated risk factors for school attendance problems as well as factors that may protect against such problems. Risk and protective factors have been historically examined in categorical and circumscribed fashion, often with a separate focus on child, parent, family, peer, school, community/neighborhood, or macroeconomic and other broader factors (Gubbels et al., 2019). *Examples of risk factors:* developmental disorder, poor health, substance use (child-based); ineffective caregiving style, low school involvement, psychopathology (parent-based); conflict, residential movement, stressful transitions (family-based); low social support; proximity to deviant peers, victimization (peer-based); exclusionary discipline, lack of safety and academic support, poor climate (school-based); lack of access to care, school closures, neighborhood violence (community-based); education deprivation, migration, structural economic inequalities and racism (broader-based) see Kearney (2016); Gottfried and Hutt (2019). Conversely, *protective factors* can include those at student (e.g., academic engagement), parent (e.g., involvement in education), peer (e.g., positive

norms), school (e.g., positive student-teacher relationships), and community (e.g., participation in service programs) levels (Zaff et al., 2017).

Stakeholders from various perspectives tend to concentrate on one set (category) of risk (and versus protective) factors for school attendance problems (Kearney, 2021; Singer et al., 2021). A consequence of this approach is a bifurcated view of SA/Ps that tends to be narrowed to categories of *either* (1) broad, systemic factors, especially for geographical areas with very high school absenteeism rates, with a corresponding de-emphasis on proximal variables such as parental involvement, *or* (2) granular, analytic factors, especially for individual cases of school attendance problems, with a corresponding de-emphasis on distal variables such as structural economic inequalities. The plethora of disciplines investigating SA/Ps and the need to help explain at least part of the vast ecology of SA/Ps makes this forked approach understandable from a historical viewpoint. Unfortunately, such an approach impedes grander theories of SA/Ps that consider the entire ecology relevant to this population. As such, evaluation and intervention avenues can be restricted as well (Nation et al., 2020). In related fashion, “blame” for school attendance problems can fall disproportionately either on societal systems or on students and their families, and typically the latter (Baskerville, 2021; Grooms and Bohorquez, 2021).

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era moves beyond siloed approaches and focuses on spectra of risk and protective factors that could include linkages of (1) upstream and downstream factors as part of developmental cascade models and/or (2) various ecological levels examined concurrently as part of proximal-distal models. Developmental cascade models involve spectra of upstream risk and protective factors linked to downstream risk and protective factors that may lead to (or prevent) a particular outcome (Hentges et al., 2019). A sample risk cascade for SA/Ps may include early upstream factors (e.g., poverty, lack of access to preschool or psychoeducational assessment services) intersecting with later downstream factors (e.g., residential relocation, lack of home- and school-based supports, peer victimization) that create the stage for possible academic, social, and behavioral problems and/or school disengagement that can elevate risk for school attendance problems. Protective variables in this cascade (e.g., early intervention, tutoring) could help blunt the possibility of later school attendance problems. In similar fashion, ecological models along the classic Bronfenbrenner approach involve a spectrum of relationships involving microsystem (immediate, proximal), mesosystem (interconnections among microsystems), exosystem (interconnections among social systems), macrosystem (geographical, cultural, and community

contexts), and chronosystem (transitions over time) influences that simultaneously impact a particular phenomenon (Hertler et al., 2018). A sample ecological model of SA/Ps could involve concurrent considerations of caregiver responses to a child’s behavior and school attendance problems (microsystem), parent-school official interactions to address these issues (mesosystem), school climate, safety, and educational policies (exosystem), structural economic inequalities, transportation challenges, and racism (macrosystem), and changes in these systems as a child moves into middle and high school (chronosystem). Protective variables in this model (e.g., mentoring, housing support) could occur at each level of influence as well. In these approaches, any discussion of SA/Ps thus requires an examination of *both* systemic and analytic variables.

Longitudinal studies can inform cascade models of SA/Ps. Such studies have revealed patterns as children move from preschool to elementary school (e.g., lower levels of school readiness to chronic absenteeism; Ehrlich et al., 2018); from elementary school to middle school (e.g., increased school disengagement and declining grades to absenteeism; Schoenberger, 2012); and from middle school to high school (e.g., increased psychopathology to absenteeism; Wood et al., 2017). Others have examined longitudinal patterns for SA/Ps with respect to disabilities, emotional difficulties, and academic achievement, among other variables (e.g., Chen et al., 2016; Smerillo et al., 2018; Panayiotou et al., 2021). In addition, application of an ecological system model to SA/Ps has burgeoned in recent years. Such application has included student agency, health, and mobility (Stempel et al., 2017; Welsh, 2018; Kipp and Clark, 2021), school-community collaborations (Childs and Scanlon, 2022; Lenhoff and Singer, 2022), and intervention scope and fit (Sugrue et al., 2016; Melvin et al., 2019), among other areas.

Interventions for school attendance problems

Historical categories

Interventions to enhance school attendance and/or reduce school attendance problems have historically involved those directed either toward schools and their communities more generally *or* toward students and their families more specifically (Kearney, 2021; Eklund et al., 2022). *Systemic or school-based interventions* include broad strategies to improve climate, safety, health, physical/mental health support, and academic and life skills in addition to social services that can be facilitated at a school setting (Keppens and Spruyt, 2020). In addition, interventions have been crafted to address communities that surround schools with high chronic absenteeism rates, with a focus on food and housing

insecurity, transportation challenges, digital divides, and other barriers to school attendance (Montoya-Ávila et al., 2018). However, as mentioned earlier, many systemic, school-based “interventions” for school attendance problems tend to be punitive and not restorative in nature (Weathers et al., 2021). *Analytic or student/family-based interventions* include cognitive-behavioral, contingency management, and family therapies to improve emotional and other mental disorders, caregiver responses, and problematic communication and problem-solving abilities that may be interfering with school attendance (Maynard et al., 2018). Interventions have also been crafted to address ancillary challenges that surround students and families with school attendance problems, with a focus on family-school relationships, academic assistance, psychoeducational assessment, and other targets (Smith et al., 2020).

As with risk and protective factors, researchers and other stakeholders tend to emphasize one categorical set of interventions for SA/Ps exclusive to the other set. School-based interventions, even if well-coordinated, tend to be broad-based and not always focused on individual attendance problems and unique circumstances (Gase et al., 2015). This is especially the case for already overburdened school districts (Balu and Ehrlich, 2018). In related fashion, many schools apply (or do not apply) encompassing or single-component interventions or sanctions (e.g., an automatic administrative or legal response) (Freeman and Simonsen, 2015). Conversely, student/family-based interventions, even if well-resourced, can be narrow-based and not always coordinated with school officials (Elliot and Place, 2019). This is especially the case for already overburdened clinicians (Kearney, 2019). In related fashion, lack of access to specialized care for school attendance and other child-based problems is endemic in many areas (Kohrt et al., 2018). Best practices to address school attendance problems involve synchronized efforts between family, school, and community units, but coordinated systems of care tend to be lacking especially for areas with very high chronic absenteeism rates (Allison et al., 2019).

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era would include a spectrum of interventions and/or responses to enhance overall school attendance more broadly and address a wide variety of school attendance problems more specifically. In addition, such a system would involve a coordinated set of service systems (education, medical/mental health, legal, developmental) in a given community to address complex types of school attendance problems (Kearney and Benoit, 2022). Such coordination would require integration of multiple agencies (e.g., housing, financial assistance, and school district), including information sharing for areas of high transience;

community asset mapping to identify key areas of support; and multigenerational responses to school absenteeism (Minier et al., 2018; Green et al., 2019; Lenhoff and Singer, 2022). In addition, such coordination would likely require a focal point, which for SA/Ps could mean utilizing school systems as a primary conduit given that these systems already operate as a *de facto* support system in many areas, as long as such coordination is done in a cost-effective manner (Webber, 2018).

One potential avenue for pursuing this spectrum of interventions and responses and serving as a conduit for coordinated services and information sharing is a multi-tiered systems of support (MTSS) approach, or school-based service delivery system of assessment and intervention strategies targeted toward different levels of student need in various areas of functioning (Stoiber and Gettinger, 2016). MTSS approaches involve preventative (Tier 1), early intervention (Tier 2), and later intervention (Tier 3) strategies to address non-problematic, acute, and chronic issues, in this case to improve school attendance and to ameliorate emerging and intense school attendance problems (August et al., 2018). MTSS approaches also contain several spectra with respect to nuanced and tailored responses that are administered across various settings and providers (O’Brennan et al., 2020). MTSS approaches remain in the nascent stage with respect to SA/Ps, though recommendations for each level have been developed (Kearney and Graczyk, 2014; Chang et al., 2018). Furthermore, the approaches can be tailored across various spectra such as developmental stages, absenteeism severity, and ecological levels; linked to community assets and expertise; and implemented within already existing and culturally responsive frameworks (Kearney and Graczyk, 2020; Graczyk and Kearney, 2022).

School completion

Historical categories

Many educational systems worldwide focus on a well-defined point of school completion, or graduation, that often formally marks the end of primary schooling and, informally, the beginning of adulthood (Fernández-Suárez et al., 2016). For many areas, school completion involves accumulating a certain number of credits or surpassing a series of examinations or categorical benchmarks to qualify for graduation (Macdonald et al., 2019). Students that do not reach this endpoint are considered to have “dropped out” of school and often constitute their own category of study juxtaposed with “graduates” (e.g., Robison et al., 2017). Such comparisons reveal considerable peril for students who drop out of school, many of whom are at substantially increased risk for various occupational, economic, social, and psychiatric problems in adulthood compared to

students who graduate (Ecker-Lyster and Niileksela, 2016; Rumberger, 2020).

School dropout is a complicated phenomenon often marked by an accumulation of multiple and multilayered risk variables (Gubbels et al., 2019). These risk variables are often outside student or family control; school dropout rates worldwide remain elevated and particularly in areas of systemic education deprivation and low quality of education (Adelman and Székely, 2017). School dropout is also related closely to the use of exclusionary discipline and premature diversion of students into the criminal justice system (Leban and Masterson, 2022). School dropout is further amplified by poor school safety and academic support as well as the need for many students to support their families economically or otherwise (Rodríguez et al., 2022). School dropout thus tends to occur disproportionately among students of color, students with disabilities, students who are English language learners, and migrant students, among other vulnerable groups (Garcia and Weiss, 2018; Free and Križ, 2022). Most students who drop out of school do not re-enroll for completion purposes (Barrat et al., 2012). A first response to this situation is to provide sufficient resources, including academic supports to meet the needs of all students, in order to achieve timely school completion. A second response may involve the postmodern dimensions discussed next.

Postmodern dimensions

A *dimensional* perspective of SA/Ps in a postmodern era would involve spectra related to school completion timelines as well as multiple avenues for school completion. With respect to timelines, a more flexible approach involving permissible school completion at different ages could help alleviate key disparities by compensating for some of the push and pull factors encountered by many students (McDermott et al., 2018). In addition, allowing school completion at different ages dovetails with evidence from developmental psychology that many students possess greater maturity and competence during emerging adulthood than during adolescence (Wood et al., 2018). Many students are thus better equipped psychologically and academically, and perhaps economically, to complete primary education in emerging adulthood (Hochberg and Konner, 2020).

With respect to multiple avenues, a dimensional perspective would allow students to pursue flexible and personalized methods of school completion based on individual circumstances and interests (Zhang et al., 2020). Different avenues could include vocational training, community-based learning centers, home-based and virtual programs, portfolio work, extra-year and credit recovery initiatives, and various second-chance and other pliable options (Kearney, 2016). A key consequence of this approach is that more students could achieve readiness for

adulthood in a globalized economy that will increasingly require critical thinking, communication, subject-based and social/emotional competencies, collaboration, innovativeness, problem-solving, entrepreneurship, and digital skills, among other proficiencies (Yoder et al., 2020). In addition, allowing school completion *via* multiple avenues dovetails with researchers who view school dropout as more of a process than as a singular event (e.g., Samuel and Burger, 2020). Many students could thus be diverted from a school dropout process by maintaining an academic training program in continuous and innovative ways (Mardolkar and Kumaran, 2020).

Conclusion

Addressing school attendance and its problems will require an even higher-order set of dimensions than the ones described here in order to fully unlearn calcified historical approaches and implement more inclusive paradigms for a postmodern era. Individualized, compartmentalized, and siloed approaches must yield to a spectrum of multidisciplinary systemic-analytic collaborations and shared alliances across agencies. Such a spectrum must involve various professionals, lay persons, systems of care, and government and educational entities to better conceptualize and manage the *full* ecology of this population. In addition, temptations to engage in small iterative steps for short-term gain will need to be set aside in favor of broader visions of change and future goals for long-term gain. Recent seismic events have provided a rare opportunity to fundamentally realign thought in this area. We encourage stakeholders to take advantage of this open window before the winds of resistance come.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

Both authors have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Adelman, M. A., and Székely, M. (2017). An overview of school dropout in central America: Unresolved issues and new challenges for education progress. *Eur. J. Educ. Res.* 6, 235–259. doi: 10.12973/eu-er.6.3.235
- Allison, M. A., Attisha, E., Lerner, M., De Pinto, C. D., Beers, N. S., Gibson, E. J., et al. (2019). The link between school attendance and good health. *Pediatr* 143:e20183648. doi: 10.1542/peds.2018-3648
- American Psychiatric Association (2022). *Diagnostic and Statistical Manual of Mental Disorders*. Washington, DC: Author.
- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Absenteeism in the first decade of education forecasts civic engagement and educational and socioeconomic prospects in young adulthood. *J. Youth Adolesc.* 49, 1835–1848. doi: 10.1007/s10964-020-01272-4
- Atkinson, L., Quarrington, B., Cyr, J. J., and Atkinson, F. V. (1989). Differential classification in school refusal. *Br. J. Psychiatry* 155, 191–195.
- August, G. J., Piehler, T. F., and Miller, F. G. (2018). Getting “SMART” about implementing multi-tiered systems of support to promote school mental health. *J. Sch. Psychol.* 66, 85–96. doi: 10.1016/j.jsp.2017.10.001
- Bacon, V. R., and Kearney, C. A. (2020). School climate and student-based contextual learning factors as predictors of school absenteeism severity at multiple levels via CHAID analysis. *Child. Youth Serv. Rev.* 118, 1–9. doi: 10.1016/j.childyouth.2020.105452
- Baldwin, J. J., Groesbeck, D. M., Silver, S., and Dion, C. (2015). *A Study of Student Absenteeism in Pinellas County*. Clearwater, FL: Juvenile Welfare Board.
- Balu, R., and Ehrlich, S. B. (2018). Making sense out of incentives: A framework for considering the design, use, and implementation of incentives to improve attendance. *J. Educ. Stud. Placed Risk* 23, 93–106. doi: 10.1080/10824669.2018.1438898
- Barrat, V. X., Berliner, B., and Fong, A. B. (2012). When dropping out is not a permanent high school outcome: Student characteristics, motivations, and reenrollment challenges. *J. Educ. Stud. Placed Risk* 17, 217–233. doi: 10.1080/10824669.2012.717028
- Baskerville, D. (2021). Mattering: changing the narrative in secondary schools for youth who truant. *J. Youth Stud.* 24, 834–849. doi: 10.1080/13676261.2020.1772962
- Bauer, L., Liu, P., Schanzenbach, D. W., and Shambaugh, J. (2018). *Reducing Chronic Absenteeism Under the Every Student Succeeds Act*. Washington, DC: Brookings.
- Berg, I., Nichols, K., and Pritchard, C. (1969). School phobia: Its classification and relationship to dependency. *J. Child Psychol. Psychiatry* 10, 123–141.
- Bernstein, G. A., and Garfinkel, B. D. (1986). School phobia: The overlap of affective and anxiety disorders. *J. Am. Acad. Child Adolesc. Psychiatry* 25, 235–241.
- Birioukov, A. (2016). Beyond the excused/unexcused absence binary: Classifying absenteeism through a voluntary/involuntary absence framework. *Educ. Rev.* 68, 340–357. doi: 10.1080/00131911.2015.1090400
- Brault, C., Thomas, I., Moro, M. R., and Benoit, L. (2022). School refusal in immigrants and ethnic minority groups: A qualitative study of adolescents' and young adults' experiences. *Front. Psychiatry*. 13:803517. doi: 10.3389/fpsy.2022.803517
- Broadwin, I. T. (1932). A contribution to the study of truancy. *Am. J. Orthopsychiatry* 2, 253–259. doi: 10.1111/j.1939-0025.1932.tb05183.x
- Chang, H. (2018). *Seize the Data Opportunity in California: Using Chronic Absence to Improve Educational Outcomes*. San Francisco: Attendance Works.
- Chang, H. N., Bauer, L., and Byrnes, V. (2018). *Data Matters: Using Chronic Absence to Accelerate Action for Student Success*. San Francisco, CA: Everyone Graduates Center/Attendance Works.
- Chen, C. C., Culhane, D. P., Metraux, S., Park, J. M., and Venable, J. C. (2016). The heterogeneity of truancy among urban middle school students: A latent class growth analysis. *J. Child Fam. Stud.* 25, 1066–1075. doi: 10.1007/s10826-015-0295-3
- Childs, J., and Grooms, A. A. (2018). Improving school attendance through collaboration: A catalyst for community involvement and change. *J. Educ. Stud. Placed Risk* 23, 122–138. doi: 10.1080/10824669.2018.1439751
- Childs, J., and Lofton, R. (2021). Masking attendance: How education policy distracts from the wicked problem(s) of chronic absenteeism. *Educ. Policy* 35, 213–234. doi: 10.1177/0895904820986771
- Childs, J., and Scanlon, C. L. (2022). Coordinating the mesosystem: An ecological approach to addressing chronic absenteeism. *Peabody J. Educ.* 97, 74–86. doi: 10.1080/0161956X.2022.2026722
- Childs, J., Grooms, A., and Mozley, M. P. (2022). Hidden in (virtual) plain sight: A charter district's focus on attendance during COVID-19. *Educ. Urban Soc.* 2022:11065414. doi: 10.1177/00131245211065414
- Chu, E. M., and Ready, D. D. (2018). Exclusion and urban public high schools: Short- and long-term consequences of school suspensions. *Am. J. Educ.* 124, 479–509.
- Coghill, D., and Sonuga-Barke, E. J. S. (2012). Annual research review: Categories versus dimensions in the classification and conceptualisation of child and adolescent mental disorders - implications of recent empirical study. *J. Child Psychol. Psychiatry* 53, 469–489. doi: 10.1111/j.1469-7610.2011.02511.x
- Conry, J. M., and Richards, M. P. (2018). The severity of state truancy policies and chronic absenteeism. *J. Educ. Stud. Placed Risk* 23, 187–203. doi: 10.1080/10824669.2018.1439752
- Coolidge, J. C., Hahn, P. B., and Peck, A. L. (1957). School phobia: Neurotic crisis or way of life? *Am. J. Orthopsychiatry* 27, 296–306.
- Coughenour, C., Kleven, B. C., Gakh, M., Stephen, H., Chien, L. C., Labus, B., et al. (2021). School absenteeism is linked to household food insecurity in school catchment areas in southern Nevada. *Public Health Nutr* 2021, 1–7. doi: 10.1017/S136898002100063X
- De Boeck, P., Wilson, M., and Acton, G. S. (2005). A conceptual and psychometric framework for distinguishing categories and dimensions. *Psychol. Rev.* 112, 129–158. doi: 10.1037/0033-295X.112.1.129
- Deitrick, S., Ye, F., Childs, J., and Zhang, C. (2015). *Connecting People and Place - Improving Communities Through Integrated Data Systems: Chronic School Absenteeism in Public Schools*. Pittsburgh, PA: University of Pittsburgh University Center for Social and Urban Research.
- Díaz-Herrero, Á., González, C., Sanmartín, R., Vicent, M., Martín, L. S., Inglés, C. J., et al. (2018). Profiles of emotional intelligence and demotivation to attend school in Chilean adolescents. *Motiv. Emot.* 42, 947–959.
- Donat, M., Gallschütz, C., and Dalbert, C. (2018). The relation between students' justice experiences and their school refusal behavior. *Soc. Psychol. Educ.* 21, 447–475. doi: 10.1007/s11218-017-9423-9
- Dougherty, S. M., and Childs, J. (2019). “Attending to attendance: Why data quality and modeling assumptions matter when using attendance as an outcome,” in *Absent From School: Understanding and Addressing Student Absenteeism*, eds M. A. Gottfried and E. L. Hutt (Cambridge, MA: Harvard Education Press), 53–66.
- Eaton, M. J. (1979). A study of some factors associated with the early identification of persistent absenteeism. *Educ. Rev.* 31, 233–242. doi: 10.1080/0013191790310305
- Ecker-Lyster, M., and Niileksela, C. (2016). Keeping students on track to graduate: A synthesis of school dropout trends, prevention, and intervention initiatives. *J. Risk Issues* 19, 24–31.
- Ehrlich, S. B., Gwynne, J. A., and Allensworth, E. M. (2018). Pre-kindergarten attendance matters: Early chronic absence patterns and relationships to learning outcomes. *Early Child. Res. Q.* 44, 136–151. doi: 10.1016/j.ecresq.2018.02.012

- Eklund, K., Burns, M. K., Oyen, K., DeMarchena, S., and McCollom, E. M. (2022). Addressing chronic absenteeism in schools: A meta-analysis of evidence-based interventions. *School Psych. Rev.* 51, 95–111. doi: 10.1080/2372966X.2020.1789436
- Elliot, J. G., and Place, M. (2019). School refusal: Developments in conceptualisation and treatment since 2000. *J. Child Psychol. Psychiatry* 60, 4–15. doi: 10.1111/jcpp.12848
- Esterberg, M. L., and Compton, M. T. (2009). The psychosis continuum and categorical versus dimensional diagnostic approaches. *Curr. Psychiatry Rep.* 11, 179–184.
- Estévez, I., Rodríguez-Llorente, C., Piñero, I., González-Suárez, R., and Valle, A. (2021). School engagement, academic achievement, and self-regulated learning. *Sustain* 13:3011. doi: 10.3390/su13063011
- Fernández-Suárez, A., Herrero, J., Pérez, B., Juarros-Basterretxea, J., and Rodríguez-Díaz, F. J. (2016). Risk factors for school dropout in a sample of juvenile offenders. *Front. Psychol.* 7:1993. doi: 10.3389/fpsyg.2016.01993
- Finning, K., Ford, T., and Moore, S. (2022). *Mental Health and Attendance at School*. Cambridge: Cambridge University Press.
- Fornander, M., and Kearney, C. A. (2019). Family environment variables as predictors of school absenteeism severity at multiple levels: Ensemble and classification and regression tree analysis. *Front. Psychol.* 10:2381. doi: 10.3389/fpsyg.2019.02381
- Free, J. L., and Križ, K. (2022). The not-so-hidden curriculum: How a public school system in the United States minoritizes migrant students. *Equity Excell. Educ.* 2022, 1–23. doi: 10.1080/10665684.2022.2047409
- Freeman, J., and Simonsen, B. (2015). Examining the impact of policy and practice interventions on high school dropout and school completion rates: A systematic review of the literature. *Rev. Educ. Res.* 85, 205–248. doi: 10.3102/0034654314554431
- García, E., and Weiss, E. (2018). *Student Absenteeism: Who Misses School and How Missing School Matters for Performance*. Washington, DC: Economic Policy Institute.
- Gase, L. N., Butler, K., Kuo, T., Workgroup, T. F., Bodin, L., Byrdson, K., et al. (2015). The current state of truancy reduction programs and opportunities for enhancement in los angeles county. *Child. Youth Serv. Rev.* 52, 17–25. doi: 10.1016/j.childyouth.2015.02.008
- Gee, K. A. (2018). Minding the gaps in absenteeism: Disparities in absenteeism by race/ethnicity, poverty and disability. *J. Educ. Stud. Placed Risk* 23, 204–208. doi: 10.1080/10824669.2018.1428610
- Gentle-Genitty, C., Taylor, J., and Renguette, C. (2020). A change in the frame: From absenteeism to attendance. *Front. Educ.* 4:161. doi: 10.3389/feduc.2019.00161
- González, C., Díaz-Herrero, Á., Vicent, M., Sanmartín, R., Pérez-Sánchez, A. M., and García-Fernández, J. M. (2020). School refusal behavior: Latent class analysis approach and its relationship with psychopathological symptoms. *Curr. Psychol.* 41, 2078–2088. doi: 10.1007/s12144-020-00711-6
- González, C., Giménez-Mirallas, M., Vicent, M., Sanmartín, R., Quiles, M. J., and García-Fernández, J. M. (2021). School refusal behaviour profiles and academic self-attributions in language and literature. *Sustain* 13:7512. doi: 10.3390/su13137512
- González, C., Inglés, C. J., Kearney, C. A., Sanmartín, R., Vicent, M., and García-Fernández, J. M. (2019a). Relationship between school refusal behavior and social functioning: A cluster analysis approach. *Eur. J. Educ. Psychol.* 12, 17–29. doi: 10.30552/ejep.v12i1.238
- González, C., Inglés, C. J., Sanmartín, R., Vicent, M., and García-Fernández, J. M. (2019b). Child and adolescent social adaptive functioning scale: Factorial invariance, latent mean differences, and its impact on school refusal behavior in Spanish children. *Front. Psychol.* 10:1894. doi: 10.3389/fpsyg.2019.01894
- González, C., Kearney, C. A., Jiménez-Ayala, C. E., Sanmartín, R., Vicent, M., Inglés, C. J., et al. (2018). Functional profiles of school refusal behavior and their relationship with depression, anxiety, and stress. *Psychiatry Res.* 269, 140–144. doi: 10.1016/j.psychres.2018.08.069
- Gottfried, M. A., and Hutt, E. L. (eds) (2019). *Absent From School: Understanding and Addressing Student Absenteeism*. Cambridge, MA: Harvard Education Press.
- Graczyk, P. A., and Kearney, C. A. (2022). *Implementing A Multi-Dimensional, Multi-Tiered System of Supports Framework to Promote School Attendance and Address School Attendance Problems*.
- Green, G., DeFosset, A., and Kuo, T. (2019). Residential mobility among elementary school students in Los Angeles county and early school experiences: Opportunities for early intervention to prevent absenteeism and academic failure. *Front. Psychol.* 10:2176. doi: 10.3389/fpsyg.2019.02176
- Grooms, A. A., and Bohorquez, D. G. (2021). What's your excuse? Sensemaking about chronic absenteeism in a rural, latinx high school. *J. Sch. Lead.* 32, 384–405. doi: 10.1177/10526846211026260
- Gubbels, J., van der Put, C. E., and Assink, M. (2019). Risk factors for school absenteeism and dropout: A meta-analytic review. *J. Youth Adolesc.* 48, 1637–1667. doi: 10.1007/s10964-019-01072-5
- Havik, T., and Ingul, J. M. (2022). Remote education/homeschooling during the COVID-19 pandemic, school attendance problems, and school return-teachers' experiences and reflections. *Front. Educ.* 7:895983. doi: 10.3389/feduc.2022.895983
- Havik, T., Bru, E., and Ertesvåg, S. K. (2015). Assessing reasons for school non-attendance. *Scand. J. Educ. Res.* 59, 316–336. doi: 10.1080/00313831.2014.904424
- Henderson, C. M., and Fantuzzo, J. W. (2022). Challenging the core assumption of chronic absenteeism: Are excused and unexcused absences equally useful in determining academic risk status? *J. Educ. Stud. Placed Risk* 2022, 1–35. doi: 10.1080/10824669.2022.2065636
- Hentges, R. F., Graham, S. A., Plamondon, A., Tough, S., and Madigan, S. (2019). A developmental cascade from prenatal stress to child internalizing and externalizing problems. *J. Pediatr. Psychol.* 44, 1057–1067. doi: 10.1093/jpepsy/jsz044
- Hertler, S. C., Figueredo, A. J., Peñaherrera-Aguirre, M., Fernandes, H. B. F., and Woodley, M. A. (2018). *Life History Evolution: A Biological Meta-Theory for the Social Sciences*. London: Palgrave Macmillan.
- Heyne, D., Gren-Landell, M., Melvin, G., and Gentle-Genitty, C. (2019). Differentiation between school attendance problems: Why and how? *Cogn. Behav. Pract.* 26, 8–34. doi: 10.1016/j.cbpra.2018.03.006
- Heyne, D., Strömbeck, J., Bergström, M., Alanko, K., and Ulriksen, R. (2020). A scoping review of constructs measured following intervention for school refusal: Are we measuring up? *Front. Psychol.* 11:1744. doi: 10.3389/fpsyg.2020.01744
- Hochberg, Z. E., and Konner, M. (2020). Emerging adulthood, a pre-adult life-history stage. *Front. Endocrinol.* 10:918. doi: 10.3389/fendo.2019.00918
- Huck, C., and Zhang, J. (2021). Effects of the COVID-19 pandemic on K-12 education: A systematic literature review. *New Waves Educ. Res. Dev. J.* 24, 53–84.
- Hudziak, J. J., Achenbach, T. M., Althoff, R. R., and Pine, D. S. (2007). A dimensional approach to developmental psychopathology. *Int. J. Methods Psychiatr. Res.* 16, S16–S23. doi: 10.1002/mpr.217
- Hutt, E. L. (2018). Measuring missed school: The historical precedents for the measurement and use of attendance records to evaluate schools. *J. Educ. Stud. Placed Risk* 23, 5–8. doi: 10.1080/10824669.2018.1438899
- Jordan, P. W., and Miller, R. (2017). *Who's In: Chronic Absenteeism Under the Every Student Succeeds Act*. Washington, DC: Future Ed.
- Karlberg, M., Klang, N., Andersson, F., Hancock, K., Ferrer-Wreder, L., Kearney, C. A., et al. (2022). The importance of school pedagogical and social climate to students' unauthorised absenteeism: A multilevel study of 101 Swedish schools. *Scand. J. Educ. Res.* 66, 88–104. doi: 10.1080/00313831.2020.1833244
- Kearney, C. A. (2001). *School Refusal Behavior In Youth: A Functional Approach To Assessment And Treatment*. Washington, DC: American Psychological Association.
- Kearney, C. A. (2007). Forms and functions of school refusal behavior in youth: An empirical analysis of absenteeism severity. *J. Child Psychol. Psychiatry* 48, 53–61. doi: 10.1111/j.1469-7610.2006.01634.x
- Kearney, C. A. (2016). *Managing School Absenteeism At Multiple Tiers: An Evidence-Based And Practical Guide For Professionals*. New York: Oxford University Press.
- Kearney, C. A. (2019). *Helping Families Of Youth With School Attendance Problems: A Practical Guide For Mental Health And School-Based Professionals*. New York: Oxford University Press.
- Kearney, C. A. (2021). Integrating systemic and analytic approaches to school attendance problems: Synergistic frameworks for research and policy directions. *Child Youth Care Forum* 50, 701–742. doi: 10.1007/s10566-020-09591-0
- Kearney, C. A. (2022). Functional impairment guidelines for school attendance problems in youth: Recommendations for caseness in the modern era. *Prof. Psychol. Res. Proc.* 53, 295–303. doi: 10.1037/pro0000453
- Kearney, C. A., and Albano, A. M. (2018). *When Children Refuse School: A Cognitive-Behavioral Therapy Approach/Therapist Guide*, 3rd Edn. New York: Oxford University Press.
- Kearney, C. A., and Benoit, L. (2022). Child and adolescent psychiatry and underrepresented youth with school attendance problems: Integration with systems of care, advocacy, and future directions. *J. Am. Acad. Child Adolesc. Psychiatry* 2022:16. doi: 10.1016/j.jaac.2022.03.016

- Kearney, C. A., and Childs, J. (2021). A multi-tiered systems of support blueprint for re-opening schools following COVID-19 shutdown. *Child. Youth Serv. Rev.* 122:105919. doi: 10.1016/j.childyouth.2020.105919
- Kearney, C. A., and Childs, J. (2022). Improving School Attendance Data And Defining Problematic And Chronic School Absenteeism: The Next Stage For Educational Policies And Health-Based Practices.
- Kearney, C. A., and Graczyk, P. (2014). A response to intervention model to promote school attendance and decrease school absenteeism. *Child Youth Care Forum* 43, 1–25. doi: 10.1007/s10566-013-9222-1
- Kearney, C. A., and Graczyk, P. A. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Kearney, C. A., Childs, J., and Burke, S. (2022). Social forces, social justice, and school attendance problems in youth. *Contemp. School Psychol.* doi: 10.1007/s40688-022-00425-5.
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. (2019a). Reconciling contemporary approaches to school attendance and school absenteeism: Toward promotion and nimble response, global policy review and implementation, and future adaptability (part 1). *Front. Psychol.* 10:2222. doi: 10.3389/fpsyg.2019.02222
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. (2019b). Reconciling contemporary approaches to school attendance and school absenteeism: Toward promotion and nimble response, global policy review and implementation, and future adaptability (part 2). *Front. Psychol.* 10:2605. doi: 10.3389/fpsyg.2019.02605
- Keppens, G., and Spruyt, B. (2020). The impact of interventions to prevent truancy: A review of the research literature. *Stud. Educ. Eval.* 65:100840. doi: 10.1016/j.stueduc.2020.100840
- Keppens, G., Spruyt, B., and Dockx, J. (2019). Measuring school absenteeism: Administrative attendance data collected by schools differ from self-reports in systematic ways. *Front. Psychol.* 10:2623. doi: 10.3389/fpsyg.2019.02623
- Kipp, A. L., and Clark, J. S. (2021). Student absenteeism and ecological agency. *Improv. Schools* 2021:992884. doi: 10.1177/1365480221992884
- Kirksey, J. J. (2019). Academic harms of missing high school and the accuracy of current policy thresholds: Analysis of preregistered administrative data from a California school district. *AERA Open* 5, 1–13. doi: 10.1177/2332858419867692
- Klein, M., Sosu, E. M., and Dare, S. (2022). School absenteeism and academic achievement: Does the reason for absence matter? *AERA Open* 8, 1–14. doi: 10.1177/23328584211071115
- Kline, L. W. (1897). Truancy as related to the migrating instinct. *Pedagog. Semin.* 5, 381–420.
- Kohrt, B. A., Asher, L., Bhardwaj, A., Fazel, M., Jordans, M. J., Mutamba, B. B., et al. (2018). The role of communities in mental health care in low-and middle-income countries: A meta-review of components and competencies. *Int. J. Environ. Health Res.* 15:1279. doi: 10.3390/ijerph15061279
- Kotov, R., Krueger, R. F., Watson, D., Achenbach, T. M., Althoff, R. R., Bagby, R. M., et al. (2017). The hierarchical taxonomy of psychopathology (HiTOP): A dimensional alternative to traditional nosologies. *J. Abnorm. Psychol.* 126, 454–477. doi: 10.1037/abn0000258
- Last, C. G., and Strauss, C. C. (1990). School refusal in anxiety-disordered children and adolescents. *J. Am. Acad. Child Adolesc. Psychiatry* 29, 31–35.
- Leban, L., and Masterson, M. (2022). The impact of childhood school suspension on dropout and arrest in adolescence: Disparate relationships by race and adverse childhood experiences. *Crim. Just. Behav.* 49, 550–569.
- Lee, W. F., McNeely, C. A., Rosenbaum, J. E., Alemu, B., and Renner, L. M. (2020). Can court diversion improve school attendance among elementary students? Evidence from five school districts. *J. Res. Educ. Eff.* 13, 625–651. doi: 10.1080/19345747.2020.1760976
- Lenhoff, S. W., and Pogodzinski, B. (2018). School organizational effectiveness and chronic absenteeism: Implications for accountability. *J. Educ. Stud. Placed Risk* 23, 153–169. doi: 10.1080/10824669.2018.1434656
- Lenhoff, S. W., and Singer, J. (2022). Promoting ecological approaches to educational issues: Evidence from a partnership around chronic absenteeism in Detroit. *Peabody J. Educ.* 97, 87–97. doi: 10.1080/0161956X.2022.2026723
- Lenhoff, S. W., Edwards, E. B., Claiborne, J., Singer, J., and French, K. R. (2020). A collaborative problem-solving approach to improving district attendance policy. *Educ. Policy* 2022, 4402. doi: 10.1177/0895904820974402
- Maas, M. J., and Hughes, J. M. (2020). Virtual, augmented and mixed reality in K–12 education: A review of the literature. *Technol. Pedagog. Educ.* 29, 231–249. doi: 10.1080/1475939X.2020.1737210
- Macdonald, H., Zinth, J. D., and Pompelia, S. (2019). *50-State Comparison: High School Graduation Requirements*. Denver, CO: Education Commission of the States.
- Mahoney, J. (2015). Daily, monthly, yearly attendance data charts: Improved attendance equals improved achievement scores. *Child. Schs.* 37, 125–128. doi: 10.1093/cs/cdv002
- Mallett, C. A. (2016). The school-to-prison pipeline: A critical review of the punitive paradigm shift. *Child. Adoles. Social Work J.* 33, 15–24. doi: 10.1007/s10560-015-0397-1
- Mardolkar, M., and Kumaran, N. (2020). Forecasting and avoiding student dropout using the K-nearest neighbor approach. *SN Comput. Sci.* 1:96. doi: 10.1007/s42979-020-0102-0
- Martin, R., Benoit, J. P., Moro, M. R., and Benoit, L. (2020). A qualitative study of misconceptions among school personnel about absenteeism of children from immigrant families. *Front. Psychiatry* 11:202. doi: 10.3389/fpsyg.2020.00202
- Mauro, C. F., and Machell, K. A. (2019). “When children and adolescents do not go to school: Terminology, technology, and trends,” in *Pediatric Anxiety Disorders*, eds S. N. Compton, M. Villabo, and H. Kristensen (Cambridge, MA: Academic), 439–460.
- Maynard, B. R., Heyne, D., Brendel, K. E., Bulanda, J. J., Thompson, A. M., and Pigott, T. D. (2018). Treatment for school refusal among children and adolescents: A systematic review and meta-analysis. *Res. Soc. Work Pract.* 28, 56–67. doi: 10.1177/1049731515598619
- McDermott, E. R., Anderson, S., and Zaff, J. F. (2018). Dropout typologies: Relating profiles of risk and support to later educational re-engagement. *Appl. Dev. Sci.* 22, 217–232. doi: 10.1080/10888691.2016.1270764
- McFarland, J., Cui, J., and Stark, P. (2018). *Trends In High School Dropout And Completion Rates In The United States: 2014 (NCES 2018-117)*. Washington, DC: National Center for Education Statistics.
- McNeely, C. A., Alemu, B., Lee, W. F., and West, I. (2021). Exploring an unexamined source of racial disparities in juvenile court involvement: Unexcused absenteeism policies in US schools. *AERA Open* 7:23328584211003132. doi: 10.1177/23328584211003132
- Melvin, G. A., Heyne, D., Gray, K. M., Hastings, R. P., Totsika, V., Tonge, B. J., et al. (2019). The kids and teens at school (KiTeS) framework: An inclusive bioecological systems approach to understanding school absenteeism and school attendance problems. *Front. Educ.* 4:61. doi: 10.3389/feduc.2019.00061
- Minier, M., Hirshfield, L., Ramahi, R., Glasgow, A. E., Fox, K., and Martin, M. A. (2018). Schools and health: An essential partnership for the effective care of children with chronic conditions. *J. Sch. Health* 88, 699–703. doi: 10.1111/josh.12671
- Mireles-Rios, R., Rios, V. M., and Reyes, A. (2020). Pushed out for missing school: The role of social disparities and school truancy in dropping out. *Educ. Sci.* 10:108. doi: 10.3390/educsci10040108
- Montoya-Ávila, A., Ghebream, N., and Galindo, C. (2018). “Toward improving the educational opportunities for black and latinx young children: Strengthening family-school partnerships,” in *Academic Socialization Of Young Black and Latino Children*, eds S. Sonnenschein and B. Sawyer (New York: Springer), 209–231.
- Moodley, R., Chiclana, F., Carter, J., and Caraffini, F. (2020). Using data mining in educational administration: A case study on improving school attendance. *Appl. Sci.* 10:3116. doi: 10.3390/app10093116
- Narrow, W. E., and Kuhl, E. A. (2011). Dimensional approaches to psychiatric diagnosis in DSM-5. *J. Ment. Health Policy Econ.* 14, 197–200.
- Nation, M., Christens, B. D., Bess, K. D., Shinn, M., Perkins, D. D., and Speer, P. W. (2020). Addressing the problems of urban education: An ecological systems perspective. *J. Urban Aff.* 42, 715–730. doi: 10.1080/07352166.2019.1705847
- National Forum on Educational Statistics (2018). *Forum Guide To Early Warning Systems (NFES2019035)*. U.S. Department of Education. Washington, DC: U.S. Department of Education.
- National Forum on Educational Statistics (2021). *Forum Guide To Attendance, Participation, And Engagement Data In Virtual And Hybrid Learning Models (NFES2021058)*. Washington, DC: U.S. Department of Education.
- Newman, I., Ligas, M. R., Hecht, S., Starratt, G. K., Clement, R., Ney, E., et al. (2019). Mixed methods assessment of the dimensionality of risk indicators of school failure: A collaborative approach to bridge a research-to-practice gap. *Int. J. Mult. Res. Appro.* 11, 156–182. doi: 10.29034/ijrma.v11n2a3
- O’Brennan, L. M., Suldo, S. M., Shaunessy-Dedrick, E., Dedrick, R. F., Parker, J. S., Lee, J. S., et al. (2020). Supports for youth in accelerated high school curricula: An initial study of applicability and acceptability of a motivational interviewing intervention. *Gift. Child Q.* 64, 19–40. doi: 10.1177/0016986219886933
- Olson, L. S. (2014). *Why September Matters: Improving School Attendance*. Baltimore, MD: Baltimore Education Research Consortium.

- Owen, M. J. (2014). New approaches to psychiatric diagnostic classification. *Neuron* 84, 564–571. doi: 10.1016/j.neuron.2014.10.028
- Panayiotou, M., Finning, K., Hennessey, A., Ford, T., and Humphrey, N. (2021). Longitudinal pathways between emotional difficulties and school absenteeism in middle childhood: Evidence from developmental cascades. *Dev. Psychopathol.* 2021, 1–12. doi: 10.1017/S095457942100122X
- Patnode, A. H., Gibbons, K., and Edmunds, R. R. (2018). *Attendance and Chronic Absenteeism: Literature Review*. Saint Paul, MN: University of Minnesota, College of Education and Human Development, Center for Applied Research and Educational Improvement.
- Patrick, S., and Chambers, A. (2020). *Determining Attendance And Alternatives To Seat-Time: Issue Brief*. Vienna, VA: Aurora Institute.
- Pyne, J., Grodsky, E., Vaade, E., McCready, B., Camburn, E., and Bradley, D. (2021). The signaling power of unexcused absence from school. *Educ. Policy* 2021:49428. doi: 10.1177/08959048211049428
- Rapee, R. M., Bögels, S. M., Van Der Sluis, C. M., Craske, M. G., and Ollendick, T. (2012). Annual research review: Conceptualising functional impairment in children and adolescents. *J. Child Psychol. Psychiatr.* 53, 454–468. doi: 10.1111/j.1469-7610.2011.02479.x
- Robison, S., Jagers, J., Rhodes, J., Blackmon, B. J., and Church, W. (2017). Correlates of educational success: Predictors of school dropout and graduation for urban students in the Deep South. *Child. Youth Serv. Rev.* 73, 37–46. doi: 10.1016/j.childyouth.2016.11.031
- Rocque, M., Jennings, W. G., Piquero, A. R., Ozkan, T., and Farrington, D. P. (2017). The importance of school attendance: Findings from the Cambridge study in delinquent development on the life-course effects of truancy. *Crime Delinq.* 63, 592–612. doi: 10.1177/0011128716660520
- Rodriguez, D., Carrasquillo, A., Garcia, E., and Howitt, D. (2022). Factors that challenge English learners and increase their dropout rates: Recommendations from the field. *Int. J. Biling. Educ. Biling.* 25, 878–894. doi: 10.1080/13670050.2020.1722059
- Rumberger, R. W. (2020). “The economics of high school dropouts,” in *The Economics of Education: A Comprehensive Overview*, 2nd Edn, eds S. Bradley and C. Green (Cambridge, MA: Academic), 149–158.
- Samuel, R., and Burger, K. (2020). Negative life events, self-efficacy, and social support: Risk and protective factors for school dropout intentions and dropout. *J. Educ. Psychol.* 112, 973–986. doi: 10.1037/edu0000406
- Schoenberger, J. A. (2012). Longitudinal attendance patterns: Developing high school dropouts. *Clear. House* 85, 7–14. doi: 10.1080/00098655.2011.603766
- Singer, J., Pogodzinski, B., Lenhoff, S. W., and Cook, W. (2021). Advancing an ecological approach to chronic absenteeism: Evidence from Detroit. *Teach. Coll. Rec.* 123, 1–36. doi: 10.1177/016146812112300406
- Skedgell, K. K., and Kearney, C. A. (2018). Predictors of school absenteeism severity at multiple levels: A classification and regression tree analysis. *Child. Youth Serv. Rev.* 86, 236–245. doi: 10.1016/j.childyouth.2018.01.043
- Smerillo, N. E., Reynolds, A. J., Temple, J. A., and Ou, S. R. (2018). Chronic absence, eighth-grade achievement, and high school attainment in the Chicago longitudinal study. *J. School. Psychol.* 67, 163–178. doi: 10.1016/j.jsp.2017.11.001
- Smith, T. E., Sheridan, S. M., Kim, E. M., Park, S., and Beretvas, S. N. (2020). The effects of family-school partnership interventions on academic and social-emotional functioning: A meta-analysis exploring what works for whom. *Educ. Psychol. Rev.* 32, 511–544. doi: 10.1007/s10648-019-09509-w
- Stempel, H., Cox-Martin, M., Bronsert, M., Dickinson, L. M., and Allison, M. A. (2017). Chronic school absenteeism and the role of adverse childhood experiences. *Acad. Pediatr.* 17, 837–843. doi: 10.1016/j.acap.2017.09.013
- Stoiber, K. C., and Gettinger, M. (2016). “Multi-tiered systems of support and evidence-based practices,” in *The Handbook Of Response To Intervention: The Science And Practice Of Multi-Tiered Systems Of Support*, 2nd Edn, eds M. K. Jimerson, A. M. Burns, and A. M. VanDerHeyden (New York, NY: Springer), 124–141.
- Sugrue, E. P., Zuel, T., and LaLiberte, T. (2016). The ecological context of chronic school absenteeism in the elementary grades. *Child. School.* 38, 137–145. doi: 10.1093/cs/cdw020
- Teasley, M., and Homer, B. (2020). “Racial disparities in the education system,” in *Encyclopedia of Social Work*, ed. C. Franklin (New York: Oxford).
- U.S. Department of Education Office of Civil Rights (2016). *Chronic Absenteeism In The Nation's Schools: A Hidden Educational Crisis*. Washington, DC: Author.
- Warne, M., Svensson, Å, Tirén, L., and Wall, E. (2020). On time: A qualitative study of Swedish students, parents' and teachers' views on school attendance, with a focus on tardiness. *Int. J. Environ. Res. Public Health* 17:1430. doi: 10.3390/ijerph17041430
- Weathers, E. S., Hollett, K. B., Mandel, Z. R., and Rickert, C. (2021). Absence unexcused: A systematic review on truancy. *Peabody J. Educ.* 96, 540–564. doi: 10.1080/0161956X.2021.1991696
- Webber, K. C. (2018). A qualitative study of school social workers' roles and challenges in dropout prevention. *Child. School.* 40, 82–90. doi: 10.1093/cs/cdy003
- Welsh, R. O. (2018). Opposite sides of the same coin? Exploring the connections between school absenteeism and student mobility. *J. Educ. Stud. Placed Risk* 23, 70–92. doi: 10.1080/10824669.2018.1438204
- Widakowich, C., Hubain, P., Jurysta, P. F., and Linkowski, P. P. (2012). P-960-dimensional approach vs. categorical approach in psychiatric diagnosis: Historical and epistemological aspects. *Eur. Psychiatry* 27:1. doi: 10.1016/S0924-9338(12)75127-1
- Wood, D., Crapnell, T., Lau, L., Bennett, A., Lotstein, D., Ferris, M., et al. (2018). “Emerging adulthood as a critical stage in the life course,” in *Handbook of Life Course Health Development*, eds N. Halfon, C. B. Forrest, R. M. Lerner, and E. M. Faustman (New York: Springer), 123–143.
- Wood, L., Kiperman, S., Esch, R. C., Leroux, A. J., and Truscott, S. D. (2017). Predicting dropout using student- and school-level factors: An ecological perspective. *School. Psychol. Q.* 32, 35–49. doi: 10.1037/spq0000152
- World Economic Forum (2020). *Schools of the Future: Defining New Models Of Education For The Fourth Industrial Revolution*. Geneva: Author.
- World Health Organization (2019). *ICD-11: International classification of diseases*. Geneva: World Health Organization.
- Yoder, N., Atwell, M. N., Godek, D., Dusenbury, L., Bridgeland, J. M., and Weissberg, R. (2020). *Preparing Youth for the Workforce of Tomorrow: Cultivating the Social and Emotional Skills Employers Demand*. Chicago: Collaborative for Academic, Social, and Emotional Learning.
- Zaff, J. F., Donlan, A., Gunning, A., Anderson, S. E., McDermott, E., and Sedaca, M. (2017). Factors that promote high school graduation: A review of the literature. *Educ. Psychol. Rev.* 29, 447–476. doi: 10.1007/s10648-016-9363-5
- Zhang, L., Basham, J. D., and Yang, S. (2020). Understanding the implementation of personalized learning: A research synthesis. *Educ. Res. Rev.* 31:100339. doi: 10.1016/j.edurev.2020.100339



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Multi-tiered systems of support for school attendance and its problems: An unlearning perspective for areas of high chronic absenteeism

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School attendance problems (SAPs) are a vexing challenge for many educational districts given their complexity, heterogeneity, and opacity. One potential coordinated, integrated approach to ameliorate SAPs and boost school attendance is to leverage existing school-based systems already designed to address multiple individual domains of functioning in students. Multi-tiered systems of support frameworks for school attendance and its problems have been developed but remain in the nascent stage. The purpose of this perspective article is to begin a discussion as to how such frameworks for SAPs could be fundamentally reconfigured in areas with very high rates of chronic absenteeism. Recommendations are provided at each tier, with the understanding that original notions of how tiers are ostensibly constructed and aimed must be unlearned in these circumstances.

KEYWORDS

school attendance, school absenteeism, chronic absenteeism, truancy, unlearning, multi-tiered systems of support

Introduction

School attendance problems are a vexing challenge for many educational districts given their complexity, heterogeneity, and opacity. The complexity of attendance problems is manifested by multiple risk factors at student, caregiver, family, peer, school, community, and macro levels (Gubbels et al., 2019). The heterogeneity of attendance problems is manifested by different forms along a spectrum (full and partial day absences, skipped classes, tardiness, mental health symptoms interfering with attendance) that vary over time (Knollmann et al., 2022). The opacity of attendance problems is manifested by concurrent, fluid characteristics such as residential mobility that make student tracking and assessment difficult (Chen et al., 2016). Furthermore, these facets have been exacerbated by recent health crises, technological and demographic changes, modified instructional formats, and global economic

challenges. In addition, attendance problems are addressed by professionals from many different disciplines, and variously across geographical areas, which has led to a wide array of systemic and analytic interventions that are rarely well-coordinated or integrated (Kearney, 2021).

One potential coordinated, integrated approach to ameliorate attendance problems (and boost school attendance) is to leverage existing school-based systems already designed to address multiple individual domains of functioning in students (e.g., academic, social performance) and to address complex systemic problems such as school safety, violence, disciplinary issues, mental health challenges, climate, and inequities in access to student services and supports. These systems of support can be arranged in tiers (multi-tiered systems of support) based on individual student need that include Tier 1 strategies to help prevent a problem or to augment an area of strength, Tier 2 strategies to provide early intervention to those in need of extra assistance, and Tier 3 strategies to provide later, intensive intervention to those in need of substantial assistance.

Kearney and Graczyk (Kearney and Graczyk, 2014, 2020; Kearney, 2016; Kearney et al., 2019; Graczyk and Kearney, 2022) outlined the main parameters of a multidimensional multi-tiered systems of support (MD-MTSS) framework for school attendance/problems and issued preliminary recommendations for implementation. Tier 1 includes universal interventions to enhance school climate, safety, health, student skills, parental involvement, and school readiness; as well as district-wide attendance initiatives and school dropout prevention components. Tier 2 includes clinical approaches for acute/emerging attendance problems related to mental health issues; student engagement initiatives; and teacher and peer mentoring programs. Tier 3 includes expanded Tier 2 strategies and intensive case study and management, among other elements. An MD-MTSS framework can be modified to simultaneously accommodate numerous domains (e.g., developmental levels; see Kearney and Graczyk, 2020) and special circumstances (e.g., health emergencies; Kearney and Childs, 2021). MD-MTSS frameworks for attendance problems remain in the nascent stage but the individual components that can comprise each stage have moderate to strong empirical support (McIntosh and Goodman, 2016). In addition, researchers have implemented strategies to address school attendance and its problems utilizing MD-MTSS as a theoretical context (e.g., Young et al., 2020).

Kearney and Graczyk (2020) noted that emerging MD-MTSS frameworks for attendance problems may have restricted applicability to school districts, particularly large urban ones, with very high rates of chronic absenteeism. In the United States, 30.2% of students attend urban schools, some of which are part of the largest districts in the country and some of which have substantially elevated school absenteeism and dropout rates (National Center for Education Statistics, 2017). Three key challenges help explain why emerging school-based MD-MTSS frameworks may have restricted applicability in

these districts. First, many school districts with very high rates of chronic absenteeism are in areas with external and deep structural inequalities and multiple fundamental barriers to school attendance (Singer et al., 2021). Second, many school districts with very high rates of chronic absenteeism are in areas where support services are fragmented and uncoordinated (Singh et al., 2017). Families of youth with attendance problems must often navigate sparse and/or splintered avenues of support. Third, many school districts with very high rates of chronic absenteeism are faced with enormous student caseloads that overwhelm in-house support services (e.g., school-based counselors, psychologists, social workers) (Braun et al., 2020).

MTSS approaches in general are designed to accommodate 10–15% of students transitioning to Tier 2 and 1–5% of students transitioning to Tier 3 (McDaniel et al., 2015). In districts with very high rates of chronic absenteeism, however, Tier 2 and 3 cases can surge to 50% or more; schools are not typically equipped to provide Tier 2/3 services to more than 20–30% of students (Kilgus and Eklund, 2016). The purpose of this perspective article is thus to begin a discussion as to how MD-MTSS frameworks for attendance problems could be fundamentally reconfigured in areas with very high rates of chronic absenteeism. Recommendations are provided at each tier, with the understanding that original notions of how MD-MTSS tiers are ostensibly constructed and aimed must be unlearned in these circumstances. At Tier 1, this can include root cause analysis and remediation of barriers to school attendance as well as shared alliances and community schools. At Tier 2, this can include mapping community assets, reducing barriers to care, and modifying supports based on cultural relevance, existing resources, and equity. At Tier 3, this can include a centralized catchment and intervention process linked to a coordinated system of care as well as alternative, creative, and viable pathways to school completion.

Tier 1

Researchers have noted that fundamental intervention processes for areas of high absenteeism severity must include a root cause analysis of systemic barriers to attendance, many of which can be *external* to educational centers and sometimes unique to a specific geographical area (Lenhoff et al., 2020). Systemic barriers can include digital divides, food insecurity, poor housing quality, frequent residential mobility, transportation challenges, lengthy and unsafe avenues to school, and resource deprivation via underemployment and limited access to support services (Gottfried et al., 2022; Kearney et al., 2022). As such, Tier 1 interventions must include identifying primary community aspects that impede school attendance *as well as* partnering with external agencies to ameliorate these barriers. The surrounding community must thus become an additional and sometimes primary target of intervention (Childs and Grooms, 2018). Political and organizational challenges

to this process can include decentralized school districts and service agencies, varied lines of authority, and ingrained deficit-oriented beliefs; schools have been encouraged to fund and develop research partnerships to enhance connectivity with key social welfare entities, examine empirical evidence on root causes and solutions, and utilize data to shape policy decisions (Lenhoff and Singer, 2022).

This shift in mindset requires less burden on under-resourced schools and more burden on shared alliances for purposes of community development and positive youth development frameworks (Zaff et al., 2015). School absenteeism is often a complex, multigenerational, and relentless (wicked) problem (Childs and Lofton, 2021). As such, shared alliances are necessary to address multilayered characteristics and can include collaborations among agencies (e.g., education, housing, legal, public health, welfare) to better track students removed from the educational process and to develop comprehensive early warning and intervention systems salient to a particular area. An example involves multiagency collaboration in areas of housing instability and residential mobility to facilitate rental assistance and transportation to a previous school for vulnerable students (Fenelon et al., 2021).

Kearney and Graczyk (2020) noted as well that the very nature of a school's purpose must change in MD-MTSS frameworks of school attendance/problems in areas of high absenteeism severity. This can include family-school-community partnerships and full-service community schools to address the needs of vulnerable students by integrating community agencies into a school setting (see Oakes et al., 2017). Such arrangements are designed to minimize cost, transportation challenges, stigma, and wait time as well as to identify families with needs that supersede school attendance. In addition, such arrangements require alignment with a surrounding community and its challenges, meaning an emphasis on democratic collaboration, educational and social justice, empowerment, equity, and strengths-based principles (Bryan et al., 2020). Best practice examples may be derived from positive behavior intervention support programs that have been adapted for large districts (Netzel and Eber, 2003) and that address barriers such as lack of training, limited financial resources, resistance, low expectations, and poor fidelity (Warren and Robinson, 2015).

Tier 2

As mentioned, school districts with very high levels of chronic absenteeism are often in areas with fragmented and uncoordinated systems of support. This is unfortunate because Tier 2 attendance problems often demand rapid, specialized, and streamlined responses. As such, a priority of Tier 2 systems of support must include thorough community asset mapping to identify mental health and academic support options, particularly for vulnerable students such as those

with disabilities (Suarez-Balcazar et al., 2021). In addition, community providers such as physicians, psychologists, and social workers can be enlisted to reduce barriers to care. Examples include providing prompt and low-cost services, resolving educational access issues, engaging in culturally competent care, conducting forensic assessments in legal settings, identifying neurodevelopmental problems, facilitating access to preschool and academic supports, and advocating for nuanced treatment rather than punitive approaches (Kearney and Benoit, 2022).

Tier 2 supports in large school districts require other modifications as well. Walter et al. (2019) noted that tiered approaches must reduce burden on school districts by emphasizing available crisis services, extended capacity building as a separate part of tier development, and shared decision making and local control. Schools can engage in self-assessment to measure existing resources, build a roadmap to develop further support services, and develop an attendance action plan (Attendance Works, 2021). Malone et al. (2021) also emphasized the importance of cultural relevance for Tier 2 systems with respect to language, goals, program content, and local community context; other recommendations included helping students navigate hostile racial school climates and promote racial identity development as well as engaging stakeholders who reflect the values and culture of students in various interventions. Others have discussed the need for enhanced equity in Tier 2 interventions involving special education as well as access to culturally responsive interventions (DeBoer et al., 2022; Raviv et al., 2022). Tier 2 approaches for these areas must also fully incorporate trauma-informed practices given elevated rates of adverse child experiences that impact school attendance (Stempel et al., 2017). Trauma-informed practices must emphasize growth mindsets and cultural responsiveness (Thomas et al., 2019) and are linked to increased school attendance via improved functioning in daily living, emotional regulation, interpersonal relationships, and fewer symptoms of mental disorder (Dorado et al., 2016).

Tier 3

As mentioned, local school-based support systems (e.g., school counselors, psychologists, social workers) are typically overwhelmed by high student caseloads in areas of very high chronic absenteeism. This is particularly problematic with respect to Tier 3 cases that demand inordinate time for data collection, analysis, and management. As such, mechanisms are needed to draw Tier 3 cases into a centralized catchment and intervention process that has the resources required to holistically assess student/family history, interface with multiple professionals relevant to a case (e.g., physician, probation officer, special education teacher), and develop and coordinate intricate and prolonged interventions. Existing entities such as district-wide panels and school review boards can be repurposed toward

this end to allow local school-based support systems to focus more on Tier 2 cases. This would involve blending school-based referrals with a system of coordinated care that addresses economic (e.g., employment, financial, nutrition assistance), logistical (e.g., housing, transportation), physical and mental health/disability (e.g., medical, counseling, psychoeducational centers), and legal and other relevant domains. Such an approach in a real-world setting requires strong district commitment and investment in training as well as collaboration between districts as students transfer from one to the other (Battal et al., 2020).

Tier 3 interventions will also require expanded use of existing mechanisms to provide alternative, creative, and viable pathways to school completion. Accommodation plans can be used to establish part-time attendance schedules, family and mental health support, modifications in class schedule and academic work, mentoring and tutoring, assessment of learning and other disorders, and other palliative options (Kearney, 2016). More broadly, Tier 3 practices must include a district-wide policy review to reduce the use of suspensions and expulsions to address school absenteeism and to establish more restorative responses. Part of this effort can include flexible and personalized methods of school completion based on individual circumstances and interests that extend into emerging adulthood; examples include partnerships with community-based learning centers, home-based and virtual programs, year-round schooling, extra-year and credit recovery initiatives, and second-chance options (Zhang et al., 2020). Unlearning traditional notions of “seat time” and instead utilizing more flexible, valid methods to define attendance for diverse, contemporary learning formats must also be prioritized (National Forum on Education Statistics, 2021; Kearney and González, 2022).

Conclusion

MD-MTSS frameworks hold promise but remain a work in progress for addressing school attendance and its problems. Part of this evolutionary process must involve *unlearning* original notions of these frameworks to better apply them to different geographical areas with very high levels of absenteeism. Such unlearning will require innovative and sometimes radical

reconfigurations at both systemic and analytic levels. In related fashion, such unlearning must account for large-scale changes in pedagogy, technology, demographics, and macroeconomic and political factors/constraints. With respect to the latter, stakeholders have noted the tension between expectations for schools to improve attendance with existing, limited resources and what communities must do to reduce or eliminate structural inequalities that continue to exacerbate widespread attendance problems. An unlearning process must therefore absorb not only circumscribed technical and policy issues but also broader political and economic issues. We invite further discussions in this regard across disciplines.

Data availability statement

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

Both authors contributed to the writing and editing of the manuscript.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Attendance Works, (2021). *School team self-assessment*. Available online at: <https://www.attendanceworks.org/resources/self-assessment/> (accessed July 19, 2022).

Battal, J., Pearrow, M. M., and Kaye, A. J. (2020). Implementing a comprehensive behavioral health model for social, emotional, and behavioral development in an urban district: An applied

study. *Psychol. Sch.* 57, 1475–1491. doi: 10.1002/pits.22420

Braun, G., Kumm, S., Brown, C., Walte, S., Hughes, M. T., and Maggin, D. M. (2020). Living in Tier 2: Educators' perceptions of MTSS in urban schools. *Intern. J. Inclusive Educ.* 24, 1114–1128. doi: 10.1080/13603116.2018.1511758

- Bryan, J., Williams, J. M., and Griffin, D. (2020). Fostering educational resilience and opportunities in urban schools through equity-focused school-family-community partnerships. *Prof. Sch. Counseling* 23, 1–14. doi: 10.1177/2156759X19899179
- Chen, C. C., Culhane, D. P., Metraux, S., Park, J. M., and Venable, J. C. (2016). The heterogeneity of truancy among urban middle school students: A latent class growth analysis. *J. Child Fam. Stud.* 25, 1066–1075. doi: 10.1007/s10826-015-0295-3
- Childs, J., and Grooms, A. A. (2018). Improving school attendance through collaboration: A catalyst for community involvement and change. *J. Educ. Stud. Placed Risk* 23, 122–138. doi: 10.1080/10824669.2018.1439751
- Childs, J., and Lofton, R. (2021). Masking attendance: How education policy distracts from the wicked problem(s) of chronic absenteeism. *Educ. Policy* 35, 213–234. doi: 10.1177/0895904820986771
- DeBoer, J. L., Allouche, S. F., Vasquez, J. I., and Rhodes, J. (2022). Equitable practices in school mental health. *Psychol. Sch.* 59, 1222–1238. doi: 10.1002/pits.22678
- Dorado, J. S., Martinez, M., McArthur, L. E., and Leibovitz, T. (2016). Healthy environments and response to trauma in schools (HEARTS): A whole-school, multi-level, prevention and intervention program for creating trauma-informed, safe and supportive schools. *Sch. Ment. Health* 8, 163–176. doi: 10.1007/s12310-016-9177-0
- Fenelon, A., Boudreaux, M., Slopen, N., and Newman, S. J. (2021). The benefits of rental assistance for children's health and school attendance in the United States. *Demography* 58, 1171–1195. doi: 10.1215/00703370-9305166
- Gottfried, M., Page, L., and Edwards, D. (2022). *District strategies to reduce student absenteeism*. Providence, RI: Annenberg Institute for School Reform at Brown University.
- Graczyk, P. A., and Kearney, C. A. (2022). *Implementing a multi-dimensional, multi-tiered system of supports framework to promote school attendance and address school attendance problems*. Manuscript submitted for publication.
- Gubbels, J., van der Put, C. E., and Assink, M. (2019). Risk factors for school absenteeism and dropout: A meta-analytic review. *J. Youth Adolesc.* 48, 1637–1667. doi: 10.1007/s10964-019-01072-5
- Kearney, C. A. (2016). *Managing school absenteeism at multiple tiers: An evidence-based and practical guide for professionals*. New York, NY: Oxford.
- Kearney, C. A. (2021). Integrating systemic and analytic approaches to school attendance problems: Synergistic frameworks for research and policy directions. *Child Youth Care Forum*. 50, 701–742. doi: 10.1007/s10566-020-09591-0
- Kearney, C. A., and Benoit, L. (2022). Child and adolescent psychiatry and underrepresented youth with school attendance problems: Integration with systems of care, advocacy, and future directions. *J. Amer. Acad. Child Adolesc. Psychiatry*. doi: 10.1016/j.jaac.2022.03.016
- Kearney, C. A., and Childs, J. (2021). A multi-tiered systems of support blueprint for re-opening schools following COVID-19 shutdown. *Child Youth Serv. Rev.* 122:105919. doi: 10.1016/j.childyouth.2020.105919
- Kearney, C. A., and González, C. (2022). Unlearning school attendance and its problems: Moving from historical categories to postmodern dimensions. *Front. Educ.* 7:977672. doi: 10.3389/feeduc.2022.977672
- Kearney, C. A., and Graczyk, P. (2014). A Response to Intervention model to promote school attendance and decrease school absenteeism. *Child Youth Care Forum*. 43, 1–25. doi: 10.1007/s10566-013-9222-1
- Kearney, C. A., and Graczyk, P. A. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Kearney, C. A., Childs, J., and Burke, S. (2022). Social forces, social justice, and school attendance problems in youth. *Contemp. School Psychol.* doi: 10.1007/s40688-022-00425-5
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. (2019). Reconciling contemporary approaches to school attendance and school absenteeism: Toward promotion and nimble response, global policy review and implementation, and future adaptability (Part 2). *Front. Psychol.* 10:2605. doi: 10.3389/feeduc.2019.02605
- Kilgus, S. P., and Eklund, K. R. (2016). Consideration of base rates within universal screening for behavioral and emotional risk: A novel procedural framework. *Sch. Psychol. Forum. Res. Pract.* 10, 120–130.
- Knollmann, M., Waltz, E., Reissner, V., Neumann, U., and Hebebrand, J. (2022). Course of school absenteeism 1.5-3 years after initial evaluation: Symptoms, psychosocial functioning, and help-seeking behavior. *Zeitschrift für Kinder- und Jugendpsychiatrie und Psychotherapie*. doi: 10.1024/1422-4917/a000884
- Lenhoff, S. W., and Singer, J. (2022). Promoting ecological approaches to educational issues: Evidence from a partnership around chronic absenteeism in Detroit. *Peabody J. Educ.* 97, 87–97. doi: 10.1080/0161956X.2022.2026723
- Lenhoff, S. W., Edwards, E. B., Claiborne, J., Singer, J., and French, K. R. (2020). A collaborative problem-solving approach to improving district attendance policy. *Educ. Policy* 36, 1464–1506. doi: 10.1177/0895904820974402
- Malone, C. M., Wycoff, K., and Turner, E. A. (2021). Applying a MTSS framework to address racism and promote mental health for racial/ethnic minoritized youth. *Psychol. Sch.* doi: 10.1002/pits.22606
- McDaniel, S. C., Bruhn, A. L., and Mitchell, B. S. (2015). A tier 2 framework for behavior identification and intervention. *Beyond Behav.* 24, 10–17. doi: 10.1177/107429561502400103
- McIntosh, K., and Goodman, S. (2016). *Integrated multi-tiered systems of support: Blending RTI and PBIS*. New York, NY: Guilford.
- National Center for Education Statistics (2017). *Selected statistics from the public elementary and secondary education universe: School year 2015-16*. Washington, DC: National Center for Education Statistics.
- National Forum on Education Statistics (2021). *Forum guide to attendance, participation, and engagement data in virtual and hybrid learning models (NFES2021058)*. Washington, DC: U.S. Department of Education.
- Netzel, D. M., and Eber, L. (2003). Shifting from reactive to proactive discipline in an urban school district: A change of focus through PBIS implementation. *J. Posit. Behav. Intervent.* 5, 71–79. doi: 10.1177/10983007030050020201
- Oakes, J., Maier, A., and Daniel, J. (2017). *Community schools: An evidence-based strategy for equitable school improvement*. Boulder, CO: National Education Policy Center.
- Raviv, T., Smith, M., Hurwitz, L., Gill, T. L., Baker, S., Torres, S. A., et al. (2022). Supporting school-community collaboration for the implementation of a multi-tiered school mental health program: The Behavioral Health Team model. *Psychol. Sch.* 59, 1239–1258. doi: 10.1002/pits.22683
- Singer, J., Pogodzinski, B., Lenhoff, S. W., and Cook, W. (2021). Advancing an ecological approach to chronic absenteeism: Evidence from Detroit. *Teach. College Record* 123, 1–36. doi: 10.1177/016146812112300406
- Singh, G. K., Daus, G. P., Allender, M., Ramey, C. T., Martin, E. K., Perry, C., et al. (2017). Social determinants of health in the United States: Addressing major health inequality trends for the nation, 1935-2016. *Intern. J. MCH AIDS* 6:139. doi: 10.21106/ijma.236
- Stempel, H., Cox-Martin, M., Bronsert, M., Dickinson, L. M., and Allison, M. A. (2017). Chronic school absenteeism and the role of adverse childhood experiences. *Acad. Pediatr.* 17, 837–843. doi: 10.1016/j.acap.2017.09.013
- Suarez-Balcazar, Y., Early, A., Miranda, D. E., Marquez, H., Maldonado, A., and Garcia-Ramirez, M. (2021). Community-engaged asset mapping with Latinx immigrant families of youth with disabilities. *Am. J. Commun. Psychol.* 70, 89–101. doi: 10.1002/ajcp.12578
- Thomas, M. S., Crosby, S., and Vanderhaar, J. (2019). Trauma-informed practices in schools across two decades: An interdisciplinary review of research. *Rev. Res. Educ.* 43, 422–452. doi: 10.3102/0091732X18821123
- Walter, H. J., Kaye, A. J., Dennery, K. M., and DeMaso, D. R. (2019). Three-year outcomes of a school-hospital partnership providing multitiered mental health services in urban schools. *J. Sch. Health* 89, 643–652. doi: 10.1111/josh.12792
- Warren, J. M., and Robinson, G. (2015). Addressing barriers to effective RTI through school counselor consultation: A social justice approach. *Electr. J. Inclusive Educ.* 3:4.
- Young, S., Connolly Sollose, L., and Carey, J. P. (2020). Addressing chronic absenteeism in middle school: A cost-effective approach. *Children Schools* 42, 131–138. doi: 10.1093/cs/cdaa009
- Zaff, J. F., Donlan, A. E., Jones, E. P., and Lin, E. S. (2015). Supportive developmental systems for children and youth: A theoretical framework for comprehensive community initiatives. *J. Appl. Dev. Psychol.* 40, 1–7. doi: 10.1016/j.appdev.2015.03.004
- Zhang, L., Basham, J. D., and Yang, S. (2020). Understanding the implementation of personalized learning: A research synthesis. *Educ. Res. Rev.* 31:100339. doi: 10.1016/j.edurev.2020.100339



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School attendance and school absenteeism: A primer for the past, present, and theory of change for the future

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School attendance and school absenteeism have been studied for over a century, leading to a rich and vast literature base. At the same time, powerful demographic, climate, social justice/equity, and technological/globalization forces are compelling disparate stakeholders worldwide to quickly adapt to rapidly changing conditions and to consider new visions of child education for the next century. These overarching forces are utilized within a theory of change approach to help develop such a vision of school attendance/absenteeism for this era. This approach adopts key long-range outcomes (readiness for adulthood for all students; synthesized systemic and analytic approaches to school attendance/absenteeism) derived from thematic outputs (reframing, social justice, and shared alliances) that are themselves derived from contemporary inputs (movement of educational agencies worldwide toward readiness for adulthood, technological advances, schools, and communities as one). As with theory of change approaches, the purpose of this discourse is not to provide a roadmap but rather a compass to develop multi-stakeholder partnerships that can leverage shared resources and expertise to achieve a final mutual goal.

KEYWORDS

school attendance, school absenteeism, truancy, school dropout, theory of change, readiness for adulthood

Introduction

School attendance and school absenteeism were one of the first areas of study for emerging disciplines such as education, psychology, and criminal justice in the late 19th and early 20th centuries. With the advent of the labor rights movement, new employment laws, and the needs for an educated workforce and greater social order, children were

increasingly moved from industrial and agricultural settings to more formalized school settings (Rury and Tamura, 2019). School absenteeism thus became viewed as a legal as well as a societal problem in need of remediation, with a concurrent focus on illegal truancy as well as delinquency as a primary cause (Williams, 1927; Kirkpatrick and Lodge, 1935; Gleeson, 1992). Around the mid-20th century, however, psychological approaches focused on other possible causal mechanisms of school absenteeism such as child fear/anxiety, problematic separation from caregivers, family dysfunction, and proximity to deviant peers (e.g., Johnson et al., 1941; Waldfogel et al., 1957; Kennedy, 1965). Many of these approaches centered on students and their families, a predominant focus of many professionals even today. Only later in the 20th century, and especially following the civil rights movement of the 1960s as well as a revival of Marxist theory *via* the emergence of social stratification research, did researchers and other stakeholders more intensely examine broader contexts of school absenteeism that included the school environment, the surrounding community, and economic, cultural, political, and other macro influences (Bourdieu and Passeron, 1977; Willis, 1977; Weinberg, 1991; Sleeter, 2014).

Today, the study of school attendance/absenteeism comprises many disciplines such as child development, criminal and juvenile justice, economics, education, epidemiology, law, leadership, nursing, medicine, political science, program evaluation, psychiatry, psychology, public and educational policy, school counseling, social work, and sociology, among others. These approaches can be divided generally into *systemic* perspectives that focus on overarching contexts and structural concerns as well as *analytic* perspectives that focus on specific contexts and individual concerns (Kearney, 2021). Together these approaches have produced a rich and vast repository of knowledge over the past century regarding the conceptualization of school attendance/absenteeism with respect to domains such as definition, classification, risk/protection, trajectory, measurement, and intervention. At the same time, however, the breadth and multifaceted nature of these varied systemic and analytic approaches has led to myriad avenues of investigation that are not always well-coordinated or integrated. In addition, geographical and cultural differences in systems of education, including areas where education does not exist at all, further complicate the current landscape of school attendance/absenteeism (Porto, 2020).

On top of all of this are relatively recent revolutionary and fundamental changes in human communication and interaction that are spurred in part by climate change, demands for equity and social justice, demographic and migration shifts, globalization, health crises, political movements, and technological advancements (Krishnamurthy et al., 2019; Mao et al., 2019; Cleveland-Innes, 2020; Rapanta et al., 2021). As such, the very nature of educating children is being radically altered and will continue to evolve (or devolve) quickly over the next decades. The challenge before us in the next century is thus not only to assimilate the different systemic/analytic and geographic/cultural approaches to school attendance/absenteeism but also to meld this

assimilation process with rapidly changing undercurrents of essential human functioning.

The purpose of this article is to provide a *primer* for stakeholders in this area regarding the past and next century vis-à-vis school attendance/absenteeism. As such, *broad strokes are emphasized* at the expense of greater detail regarding specific investigations. The article is divided into three main sections. The first section outlines key conclusions that can be drawn from a century's worth of study of school attendance/absenteeism. The second section outlines how some of the revolutionary and fundamental changes noted above are impacting child education as well as traditional notions of school attendance/absenteeism. The third section, a theory of change approach, outlines a potential mutual vision for what the study of school attendance/absenteeism could look like in the coming decades.

The past: What is known?

A more than century's worth of study allows for several broad conclusions about what is known regarding school attendance/absenteeism. Six such conclusions are presented next that are drawn from communal themes across the many disciplines in this area. First, *school attendance/absenteeism are global issues but ones that are studied primarily within geographically limited areas*. Less than three-quarters of children worldwide complete at least a lower secondary school education (UNESCO, 2019). This rate is particularly restricted for sub-Saharan Africa (38%), northern Africa and western Asia (72%), central and southern Asia (75%), and Latin America and the Caribbean (76%). Unfortunately, the vast majority of research regarding school attendance/absenteeism comes from continental areas that have the highest completion rates in this regard: Europe and North America (98%) and Oceania (92%). Although emerging research is emanating from places such as South America, Asia, and Africa (e.g., Momo et al., 2019; González et al., 2020), not nearly enough is known in these areas about the domains of school attendance/absenteeism noted earlier.

Second, *rates of school attendance/absenteeism differ substantially and disproportionately affect vulnerable student groups*. Approximately 17% of children worldwide do not attend school, and many of these students are deliberately deprived of an education on the basis of gender, disability, and/or ethnicity. Students in low-income countries also experience greater barriers to an education such as food and housing insecurity, lack of instructors and academic materials, large class sizes, long distances to school, poor infrastructure, and violence (UNESCO, 2019). Health crises and limited economic opportunities in these regions also drive students out of school and into premature labor roles (Mussida et al., 2019; Reimers, 2022). Even in developed countries, elevated school absenteeism and dropout rates occur among vulnerable groups such as impoverished students, migrant students, students of color, students with disabilities, and students less familiar with the

dominant cultural language (Garcia and Weiss, 2018; Koehler and Schneider, 2019; Sosu et al., 2021).

Third, *school attendance is generally associated with student benefit and school absenteeism is generally associated with student harm*. One could contend that formal schooling is one of the best interventions ever designed for children, or at least for many children. Regular school attendance and school completion have been linked to adaptive functioning in many child developmental domains (e.g., academic, behavioral, health, psychological, and social; Rocque et al., 2017; Ehrlich et al., 2018). These effects have both short-term (e.g., educational achievement) as well as long-term (e.g., enhanced lifetime earning potential) positive impacts. Conversely, school absenteeism and school dropout have been associated with less adaptive functioning in these domains, with both short-term and long-term negative impacts (Ansari et al., 2020; Rumberger, 2020). Caveats apply to this general conclusion, however. For many students, particularly vulnerable students, school is an environment associated with biased exclusionary discipline, racism, oppression, systemic discrimination, and victimization (Kohli et al., 2017; Sanders, 2022). In related fashion, many students miss school as a *more adaptive* choice, such as to support a family economically (Chang et al., 2019; Ricking and Schulze, 2019).

Fourth, *school attendance/absenteeism are complicated constructs that require innovative measurement strategies*. School attendance/absenteeism represents more than just physical presence or absence in a brick-and-mortar building. Many forms of school attendance/absenteeism exist across multiple instructional formats, including virtual or distance learning formats, that demand new and broader metrics (e.g., log-ins, completed assignments, student-teacher interactions, and mastery of skills) for measuring these constructs (National Forum on Education Statistics, 2021). In addition, school absenteeism comprises a spectrum of attendance problems that can include full or partial day absences, missing classes, tardiness, student/family problems in the morning, and distress, somatic complaints, and other psychological problems that interfere with school attendance (Li et al., 2021; Kearney and González, 2022). This has led to broader definitions of school attendance/absenteeism that focus less on physical presence/absence and more on engagement (Patrick and Chambers, 2020; Kearney, 2021). Greater sophistication with respect to systemic evaluation (e.g., early warning systems) and analytic assessment (e.g., clinical protocols) methods also allows for more sensitive data analytic strategies to define problematic school absenteeism for certain student groups and across geographical regions (Balfanz and Byrnes, 2019; González et al., 2021; Kearney and Childs, 2022).

Fifth, *school attendance/absenteeism remains associated with multiple risk and protective factors across ecological levels*. One advantage of the contemporary era is that a historical, singular focus on either student/family or other narrow-band risk/protective factors or on school-related or other broad-band risk/protective factors is yielding to more integrated approaches for understanding the complex ecology of school attendance/

absenteeism (Kim, 2020; Singer et al., 2021). Stakeholders now understand that interconnected risk/protective factors in this area range from granular to immense levels; examples include disability/academic achievement (student level), psychopathology/academic involvement (caregiver level), residential movement/cohesion (family level), victimization/positive norms (peer level), negative/positive climate quality (school level), neighborhood violence/safe avenues to school (community level), and structural economic inequalities/well-financed educational agencies (macro level; e.g., Zaff et al., 2017; Gubbels et al., 2019). In addition, stakeholders increasingly view school attendance/absenteeism from a comprehensive Bronfenbrenner-like ecological approach; examples include linkages between student-caregiver interactions (microsystem), caregiver-school staff communications (mesosystem), educational policies (exosystem), transportation vulnerabilities (macrosystem), and changes in these systems as children move from preschool to elementary, middle, and high school and beyond (chronosystem; e.g., Melvin et al., 2019; Childs and Scanlon, 2022).

Sixth, *positive interventions to enhance school attendance and to reduce school absenteeism are generally though perhaps only moderately effective*. Positive interventions are defined here as those that are empirically supported, intentional, and designed to foster well-being (Tejada-Gallardo et al., 2020). Systematic reviews and meta-analyses reveal that positive interventions from both systemic and analytic perspectives are modestly effective at boosting school attendance and reducing school absenteeism (refer to, for example, Maynard et al., 2018; Keppens and Spruyt, 2020; Eklund et al., 2022). Key limitations, however, include insufficient integration of these various intervention strategies as well as incomplete dissemination and implementation across schools, community support agencies, and student groups (Heyne et al., 2020; Kearney and Benoit, 2022). In contrast, negative interventions, defined here as punitive measures to suppress certain behaviors, paradoxically exacerbate school absenteeism and are disproportionately and perniciously applied to vulnerable student groups (Mireles-Rios et al., 2020; Weathers et al., 2021). Examples include exclusionary discipline (e.g., arrests, expulsion, and suspension) and zero tolerance laws that often focus on deprivation of resources (e.g., *via* fines or restrictions on financial assistance or licenses) for absenteeism (Conry and Richards, 2018; Rubino et al., 2020).

A century of work has produced a prodigious amount of knowledge regarding school attendance/absenteeism. But, the world is changing fast. As mentioned, revolutionary and fundamental changes in human communication and interaction will alter the course of child education and thus the study of school attendance/absenteeism for decades to come. A complete summary of all possible future effects on education is beyond the scope of this paper. Instead, we concentrate on some of the broadest and perhaps most wide-ranging influences in this regard: demographic shifts, climate change, demands for social justice and equity, and technological advancements and globalization. These

influences, discussed next, are naturally complex, often subsuming other themes, and are naturally interwoven with one another.

The present: What is changing?

As stakeholders develop new visions of child education and school attendance/absenteeism for the future, several key fundamental shifts must be considered. One key fundamental shift worldwide involves *demographic changes* such as uneven (rising and declining) birthrates, more frequent migration patterns between regional countries and especially from south to north, and increased urbanization. Population growth is expected to largely emanate from African and Indo-Pacific countries and population decline is expected to be most acute for European and eastern Asian countries (United Nations Department of Economic and Social Affairs, Population Division, 2022). In addition, older age groups will grow fastest and will eventually outnumber children and adolescents. Migration is expected to expand considerably due to violence, persecution, deprivation, and natural disasters. Urbanization will increase from 55 to 68 percent of people by 2050, especially in Asia and Africa (United Nations Department of Economic and Social Affairs, Population Division, 2018).

These demographic shifts have many ramifications for child education and the study of school attendance/absenteeism. First, *school closures* in areas of population decline, a phenomenon already present in many countries, would be expected to accelerate. School closures create interrupted learning and measurements of learning, lengthy distances to new schools, compromised nutrition, social isolation, economic costs for families, and burden on existing schools (Hanushek and Woessmann, 2020). Learning losses due to school closures are particularly negatively impactful for disadvantaged students (Maldonado and De Witte, 2022). Conversely, education infrastructure for fastest-growing areas, already a problematic situation in areas noted above, will need to be prioritized. Second, *increased migration* means the need to integrate different student groups into a dominant educational culture. Challenges with respect to interrupted schooling, language, seasonal work, community isolation, socioeconomic disadvantages, fears of deportation, stigma, discrimination, and family separation thus apply (Martin et al., 2020; Osler, 2020; Rosenthal et al., 2020; Brault et al., 2022). Increased migration will also magnify brain drain of highly skilled educational professionals (Docquier and Rapoport, 2012) that contributes to international student performance gaps (Hanushek et al., 2019). Third, *increased urbanization* often means more concentrated economic disadvantage, racial segregation, affordable housing shortages, educational inequalities, and transportation vulnerabilities (Shankar-Brown, 2015).

A second key fundamental shift worldwide involves *climate change*. Climate change affects migration, as noted above, forcing students to change schools, adapt to new curricula, and potentially

experience greater trauma (Prothero, 2022). Greater pressure to drop out of school to support families economically may occur as well (Nordengren, 2021). Climate change can also affect the physical structure of schools with limited air conditioning or ventilation or ability to withstand extreme weather, forcing cancellation of school days and reducing the availability of safe water and school-based meals (Sheffield et al., 2017). Schools in many parts of the world have closed for lengthy periods or been destroyed by cyclones, typhoons, floods, drought, landslides, and sea level rise. Related climate change risks include parent mortality, food insecurity, and increased air and water pollution in part due to lack of access to electricity and modern fuels (UNICEF, 2019). Environmental activism appears to buffer climate change anxiety and may be a protective factor for mental health in the climate crisis (Schwartz et al., 2022). Accordingly, students question the purpose of school attendance when their schools fail to provide curricular innovation regarding climate change, or to mitigate their environmental impact (Benoit et al., 2022).

Such changes in climate, already rapidly accelerating, may demand abrupt shifts between in-person and distance learning, enhanced methods for student tracking and records transfer, and improvements in educational infrastructure (Chalupka and Anderko, 2019). School buildings are also large energy consumers and may need to transition toward a reduced carbon footprint by shifting education to home- or community-based settings and/or by adopting energy efficient appliances, electric vehicles, and elimination of single use plastics, among other measures (Bauld, 2021). Education will also need to shift to careers of the future that intersect with a changing climate, such as renewable energy, environmental engineering, and emergency management (Kovacs, 2022). Basic education about the climate crisis, especially in developing countries, will need to be prioritized as well (Rousell and Cutter-Mackenzie-Knowles, 2020). The transition to sustainable development starts with pedagogical strategy and teacher training involving an Education for Sustainable Development program that emphasizes a concordant balance between societal, economic, and environmental imperatives (Ferguson et al., 2021).

A third key fundamental shift worldwide involves an increased demand for, as well as pushback against, *social justice and equity in educational systems*. Calls are growing to reduce or eliminate barriers to school attendance such as digital divides, disparities in school discipline, inequities in school funding, lack of access to school- and community-based care, oppressive school climates, transportation vulnerabilities, and victimization, all of which disproportionately impact vulnerable youth (Kearney et al., 2022). In addition, efforts to integrate themes of social justice and equity into education include revising school curricula toward multiple perspectives, addressing personal biases, supporting vulnerable students with respect to school completion, and matching the demographic characteristics of school staff and students (Spitzman and Balconi, 2019; Gottfried et al., 2021). Such efforts will also include a greater recognition that the surrounding community

must be a target of intervention, especially in areas of high chronic absenteeism (Grooms and Bohorquez, 2022; Kearney and Graczyk, 2022).

At the same time, however, an active global anti-science movement coupled with laws to restrict access to education, certain academic materials, and LGBTQ and gender rights in many countries serve as powerful counterweights to enhancing social justice and equity in educational systems (Hotez, 2020; Horne et al., 2022). Political movements emphasizing meritocracy but simultaneously depriving the means for equitable educational and social mobility also remain active and influential (Owens and de St Croix, 2020). Growing dissatisfaction with traditional educational settings and methods also means that many constituents are emboldened to attack educational system components such as school boards and curricula (Borter et al., 2022). More caregivers are thus seeking alternative choices, including home-based education, and many schools are facing critical teacher and leadership shortages (Eggleston and Fields, 2021; Wiggan et al., 2021).

A fourth key fundamental shift worldwide involves an ongoing modification of pedagogical goals and instructional formats for child education due to *globalization and technological advancements*. The pedagogical goals of education will depart from the historical Industrial Revolution model of memorization and standardization and toward a whole child/citizen approach where learning is accessible, collaborative, competency-based, inclusive, personalized, self-paced, and in part focused on student well-being. Such learning will emphasize skills needed for adult readiness that surround communication, creativity, innovation, and problem-solving (World Economic Forum, 2020). In addition, such learning will extend into emerging adulthood and be lifelong in nature as necessary skills require continual upgrades (Kim and Park, 2020).

Technological advancements also mean that the nature of education will be changing rapidly over the next decades. Some of these advancements will involve existing avenues such as cloud computing, hand-held devices and their applications, multi-touch surfaces, and social media (Polly et al., 2021). Other advancements will involve currently nascent avenues such as artificial intelligence, augmented reality, biometrics, robots, and metaverse (Aggarwal et al., 2022). As such, myriad alterations are expected with respect to instructional formats and settings, student-teacher communications, and strategies for learning (Yang et al., 2021). Less distinction will be made between traditional schools and other home and community settings, and the classroom of tomorrow may represent more of a digital network than a physical space (Kearney, 2016).

All of these changes demand consideration of new and more integrative visions for the future study of school attendance/absenteeism. Stakeholders in this area are often incentivized to pursue iterative processes or incremental changes; examples include researchers and clinicians beholden to outmoded conceptualization systems, granting agencies that reward piecemeal advancements, and policymakers searching for rapid

and simple (and usually punitive) responses to a complex problem. Instead, a proactive approach is needed that integrates all stakeholders in part by establishing a mutual vision for the future. Such a vision would itself demand a focus on what is already known, what is changing, and what long-term goals must be pursued. One attempt to craft such a vision is presented next.

The future: What is the vision?

In this section, we make observations and recommendations for the future study of school attendance/absenteeism in light of the changing world and educational landscape noted in the previous section. We adopt two main perspectives in this regard. One perspective, a *constructivist* approach, means that stakeholders across the globe would be expected to view, develop, and apply these observations and recommendations quite differently based on their unique challenges, experiences, communities, viewpoints, and evolving life circumstances. In related fashion, areas of the world have vastly different systems, laws, and resources regarding education and thus school attendance/absenteeism. A second perspective, a *theory of change* approach, means that, despite these many global differences, a mutual vision could be developed to serve as a compass over the next decades for myriad global stakeholders. Such an approach toward a mutual vision may also be helpful for synthesizing systemic/analytic as well as geographic/cultural approaches to school attendance/absenteeism.

Theory of change

One avenue for integrating various approaches for a complex problem is the development of multi-stakeholder partnerships that leverage shared resources and expertise to achieve an eventual final goal in a postmodern era. Such partnerships involve establishing a *mutual vision* that sets the stage for ongoing interactions among the partner entities. Indeed, the sustainability of an alliance among partner entities is often enhanced by belief in a collective outlook, use of similar strategies, and some prior success working together (D'Aunno et al., 2019). Key partner entities for school attendance/absenteeism that meet these criteria include those representing both systemic and analytic approaches, such as educators, health-based professionals, policymakers, researchers, students, caregivers, state agencies, and national and international organizations.

One mechanism for creating a mutual vision among disparate partner entities involves *theory of change*, which is a “participatory process whereby groups and stakeholders in a planning process articulate their long-term goals and identify the conditions they believe have to unfold for those goals to be met” (p. 2, Taplin and Clark, 2012). Theories of change are typically designed in *backward fashion* around desired long-term goals (outcomes), intermediate steps and interventions that can produce those

outcomes (outputs), and current conditions and initiatives that serve as the impetus for the outputs (inputs; [Guarneros-Meza et al., 2018](#)). Theory of change helps inform overarching long-term vision and strategic planning by producing assumptions that can be tested by research. Theory of change is “method-neutral,” relying on many informational sources (e.g., grey/published literature, program/policy evaluation, stakeholder feedback), which makes the approach particularly amenable to the disparate area of school attendance/absenteeism ([Breuer et al., 2015](#)).

The following sections introduce a futuristic, broad-strokes theory of change for school attendance/absenteeism that coalesces systemic and analytic approaches and assumes a mutual long-term (postmodern) goal of *readiness for adulthood for all students*. Although such a goal may pertain to quality of education more broadly, a specific focus on school attendance/absenteeism is chosen here because these constructs are better defined operationally, underpin education, and serve as a proxy for variables such as behavioral school engagement. Theory of change for a postmodern era seems particularly salient given substantial demographic, climate, social justice, pedagogical, technological, globalization, and other forces in the contemporary era that are compelling educators and other stakeholders to re-examine historical assumptions about instructional formats, equity of systems, and economic sustainability in adulthood ([Atiku and Boateng, 2020](#)).

The theory of change framework introduced here is not a final blueprint but rather a starting point for discussion. All aspects of a theory of change framework, including its fundamental assumptions, are subject to debate, analysis, modification, and refutation. As such, the theory of change framework introduced here is a fundamental model of action and not an advanced log frame approach that articulates specific indicators for success, measurement milestones, and mechanisms for causal connections ([De Silva et al., 2014](#)). The framework described here ([Figure 1](#)) is instead presented in a flexible, constructivist format without a rigid, predefined structure in order to allow for multiple causal pathways and interlocking systems that may progress toward a mutual goal in various ways.

Outcomes

The first step in designing a theory of change for a given issue is to define the primary long-term goals or outcomes. With respect to school attendance/absenteeism, the primary outcome utilized here is readiness for adulthood for all students. The secondary outcome is a synthesis of systemic/analytic and geographic/cultural approaches to school attendance/absenteeism to enhance multi-stakeholder partnerships that leverage shared resources and expertise to achieve full school attendance and thus readiness for adulthood for all students.

One overarching purpose of youth-based education, and thus school attendance, is to ensure *readiness for adulthood for all students* ([Pimentel, 2013](#)). Readiness is a multifaceted construct

that includes career and life skills necessary to be successful in postsecondary education and employment ([Mishkind, 2014](#)). Career (or academic) readiness can include variables such as critical thinking, problem solving, learning strategies, and organizational/study skills, among others ([Monahan et al., 2018](#)). Life skills (or nonacademic) readiness can include variables such as communication abilities, interpersonal skills, self-management, creativity/innovation, and conscientiousness, among others ([Morningstar et al., 2017](#)). In addition, broader factors such as student motivation/engagement, growth mindset, understanding of postsecondary requirements, and opportunities and supports for post-high school development enhance career and life skills readiness ([Morningstar et al., 2018](#)). All of these domains overlap considerably with one another, have been enshrined in educational policies, initiatives, and mandates (e.g., Common Core State Standards; Every Student Succeeds Act), and are considered crucial for employment in a globalized economy ([Malin et al., 2017](#)).

Readiness for adulthood also hinges on evolving developmental theory that defines adolescence and emerging adulthood as overlapping, extended phases of growth that precede formal adulthood. Adolescence includes youth in pubertal years as well as youth up to age 24 years who have not yet assumed adult roles due to slower behavioral maturation (e.g., impulsivity; [Hochberg and Konner, 2020](#)). Emerging adulthood represents youth up to age 28 years who progress toward independence, complex interrelationships, and career trajectories within a volatile period of emotional, neurodevelopmental, and social development ([Wood et al., 2018](#)). Evolving concepts of adolescence and emerging adulthood have important ramifications for K-12 educational systems, and thus school attendance, in that many students are not prepared to complete high school with respect to readiness at legally predefined ages (e.g., age 18 years; [Duncheon, 2018](#)). Instead, many students, and particularly those with disabilities, require extended time for school completion, transition services, and/or continuing academic and vocational training programs to successfully bridge adolescence, emerging adulthood, and formal adulthood ([Lombardi et al., 2020](#)).

School attendance relevant to both K-12 and continuing education is a key cornerstone and positive consequence of readiness initiatives ([Hemelt et al., 2019](#)). Unfortunately, as mentioned, school attendance problems remain stubbornly elevated among vulnerable student groups worldwide ([Garcia and Weiss, 2018](#)). Key reasons for this include, from a systemic perspective, early structural disparities and achievement gaps that are exacerbated over time; and, from an analytic perspective, fewer home-based academic activities and greater mental health challenges and adverse experiences that impede learning. As such, large swaths of youth are ill-prepared for employment and have considerably lower lifetime earning potential than peers who at least completed high school ([Pfeffer, 2008](#); [U.S. Department of Education, National Center for Education Statistics, 2020](#)).

Readiness for adulthood for *all* students is the primary outcome chosen here for a theory of change regarding school

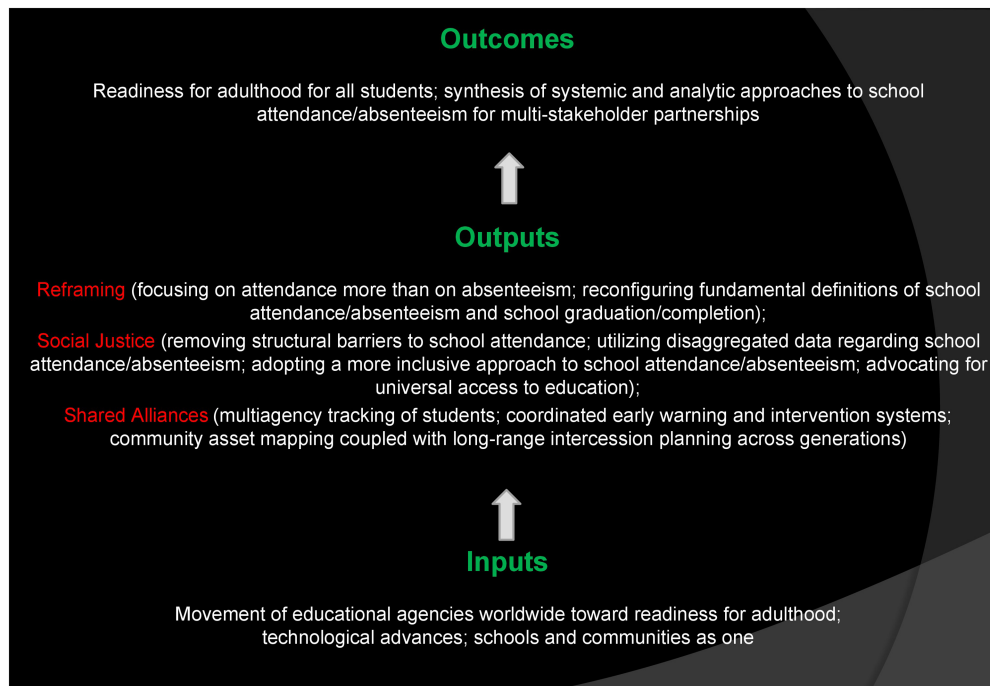


FIGURE 1

Theory of change for school attendance and its problems. This figure shows how contemporary inputs could lead to key outputs that could produce outcomes in a postmodern era.

attendance/absenteeism. Such an outcome will require ample resources, will, and creative educational efforts such as dual enrollment programs, reconfigured high school curricula, sectoral employment strategies, and revised graduation policies to essentially blur the line between completing high school and beginning the adult readiness process (e.g., *via* vocational training, community college, military service; Spangler and O'Sullivan, 2017). Such an outcome also requires a revised approach to understanding school attendance/absenteeism over the next decades. This revised approach involves viewing the readiness transition from adolescence to adulthood as a process and to ensure that this process is equitable for all students and informed by systemic and analytic perspectives.

Outputs

As mentioned, a theory of change is typically designed in backward fashion; as such, the outputs, or intermediate steps and interventions that can produce identified outcomes, are discussed next. Outputs toward a vision of readiness for adulthood for all students, with specific reference to school attendance/absenteeism, intersect with the present changes described earlier and are arranged according to themes of *reframing*, *social justice*, and *shared alliances*. Each output involves a focus on transitional process, equity, and synthesis of systemic and analytic perspectives to school attendance/absenteeism.

Reframing

Over the next decades, reframing with respect to school attendance/absenteeism will involve (1) focusing on attendance more than on absenteeism and (2) reconfiguring fundamental definitions of school attendance/absenteeism and school graduation/completion. Such reframing is necessary to accommodate an overall goal of readiness for adulthood for all students by emphasizing inclusivity and school engagement, allowing for an extended developmental period of preparatory education into emerging adulthood, and accounting for massive technological changes in instructional formats expected in the next decades (Dimitrova and Wiium, 2021). Such reframing also requires synthesis of systemic and analytic approaches to school attendance.

The first aspect of reframing involves *focusing on attendance more so than on absenteeism*. Contemporary school and policy approaches often emphasize punitive measures for absenteeism such as exclusionary discipline (arrest, suspension, and expulsion) and referral to juvenile and criminal justice systems (McNeely et al., 2021). In addition, as mentioned, absenteeism policies are often used to perniciously exclude students with behavioral and academic problems from the educational process (Mireles-Rios et al., 2020). These policies thus derail an overall outcome of readiness for adulthood for many vulnerable students. A focus on absenteeism also tends to place burden for remediation on families and neglects more systemic reasons why many students cannot attend school, such as school

closures, lack of timely bus and school assignments, limited access to educational technology, and health-based disparities in services (U.S. Department of Education, 2018). Long-range early warning systems that focus more on absenteeism and dropout are also unstable across student groups and are unlinked to interventions to improve school attendance (Newman et al., 2019).

In contrast, a focus on *restorative practices and attendance* augments connection and engagement with school. These efforts can do so *via* systemic school-family-community partnerships as well as analytic health-based strategies to enhance safety, academic growth, mental health, social relationships, family resources, and career development (Gentle-Genitty et al., 2020). These efforts are further supported by large-scale data analytic/mining models in this area that often reveal greater specificity than sensitivity, meaning the models are better at predicting which students *attend* school rather than which students are *absent* from school (Chung and Lee, 2019). As such, early warning systems can be designed in accordance with these models to provide a more nuanced, localized, and real-time analysis of attendance patterns. Such systems can be linked as well to attendance dashboards that absorb information from multiple agencies such as housing or public health to better track student attendance (refer also to the shared alliances section; Childs and Grooms, 2018; Kearney and Childs, 2022).

The second aspect of reframing involves *reconfiguring fundamental definitions of school attendance/absenteeism as well as school graduation/completion* by adopting broader and more flexible characterizations of these constructs to account for fast-moving changes in educational formats and to better synthesize systemic and analytic perspectives. Contemporary school and policy approaches in this area emphasize traditional metrics such as in-seat class time in a physical building and point-in-time graduation, which are becoming obsolete for many students given expansions in teaching and learning formats as well as evolving developmental theory regarding emerging adulthood. These approaches also rely on archaic, derogatory, and confusing terminologies. For example, the terms “truancy” and “unexcused absences” are rife with multiple and stigmatizing meanings that are applied disproportionately to vulnerable students and include negative connotations regarding delinquency and poverty (Kearney et al., 2019a; Martin et al., 2020; Pyne et al., 2021). In addition, school completion is often viewed more as a singular event (graduation) in adolescence rather than as an ongoing preparatory process into emerging adulthood, thus disenfranchising students who require additional supports. These approaches insufficiently promote an overall outcome of readiness for all students.

Broader and more flexible characterizations of school attendance/problems have been proposed. Patrick and Chambers (2020) redefined school attendance as time on task, participation or evidence of student work, and competency-based attainment with demonstrations of knowledge and skill-building. Kearney (2021) redefined school attendance/

problems as involvement in teaching and learning practices that augments or subverts the prospect of school graduation or completion. Both revised definitions broaden school attendance toward *engagement* that can include cognitive, behavioral, and emotional investment in academic work and progression. The revised definitions also allow for growth metrics such as school achievement that focus on on-track instead of off-track status for students (Bauer et al., 2018). The revised definitions further allow for greater understanding of whether engagement, or lack thereof, could be informed by impairment in school (e.g., academic achievement), social (e.g., interpersonal skills, relationships), and family (e.g., financial cost) domains (Kearney, 2022). Both examples eschew traditional emphases on timeline and physical location and synthesize systemic and analytic perspectives by adopting a mutual language to define school attendance/absenteeism, incorporating multiple instructional formats (e.g., in-person, hybrid, and online), and allowing for categorical distinctions better informed by dimensional aspects (Kearney and González, 2022).

Broader and more flexible characterizations of school *graduation* will also be necessary for the next decades. In particular, graduation will need to be viewed more as a *process* extending potentially into emerging adulthood than as a singular event in adolescence and with an emphasis more on school *completion* without, necessarily, a predefined timeline. An analogy is the systemic conceptualization of school dropout as an elongated process of school disengagement, declining academic performance, and premature departure from school as opposed to a singular event (Rumberger and Rotermund, 2012). As mentioned, systemic and flexible educational programs that blur the line between end of high school and beginning of adulthood are emerging (Kearney, 2016). In addition, analytic health-based protocols for school attendance problems increasingly incorporate an extended developmental focus such as competencies for emerging adulthood (e.g., independent living skills) that may have been compromised by school absenteeism (e.g., Kearney and Albano, 2018). Extension of the school completion process allows for greater transition to readiness in emerging and later adulthood for a greater number of students and assimilates key systemic and analytic developments that emphasize flexibility for conceptualizing school attendance/absenteeism.

Social justice

Over the next century, social justice with respect to school attendance/problems will involve mechanisms and processes ensuring that *all* students have access to opportunities to achieve readiness for adulthood, in this case *via* school attendance. Such mechanisms and processes involve (1) removing structural barriers to school attendance, (2) utilizing disaggregated data regarding school attendance/absenteeism, (3) adopting a more inclusive and less deficit- and reductionistic-oriented approach to school attendance/absenteeism among key stakeholders, and (4)

advocating for universal access to education. Such mechanisms and processes must involve a synthesis of systemic and analytic perspectives on school attendance/absenteeism.

The first aspect of social justice is *removing structural barriers to school attendance*, especially for vulnerable students. Recall that barriers in less developed countries include systematic deprivation of educational opportunity for all students often based on gender, ethnic status, poverty, and disability as well as limited qualified instructors and learning materials. Barriers in more developed countries include school closures, inequities in school funding, racial disparities in school discipline, oppressive school climate, victimization, lack of access to school counselors/nurses and mental health care, transportation vulnerability, and restricted access to technological supports for academic endeavors (Kearney et al., 2022).

Over the next decades, efforts to remove structural barriers to school attendance will involve a coordinated effort among school officials, community partners, health professionals, and researchers from systemic and analytic perspectives to examine localized patterns of absenteeism and conditions that contribute most to that absenteeism. A key part of this effort will be to utilize sophisticated data analytic strategies for large data sets to pinpoint root causes of absenteeism for a given community, school, or student group (Hough, 2019). These strategies include algorithm- and model-based strategies designed to reveal predictive patterns or outcomes.

Algorithm-based models establish predictive rules for a given outcome such as absenteeism that can also identify key barriers to attendance. These models have been used to identify specific barriers such as delays in assigning new schools following residential changes, safety concerns at school, lack of transportation, grade retention, teacher turnover, and lack of certain courses needed for graduation (e.g., Deitrick et al., 2015). These analyses can also be used to provide predictive information for certain developmental levels/grades, student groups, and schools and classrooms (Newman et al., 2019). Model-based analyses identify relationships or clusters among variables related to absenteeism. Such approaches have also helped identify key barriers to school attendance in certain locations such as food and housing insecurity, elevated school suspension rates, and entry into juvenile/criminal justice systems (e.g., Coughenour et al., 2021).

The second aspect of social justice is *focusing on disaggregated data regarding school attendance and absenteeism*. Contemporary school and policy approaches emphasize aggregated data across various student groups to evaluate progress in a given area, such as overall graduation rates across schools or districts. A frequent tactic is to rely on cutoffs to determine acceptable levels of overall attendance rates for a school or district, such as 90% (Durham et al., 2019). Reliance on aggregated data and cutoffs, however, discounts nuanced sources of information pertinent to targeted intervention efforts, such as timing of absences, information from other relevant agencies (e.g., housing and public health), qualitative data, and information on long-range attendance

patterns (Falissard et al., 2022; Kearney and Childs, 2022; Keppens, 2022). Reliance on aggregated data and cutoffs also discounts broader factors related to absenteeism such as lack of safe transportation to school, ignores attendance rates parsed by student group, and fails to inform effective interventions (Hutt, 2018). Reliance on aggregated data also fails to capture important, nuanced, historical information for a given community that can be critical for addressing broader issues related to school attendance and absenteeism.

Over the next decades, efforts to address school attendance/absenteeism will focus on disaggregated data to better identify high-risk groups, focus on a continuum of school attendance/absenteeism, and include growth metrics to enhance school accountability efforts (Bauer et al., 2018). Disaggregated data as opposed to cutoffs will help identify specific student groups, often those with intersecting risk factors, most in need of services. Examples include students of various racial and ethnic groups with certain health problems, students who are English language learners living in impoverished neighborhoods, students with disabilities without transportation to school, and migrant students with varying degrees of assimilation into a particular school (Childs and Grooms, 2018). Alternatives to cutoffs will require synthesis of systemic and analytic approaches by adopting diverse disaggregation strategies such as conducting needs assessments, data system reconfigurations, and case studies in educational agencies (National Forum on Education Statistics, 2016).

The use of disaggregated data also allows for greater consideration of a continuum of school attendance/absenteeism. Although many schools rely on full-day presence or absence from school, school attendance/absenteeism more accurately also includes partial absences (e.g., tardiness, skipped classes, or parts of a school day) and difficulties attending school (e.g., morning behavior problems to miss school and distress during a school day; Kearney et al., 2019a). Reliance on full-day absences also penalizes students who are late to school due to transportation and other problems outside their control (Chang, 2018). A focus on a continuum as opposed to full-day absences allows for more granular attendance coding, especially for online or hybrid learning environments and for vulnerable students, that supports a standards-based or competency-oriented progression with respect to academic progress and eventual school completion (National Forum on Education Statistics, 2021).

A focus on disaggregated data also permits greater use of growth or on-track metrics to enhance school accountability regarding specific student groups (Leventhal et al., 2022). Growth metrics can include school metrics related to climate and academic quality, achievement metrics related to academic progress (including attendance), and protective metrics related to school engagement and other variables that propel students toward school completion (Zaff et al., 2017). These metrics are better suited for proactive practices to identify specific students drifting off track and in need of resources and moving away from reactive, punitive, and often discriminatory absenteeism policies that exclude students from the educational process (Spruyt et al., 2017;

Bauer et al., 2018). Growth metrics also synthesize systemic and analytic approaches in this area by emphasizing academic and non-academic variables.

The third aspect of social justice is *adopting a more inclusive and less deficit- or reductionistic-oriented approaches among key stakeholders*. Contemporary research, policy, and educational practices emphasize specific risk factors for school attendance problems involving youth and caregivers (Conry and Richards, 2018). Examples include mental, behavioral, and learning challenges; caregiver strategies; and family dynamics (e.g., Roué et al., 2021). As such, researchers and other stakeholders disproportionately place blame and burden for remediating school attendance problems on students and their families, especially for vulnerable groups (Grooms and Bohorquez, 2022). Less attention is paid to broader factors outside a family's control such as structural barriers to school attendance or school and community factors (Gubbels et al., 2019). Indeed, students often report that problems with the physical and social school environment impact their attendance more so than home-based experiences (Corcoran and Kelly, 2022). School attendance/absenteeism constructs are instead, however, often framed within a deficit narrative.

Over the next decades, a more inclusive approach to school attendance/problems will include better recognition of broader contextual factors other than student and family variables that contribute to separation from the educational process. This will include consideration of various ecological levels associated with school attendance and absenteeism that involve both proximal and distal factors. Microsystem-level or proximal factors are often the focus of researchers and school personnel and are valid predictors of school absenteeism; examples include mental health challenges, limited parent involvement, and learning disorders. A more inclusive and less stigmatizing approach to school attendance/problems will involve greater analysis of, and integration with, broader ecological levels. Examples include interactions among microsystem variables such as caregiver-teacher communications (mesosystem), indirect influences of social structures such as caregiver unemployment and housing insecurity (exosystem), and cultural and policy influences such as neighborhood violence and exclusionary disciplinary practices (macrosystem; Singer et al., 2021). Developmental cascade models can also blend systemic/proximal and analytic/distal variables of causation for school attendance/absenteeism across multiple ecological levels (Kearney, 2021).

Key stakeholders will also better recognize that missing school is often an *adaptive option* for many students. Examples include pursuing employment or caring for siblings to assist one's family, avoiding victimizing or repressive school environments, or rejecting an academic system biased against certain student groups with respect to academic and social opportunities and disciplinary policies (Kohli et al., 2017). Absence from school is thus not "disordered" in nature for many students. In related fashion, epistemic injustice in many educational institutions worldwide means that student knowledge and expression of local/

indigenous contexts, practices, and culture are suppressed in favor of a dominant and oppressive orientation (Elicor, 2020). Adopting an ecological, developmental, and equitable approach to school attendance/absenteeism thus requires synthesizing systemic and analytic perspectives with respect to racial inequality, implicit bias, and structural disadvantage.

The fourth aspect of social justice is *advocating for universal access to education*. Stakeholders in the next decades must pursue a more active advocacy agenda, in particular for vulnerable students worldwide who are deprived of an education. Such advocacy can occur at a systemic level, as when national and international organizations denounce educational oppression and promote the basic right to education. Such advocacy can also occur at the individual level, as when various professionals help students reconnect with the educational process after having been derailed by injustices and exclusionary and biased policies.

Shared alliances

Over the next decades, school absenteeism will be increasingly and accurately viewed as a wicked problem that is highly intertwined and relentless across communities and generations (Childs and Lofton, 2021). Contemporary approaches to school attendance/problems are quite siloed across disciplines, but progression toward a postmodern era involves shared alliances among key agencies and stakeholders to address the complexities inherent in school attendance/absenteeism. Manifestations of these shared alliances include (1) multiagency tracking of students, (2) coordinated early warning and intervention systems, and (3) community asset mapping coupled with long-range intercession planning across generations. Shared alliances with respect to these manifestations necessarily involve partnerships among those from systemic and analytic perspectives, such as between policymakers who mandate school attendance practices and researchers and others who generate data to inform best practices in education and school attendance (Iftimescu et al., 2020).

Multiagency tracking of students refers to collaboration among educational, governmental, public health, and other key community entities to better trace students who are separated from the educational process. Frequent reasons for separation include housing insecurity and residential mobility. Mechanisms of multiagency tracking include sharing data, liaisons, and office spaces among departments, meeting regularly to define appropriate metrics, and expanding criteria for those selected for assistance programs (Welsh, 2018). Multiagency collaboration can also address key drivers of absenteeism related to housing insecurity *via* rental assistance and transportation to a previous school. Such collaboration can align with existing multiagency efforts for adult readiness (Sambolt and Balestreri, 2013) and requires coalitions among those from systemic (e.g., public housing) and analytic (e.g., school counselor) perspectives.

Coordinated early warning and intervention systems refer to mechanisms by which students are identified as at-risk for

short-range absenteeism or long-range school dropout, coupled with strategies to ameliorate risk and enhance school attendance for these students. Short-term risk for a given academic year can be quantified based on local conditions such as a particular school, whereas long-term risk over several years can be quantified for larger educational agencies across districts or states/provinces (Balfanz and Byrnes, 2019). Risk factors thus often include broader variables such as school disengagement and academic progress as well as specific variables such as accommodation plans and newness to a school, thus blending systemic and analytic approaches (Chu et al., 2019). Early warning/intervention systems can be also linked to adult readiness programs by incorporating readiness indicators such as enrollment in career/technical programs or dual high school/college courses (National Forum on Education Statistics, 2018).

Community asset mapping with long-range intercession planning across generations refers to identifying and obtaining resources from businesses, individuals, and service and educational agencies to form family-school-community partnerships to enhance school attendance and adult readiness, particularly for vulnerable students (Kearney and Graczyk, 2022). Key mechanisms include mentoring, tutoring, skills development, mental health support, and academic enrichment and adult readiness programs. Such partnerships are particularly useful for high-risk groups such as students who are homeless or those with disabilities (Griffin and Farris, 2010) and can include support for families across generations. The partnerships blend systemic and analytic approaches to school attendance/absenteeism and support a developmental focus with respect to college and career readiness programs for underserved adolescents (Gee et al., 2021).

Inputs

As mentioned, a theory of change is typically designed in backward fashion; as such, the inputs, or current conditions and initiatives that can serve as the impetus for the outputs, are discussed next. Key inputs in the contemporary era include (1) movement of educational agencies worldwide toward readiness for adulthood, (2) technological advances, and (3) schools and communities as one. Each input directly supports avenues toward reframing, social justice, and shared alliances as well as increased synthesis of systemic and analytic perspectives with respect to school attendance/absenteeism.

Movement of educational agencies toward readiness for adulthood

The World Economic Forum Education 4.0 Framework emphasizes skills (global citizenship, innovation and creativity, technology, and interpersonal) and forms of learning (personalized and self-paced, accessible and inclusive, problem-based and collaborative, lifelong, and student-driven) necessary for adult readiness (World Economic Forum, 2020). As mentioned, education and pedagogy are moving away from the

Industrial Revolution model of memorization and standardization to a whole child/citizen education approach for postmodern globalization. Movement of educational agencies in this direction has implications for school attendance/absenteeism vis-à-vis the outputs described above.

With respect to *reframing*, school attendance is increasingly viewed as participation and engagement in instructional formats, including online and hybrid formats, that augment readiness for adulthood in more flexible and accessible ways. Alternative codes for attendance in this new context include number of hours per day; log-ins to virtual learning; student-teacher interactions; completion of assignments; measures of competency, mastery, and achievement (skills and knowledge); and meeting timelines for course objectives (National Forum on Education Statistics, 2021). In addition, the proliferation of online, technical, skills training, and other nontraditional education programs available to those in emerging adulthood, including mechanisms to address the needs of students with disabilities and to simultaneously complete primary education while initiating these programs, propels a greater focus on participation/attendance than on absenteeism and set graduation times (U.S. Department of Education, 2012). Moreover, ongoing educational disciplinary reforms recognizing the disparate punitive nature of truancy and related policies require a shift in emphasis from absenteeism to participation/attendance (Gentle-Genitty et al., 2020).

With respect to *social justice*, school attendance is increasingly framed as an access issue and as a key pathway to address entrenched inequalities. A key foundational principle in this regard is assuring the right to quality education throughout the lifespan, including the right to access and contribute to bodies of knowledge and to participate in discussions about education (UNESCO, 2021). Learning frameworks are moving toward enhanced student agency to remove barriers to education, provide personalized learning environments to boost access to education, and ensure literacy and numeracy for as many as possible (OECD, 2018). Researchers have also begun integrating global social justice variables in their models of school attendance/absenteeism, particularly with respect to migration, racial and income inequality, economic policies and opportunities, labor markets, violence, food insecurity, and healthcare (Keppens and Spruyt, 2018; Kearney et al., 2019b).

With respect to *shared alliances*, the emergence of family-school-community partnerships to address the needs of vulnerable students also allows for mechanisms to coordinate tracking, assessment, and early intervention services (Benoit et al., 2018). Such partnerships often involve incorporating a set of community agencies into the school setting to reduce stigma, transportation problems, cost, wait time, and other barriers and thus draw students and their families. Such a process enhances the ability to identify families absent from this process, address family needs that supersede school attendance, and map community assets tailored best to a school's jurisdiction (Iftimescu et al., 2020).

Technological advances

As mentioned, myriad technological changes are occurring in education and include augmented reality, metaverse, artificial intelligence, social media, biometrics, cloud computing, multi-touch surfaces, 3D printing, hand-held devices, applications, blockchain, and gamification. Such changes obviously impact instructional formats and settings, learning strategies, communications, student-teacher relationships, and other core aspects of the educational process. These changes carry risks, such as unequal access to equipment and connectivity, as well as benefits such as reduced barriers and extension of education on a continuum from childhood to adolescence to emerging and later adulthood. Technological advances also have important ramifications for school attendance/absenteeism over the next decades.

With respect to *reframing*, technological advances that include remote learning are necessarily compelling educational agencies to reconfigure metrics for school attendance/absenteeism, as noted above. In addition, technological advances allow for enhanced attendance tracking, feedback to caregivers, and data accumulation for learning analytic practices, though privacy concerns remain relevant. The advances also allow for more nimble interventions and pinpointed root cause analyses of attendance and absenteeism patterns for a given jurisdiction (Center for Education Policy Research, 2021). Various technologies also facilitate real-time communications between school counselors, caregivers, and mental health professionals at an analytic level or for designing proactive measures to boost school attendance at a systemic level (Cook et al., 2017).

With respect to *social justice*, technological advances certainly have the potential to reinforce oppressive systems as well as a digital divide (Elena-Bucea et al., 2021). Constructed properly, however, technological advances have the potential to increase access to education and reduce barriers to school attendance *via* mechanisms that provide students with multiple ways of engaging the same material, expressing academic work, and accessing options to learn a particular competency or skill, even into emerging and later adulthood (U.S. Department of Education, 2017). Technological advances also enhance cross-cultural classrooms to build relationships and exchange skills while empowering and drawing more youth into the educational process (Marx and Kim, 2019).

With respect to *shared alliances*, technological advances allow multiple agencies to better coordinate data systems by enhancing value and mitigating risk and friction that inhibit sharing. Advances in cloud computing, encryption, interoperability, data directories, execution environments, and artificial intelligence are used in this regard. Such developments will be particularly necessary for those agencies most pertinent to school attendance/absenteeism that have historically not collaborated and thus have quite disparate data sets, such as schools, medical centers, public housing agencies, legal systems, and developmental services (Kearney and Benoit, 2022).

Schools and communities as one

As mentioned, the future of education will increasingly involve a blending and shifting of traditional school-based with home and community settings. Various mechanisms already exist for this process, sometimes derived from emergency and disaster contingency planning (such as following climate change events), that include formats for blended and self-learning, multiple learning modalities, online social networking, media broadcasts, and home- and nonprofit agency-based instruction (Lennox et al., 2021). Other mechanisms include a greater reliance in education on community-based service and experiential learning, internships, practicum placements, portfolios, vocational and field work, and other applied demonstrations of academic competency that do not require traditional attendance in a physical building (Filges et al., 2022).

Systemic and analytic approaches have also been moving toward school-based service delivery frameworks based on levels of support for different student needs that integrate school and community resources. Integrated multi-tiered systems of support (MTSS) models emphasize Tier 1 universal or primary prevention practices to promote adaptive behavior and deter maladaptive behavior; Tier 2 early, selective intervention or secondary prevention practices to address emerging and less severe problems; and Tier 3 intensive intervention or tertiary prevention practices to address chronic and severe problems. Strategies for school attendance/problems include systemic and analytic elements such as school dropout prevention and screening practices (Tier 1), mentoring and clinical practices (Tier 2), and alternative educational and specialized care practices (Tier 3; Kearney and Graczyk, 2020).

With respect to *reframing*, MTSS models themselves represent a transformative change by adopting sustainable school improvement practices and outcomes and eschewing “wait-to-fail” achievement-discrepancy frameworks to assess student growth. As such, interactive environmental factors (e.g., curricula and school responses) receive as much if not more emphasis than student factors for academic progress, behavior, and skills. Such an approach allows for a broader reframing of school absenteeism toward efforts to enhance school attendance *via* incentives, positive climate, and policy review as well as growth metrics for school accountability purposes. MTSS models are also amenable to long-term educational initiatives such as transition services that enhance readiness into emerging adulthood for all students (Osgood et al., 2010).

With respect to *social justice*, MTSS models can be a means to enhance equity among student groups because the models (1) rely on data-driven processes to drive continuous improvements to instruction and other outcomes, (2) include all students in a given school, and (3) specifically provide intensive services for at-risk students (Fien et al., 2021). MTSS models are compatible with disaggregated data and learning analytic approaches to personalize learning experiences for individual students and include proactive preventative approaches instead of reactive, often punitive approaches. The models are also amenable to culturally responsive

practices by welcoming traditionally marginalized students, validating student home cultures and communities, nurturing student cultural identities, promoting advocacy, and resisting deficit-oriented constructions of student performance (Khalifa et al., 2016).

With respect to *shared alliances*, MTSS models depend on cross-system collaborations that include members of systemic and analytic approaches. Systems of care for youth and their families often include educational, primary care/community mental health, legal, and developmental systems. MTSS models utilize team-based approaches across these systems; examples include community mental health professionals within schools, hybrid truancy court practices, and linkage of preschool supports with early grade accommodations, especially for students with disabilities (Kearney, 2016). Other key collaborators include researchers for expertise and technical support, external participating agencies for student tracking and progress monitoring (early warning) and service provision, and community stakeholders for asset mapping. Indeed, a key shared alliance for the future will involve partnerships between academia, industry, and other stakeholders (e.g., Heyne et al., 2020; Rocha et al., 2022).

Conclusion

Much is known about school attendance/absenteeism but we live in unprecedented times of rapid systemic shifts in basic human functioning. New visions are needed. The theory of change for school attendance/absenteeism presented here offers one possible compass that outlines how contemporary forces could shape key outputs that themselves could produce desirable long-range outcomes over the next decades. The theory is designed as a starting point for discussion among various stakeholders in this area, particularly those from disparate systemic and analytic

References

- Aggarwal, R., and Girdhar, N. Alpana (2022). "The role of artificial intelligence in the education sector: possibilities and challenges," in *Machine Learning, Blockchain, and Cyber Security in Smart Environments: Application and Challenges*. eds. S. Tanwar, S. Badotra and A. Rana (Boca Raton, FL: CRC Press).
- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Absenteeism in the first decade of education forecasts civic engagement and educational and socioeconomic prospects in young adulthood. *J. Youth Adolesc.* 49, 1835–1848. doi: 10.1007/s10964-020-01272-4
- Atiku, S. O., and Boateng, F. (2020). "Rethinking education system for the fourth industrial revolution" in *Human Capital Formation for the Fourth Industrial*. ed. S. O. Atiku (Hershey, PA: IGI Global), 1–17.
- Balfanz, R., and Byrnes, V. (2019). "Early warning indicators and early intervention systems: state of the field," in *Handbook of Student Engagement Interventions: Working With Disengaged Students*. eds. J. A. Fredricks, A. L. Reschly and S. L. Christenson (New York, NY: Elsevier), 45–56.
- Bauer, L., Liu, P., Schanzenbach, D. W., and Shambaugh, J. (2018). *Reducing Chronic Absenteeism Under the Every Student Succeeds Act*. Washington, DC: Brookings.
- Bauld, A. (2021). *Why Schools Need to Look at Their Own Carbon Footprint*. Cambridge, MA: Harvard Graduate School of Education.
- Benoit, L., Cottin, P., and Moro, M. R. (2018). What is a "Maison des adolescents"? A history of integrated youth health care services in France. *Early Interv. Psychiatry* 12, 1000–1005. doi: 10.1111/eip.12680

perspectives. Agreement on long-term outcomes can help crystallize cohesive narratives that can then influence policy and educational and health-based practice. Such agreement also allows for frameworks specifically crafted to include *all* youth in the educational process. At the same time, the theory of change outlined here is designed to be flexible enough in a constructivist fashion to be fitted to jurisdictions worldwide that differ tremendously in their approaches to education, law, research, and child development. We invite commentary and input into the crystal ball.

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All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- Benoit, L., Thomas, I., and Martin, A. (2022). Ecological awareness, anxiety, and actions among youth and their parents—a qualitative study of newspaper narratives. *Child Adolesc. Mental Health* 27, 47–58. doi: 10.1111/camh.12514
- Borner, G., Ax, J., and Tanfani, J. (2022). School boards get death threats amid rage over race, gender, mask policies. Available at: <https://www.reuters.com/investigates/special-report/usa-education-threats/>
- Bourdieu, P., and Passeron, J. (1977). *Reproduction in Education, in Society, and Culture*. London: Sage.
- Brault, C., Thomas, I., Moro, M. R., and Benoit, L. (2022). School refusal in immigrants and ethnic minority groups: a qualitative study of Adolescents' and young Adults' experiences. *Front. Psychol.* 13:803517. doi: 10.3389/fpsy.2022.803517
- Breuer, E., Lee, L., De Silva, M., and Lund, C. (2015). Using theory of change to design and evaluate public health interventions: a systematic review. *Implement. Sci.* 11, 1–17. doi: 10.1186/s13012-016-0422-6
- Center for Education Policy Research. (2021). Tackling chronic absenteeism through continuous improvement. Available at: <https://provingground.cepr.harvard.edu/chronic-absenteeism-impact>
- Chalupka, S., and Anderko, L. (2019). Climate change and schools: implications for children's health and safety. *Creat. Nurs.* 25, 249–257. doi: 10.1891/1078-4535.25.3.249.

- Chang, H. (2018). *Seize the Data Opportunity in California: Using Chronic Absence to Improve Educational Outcomes*. San Francisco: Attendance Works
- Chang, H. N., Osher, D., Schanfield, M., Sundius, J., and Bauer, L. (2019). *Using Chronic Absence Data to Improve Conditions for Learning*. San Francisco: Attendance Works.
- Childs, J., and Grooms, A. A. (2018). Improving school attendance through collaboration: a catalyst for community involvement and change. *J. Educ. Stud. Placed Risk* 23, 122–138. doi: 10.1080/10824669.2018.1439751
- Childs, J., and Lofton, R. (2021). Masking attendance: how education policy distracts from the wicked problem(s) of chronic absenteeism. *Educ. Policy* 35, 213–234. doi: 10.1177/0895904820986771
- Childs, J., and Scanlon, C. L. (2022). Coordinating the mesosystem: an ecological approach to addressing chronic absenteeism. *Peabody J. Educ.* 97, 74–86. doi: 10.1080/0161956X.2022.2026722
- Chu, B. C., Guarino, D., Mele, C., O'Connell, J., and Coto, P. (2019). Developing an online early detection system for school attendance problems: results from a research-community partnership. *Cog. Behav. Pract.* 26, 35–45. doi: 10.1016/j.cbpra.2018.09.001
- Chung, J. Y., and Lee, S. (2019). Dropout early warning systems for high school students using machine learning. *Child Youth Serv. Rev.* 96, 346–353. doi: 10.1016/j.childyouth.2018.11.030
- Cleveland-Innes, M. (2020). "Student demographic change and pedagogical issues in higher education" in *Inequality, Innovation and Reform in Higher Education*. eds. M. Slowey, H. G. Schuetze and T. Zubrzycki (Cham: Springer), 159–173.
- Conry, J. M., and Richards, M. P. (2018). The severity of state truancy policies and chronic absenteeism. *J. Educ. Stud. Placed Risk* 23, 187–203. doi: 10.1080/10824669.2018.1439752
- Cook, P. J., Dodge, K. A., Gifford, E. J., and Schulting, A. B. (2017). A new program to prevent primary school absenteeism: results of a pilot study in five schools. *Child Youth Serv. Rev.* 82, 262–270. doi: 10.1016/j.childyouth.2017.09.017
- Corcoran, S., and Kelly, C. (2022). A meta-ethnographic understanding of children and young people's experiences of extended school non-attendance. *J. Res. Special. Educ. Needs*, 1:13. doi: 10.1111/1471-3802.12577
- Coughenour, C., Kleven, B. C., Gakh, M., Stephen, H., Chien, L. C., Labus, B., et al. (2021). School absenteeism is linked to household food insecurity in school catchment areas in southern Nevada. *Public Health Nutr.*, 1–7. doi: 10.1017/S136898002100063X
- D'Aunno, T., Hearld, L., and Alexander, J. A. (2019). Sustaining multistakeholder alliances. *Health Care Manag. Rev.* 44, 183–194. doi: 10.1097/HMR.0000000000000175
- De Silva, M. J., Breuer, E., Lee, L., Asher, L., Chowdhary, N., Lund, C., et al. (2014). Theory of change: a theory-driven approach to enhance the Medical Research Council's framework for complex interventions. *Trials* 15, 1–13. doi: 10.1186/1745-6215-15-267
- Deitrick, S., Ye, F., Childs, J., and Zhang, C. (2015). Connecting people and place - improving communities through integrated data systems: Chronic school absenteeism in public schools in Pittsburgh, PA. University of Pittsburgh: University Center for Social and Urban Research.
- Dimitrova, R., and Wiium, N. (eds.) (2021). *Handbook of Positive Youth Development: Advancing the Next Generation of Research, Policy and Practice in Global Contexts*. New York: Springer.
- Docquier, F., and Rapoport, H. (2012). Globalization, brain drain, and development. *J. Econ. Lit.* 50, 681–730. doi: 10.1257/jel.50.3.681
- Duncheon, J. C. (2018). Making sense of college readiness in a low-performing urban high school: perspectives of high-achieving first generation youth. *Urban Educ.* 56, 1360–1387. doi: 10.1177/0042085918756712
- Durham, R. E., Shiller, J., and Connolly, F. (2019). Student attendance: a persistent challenge and leading indicator for Baltimore's community school strategy. *J. Educ. Stud. Placed Risk* 24, 218–243. doi: 10.1080/10824669.2019.1615922
- Eggleston, C., and Fields, J. (2021). Census Bureau's household pulse survey shows significant increase in homeschooling rates in fall 2020. Available at: <https://www.census.gov/library/stories/2021/03/homeschooling-on-the-rise-during-covid-19-pandemic.html>
- Ehrlich, S. B., Gwynne, J. A., and Allensworth, E. M. (2018). Pre-kindergarten attendance matters: early chronic absence patterns and relationships to learning outcomes. *Early Child. Res. Q.* 44, 136–151. doi: 10.1016/j.ecresq.2018.02.012
- Eklund, K., Burns, M. K., Oyen, K., DeMarchena, S., and McCollom, E. M. (2022). Addressing chronic absenteeism in schools: a meta-analysis of evidence-based interventions. *School Psych. Ver.* 51, 95–111. doi: 10.1080/2372966X.2020.1789436
- Elena-Bucea, A., Cruz-Jesus, F., Oliveira, T., and Coelho, P. S. (2021). Assessing the role of age, education, gender and income on the digital divide: evidence for the European Union. *Inf. Syst. Front.* 23, 1007–1021. doi: 10.1007/s10796-020-10012-9
- Elicor, P. P. E. (2020). Mapping identity prejudice: locations of epistemic injustice in philosophy for/with children. *Childhood Philos.* 16, 1–25. doi: 10.12957/childphilo.2020.47899
- Falissard, B., Benoit, L., and Martin, A. (2022). Qualitative methods in child and adolescent psychiatry: the time has come. *Eur. Child Adolesc. Psychiatry* 31, 541–544. doi: 10.1007/s00787-022-01978-9
- Ferguson, T., Roofe, C., and Cook, L. D. (2021). Teachers' perspectives on sustainable development: the implications for education for sustainable development. *Environ. Educ. Res.* 27, 1343–1359. doi: 10.1080/13504622.2021.1921113
- Fien, H., Chard, D. J., and Baker, S. K. (2021). Can the evidence revolution and multi-tiered systems of support improve education equity and reading achievement? *Read. Res. Q.* 56, S105–S118. doi: 10.1002/trq.391
- Filges, T., Dietrichson, J., Viinholt, B. C., and Dalgaard, N. T. (2022). Service learning for improving academic success in students in grade K to 12: a systematic review. *Campbell Syst. Rev.* 18:e1210. doi: 10.1002/cl2.1210
- García, E., and Weiss, E. (2018). *Student Absenteeism: Who Misses School and How Missing School Matters for Performance*. Washington, DC: Economic Policy Institute
- Gee, K. A., Beno, C., Lindstrom, L., Lind, J., Gau, J., and Post, C. (2021). Promoting college and career readiness among underserved adolescents: a mixed methods pilot study. *J. Adolesc.* 90, 79–90. doi: 10.1016/j.adolescence.2021.06.002
- Gentle-Genitty, C., Taylor, J., and Renguette, C. (2020). A change in the frame: from absenteeism to attendance. *Front. Educ.* 4:161. doi: 10.3389/feduc.2019.00161
- Gleeson, D. (1992). School attendance and truancy: a socio-historical account. *Sociol. Rev.* 40, 437–490. doi: 10.1111/j.1467-954X.1992.tb00398.x
- González, C., Inglés, C. J., Sanmartín, R., Vicent, M., Calderón, C. M., and García-Fernández, J. M. (2020). Testing factorial invariance and latent means differences of the school refusal assessment scale-revised in Ecuadorian adolescents. *Curr. Psychol.* 39, 1715–1724. doi: 10.1007/s12144-018-9871-1
- González, C., Kearney, C. A., Vicent, M., and Sanmartín, R. (2021). Assessing school attendance problems: a critical systematic review of questionnaires. *Int. J. Educ. Res.* 105:101702. doi: 10.1016/j.ijer.2020.101702
- Gottfried, M. A., Kirksey, J. J., and Fletcher, T. L. (2021). Do high school students with a same-race teacher attend school more often? *Educ. Eval. Policy Anal.* 44, 149–169. doi: 10.3102/01623737211032241
- Griffin, D., and Farris, A. (2010). School counselors and collaboration: finding resources through community asset mapping. *Prof. Sch. Couns.* 13, 248–256. doi: 10.5330/PSC.n.2010-13.248
- Grooms, A. A., and Bohorquez, D. G. (2022). What's your excuse? Sensemaking about chronic absenteeism in a rural, Latinx high school. *J. Sch. Leadersh.* 32, 384–405. doi: 10.1177/10526846211026260
- Guarneros-Meza, V., Downe, J., and Martin, S. (2018). Defining, achieving, and evaluating collaborative outcomes: a theory of change approach. *Public Manag. Rev.* 20, 1562–1580. doi: 10.1080/14719037.2017.1383782
- Gubbels, J., van der Put, C. E., and Assink, M. (2019). Risk factors for school absenteeism and dropout: a meta-analytic review. *J. Youth Adolesc.* 48, 1637–1667. doi: 10.1007/s10964-019-01072-5
- Hanushek, E. A., Piopiunik, M., and Wiederhold, S. (2019). The value of smarter teachers: international evidence on teacher cognitive skills and student performance. *J. Hum. Resour.* 54, 857–899. doi: 10.3368/jhr.54.4.0317.8619R1
- Hanushek, E. A., and Woessmann, L. (2020). *The Economic Impacts of Learning Losses*. Paris: Organisation for Economic Co-operation and Development
- Hemelt, S. W., Lenard, M. A., and Paeplow, C. G. (2019). Building bridges to life after high school: contemporary career academies and student outcomes. *Econ. Educ. Rev.* 68, 161–178. doi: 10.1016/j.econedurev.2018.08.005
- Heyne, D., Gentle-Genitty, C., Gren Landell, M., Melvin, G., Chu, B., Galle-Tessonneau, M., et al. (2020). Improving school attendance by enhancing communication among stakeholders: establishment of the international network for school attendance (INSA). *Eur. Child Adolesc. Psychiatry* 29, 1023–1030. doi: 10.1007/s00787-019-01380-y
- Hochberg, Z. E., and Konner, M. (2020). Emerging adulthood, a pre-adult life-history stage. *Front. Endocrinol.* 10:918. doi: 10.3389/fendo.2019.00918
- Horne, S. G., McGinley, M., Yel, N., and Maroney, M. R. (2022). The stench of bathroom bills and anti-transgender legislation: anxiety and depression among transgender, nonbinary, and cisgender LGBTQ people during a state referendum. *J. Couns. Psychol.* 69, 1–13. doi: 10.1037/cou0000558
- Hotez, P. J. (2020). Anti-science extremism in America: escalating and globalizing. *Microbes Infect.* 22, 505–507. doi: 10.1016/j.micinf.2020.09.005
- Hough, H. (2019). "Roll call" in *Absent From School: Understanding and Addressing Student Absenteeism*. eds. M. A. Gottfried and E. L. Hutt (Cambridge, MA: Harvard Education Press), 15–34.

- Hutt, E. L. (2018). Measuring missed school: the historical precedents for the measurement and use of attendance records to evaluate schools. *J. Educ. Stud. Placed Risk* 23, 5–8. doi: 10.1080/10824669.2018.1438899
- Iftimescu, S., Ion, G., Proteasa, C., Iucu, R., Marin, E., and Stingu, M. (2020). "Closing the circle: research and policymaking in education" in *European Higher Education Area: Challenges for a New Decade*. eds. A. Curaj, L. Deca and R. Pricopie (New York: Springer), 323–340.
- Johnson, A. M., Falstein, A. I., Szurek, S. A., and Svendsen, M. (1941). School phobia. *Am. J. Orthop.* 11, 702–711.
- Kearney, C. A. (2016). *Managing School Absenteeism at Multiple Tiers: An Evidence-Based and Practical Guide for Professionals*. New York: Oxford University Press.
- Kearney, C. A. (2021). Integrating systemic and analytic approaches to school attendance problems: synergistic frameworks for research and policy directions. *Child Youth Care Forum* 50, 701–742. doi: 10.1007/s10566-020-09591-0
- Kearney, C. A. (2022). Functional impairment guidelines for school attendance problems in youth: recommendations for caseness in the modern era. *Prof. Psychol. Res. Pr.* 53, 295–303. doi: 10.1037/pro0000453
- Kearney, C. A., and Albano, A. M. (2018). *When Children Refuse School: A Cognitive-Behavioral Therapy Approach/Therapist Guide (3rd Edn)*. New York: Oxford University Press.
- Kearney, C. A., and Benoit, L. (2022). Child and adolescent psychiatry and underrepresented youth with school attendance problems: integration with systems of care, advocacy, and future directions. *J. Am. Acad. Child Adolesc. Psychiatry* doi: 10.1016/j.jaac.2022.03.016 [Epub ahead of print].
- Kearney, C. A., and Childs, J. (2022). Improving school attendance data and defining problematic and chronic school absenteeism: the next stage for educational policies and health-based practices. *Prev. Sch. Fail.*
- Kearney, C. A., Childs, J., and Burke, S. (2022). Social forces, social justice, and school attendance problems in youth. *Contemp. Sch. Psychol.* doi: 10.1007/s40688-022-00425-5 [Epub ahead of print].
- Kearney, C. A., and González, C. (2022). Unlearning school attendance and its problems: moving from historical categories to postmodern dimensions. *Front. Educ.* 7:977672. doi: 10.3389/feduc.2022.977672
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. (2019a). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 1). *Front. Psychol.* 10:2222. doi: 10.3389/fpsyg.2019.02222
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. (2019b). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 2). *Front. Psychol.* 10:2605. doi: 10.3389/fpsyg.2019.02605
- Kearney, C. A., and Graczyk, P. A. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child. Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Kearney, C. A., and Graczyk, P. A. (2022). Multi-tiered systems of support for school attendance and its problems: an unlearning perspective for areas of high chronic absenteeism. *Front. Educ.* doi: 10.3389/feduc.2022.1020150 [Epub ahead of print].
- Kennedy, W. A. (1965). School phobia: rapid treatment of 50 cases. *J. Abnorm. Psychol.* 70, 285–289. doi: 10.1037/h0022440
- Keppens, G. (2022). Who is absent from school when? An optimal matching analysis of within-year variation in the timing of school absences. *J. Sch. Psychol.* 95, 90–104. doi: 10.1016/j.jsp.2022.07.003
- Keppens, G., and Spruyt, B. (2018). Truancy in Europe: does the type of educational system matter? *Eur. J. Educ.* 53, 414–426. doi: 10.1111/ejed.12282
- Keppens, G., and Spruyt, B. (2020). The impact of interventions to prevent truancy: a review of the research literature. *Stud. Educ. Eval.* 65:100840. doi: 10.1016/j.stueduc.2020.100840
- Khalifa, M. A., Gooden, M. A., and Davis, J. E. (2016). Culturally responsive school leadership: a synthesis of the literature. *Rev. Educ. Res.* 86, 1272–1311. doi: 10.3102/0034654316630383
- Kim, D. H. (2020). Applying the social-ecological framework on the pattern of longitudinal trajectory of truancy in south Korean adolescents. *Child Youth Serv. Rev.* 119:105511. doi: 10.1016/j.childyouth.2020.105511
- Kim, J., and Park, C. Y. (2020). Education, skill training, and lifelong learning in the era of technological revolution: a review. *Asia. Pac. Econ. Lit.* 34, 3–19. doi: 10.1111/apel.12299
- Kirkpatrick, M. E., and Lodge, T. (1935). Some factors in truancy. *Ment. Hyg.* 14, 610–618.
- Koehler, C., and Schneider, J. (2019). Young refugees in education: the particular challenges of school systems in Europe. *Comp. Migr. Stud.* 7, 1–20. doi: 10.1186/s40878-019-0129-3
- Kohli, R., Pizarro, M., and Nevarez, A. (2017). The "new racism" of K-12 schools: centering critical research on racism. *Rev. Res. Educ.* 41, 182–202. doi: 10.3102/0091732X16686949
- Kovacs, K. (2022). Top 10 jobs to help fight climate change. Available at: <https://www.bestcolleges.com/blog/climate-change-jobs/>
- Krishnamurthy, K., Choi, S., Benavides, F., and Suarez Cortes, J. (2019). It is getting hot: Call for education systems to respond to the climate crisis: Perspectives from East Asia and the Pacific. New York: UNICEF.
- Lennox, J., Reuge, N., and Benavides, F. (2021). UNICEF's lessons learned from the education response to the COVID-19 crisis and reflections on the implications for education policy. *Int. J. Educ. Dev.* 85:102429. doi: 10.1016/j.ijedudev.2021.102429
- Leventhal, B. L., Konishcheva, K., Rotenberg, E., Krishnakumar, A., Page, N., Gares, L., et al. (2022). Functional activity, cognition, emotion and thinking scale (FACETS): Initial examination of reliability and utility. *J. Am. Acad. Child Adolesc. Psychiatry.* 61:S210. doi: 10.1016/j.jaac.2022.09.226
- Li, A., Guessoum, S. B., Ibrahim, N., Lefevre, H., Moro, M. R., and Benoit, L. (2021). A systematic review of somatic symptoms in school refusal. *Psychosom. Med.* 83, 715–723. doi: 10.1097/PSY.0000000000000956
- Lombardi, A., Monahan, J., and Morningstar, M. E. (2020). "Integrating college and career readiness into transition education" in *Handbook of Adolescent Transition Education for Youth With Disabilities*. eds. K. A. Shogren and M. L. Wehmeyer (Abingdon, UK: Routledge), 268–281.
- Maldonado, J., and De Witte, K. (2022). The effect of school closures on standardised student test outcomes. *Br. Educ. Res. J.* 48, 49–94. doi: 10.1002/berj.3754
- Malin, J. R., Bragg, D. D., and Hackmann, D. G. (2017). College and career readiness and the every student succeeds act. *Educ. Adm. Q.* 53, 809–838. doi: 10.1177/0013161X17714845
- Mao, J., Ifenthaler, D., Fujimoto, T., Garavaglia, A., and Rossi, P. G. (2019). National policies and educational technology: a synopsis of trends and perspectives from five countries. *TechTrends* 63, 284–293. doi: 10.1007/s11528-019-00396-0
- Martin, R., Benoit, J. P., Moro, M. R., and Benoit, L. (2020). A qualitative study of misconceptions among school personnel about absenteeism of children from immigrant families. *Front. Psychol.* 11:202. doi: 10.3389/fpsyg.2020.00202
- Marx, S., and Kim, Y. (2019). Technology for equity and social justice in education: introduction to the special issue. *Int. J. Multicult. Educ.* 21, 1–4. doi: 10.18251/ijme.v21i1.1939
- Maynard, B. R., Heyne, D., Brendel, K. E., Bulanda, J. J., Thompson, A. M., and Pigott, T. D. (2018). Treatment for school refusal among children and adolescents: a systematic review and meta-analysis. *Res. Soc. Work. Pract.* 28, 56–67. doi: 10.1177/1049731515598619
- McNeely, C. A., Alemu, B., Lee, W. F., and West, I. (2021). Exploring an unexamined source of racial disparities in juvenile court involvement: unexcused absenteeism policies in US schools. *AERA Open* 7:23328584211003132. doi: 10.1177/23328584211003132
- Melvin, G. A., Heyne, D., Gray, K. M., Hastings, R. P., Totsika, V., Tonge, B. J., et al. (2019). The kids and teens at school (KiTeS) framework: an inclusive bioecological systems approach to understanding school absenteeism and school attendance problems. *Front. Educ.* 4:61. doi: 10.3389/feduc.2019.00061
- Mireles-Rios, R., Rios, V. M., and Reyes, A. (2020). Pushed out for missing school: the role of social disparities and school truancy in dropping out. *Educ. Sci.* 10:108. doi: 10.3390/educsci10040108
- Mishkind, A. (2014). Overview: State definitions of college and career readiness. Washington, DC: College and Career Readiness and Success Center.
- Momo, M. S., Cabus, S. J., De Witte, K., and Groot, W. (2019). A systematic review of the literature on the causes of early school leaving in Africa and Asia. *Rev. Educ.* 7, 496–522. doi: 10.1002/rev3.3134
- Monahan, J., Lombardi, A., and Madaus, J. (2018). Promoting college and career readiness: practical strategies for the classroom. *Teach. Except. Child.* 51, 144–154. doi: 10.1177/0040059918802579
- Morningstar, M. E., Lombardi, A., and Test, D. (2018). Including college and career readiness within a multitiered systems of support framework. *AERA Open* 4:2332858418761880. doi: 10.1177/2332858418761880
- Morningstar, M. E., Zagona, A. L., Uyanik, H., Xie, J., and Mahal, S. (2017). Implementing college and career readiness: critical dimensions for youth with severe disabilities. *Res. Pract. Pers. Sever. Disabl.* 42, 187–204. doi: 10.1177/1540796917711439
- Mussida, C., Sciuilli, D., and Signorelli, M. (2019). Secondary school dropout and work outcomes in ten developing countries. *J. Policy Model* 41, 547–567. doi: 10.1016/j.jpolmod.2018.06.005

- National Forum on Education Statistics (2016). Forum guide to collecting and using disaggregated data on racial/ethnic subgroups (NFES 2017–017). Washington, DC: U.S. Department of Education.
- National Forum on Education Statistics (2018). Forum guide to early warning systems (NFES2019035). U.S. Department of Education. Washington, DC: U.S. Department of Education.
- National Forum on Education Statistics (2021). Forum guide to attendance, participation, and engagement data in virtual and hybrid learning models (NFES2021058). U.S. Department of Education, Washington, DC.
- Newman, I., Ligas, M. R., Hecht, S., Starratt, G. K., Clement, R., Ney, E., et al. (2019). Mixed methods assessment of the dimensionality of risk indicators of school failure: a collaborative approach to bridge a research-to-practice gap. *Int. J. Mult. Res. Approac.* 11, 156–182. doi: 10.29034/ijmra.v11n2a3
- Nordengren, C. (2021). Climate change will drive major changes in student learning needs. Oakland, CA: EdSource.
- OECD (2018). The future of education and skills: Education 2030. Paris: Author.
- Osgood, D. W., Foster, E. M., and Courtney, M. E. (2010). Vulnerable populations and the transition to adulthood. *Futur. Child.* 20, 209–229. doi: 10.1353/foc.0.0047
- Osler, A. (2020). Education, migration and citizenship in Europe: untangling policy initiatives for human rights and racial justice. *Intercult. Educ.* 31, 562–577. doi: 10.1080/14675986.2020.1794231
- Owens, J., and de St Croix, T. (2020). Engines of social mobility? Navigating meritocratic education discourse in an unequal society. *Br. J. Educ. Stud.* 68, 403–424. doi: 10.1080/00071005.2019.1708863
- Patrick, S., and Chambers, A. (2020). *Determining Attendance and Alternatives to Seat-Time: Issue Brief*. Vienna, VA: Aurora Institute
- Pfeffer, F. T. (2008). Persistent inequality in educational attainment and its institutional context. *Eur. Sociol. Rev.* 24, 543–565. doi: 10.1093/esr/jcn026
- Pimentel, S. (2013). College and career readiness standards for adult education. Washington, DC: Office of Vocational and Adult Education, US Department of Education.
- Polly, D., Byker, E. J., and Colonnese, M. W. (2021). Future directions for K-12 technology-enhanced learning environments. *TechTrends* 65, 240–242. doi: 10.1007/s11528-021-00602-y
- Porto, G. (ed.) (2020). *Education Systems Around the World*. London: InTechOpen
- Prothero, A. (2022). *Nearly Half of Educators Say Climate Change is Affecting Their Schools—or Will Soon*. Bethesda, MD: EducationWeek
- Pyne, J., Grodsky, E., Vaade, E., McCreedy, B., Camburn, E., and Bradley, D. (2021). The signaling power of unexcused absence from school. *Educ. Policy*:08959048211049428. doi: 10.1177/08959048211049428
- Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., and Koole, M. (2021). Balancing technology, pedagogy and the new normal: Post-pandemic challenges for higher education. *Postdigital Sci. Educ.* 3, 715–742. doi: 10.1007/s42438-021-00249-1
- Reimers, F. M. (ed.) (2022). *Primary and Secondary Education During Covid-19: Disruptions to Educational Opportunity During a Pandemic*. New York: Springer
- Ricking, H., and Schulze, G. (2019). Research and management of school absenteeism in Germany: educational perspectives. *Urban Scope* 10, 39–54.
- Rocha, J., Castillo-Lavergne, C. M., Byrd, M. J., Carnethon, M. R., Miller, R., Lin, M., et al. (2022). Reimagining educational equity through strategic alliance partnerships in response to the USA STEM-M diversity gap. *Health Promot. Int.* 37:daab094. doi: 10.1093/heapro/daab094
- Rocque, M., Jennings, W. G., Piquero, A. R., Ozkan, T., and Farrington, D. P. (2017). The importance of school attendance: findings from the Cambridge study in delinquent development on the life-course effects of truancy. *Crime Delinq.* 63, 592–612. doi: 10.1177/0011128716660520
- Rosenthal, L., Moro, M. R., and Benoit, L. (2020). Migrant parents of adolescents with school refusal: a qualitative study of parental distress and cultural barriers in access to care. *Front. Psychol.* 10:942. doi: 10.3389/fpsy.2019.0094
- Roué, A., Harf, A., Benoit, L., Sibeoni, J., and Moro, M. R. (2021). Multifamily therapy for adolescents with school refusal: perspectives of the adolescents and their parents. *Front. Psychol.* 12:624841. doi: 10.3389/fpsy.2021.624841
- Rousell, D., and Cutter-Mackenzie-Knowles, A. (2020). A systematic review of climate change education: giving children and young people a ‘voice’ and a ‘hand’ in redressing climate change. *Child. Geogr.* 18, 191–208. doi: 10.1080/14733285.2019.1614532
- Rubino, L. L., Anderson, V. R., and Campbell, C. A. (2020). An examination of racial/ethnic disparities in truancy court. *Crime Delinq.* 66, 33–58. doi: 10.1177/0011128719847456
- Rumberger, R. W. (2020). “The economics of high school dropouts” in *The Economics of Education: A Comprehensive Overview*. eds. S. Bradley and C. Green. 2nd ed (Cambridge, MA: Academic), 149–158.
- Rumberger, R. W., and Rotermund, S. (2012). “The relationship between engagement and high school dropout” in *Handbook of Research on Student Engagement*. eds. S. J. Christenson, A. L. Reschly and C. Wylie (New York, NY: Springer), 491–513.
- Rury, J. L., and Tamura, E. H. (eds.) (2019). *The Oxford Handbook of the History of Education*. New York: Oxford
- Sambolt, M., and Balestreri, K. (2013). Considerations for collaborations to support college and career readiness: A facilitator’s guide. College and Career Readiness and Success Center, Arlington, VA.
- Sanders, J. E. (2022). Coping with the impact of systemic racism, inequity, school and community violence among high school students who are suspended or expelled. *J. Interpers. Violence* doi: 10.1177/08862605211056724 [Epub ahead of print].
- Schwartz, S. E., Benoit, L., Clayton, S., Parnes, M. F., Swenson, L., and Lowe, S. R. (2022). Climate change anxiety and mental health: environmental activism as buffer. *Curr. Psychol.* 1–14. doi: 10.1007/s12144-022-02735-6
- Shankar-Brown, R. (2015). Urbanization and persistent educational inequalities: the need for collective action towards equity and social justice. *Nat. Youth Advoc. Resil. J.* 1:1. doi: 10.20429/nyarj.2015.010104
- Sheffield, P. E., Uijtewaal, S. A., Stewart, J., and Galvez, M. P. (2017). Climate change and schools: environmental hazards and resiliency. *Int. J. Environ. Res. Public Health* 14:1397. doi: 10.3390/ijerph14111397
- Singer, J., Pogodzinski, B., Lenhoff, S. W., and Cook, W. (2021). Advancing an ecological approach to chronic absenteeism: evidence from Detroit. *Teach. Coll. Rec.* 123, 1–36. doi: 10.1177/016146812112300406
- Sleeter, C. E. (2014). “An analysis of multicultural education in the United States” in *Multiculturalism in Education and Teaching*. ed. C. A. Grant (New York: Routledge), 57–82.
- Sosu, E. M., Dare, S., Goodfellow, C., and Klein, M. (2021). Socioeconomic status and school absenteeism: a systematic review and narrative synthesis. *Rev. Educ.* 9:e3291. doi: 10.1002/rev3.3291
- Spangler, D., and O’Sullivan, K. (2017). Connecting young adults to skills and jobs: Lessons from the National Fund’s sectoral strategies. National Fund for Workforce Solutions, Washington, SC.
- Spitzman, E., and Balconi, A. (2019). Social justice in action: a document analysis of the integration of social justice principles into teaching. *J. Scholh. Teach. Learn.* 19, 1–17. doi: 10.14434/josotl.v19i5.25071
- Spruyt, B., Keppens, G., Kemper, R., and Bradt, L. (2017). ‘If only they had a file on every pupil’: on the mismatch between truancy policy and practice in Flanders. *Int. Stud. Sociol. Educ.* 26, 171–189. doi: 10.1080/09620214.2016.1191965
- Taplin, D. H., and Clark, H. (2012). *Theory of Change Basics: A Primer on Theory of Change*. New York: ActKnowledge
- Tejada-Gallardo, C., Blasco-Belled, A., Torrelles-Nadal, C., and Alsinet, C. (2020). Effects of school-based multicomponent positive psychology interventions on well-being and distress in adolescents: a systematic review and meta-analysis. *J. Youth Adolesc.* 49, 1943–1960. doi: 10.1007/s10964-020-01289-9
- U.S. Department of Education (2012). Promoting college and career readiness: Bridge programs for low-skill adults. Washington, DC: Author.
- U.S. Department of Education (2017). Reimagining the role of technology in education: 2017 national education technology plan update. Washington, DC: Author.
- U.S. Department of Education (2018). Student access to digital learning resources outside of the classroom. Washington, DC: Author.
- U.S. Department of Education, National Center for Education Statistics (2020). The condition of education 2020 (NCES 2020–144), employment and unemployment rates by educational attainment. Washington, DC: Author.
- UNESCO (2019). Combining data on out-of-school children, completion and learning to offer a more comprehensive view on SDG 4. UNESCO Institute for Statistics, Montreal.
- UNESCO (2021). *Reimagining Our Futures Together: A New Social Contract for Education*. Paris: Author
- UNICEF (2019). It is getting hot: Call for education systems to respond to the climate crisis: Perspectives from East Asia and the Pacific. UNICEF East Asia and Pacific Regional Office, Bangkok.
- United Nations Department of Economic and Social Affairs, Population Division (2018). World urbanization prospects: The 2018 revision. ST/ESA/SER.A/420. United Nations, New York.
- United Nations Department of Economic and Social Affairs, Population Division (2022). World population prospects 2022: Summary of results. UN DESA/POP/2022/TR/NO. 3. United Nations, New York.
- Waldfoegel, S., Coolidge, J. C., and Hahn, P. B. (1957). The development, meaning, and management of school phobia. *Am. J. Orthop.* 27, 754–780. doi: 10.1111/j.1939-0025.1957.tb05543.x

- Weathers, E. S., Hollett, K. B., Mandel, Z. R., and Rickert, C. (2021). Absence unexcused: a systematic review on truancy. *Peabody J. Educ.* 96, 540–564. doi: 10.1080/0161956X.2021.1991696
- Weinberg, M. (1991). “The civil rights movement and educational change” in *The Education of African-Americans*. (eds. C. V. Willie, A. M. Garibaldi and W. L. Reed (New York: Auburn House), 3–6.
- Welsh, R. O. (2018). Opposite sides of the same coin? Exploring the connections between school absenteeism and student mobility. *J. Educ. Stud. Placed Risk* 23, 70–92. doi: 10.1080/10824669.2018.1438204
- Wiggin, G., Smith, D., and Watson-Vandiver, M. J. (2021). The national teacher shortage, urban education and the cognitive sociology of labor. *Urban Rev.* 53, 43–75. doi: 10.1007/s11256-020-00565-z
- Williams, H. D. (1927). Truancy and delinquency. *J. Appl. Psychol.* 11, 276–288.
- Willis, P. (1977). *Learning to Labour: How Working Class Kids Get Working Class Jobs*. Farnborough: Saxon House.
- Wood, D., Crapnell, T., Lau, L., Bennett, A., Lotstein, D., Ferris, M., et al. (2018). “Emerging adulthood as a critical stage in the life course” in *Handbook of Life Course Health Development*. eds. N. Halfon, C. B. Forrest, R. M. Lerner and E. M. Faustman (New York: Springer), 123–143.
- World Economic Forum (2020). *Schools of the Future: Defining New Models of Education for the Fourth Industrial Revolution*. Geneva: Author.
- Yang, S., Carter, R. A. Jr., Zhang, L., and Hunt, T. (2021). Emanant themes of blended learning in K-12 educational environments: lessons from the every student succeeds act. *Comput. Educ.* 163:104116. doi: 10.1016/j.compedu.2020.104116
- Zaff, J. F., Donlan, A., Gunning, A., Anderson, S. E., McDermott, E., and Sedaca, M. (2017). Factors that promote high school graduation: a review of the literature. *Educ. Psychol. Rev.* 29, 447–476. doi: 10.1007/s10648-016-9363-5



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Elective home education of children with neurodevelopmental conditions before and after the COVID-19 pandemic started

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COVID-19 brought disruptions to children's education and mental health, and accelerated school de-registration rates. We investigated Elective Home Education (EHE) in families of children with a neurodevelopmental condition. A total of 158 parents of 5–15 year-old children with neurodevelopmental conditions (80% autistic) provided information on reasons for de-registration, their experience of EHE, and children's mental health. Few differences were found between children participating in EHE before and after the pandemic started. Low satisfaction with school for not meeting children's additional needs was the main reason for de-registering in both groups. COVID-19 had a more limited role in parents' decision to de-register. The main advantage of EHE reported in both groups was the provision of personalised education and one-to-one support. Levels of anxiety, internalising and externalising problems were similar between children participating in EHE before and after the pandemic started, and also similar between all children in EHE and school-registered children ($N=1,079$).

KEYWORDS

elective home education, intellectual disability, autism, mental health, COVID-19

Introduction

Elective Home Education (EHE) refers to the provision of education in the family's home or a location outside of a school (e.g., online; [Department for Education, 2019](#)). When a child is home educated, parents take full responsibility for their child's education and the associated costs ([Department for Education, 2019](#)). Children may be home

educated for their whole education without ever attending a school, or they may be de-registered from school after a period of school education (Department for Education, 2019). Therefore, school deregistration and EHE may be linked to chronic school non-attendance (Schoeneberger, 2012).

The number of children in home education has been rising steadily in the UK and across the world in the past few years (Department for Education, 2019; Kunzman and Gaither, 2020). Recent data suggest that the pandemic led to further increases in EHE, particularly among families with children with a neurodevelopmental condition (The Association of Directors of Children's Services, 2020, 2021). The present study investigates the experience of EHE in families of children with a neurodevelopmental condition (intellectual disability and/or autism), including in families who de-registered their child from school after the start of the COVID-19 pandemic in the United Kingdom.

In March 2019, there were 60,544 registered home educated children in England (about 0.7% of the whole student population), and it was estimated that numbers increased by 20% yearly for the 5 years before that (Department for Education, 2020; Office of the Schools Adjudicator, 2021). In the absence of a national register of home education, these numbers are likely an underestimate because parents are not obligated to report removing their children from school except when de-registering children with special educational needs and disabilities (SEND) - a term used in English educational settings to refer broadly to all children with any learning difficulty or/and disability that require additional support in schools (Department for Education, 2015). Research on reasons for de-registration from school points to parent dissatisfaction with school (including having issues with a teacher or/and other students), logistic reasons (such as moving to a different area), child mental or/and physical health problems, and religious or philosophical reasons (such as feeling that education at schools is too restrictive or formal; Smith and Nelson, 2015).

Children with neurodevelopmental conditions, school attendance, and elective home education

Children with neurodevelopmental conditions such as intellectual disability or autism have complex needs (e.g., cognitive difficulties, limitations in social and verbal communication skills, and sensory processing issues) and many require individualised support and input from professionals for their learning and development (Buckley et al., 2020; Fleming et al., 2020). The prevalence of mental health problems in children with neurodevelopmental conditions is at least double that of typically developing children (Lai et al., 2019; Totsika et al., 2022). On average, their academic attainment is at the bottom of national indicators (Department for Education, 2014) and many of them feel isolated and/or are bullied at school (Humphrey and Hebron, 2015; Goodall, 2018; Bower, 2021). These children often experience problems with school attendance at rates higher than

typically developing children (Munkhaugen et al., 2017; Black and Zablotzky, 2018; Ochi et al., 2020). Such problems are often a precursor to school de-registration and EHE (Munkhaugen et al., 2017; Black and Zablotzky, 2018; Ochi et al., 2020).

Research on reasons for EHE in children with neurodevelopmental conditions has been predominantly conducted with parents of autistic children (Arora, 2006; Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). In these studies, the most frequently reported reason given by parents for providing EHE was that schools failed to meet the needs of their children. These failures included schools lacking knowledge and skills about how to educate children with complex needs and/or not providing education to match children's needs (e.g., individualised, and flexible learning); children being bullied at school, experiencing mental health difficulties and/or refusing to attend (Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). Some parents also reported that they felt pressure from schools to de-register their children from school and that EHE was rarely a "choice" but rather the only option (Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; O'Hagan et al., 2021).

Elective home education and child mental health

The negative experiences of school attendance in some children (e.g., bullying, stressors associated with academic achievements or/and not receiving adequate support for learning) may be a contributing factor towards children's poor mental health (Heyne et al., 2022). In contrast, home education is tailored to the child's needs and avoids some of the environmental stressors associated with school (e.g., bullying; Maxwell et al., 2020). Therefore, it could be hypothesised that home education might be associated with better mental health.

Empirical evidence about the mental health of children participating in EHE is limited. The literature has predominantly compared the mental health of typically developing children participating in home education to that of school-registered peers, reporting mixed results (Guterman and Neuman, 2017; Schepis et al., 2020; Chen et al., 2021). First, researchers in Israel (Guterman and Neuman, 2017) compared depression scores, attachment security, and internalising and externalising problems of home educated children ($N=65$, aged 6–12 years) to school-registered children ($N=101$) matched on age, gender, religiosity, and family social economic circumstances. Findings showed that school-registered children had higher depression scores and externalising problems compared to home educated children. However, there was no difference between the groups on child internalising problems and attachment security (Guterman and Neuman, 2017). Second, findings from a national survey in the United States (Schepis et al., 2020) indicated a lower incidence of depression and lower levels of mental health treatment receipt among home educated adolescents (aged on average 14 years)

compared to school-registered children. However, it is unclear if lower rates of treatments received indicated better mental health or more unfulfilled needs in this group. Third, a longitudinal study carried out in the U.S. (Chen et al., 2021) compared the mental health of home educated children to school-registered children at baseline (aged on average 14.56 years, range 11–19 years) and at 10-year follow-up (aged on average 25.10 years). At follow-up there were no significant differences in depression and anxiety between home educated and school-registered children but post-traumatic stress disorder (PTSD) symptoms were higher in home educated children. The difference in findings across the three studies could be due to sample differences. For example, Chen et al. (2021) used data from a nurses' cohort and thus all parents in the study were highly educated. Differences may also be due to how children's mental health outcomes were assessed; in Schepis et al. (2020) children's mental health was assessed by mental health treatments received rather than standardised measures of child mental health symptoms.

There are no studies comparing the mental health of home educated children and school-registered children with neurodevelopmental conditions, despite the increased mental health needs in this population. A small number of qualitative studies have been mainly carried out with parents of children with SEND (Arora, 2006; Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). In these studies, parents reported that after choosing to educate their children at home, their children appeared to be less anxious, happier, and more confident (Arora, 2006; Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). Some parents reported an increase in children's social skills and academic achievement, attributed to the fact that the education provided at home was flexible and individualised (Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; O'Hagan et al., 2021). Overall, findings from this limited number of small-scale qualitative studies suggest likely improvements in mental health.

Elective home education accelerated during the pandemic

The COVID-19 pandemic is believed to have accelerated the rate of uptake of EHE in the United Kingdom. A survey carried out in October 2020 by the Association of Directors of Children's Services (ADCS) collected data from local authorities in England on the number of all children in their area they believed were participating in EHE (The Association of Directors of Children's Services, 2020). Data in these areas were only available from parents who volunteered such information and thus do not reflect the actual number. Findings from the survey suggested that since the start of the pandemic the number of children participating in EHE might have increased by 38% (The Association of Directors of Children's Services, 2020). In that survey, local authorities reported that the most frequent reason provided by parents was health concerns associated with COVID-19 (The Association of Directors of

Children's Services, 2020). In a 2021 survey (The Association of Directors of Children's Services, 2021), some local authorities reported that there had been a significant increase of children with SEND de-registered from school during the pandemic.

Overall, data appear to indicate an increase in the number of families opting for EHE and this increase appears to have accelerated after the COVID-19 pandemic where more families, including families of children with neurodevelopmental conditions, were de-registering their child from school (The Association of Directors of Children's Services, 2020, 2021). This increase in de-registration may have been associated with health concerns due to COVID-19, although it is not known whether reasons for de-registering a child with neurodevelopmental conditions differed before and after the pandemic started. This information would provide useful insight in families' decision making around de-registration as a result of COVID-19.

COVID-19 disruptions to education and the mental health of children with neurodevelopmental conditions

The mental health of children with a neurodevelopmental condition deteriorated during the pandemic (Nonweiler et al., 2020; Guller et al., 2021; Masi et al., 2021). Educational disruptions experienced during the pandemic might have impacted on children's mental health and families' subsequent decision to de-register from school. Some evidence from data on home schooling (that is, the provision of education at home for a school-registered child while schools were closed during the pandemic) indicated mixed experiences in families of children with a neurodevelopmental condition (Greenway and Eaton-Thomas, 2020; Asbury et al., 2021; English, 2021; Ludgate et al., 2021; Wenham et al., 2021). Some parents reported that their children "thrived" during home schooling (Greenway and Eaton-Thomas, 2020; English, 2021; Ludgate et al., 2021). In Wenham et al. (2021) study parents reported that they were not considering sending their children back to school after the lockdowns were lifted in the United Kingdom and already de-registered their children from school because children's well-being had improved since home schooling. Other parents reported that the child's mental health had deteriorated during home schooling possibly due to loss of regular school support (Greenway and Eaton-Thomas, 2020; Asbury et al., 2021; Ludgate et al., 2021; Wenham et al., 2021). As these findings are from studies with school-registered children, they are not necessarily generalisable to children participating in EHE. Therefore, the impact that COVID-19 might have had on these children's mental health has not been explored.

The present study

The aim of the present study was to investigate EHE in UK families of children with neurodevelopmental conditions, namely

autism and/or intellectual disability. We explored parents' experience of EHE as well as reasons for school de-registration before and after the COVID-19 pandemic started. Further, we investigated, for the first-time, child mental health outcomes (anxiety, internalising, and externalising problems) both in relation to the timing of de-registration and in comparison with school-registered children.

Materials and methods

Procedure

Ethical approval was provided by the University College London Research Ethics Committee (Reference number: 20633/001). To be eligible to participate, parents had to have a 5 to 15-year-old child with a neurodevelopmental condition, namely autism and/or intellectual disability (and any co-occurring conditions) and be resident in any of the four UK countries. Eligible children could have been participating in EHE or registered with a school. The study included a total of 1,234 parents of 5- to 15-year-old children of whom 1,076 were parents of school-registered children. Participation in the survey was anonymous. Data were collected through an online survey. The focus of the survey was on the educational experiences of children with neurodevelopmental conditions 1 year after the start of COVID-19 in the United Kingdom. Data were collected between June and November 2021. Parents were invited to take part *via* social media posts (e.g., Twitter), mailing lists and newsletters by the study team and third sector recruitment partners (e.g., charities for children with neurodevelopmental conditions and EHE support groups). A Parent Advisory Group guided all stages of the study including survey development, data analysis and interpretation.

Participants

Participants were 158 parents of home educated 5–15 year-old children. Among the 158 parents of home educated children, 93 parents had children participating in EHE before March 2020 (pre-pandemic EHE group) while 65 parents had children de-registered from school after the pandemic started in the UK in March 2020 (pandemic EHE group). Among the pre-pandemic EHE group, 23 children had always been participating in EHE meaning they had never registered with a school, and 68 children were de-registered at some point pre-pandemic (information was missing for 2 children in this group).

Table 1 reports participants' demographic characteristics. In both groups, the majority of children were boys (60.0% in EHE pre-pandemic and 69.2% in EHE pandemic) aged on average 11 years-old (Mean age = 11 years, SD = 2.9, range = 5–15 years and Mean age = 10.9 years, SD = 2.7, range = 5–15 years, respectively for the EHE pre-pandemic group and EHE pandemic group). Most

children were autistic: 82.6% in EHE pre-pandemic group and 76.9% in the EHE pandemic group. The majority of children lived in England (72.8% in EHE pre-pandemic and 78.1% EHE pandemic). About a third of children in both EHE groups had intellectual disability (28.3% in EHE pre-pandemic group and 26.2% in EHE pandemic group). Children were very similar in terms of their profile with some exceptions: there was a higher proportion of White ethnicity in the EHE pre-pandemic group, whereas more children in the EHE pandemic group had a formal recognition of their special educational needs (e.g., a SEND plan). Please see Table 1 for more details.

Similarly, families' profiles were very similar across both groups, with the majority of respondents being mothers (92.4% in the EHE pre-pandemic and 92.2% in the EHE pandemic group) aged on average 44 years-old (Mean age = 44.4 years, SD = 8, range = 27–60 years and Mean age = 43.8 years, SD = 8.3, range = 29–66 years, respectively, for both groups). Across the EHE groups, similar numbers of parents reported having a disability (45.8 and 45.9% and, respectively, for two groups) and having at least one parent employed in the household (67.4 and 69.2%, respectively, for two groups). Whilst non-significant, a higher percentage of families in the EHE pre-pandemic group reported being single parent families (26.1%), being educated to a university degree level (67.4%) and experiencing financial struggles (23.9%). It is worth noting that non-significant differences between the EHE pre-pandemic group and EHE pandemic group might be due small sample sizes and the reduced power to detect significant differences (see Table 1).

Measures

Elective home education

Parents indicated whether their child participated in EHE in May 2021 (yes/no). If not, parents were then asked whether their child was registered to attend school in March 2020 (the month the COVID-19 pandemic started in the UK). Parents who indicated their child was de-registered from school in May 2021 and March 2020 formed the EHE pre-pandemic group and were subsequently asked whether their child was ever registered with a school (yes/no) as well as the month and year of school de-registration. Parents who indicated that their child was de-registered from school in May 2021 but was still registered with a school in March 2020 formed the EHE pandemic group and were subsequently asked to indicate the month of de-registration starting from March 2020 until the time of survey completion.

Reasons for de-registration

All parents, except for those whose child had always been participating in EHE, were asked to indicate reasons for de-registration out of a list of 11 possible reasons (see Table 2). Reasons for de-registration were identified from evidence from existing studies (see Introduction) and reviewed by the Parent Advisory Group (see Procedure) for completeness and relevance

TABLE 1 Participants' demographic characteristics.

	Total EHE sample	EHE pre-pandemic	EHE pandemic	p value
	N = 158	N = 93	N = 65	
Child characteristics	N (%)	N (%)	N (%)	
Child is a boy	101 (63.9%)	56 (60.9%)	45 (69.2%)	0.28
Child age in years (SD)	11 (2.8)	11 (2.9)	10.9 (2.7)	0.83
Ethnicity – White	148 (93.7%)	90 (97.8%)	57 (87.7%)	0.01*
Lives in England	118 (75.2%)	67 (72.8%)	50 (78.1%)	0.45
Lives with family full-time	154 (98.1%)	90 (97.8%)	63 (98.4%)	0.78
Lives with two or more parents	120 (76.4%)	68 (73.9%)	51 (79.7%)	0.4
Neurodevelopmental conditions				
Child has ID	44 (27.9%)	26 (28.3%)	17 (26.2%)	0.77
Child has ASD	126 (79.8%)	76 (82.6%)	50 (76.9%)	0.38
Has two or more NDCs	72 (46.8%)	46 (51.1%)	26 (41.3%)	0.23
Additional health problems				
Deaf or blind	10 (6.3%)	4 (4.4%)	6 (9.2%)	0.22
Mobility problems	22 (13.9%)	14 (15.2%)	8 (12.3%)	0.61
Physical health problems	34 (21.5%)	20 (21.7%)	14 (21.5%)	0.97
Clinically extremely vulnerable*	9 (5.8%)	5 (5.5%)	4 (6.3%)	0.84
Shielding due to COVID-19*	13 (8.3%)	8 (8.8%)	5 (7.8%)	0.83
Formal recognition of special educational needs				
Has SEND plan	69 (43.7%)	33 (35.9%)	35 (53.9%)	0.02*
Parent characteristics				
Respondent is mother	145 (92.4%)	85 (92.4%)	59 (92.2%)	0.97
Respondent age (SD)	44.2 (8.1)	44.4 (8.0)	43.8 (8.3)	0.66
Mean N of children (SD)	2.1 (1.1)	2 (1.1)	2 (1.2)	0.97
Single parent household	37 (23.6%)	24 (26.1%)	13 (20.3%)	0.38
Disability	66 (45.8%)	38 (45.8%)	28 (45.9%)	0.99
Clinically extremely vulnerable*	14 (9.7%)	6 (7.2%)	8 (13.1%)	0.24
Educated at university degree level	76 (53.5%)	47 (57.3%)	29 (48.3%)	0.29
At least one parent is employed	107 (67.7%)	62 (67.4%)	45 (69.2%)	0.8
Struggling financially	31 (19.6%)	22 (23.9%)	9 (13.9%)	0.12
Socioeconomic deprivation (SD)	1.6 (0.9)	1.7 (0.9)	1.5 (0.8)	0.15

*Significant results; EHE = Elective Home Education; SD = standard deviation; ID = intellectual disability; ASD = autism spectrum disorder; NDCs = neurodevelopmental conditions; SEND = special educational needs and disability, clinically extremely vulnerable = classification defined by the UK Department of Health and Social Care (Department of Health and Social Care, 2020); shielding due to COVID-19 = staying at home avoiding contact with other people (Department of Health and Social Care, 2020).

to this population. Parents could select all relevant reasons. All parents of children participating in EHE were asked to indicate whether they were currently awaiting a school place (yes/no).

Support for learning and equipment needed for elective home education

Data were collected on the frequency that different providers were supporting the child's home education. Providers included the participating parent ("I teach or support my child with their learning"), another parent, a sibling, a private tutor, or an online group. Parents indicated if support was provided daily, weekly (several times or once a week), monthly or less frequently. A list of equipment items (e.g., computer, desk, and internet) was provided for parents to indicate if they had access to it, if they did not have access to it but needed it, or if they had access to it but needed/wanted better quality.

Parents' satisfaction with elective home education

Parents were asked to indicate on a 1–10 scale their level of satisfaction with EHE, with 1 being "extremely dissatisfied" to 10 being "extremely satisfied."

Barriers and facilitators of elective home education

To understand parents' experiences of EHE we asked them to write up to three barriers and up to three facilitators of EHE in free-text boxes in the survey.

Child mental health

Anxiety

Parents were asked to complete the anxiety subscale of the Developmental Behaviour Checklist – Parent Report (DBC2) to collect information on child anxiety symptoms (Gray et al., 2018).

TABLE 2 Reasons for school de-registration.

Reasons	EHE pre-pandemic N= 68	EHE pandemic N= 63
I did not feel my child was safe from COVID-19 at school	N/A	15 (23.8%)
I did not feel the school provided a good education to my child	30 (44.1%)	30 (47.6%)
My child was unhappy at the school	50 (73.5%)	38 (60.3%)
My child did not want to go to that school	32 (47.1%)	29 (46%)
My child's mental health had deteriorated	52 (76.5%)	35 (55.5%)
I felt that could provide a better education for my child at home	36 (52.9%)	44 (69.8%)
My child's additional needs were not met sufficiently in the school	53 (77.9%)	45 (71.4%)
The school had off rolled my child*	4 (5.8%)	4 (6.3%)
The school told me that my child was at risk of exclusion	4 (5.8%)	5 (7.9%)
The school had permanently excluded my child	N/A	N/A
I felt pressured from the school to remove my child	6 (8.8%)	6 (9.5%)
Other, please describe	21 (30.9%)	26 (41.3%)

EHE = Elective Home Education; * the school had off rolled my child: informal school exclusion.

The DBC2 was selected because it was developed specifically for children with neurodevelopmental conditions, such as intellectual disability and autism, and has good psychometric properties (Einfeld and Tonge, 1995; Gray et al., 2018). The Anxiety scale includes 12 items asking parents to rate their children's behaviour over the last 6 months on a 3-point scale ("not true as far as I know or not applicable to my child," "somewhat true or sometimes true" and "often true or very true"; scoring: 0–2). A total anxiety score was calculated by adding responses from all 12 questions (range: 0–24) with higher scores indicating higher levels of anxiety problems. The Cronbach's alpha for the Anxiety subscale of the total EHE sample was 0.77 indicating good internal consistency.

Internalising and externalising problems

Parents were asked to complete the parent version of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) to collect information on child internalising and externalising problems. The SDQ has been widely used to assess emotional and behavioural problems in typically developing young people and is also a reliable measure to use with children and young people with intellectual disability (Murray et al., 2021). The SDQ has 25 questions, five in each of the five subscales: Emotional Problems, Conduct Problems, Hyperactivity, Peer Problems and Prosocial Behaviour. In this study, parents were presented with all 25 questions and asked to rate their child's behaviour over the last 6 months on a 3-point scale ("not true," "somewhat true" and "certainly true"; scoring: 0–2). The Cronbach's alpha for the internalising emotional problems of the total EHE sample was 0.69 indicating acceptable internal consistency. A total score of child internalising problems was calculated by adding scores of two subscales: Emotional Problems and Peer Problems (range of scores: 0–20). A total score of child externalising problems was calculated by adding scores of two subscales: Conduct Problems and Hyperactivity (range of scores: 0–20). The Cronbach's alpha for the externalising emotional problems of the total EHE sample was 0.77 indicating good internal consistency.

Demographic information

We collected demographic information on parents' gender, age, relationship to the child, educational qualification, employment status, disability status and whether they were clinically extremely vulnerable to the COVID-19 infection as determined by the UK Department of Health (Department of Health and Social Care, 2020). Data were also collected on child age, gender, ethnicity, neurodevelopmental and health conditions, formal recognition status of special education needs (e.g., whether a child had a SEND plan), country of residence. A measure of subjective poverty assessed whether families felt were struggling financially: "How well would you say your family is managing financially these days? Would you say you are..?." The variable is rated on a 5-point scale (living comfortably, doing alright, just about getting by, finding it quite difficult, finding it very difficult). The last two options on this scale were combined to indicate the experience of subjective poverty in a family. A family socioeconomic deprivation variable was created by combining information on four dichotomised indicators: subjective poverty (struggling financially/managing OK), level of parent educational qualification (above/below university degree level), employment (at least one adult employed in household/ unemployed), and single parent household (one parent/carer in the household/more than one).

Data analysis

Quantitative analyses

We used STATA version 17 to analyse quantitative data. We compared demographic characteristics of EHE pre-pandemic and EHE pandemic groups using t-tests for continuous variables and chi-square tests for categorical variables. We report descriptive statistics for reasons for de-registration, practical arrangements, and parents' satisfaction with EHE. Satisfaction with EHE was compared between the two EHE groups (independent t-test). We compared mental health levels (anxiety, internalising and

externalising problems) between the two EHE groups using independent t-tests. Mental health levels were also compared between all EHE participants (N=158) and school-registered children (N=1,076). Comparisons were initially unadjusted (t-tests) to examine whether differences in mental health outcomes were present between groups. Comparisons were then adjusted for a range of potential confounding variables (in linear regression models) to investigate whether group differences would be attenuated after controlling for other variables known to be associated with child mental health. To identify eligible confounders, we drew on relevant literature that examined mental health outcomes of home educated children in the general population (Guterman and Neuman, 2017; Schepis et al., 2020; Chen et al., 2021) as well as theoretical models of correlates of school attendance problems (Melvin et al., 2019). We proceeded to examine the univariate associations between likely covariates (child's age, child's gender, ethnicity, country where the child lives, the presence of additional physical health conditions, the presence of two or more neurodevelopmental conditions, the presence of intellectual disability, having formal recognition of special educational needs, family socioeconomic deprivation and parent disability) and each of the three child mental health outcomes (see [Supplementary material 1](#) for findings). We adopted a parsimonious approach to model building and included in the final model variables significantly associated with each child mental health outcome: the presence of additional physical health problems, the presence of two or more neurodevelopmental conditions, the presence of intellectual disability, having formal recognition of special educational needs, family socioeconomic deprivation and parent disability.

Qualitative analysis

Content analysis (Bengtsson, 2016) was performed to analyse qualitative data on barriers and facilitators of home learning in the two EHE groups using NVivo 2020. Content analysis allows for a bottom-up coding of the data which was consistent with the aims of the study; no *a priori* assumptions were made about likely barriers and facilitators in this group of participants. Data were coded following a bottom-up approach in each group independently and researchers then examined whether themes identified in each group were similar or different. The themes identified were the same between the two groups and we then proceeded to investigate the frequency of the theme within each group. Content analysis uses both qualitative and quantitative methodology (i.e., examines the frequency each theme was reported within the data set) and can be used inductively by analysing what emerges from the data (Bengtsson, 2016). The presence of two groups in our study who experienced EHE at a different point in time as well as the likely impact of COVID-19 in their experience and decision indicated the need to compare themes across the qualitative data.

After thorough familiarisation with the data, two researchers (AT and LP) developed the codebook for analysing the data which was shared for discussion with the study team and the Parent

Advisory Group. The codebook development involved initially reading the data and developing codes inductively by two researchers independently. Then, the researchers worked together to finalise the coding scheme which involved merging the codes that were semantically related, re-naming the codes, providing descriptions to the codes using participants' quotes and grouping semantically related codes into bigger categories-themes. One researcher (AT) coded all the data and another researcher (LP) coded 20% of the data independently for an inter-rater reliability assessment. The agreement between researchers was very good (Cohen's Kappa was 0.81) based on parameters suggested by Landis and Koch (1977). Data were coded separately for each EHE group. Below we report the frequency of reported barriers and facilitators calculated by dividing the number of mentions (within each group) by the overall number of barriers or facilitators reported.

Results

Children in the EHE pandemic group were de-registered from school any time between March 2020 and September 2021 (with 25.4% of children in this EHE group deregistering in September 2020; see [Supplementary material 2](#)). Children participating in EHE pre-pandemic were de-registered from school between 2009 and up to 2020, but before March 2020 (with 32.3% reporting de-registering in 2019; see [Supplementary material 2](#)).

Reasons for school de-registration as selected by parents are shown in [Table 2](#). The most frequent reason for de-registering pre-pandemic was that the child's additional needs were not met sufficiently in the school (77.9%) followed by the child's mental health deterioration (76.5%) and the child being unhappy at school (73.5%). Twenty-one parents (30.9%) provided additional information on reasons for de-registration, including safeguarding risks/issues at the school without specifying what specific issues were (n=6), bullying in the school (n=6), and providing more detailed descriptions of the reasons specified in the table. The most frequent reasons for de-registering after the pandemic started were that the child's additional needs were not met sufficiently in the school (71.4%) and that parents felt they could provide a better education at home (69.8%). Only 15 parents (23.8%) reported de-registering because they felt that the child was not safe from COVID-19 at school. Twenty-six parents (41.3%) provided additional free-text information on reasons for de-registration, including moving home (n=3) and bullying in the school (n=2).

Daily support for learning was provided by the responding parent in 84.1% of cases for children participating in EHE pre-pandemic while this was the case in 68.3% of families in EHE pandemic group. Siblings or other family members supported the child's learning less than once per month. A private tutor and online teaching programmes were used to support child's learning at home several times a week in both groups ([Table 3](#)). Parents

TABLE 3 Type and frequency of support provided for child's learning at home presented for two EHE groups.

	EHE pre-pandemic					EHE pandemic				
	Daily	Several times a week	Once a week	Monthly	Less often	Daily	Several times a week	Once a week	Monthly	Less often
Parent	74 (84.1%)	10 (11.4%)	1 (1.1%)	-	3 (3.4%)	43 (68.3%)	13 (20.6%)	2 (3.2%)	1 (1.6%)	4 (6.4%)
Family member	16 (19.1%)	23 (27.4%)	9 (10.7%)	3 (3.6%)	33 (39.3%)	9 (16.1%)	16 (28.6%)	6 (10.7%)	2 (3.6%)	23 (41.1%)
Sibling	5 (7.3%)	7 (10.1%)	4 (5.8%)	2 (2.9%)	51 (73.9%)	2 (4.2%)	2 (4.2%)	5 (10.4%)	2 (4.2%)	37 (77.1%)
Private tutor	2 (2.7%)	16 (21.3%)	14 (18.7%)	-	43 (57.3%)	1 (2%)	11 (22.5%)	10 (20.4%)	1 (2%)	26 (53.1%)
Online school	2 (2.9%)	16 (23.2%)	11 (15.9%)	-	40 (58%)	6 (11.3%)	13 (24.5%)	4 (7.6%)	2 (3.8%)	28 (52.8%)

EHE = Elective Home Education.

TABLE 4 Type of equipment needed for child's home learning presented for the two EHE groups.

Type of equipment	EHE pre-pandemic			EHE pandemic		
	Needed and had access to	Needed but did not have access	Had access but need more or better quality	Needed and had access to	Needed but did not have access	Had access but need more or better quality
Laptop, PC, or tablet	71 (82.6%)	4 (4.7%)	11 (12.8%)	46 (74.2%)	6 (9.7%)	10 (16.1%)
Smart phone	57 (86.4%)	2 (3%)	7 (10.6%)	44 (84.6%)	1 (1.9%)	7 (13.5%)
Printer	71 (84.5%)	3 (3.6%)	10 (11.9%)	48 (81.4%)	6 (10.2%)	5 (8.5%)
Internet access/data	79 (94.1%)	1 (1.2%)	4 (4.8%)	55 (94.8%)	1 (1.7%)	2 (3.5%)
Headphones	63 (86.3%)	3 (4.1%)	7 (9.6%)	41 (78.9%)	7 (13.5%)	4 (7.7%)
Special software	31 (43.7%)	28 (39.4%)	12 (16.9%)	19 (45.2%)	16 (38.1%)	7 (16.7%)
Webcam	50 (72.5%)	15 (21.7%)	4 (5.8%)	37 (78.7%)	6 (12.7%)	4 (8.5%)
Desk/table	69 (88.5%)	4 (5.1%)	5 (6.4%)	47 (82.5%)	7 (12.3%)	3 (5.3%)
Specialist equipment	38 (48.7%)	25 (32.1%)	15 (19.2%)	37 (64.9%)	16 (28.1%)	4 (7%)

EHE = Elective Home Education; PC = personal computer.

most frequently reported that they needed but did not have access to special software (39.4% in the EHE pre-pandemic group and 38.1% in the EHE pandemic group) and other specialist equipment, e.g., books (32.1 and 28.1%, respectively, for both EHE groups, see Table 4).

Parents' experience and satisfaction with EHE

Parents in both EHE groups reported being highly satisfied with EHE and there was no statistical difference between groups (Mean satisfaction score = 8.4 points, SD = 2 in the EHE pre-pandemic group and Mean satisfaction score = 8.0 points, SD = 2.3 in the EHE pandemic group; $t(139) = -0.43$, $p = 0.24$). Eight parents (12.3%) of children in the EHE pandemic group indicated that they were waiting for a place at a different school compared to three parents (3.4%) in the EHE pre-pandemic group.

Table 5 shows the barriers and facilitators of home education. Overall, similar barriers of home education were reported by parents of children in two EHE groups. The most frequently reported barrier of home education in both EHE

groups was competing demands (30% of the barriers in EHE pre-pandemic and 43% of the barriers in EHE pandemic) followed by difficulties experienced due to child's needs (20% of the barriers in EHE pre-pandemic and 21% of the barriers in EHE pandemic). It should be noted that nine parents (three in EHE pre-pandemic and six in EHE pandemic) reported that they had not experienced any barriers with EHE.

Facilitators of home education were similar between the two EHE groups. The most frequently reported facilitator in both EHE groups was being able to provide personalised education (48% of the facilitators in EHE pre-pandemic and 39% of the facilitators in EHE pandemic). Parents reported that having the freedom to personalise and tailor education to the child's needs and interests as well as providing one to one support to the child facilitated their child's learning at home. The second most frequently reported facilitator across both EHE groups was the availability of external resources (19% of the facilitators in EHE pre-pandemic and 20% of the facilitators in EHE pandemic). Parents reported that having access to external resources such as free online courses, books, the internet, private tutors, and activities in a community were supporting and facilitating their child's learning and development.

TABLE 5 Barriers and facilitators of Elective Home Education as reported by parents in this study.

Frequency of reporting		Theme	Definition	Examples
EHE pre-pandemic	EHE pandemic			
Barriers				
30%	43%	Competing demands	The competing functions of EHE and the family impact on each other in ways that present a challenge. These include but are not limited to financial impact, other family commitments, the needs of parents, and difficulties with routines.	"Loss of income" "Being with child most of time/no time for yourself" "Caring for another member"
6%	8%	Home being unsuitable environment for learning	Aspects of the home environment make EHE more difficult, e.g., distractions or/and lack of space.	"Home distractions" "Access to TV and PlayStation have to be monitored and controlled" "Small, shared space and husband is working from home"
22%	15%	Difficulties accessing resources to support child learning	Families have limited access to resources that are typically available in schools including learning/assessment materials, sports/social activities, teachers/tutors and the internet. Also, the COVID-19 related difficulties accessing resources.	"Lack of access to exams" "Slow internet" "No access to social groups due to COVID"
21%	20%	Difficulties due to child's needs	The child's needs in terms of physical and mental health, behavioural issues, or learning problems make EHE more challenging.	"Child's low attention span" "My daughter's ADHD" "Child refusing, finds writing very stressful"
21%	15%	Lack of support or understanding from others	The parent feels lack of support or understanding from others, e.g., schools, local authorities (LAs), professionals, community, family, friends including difficulty getting helpful advice and guidance to improve their EHE delivery.	"Being forced into it with no apology from school" "Do not yet have access to therapies in EHCP as LA is refusing to help - we are at SEN Tribunal"
Facilitators				
Frequency of reporting		Theme	Definition	Examples
EHE pre-pandemic	EHE pandemic			
10%	14%	Availability of family's own resources	The family's own resources facilitate home learning in terms of physical home environment, skills, and family's social capital (e.g., having supportive friends and family).	"My education level (PhD)" "Being an educator myself" "Being able to work from home" "Access to friends and family"
19%	22%	Availability of external resources	The family has access to external resources such as online and physical resources, the internet, tutors, places to go, and activities to take part that support child's learning and development.	"Countless free resources" "Reduced entry to things like museums with disability living allowance" "Being able to meet up to learn in groups"
48%	39%	Able to provide personalised education experience	The family is able to provide flexible and personalised education that is adapted to the child's interests and needs.	"Not having to follow the curriculum" "Flexible learning" "One-to-one support which wasn't available in school"
8%	7%	Child's well-being is supported at home	The child's well-being in terms of physical health, mental health, behavioural problems is good at home.	"No bullying" "My children are happy and thriving" "My daughter feels safe at home with less sensory noise and is able to learn better"
16%	14%	Good external support	Support is provided to the parent by people or organisations external to the family, including schools and teachers, Local Authorities (LAs), EHE support groups, and other professionals such as GPs, clinicians.	"School were supportive and even lent us materials" "Excellent support from local and national home ed. community" "Supportive professionals"

EHE = elective home education.

TABLE 6 Child mental health outcomes between the total EHE sample and school-registered children.

Outcome	Total EHE sample	School-registered children	T-test coefficient (95% CI) p values	Regression coefficient (95% CI) p values
	Mean (SD)	Mean (SD)	Unadjusted*	Adjusted*
DBC2 anxiety scores	12.56 (0.16)	12.80 (0.37)	-0.25 (CI: -1.09 to 0.60) $p = 0.57$	0.01 (CI: -0.8 to 0.90) $p = 0.98$
SDQ internalising problems score	11.22 (0.13)	11.46 (0.30)	-0.23 (CI: -0.91 to 0.43) $p = 0.49$	-0.28 (CI: -1.01 to 0.45) $p = 0.45$
SDQ externalising problems score	10.62 (0.12)	11.31 (0.31)	0.69 (CI: 0.06 to 1.32) $p = 0.03^*$	-0.54 (CI: -1.20 to 0.12) $p = 0.11$

CI = confidence intervals; * = significant results; unadjusted* = t -tests; adjusted* = linear regression adjusted for child's age, child's gender, child's ethnicity, child living in England, child having additional physical conditions, child having two or more neurodevelopmental conditions, child having intellectual disability, child having formal recognition of special educational needs and family socioeconomic deprivation and parent disability.

Child mental health outcomes

Anxiety

There was no statistical difference in DBC2 anxiety scores between children participating in EHE before and after the pandemic started [$t(154) = 0.51, p = 0.51$]. There was no statistical difference in child anxiety scores (DBC2 scores) between the total EHE group and the school-registered children [$t(1168) = -0.25, p = 0.57$] (Table 6). After adjusting for child covariates, family socioeconomic deprivation, and parent disability, there was still no difference in anxiety scores between the total sample of children participating in EHE and school-registered children (adjusted mean difference: 0.14 points, 95% CI: -0.87 to 0.90, $p = 0.98$).

Internalising problems

There was no statistical difference in scores of internalising problems (SDQ scores) between children participating in EHE before and after the pandemic started [$t(154) = -0.01, p = 0.99$]. There was also no difference in internalising problems between the total EHE sample and the school-registered children [$t(1136) = -0.23, p = 0.49$]. After adjusting for child covariates, family socioeconomic deprivation, and parent disability, there was still no difference in levels of internalising problems between the total EHE sample and school-registered children (adjusted difference = -0.28 points, 95% CI: -1.01 to 0.44, $p = 0.45$).

Externalising problems

There was no evidence of a statistical difference in externalising problem levels between children participating in EHE before and after the pandemic started ($t(154) = -0.37, p = 0.55$). There was weak evidence that scores of externalising problems were statistically higher in the school-registered children than in the total EHE sample ($p = 0.03$). The unadjusted SDQ score of externalising problems was 0.69 points higher (95% CI = 0.06 to 1.32) in school-registered children compared to the total EHE sample. However, after adjusting for child covariates, family socioeconomic deprivation, and parent disability variables, there was no evidence of a statistically significant difference between the total EHE sample and school-registered children on levels of externalising problems (adjusted difference = -0.54 points, 95% CI: -1.20 to 0.12, $p = 0.11$).

Discussion

Overall, there were few differences between the children participating in EHE before and those participating in EHE after the pandemic. Parents' reasons for de-registering their child from school before and after the pandemic were broadly similar. Interestingly, health concerns due to COVID-19 were not the main reason for de-registration during the pandemic; fewer than 24% of parents whose child was de-registered after the pandemic selected this as the reason for de-registration. This finding contrasts to the 2020 and 2021 EHE surveys in England (The Association of Directors of Children's Services, 2020, 2021) where local authorities nominated health concerns due to COVID-19 as the main reason for parents selecting to de-register their children. Except for the fact these surveys were not restricted to neurodevelopmental conditions, it is also worth noting that data were not collected directly from parents. Differences in the target population and the survey design may explain the differences seen in the reasons reported.

Findings on parents' top reasons for de-registration suggest an overall dissatisfaction with the school's capacity for meeting the additional or different learning needs of these children as well as their mental health needs. For both EHE groups in our study, the most frequent reason for school de-registration was that the child's additional needs were not met sufficiently in school. Our qualitative findings appear to confirm these findings; the main advantage of EHE, as experienced by both groups of parents, was the ability to provide personalised education and one to one support that their child was not receiving at a school. Our findings align with evidence on the educational experiences of school-registered children with neurodevelopmental conditions (Brede et al., 2017; Sproston et al., 2017; Anderson, 2020), and with the reasons for choosing home education reported by parents of children with SEND in the studies carried out before the COVID-19 pandemic (Arora, 2006; Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). Taken together, the choice of EHE in families of children with a neurodevelopmental condition may be associated more strongly with perceived unmet learning and mental health needs in school; this association does not appear to have been disrupted by COVID-19, though it may have been compounded (Asbury et al., 2021).

EHE appeared to be working well for participating families. High levels of satisfaction with EHE were reported, and this was similar across groups. Families were mostly well equipped to support EHE at home both in terms of practical equipment and also support for learning. Support for learning was provided mostly by mothers (though substantially more so in the EHE pre-pandemic group), while others (other family members and tutors) supported the child on a weekly basis. Parents reported that managing competing demands (e.g., being a mother and an educator at the same time) and supporting the child's complex needs (e.g., behavioural or additional difficulties) were the main difficulties of EHE. These findings echo parents' experiences of providing home education to their children with SEND (Arora, 2006; Kidd and Kaczmarek, 2010; Parsons and Lewis, 2010; Kendall and Taylor, 2016; O'Hagan et al., 2021). On the other hand, parents' perception that EHE's affordance of individualised learning as the main facilitator of EHE might mean that the difficulties of providing EHE (e.g., managing competing demands, loss of income and less free time for themselves) might feel manageable considering the main benefit they see in their child.

We found no evidence of a statistically significant difference in levels of child mental health problems between children who were de-registered before the pandemic and those participating in EHE after the COVID-19 pandemic started. Overall, the two groups of children participating in EHE presented with almost identical levels of anxiety, internalising, and externalising problems. A recent systematic review that summarised evidence from the start of the pandemic (2020) concluded that children, in particular those with neurodevelopmental conditions, experienced an increase in anxiety and internalising symptoms following the start of the pandemic, though the evidence came mostly from studies without longitudinal data (Samji et al., 2022). In our study, where again we were unable to control for mental health levels prior to the pandemic, we found no evidence of worse mental health among children who were de-registered from school after the pandemic. However, deterioration in child's mental health was more highly endorsed by parents as a reason for selecting home education prior to the pandemic.

We also found no evidence of a difference in mental health problems between children participating in EHE and school-registered children. While to date no previous studies compared the mental health of children with neurodevelopmental conditions between home education and school education, studies that did this with typically developing children produced mixed evidence (Guterman and Neuman, 2017; Schepis et al., 2020; Chen et al., 2021), with some finding differences in some aspects of mental health and other studies finding no differences. Better child mental health was perceived to be a facilitator of EHE by families in our study, but its occurrence was rather limited; only 7–8% of reported facilitators were about improved child well-being. Clearly, more research is needed to compare the mental health of children with neurodevelopmental conditions between the two educational settings, the school and the home. Additionally, future research needs to focus on academic outcomes of this group of

children both because this is an area of great need but also because the main reason for choosing EHE as well as the main benefit of EHE appear to be the adaptation of the learning environment to suit the child's different or additional learning needs.

Strengths and limitations

This was the first study to explore EHE specifically in children with neurodevelopmental conditions in a sample much larger than previous studies (i.e., 158 participants). Participants were drawn from across all four United Kingdom nations, though the majority lived in England. The findings need to be interpreted while considering the study's limitations. Data on children's mental health were parent-reported and may not represent the actual levels of mental health problems experienced by their children. Future studies should seek the views of children with neurodevelopmental conditions on receiving EHE in addition to parent reports. Further, while our sample was larger than existing studies, it was still a small group compared to the likely overall population of children with neurodevelopmental conditions on EHE. Comparisons between children in EHE ($N=158$) and school-registered children ($N=1,076$) relied on unbalanced groups, and it is likely that the pattern of findings might differ if groups were better balanced in terms of their sample size. The small sample size of the always EHE group ($N=23$) precluded any comparison with the group of children in EHE before the pandemic ($N=68$); it is likely that children who never registered with a school (always in EHE) might differ from those who de-registered from school and opted for EHE at some point before the pandemic. Therefore, future research with a bigger sample size of families participating in EHE is needed to explore this and to replicate the pattern of findings. We used convenience sampling mostly through social media and EHE parent support groups, so it is very likely that the pattern of findings reflects possible sampling biases (e.g., people who took part in our study may have had positive experiences with EHE and the capacity in terms of time and resources to participate in an online survey).

Conclusion

Our findings indicate that the main reason families of children with neurodevelopmental conditions such as autism and/or intellectual disability elected to de-register from school was the high level of needs that were not being met at school. COVID-19 had a more limited role in decisions to de-register and opt for EHE. Parents in our study reported that the schools did not provide individualised, flexible, and adapted education while they saw EHE's main benefit as addressing these needs. EHE appeared to work well for families of children with neurodevelopmental conditions. While there was no evidence of better (or worse) child

mental health in relation to the timing of de-registration or in comparison to school-registered children, concerns about the child's mental health were an often-cited reason for de-registration and also a perceived benefit of home education.

Data availability statement

Data collected during the course of the study have been made publicly available through the UK Data Service <https://ukdataservice.ac.uk/> (database reference number SN 855596).

Ethics statement

The studies involving human participants were reviewed and approved by the University College London Research Ethics Committee (Reference number: 20633/001). The patients/participants provided their written informed consent to participate in this study.

Author contributions

The study was designed with input from authors VT, KG, RH, AA, GM, DH, and BT. LP led on the analyses and the first draft of the manuscript. AT and AK supported the analyses and write up. All authors guided the analyses, revised the manuscript, and agreed its final submitted version.

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References

- Anderson, L. (2020). Schooling for pupils with autism Spectrum disorder: parents' perspectives. *J. Autism Dev. Disord.* 50, 4356–4366. doi: 10.1007/s10803-020-04496-2
- Arora, T. (2006). Elective home education and special educational needs. *J. Res. Spec. Educ. Needs* 6, 55–66. doi: 10.1111/j.1471-3802.2006.00059.x
- Asbury, K., Fox, L., Deniz, E., Code, A., and Toseeb, U. (2021). How is COVID-19 affecting the mental health of children with special educational needs and disabilities and their families? *J. Autism Dev. Disord.* 51, 1772–1780. doi: 10.1007/s10803-020-04577-2
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open* 2, 8–14. doi: 10.1016/j.npls.2016.01.001
- Black, L. I., and Zablotsky, B. (2018). Chronic school absenteeism among children with selected developmental disabilities: national health interview survey, 2014–2016. *Natl. Health Stat. Rep.* 2018, 2014–2016.
- Bower, C. (2021). 'Um, I was getting bullied at school because I didn't believe in god': one family's experience of autism, school and home education. *Int. J. Incl. Educ.* 25, 914–927. doi: 10.1080/13603116.2019.1588926
- Brede, J., Remington, A., Kenny, L., Warren, K., and Pellicano, E. (2017). Excluded from school: autistic students' experiences of school exclusion and subsequent re-integration into school. *Autism & Developmental Language Impairments* 2, 239694151773751–239694151773720. doi: 10.1177/2396941517737511
- Buckley, N., Glasson, E. J., Chen, W., Epstein, A., Leonard, H., Skoss, R., et al. (2020). Prevalence estimates of mental health problems in children and adolescents with intellectual disability: a systematic review and meta-analysis. *Aust. N. Z. J. Psychiatry* 54, 970–984. doi: 10.1177/0004867420924101
- Chen, Y., Hinton, C., and VanderWeele, T. J. (2021). School types in adolescence and subsequent health and well-being in young adulthood: an outcome-wide analysis. *PLoS One* 16, e0258723–e0258716. doi: 10.1371/journal.pone.0258723
- Department for Education (2014). Children with special educational needs 2014: An analysis. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/350129/SFR31_2014.pdf (Accessed April 5, 2022).
- Department for Education (2015). Special educational needs and disability code of practice: 0 to 25 years. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/398815/SEND_Code_of_Practice_January_2015.pdf (Accessed April 5, 2022).
- Department for Education (2019). Elective home education. Departmental guidance for local authorities. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/791527/Elective_home_education_guidance_for_LAv2.0.pdf (Accessed April 5, 2022).

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpsyg.2022.995217/full#supplementary-material>

- Department for Education (2020). Schools, pupils and their characteristics. Academic year 2019/2020. Available at: <https://explore-education-statistics.service.gov.uk/find-statistics/school-pupils-and-their-characteristics/2019-20> (Accessed April 5, 2022).
- Department of Health and Social Care (2020). COVID-19: Guidance on protecting people defined on medical grounds as extremely vulnerable. Available at: <https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19> (Accessed April 5, 2022).
- Einfeld, S. L., and Tonge, B. J. (1995). The developmental behavior checklist: the development and validation of an instrument to assess behavioral and emotional disturbance in children and adolescents with mental retardation. *J. Autism Dev. Disord.* 25, 81–104. doi: 10.1007/BF02178498
- English, R. (2021). Getting a risk-free trial during COVID: accidental and deliberate home educators, responsabilisation and the growing population of children being educated outside of school. *J. Pedagogy* 12, 77–98. doi: 10.2478/jped-2021-0004
- Fleming, M., Salim, E. E., Mackay, D. F., Henderson, A., Kinnear, D., Clark, D., et al. (2020). Neurodevelopmental multimorbidity and educational outcomes of Scottish schoolchildren: a population-based record linkage cohort study. *PLoS Med.* 17, e1003290–e1003224. doi: 10.1371/journal.pmed.1003290
- Goodall, C. (2018). 'I felt closed in and like I couldn't breathe': a qualitative study exploring the mainstream educational experiences of autistic young people. *Autism & Developmental Language Impairments* 3, 239694151880440–239694151880416. doi: 10.1177/2396941518804407
- Goodman, R. (1997). The strengths and difficulties questionnaire: a research note. *J. Child Psychol. Psychiatry* 38, 581–586. doi: 10.1111/j.1469-7610.1997.tb01545.x
- Gray, K., Tonge, B. J., Einfeld, S., Gruber, C., and Klein, A. (2018). *DBC2: Developmental behaviour checklist 2 (DBC2) Manual*. Torrance: Western Psychological Services.
- Greenway, C. W., and Eaton-Thomas, K. (2020). Parent experiences of home-schooling children with special educational needs or disabilities during the coronavirus pandemic. *Br. J. Spec. Educ.* 47, 510–535. doi: 10.1111/1467-8578.12341
- Guller, B., Yaylaci, F., and Eyuboglu, D. (2021). Those in the shadow of the pandemic: impacts of the COVID-19 outbreak on the mental health of children with neurodevelopmental disorders and their parents. *Int. J. Dev. Disabil.* 0, 1–13. doi: 10.1080/20473869.2021.1930827
- Guterman, O., and Neuman, A. (2017). Schools and emotional and behavioral problems: a comparison of school-going and homeschooled children. *J. Educ. Res.* 110, 425–432. doi: 10.1080/00220671.2015.1116055
- Heyne, D., Kearney, C., and Finning, K. (2022). "Mental health and attendance at school: setting the scene," in *Mental health and attendance at school*. eds. K. Finning, T. Ford and D. Moore (Cambridge: Cambridge University Press), 1–21.
- Humphrey, N., and Hebron, J. (2015). Bullying of children and adolescents with autism spectrum conditions: a 'state of the field' review. *Int. J. Incl. Educ.* 19, 845–862. doi: 10.1080/13603116.2014.981602
- Kendall, L., and Taylor, E. (2016). 'We can't make him fit into the system': parental reflections on the reasons why home education is the only option for their child who has special educational needs. *Education* 44, 297–310. doi: 10.1080/03004279.2014.974647
- Kidd, T., and Kaczmarek, E. (2010). The experiences of mothers home educating their children with autism spectrum disorder. *Issues Educ. Res.* 20, 257–275.
- Kunzman, R., and Gaither, M. (2020). Homeschooling: an updated comprehensive survey of the research. *J. Edu. Alter.* 9, 253–336.
- Lai, M. C., Kasse, C., Besney, R., Bonato, S., Hull, L., Mandy, W., et al. (2019). Prevalence of co-occurring mental health diagnoses in the autism population: a systematic review and meta-analysis. *Lancet Psychiatry* 6, 819–829. doi: 10.1016/S2215-0366(19)30289-5
- Landis, J. R., and Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics* 33:159. doi: 10.2307/2529310
- Ludgate, S., Mears, C., and Blackburn, C. (2021). Small steps and stronger relationships: parents' experiences of homeschooling children with special educational needs and disabilities (SEND). *J. Res. Spec. Educ. Needs* 22, 66–75. doi: 10.1111/1471-3802.12542
- Masi, A., Mendoza Diaz, A., Tully, L., Azim, S. I., Woolfenden, S., Efron, D., et al. (2021). Impact of the COVID-19 pandemic on the well-being of children with neurodevelopmental disabilities and their parents. *J. Paediatr. Child Health* 57, 631–636. doi: 10.1111/jpc.15285
- Maxwell, N., Doughty, J., Slater, T., Forrester, D., and Rhodes, K. (2020). Home education for children with additional learning needs—a better choice or the only option? *Educ. Rev.* 72, 427–442. doi: 10.1080/00131911.2018.1532955
- Melvin, G. A., Heyne, D., Gray, K. M., Hastings, R. P., Totsika, V., Tonge, B. J., et al. (2019). The kids and teens at school (KiTeS) framework: an inclusive bioecological systems approach to understanding school absenteeism and school attendance problems. *Front. Educ.* 4:61. doi: 10.3389/educ.2019.00061
- Munkhaugen, E. K., Gjevik, E., Pripp, A. H., Sponheim, E., and Diseth, T. H. (2017). School refusal behaviour: are children and adolescents with autism spectrum disorder at a higher risk? *Res. Autism Spectr. Disord.* 41–42, 31–38. doi: 10.1016/j.rasd.2017.07.001
- Murray, C. A., Hastings, R. P., and Totsika, V. (2021). Clinical utility of the parent-reported strengths and difficulties questionnaire as a screen for emotional and behavioural difficulties in children and adolescents with intellectual disability. *Br. J. Psychiatry* 218, 323–325. doi: 10.1192/bjp.2020.224
- Nonweiler, J., Rattray, F., Baulcomb, J., Happé, F., and Absoud, M. (2020). Prevalence and associated factors of emotional and behavioural difficulties during COVID-19 pandemic in children with neurodevelopmental disorders. *Children* 7, 7–10. doi: 10.3390/children7090128
- O'Hagan, S., Bond, C., and Hebron, J. (2021). What do we know about home education and autism? A thematic synthesis review. *Res. Autism Spectr. Disord.* 80:101711. doi: 10.1016/j.rasd.2020.101711
- Ochi, M., Kawabe, K., Ochi, S., Miyama, T., Horiuchi, F., and Ueno, S. I. (2020). School refusal and bullying in children with autism spectrum disorder. *Child Adolesc. Psychiatry Ment. Health* 14, 17–17. doi: 10.1186/s13034-020-00325-7
- Office of the Schools Adjudicator (2021). Office of the Schools Adjudicator Report of our work 1 September 2019 to 31 December 2020. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/985342/Office_of_the_Schools_Adjudicator_Report_of_our_work_2019_to_2020.pdf (Accessed April 5, 2022).
- Parsons, S., and Lewis, A. (2010). The home-education of children with special needs or disabilities in the UK: views of parents from an online survey. *Int. J. Incl. Educ.* 14, 67–86. doi: 10.1080/13603110802504135
- Samji, H., Wu, J., Ladak, A., Vossen, C., Stewart, E., Dove, N., et al. (2022). Review: mental health impacts of the COVID-19 pandemic on children and youth – a systematic review. *Child Adolesc. Mental Health* 27, 173–189. doi: 10.1111/camh.12501
- Schepis, T. S., McCabe, S. E., and Ford, J. A. (2020). Substance use and mental health in homeschooled adolescents in the United States. *J. Adolesc. Health* 67, 718–721. doi: 10.1016/j.jadohealth.2020.04.016
- Schoeneberger, J. A. (2012). Longitudinal attendance patterns: developing high school dropouts. *Clear. House: J. Edu. Strat. Issues Ideas* 85, 7–14. doi: 10.1080/00098655.2011.603766
- Smith, E., and Nelson, J. (2015). Using the opinions and lifestyle survey to examine the prevalence and characteristics of families who home educate in the UK. *Educ. Stud.* 41, 312–325. doi: 10.1080/03055698.2015.1005577
- Sproston, K., Sedgewick, F., and Crane, L. (2017). Autistic girls and school exclusion: perspectives of students and their parents. *Autism Develop. Lang. Impair.* 2, 239694151770617–239694151770614. doi: 10.1177/2396941517706172
- The Association of Directors of Children's Services (2020). Elective home education survey 2020. Available at: https://adcs.org.uk/assets/documentation/ADCS_EHE_Survey_2020_FINALweb.pdf (Accessed April 5, 2022).
- The Association of Directors of Children's Services (2021). Elective home education survey 2021. Available at: https://adcs.org.uk/assets/documentation/ADCS_EHE_Survey_2021_Report_FINAL.pdf (Accessed April 5, 2022).
- Totsika, V., Liew, A., Absoud, M., Adnams, C., and Emerson, E. (2022). Mental health problems in children with intellectual disability. *Lancet Child Adolesc. Health* 6, 432–444. doi: 10.1016/s2352-4642(22)00067-0
- Wenham, L., Din, I., and Eaves, L. (2021). 'I no longer trust our son's school': parents resisting the return to face-to-face teaching. *Forum* 63, 74–88. doi: 10.3898/forum.2021.63.2.07



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School attendance problems in adolescent with attention deficit hyperactivity disorder

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Introduction: A link between having a neurodevelopmental disorder, such as attention deficit hyperactivity disorder (ADHD) and school absenteeism, has been found in previous studies. Why ADHD poses a risk for absenteeism remains unclear, and insight into the mechanisms of the association is needed. The aim of the present study was to investigate school attendance problems (SAP) and both the symptoms related and the perceived reasons for them, as reported by adolescents with ADHD ($n=95$), compared with neurotypical adolescents ($n=1,474$).

Method: The current study ($N=1,569$) was part of the *School absence in Finland*-project. SAPs were measured with the Inventory of School Attendance Problems (ISAP). The ISAP questionnaire contains a symptom scale (ISAP S) and a function scale (ISAP F), which shows if and how the symptoms impacts school attendance. A linear mixed effects model was used to analyze outcomes on the ISAP factors, controlling for background variables living status, gender, other diagnoses, highest level of education for the parent and age.

Results: Results show that adolescents with ADHD had been more absent from school compared to neurotypical adolescents during the prior 12-weeks. Adolescents with ADHD showed significantly more symptoms of agoraphobia/panic, problems within the family and problems with parents than neurotypical peers. The symptoms separation anxiety, agoraphobia/panic, aggression, problems within the family and problems with parents more often were perceived as the reason for SAP (ISAP F).

Discussion: The results are in line with our initial hypotheses and previous studies. Because of the low response rate on the ISAP F scale, the results regarding reasons for SAPs should be interpreted with caution. Future research could examine specific preventive actions of SAPs for adolescents with ADHD, and different subtypes of ADHD.

KEYWORDS

adolescence, school attendance problems, ADHD, neurotypical, school absenteeism

Introduction

School absenteeism is known to have negative consequences, as it can affect children both short term, for instance academically (Gottfried, 2009, 2014) and socially (Gottfried, 2014), and long-term causing for instance economic struggles (Ansari et al., 2020) and/or unemployment (Attwood and Croll, 2006, 2014). In the current study, the term school

attendance problems (SAPs) will be used to cover all types and kinds of school absence, both legitimate/authorized and illegitimate/unauthorized. The term covers problems in all stages of the spectrum of problem severity, such as refusing or avoiding going to school, and school absenteeism. The prevalence of problematic school absenteeism in Finland among youth in secondary school is estimated to be around 2–3% (Määttä et al., 2020). The estimation was based on reports by school staff and according to the study, SAPs have increased in Finland in recent years.

There are many reasons for children to be absent from school. Health-related problems (Havik et al., 2014) and lack of good relationships with other students at school (Havik et al., 2015) are common reasons for school absenteeism. Previous studies have also shown a connection between having a neuropsychiatric diagnosis, such as autism spectrum disorder (Munkhaugen et al., 2017) and/or attention deficit hyperactivity disorder (ADHD; Kent et al., 2010; Fleming et al., 2017; May et al., 2020), and school absenteeism. There are also other risk factors, which increase the likelihood for SAPs or school absenteeism. Research shows that the risk of school absenteeism increases if a child experiences abuse, lack of care, or other kinds of problematic home conditions (Marlow and Rehman, 2021), if they come from low socioeconomic homes (Balkis et al., 2016), or suffer from mental health problems (Egger et al., 2003). Children who display a higher level of school absenteeism during their first years in school also tend to do it later in life, meaning that the pattern of school attendance problems may be established early (Ansari and Pianta, 2019). Also, externalizing behaviors, hyperactivity, inattention, and conduct problems, are shown to be riskfactors for SAP (Ingul et al., 2011).

Attention deficit hyperactivity disorder, or ADHD, is a condition characterized by inattention and hyperactivity-impulsivity or either of them (American Psychiatric Association, 2013). To be diagnosed with ADHD the symptoms must have been present in at least two environments, for example, at school and at home (American Psychiatric Association, 2013). In addition, the symptoms must have been present for at least 6 months and have a negative impact both socially and academically (American Psychiatric Association, 2013). The symptoms must also differ from the usual level of development (American Psychiatric Association, 2013). Signs that are common in youth with ADHD are, for example, negligence at school, inability to focus on a specific thing, speaking much more than others and a habit of interrupting others (American Psychiatric Association, 2013). The prevalence of ADHD among children is between 3.4–7.2% (Polanczyk et al., 2014, 2015; Thomas et al., 2015). ADHD is more commonly found among males than among females (American Psychiatric Association, 2013).

Comorbidities are common among children with ADHD and it is, in fact, more common than uncommon to have another diagnosis or other symptoms in addition to ADHD (Biederman et al., 1991; Kadesjo and Gillberg, 2001; Yuce et al., 2013). Studies have shown that children with ADHD can have higher levels of social anxiety (Chavira et al., 2004; Schmitz et al., 2010),

separation anxiety (Biederman et al., 1996), depression (Meinzer et al., 2014), agoraphobia/panic (Biederman et al., 1996, 1997), somatic complaints (Kutuk et al., 2018), and aggression (Murray et al., 2021). It is also common among youth with attention problems to have problems with peers (Barnow et al., 2006).

Children with ADHD are more absent from school compared to other children (Kent et al., 2010; Fleming et al., 2017; May et al., 2020). In addition to school absenteeism, children with ADHD also may have other kinds of school-related difficulties, for instance, low academic achievements (Fleming et al., 2017; May et al., 2020) and learning disabilities (DuPaul et al., 2012). Children with ADHD can also experience bullying more often, especially if they also have an autism spectrum disorder (ASD) diagnosis (McClemon et al., 2020). Children with ADHD are more prone to quit school earlier than others, they are more likely to need special help in school, and they are more prone to have difficulties finding a job later in life, even when the symptoms are treated with medication (Fleming et al., 2017). Furthermore, children with ADHD may have problems with emotion regulation (Graziano and Garcia, 2016). Martin (2014) found that ADHD also predicted other school-related difficulties, such as failure to complete schoolwork and needing to switch schools or being suspended from school.

As mentioned, it is common for children with ADHD to have comorbid disorders/symptoms (Biederman et al., 1991; Kadesjo and Gillberg, 2001; Yuce et al., 2013). It is important to pay attention to the comorbidities when considering SAPs, because the ADHD diagnosis alone might not be the reason for the SAP. According to Classi et al. (2012), ADHD combined with another diagnosis can increase SAPs more than ADHD alone. Their study showed that children with ADHD, who also had anxiety, depression, or phobias, were more prone to skip school for over 14 days compared to the children with ADHD only (Classi et al., 2012). This means that having ADHD and internalized problems can increase the risk of being absent from school. Another study conducted by Sciberras et al. (2014) found that children with two or more anxiety disorders in combination with ADHD had a higher degree of SAPs compared to children having ADHD and one anxiety disorder or having ADHD alone.

Having problems with peers is also common among youth with attention problems (Barnow et al., 2006), and having problems with peer relationships is also related to SAPs (Egger et al., 2003; Havik et al., 2015). As far as other relationships are concerned, children with ADHD may not have as close a relationship to their teachers as their peers do (Ewe, 2019). Also, the relationship with their parents might not be as good as compared to neurotypical children. Studies have shown that youth with ADHD have more problematic conflicts with their parents (Barkley et al., 1992; Edwards et al., 2001). The conflicts are also more aggressive, and they have a more negative tone compared to neurotypical children (Barkley et al., 1992; Edwards et al., 2001).

Concluding, prior research has highlighted several areas within education and school, which may be problematic for children and youth with ADHD. The same areas are, however, often the reason for SAP also for neurotypical children. The first aim of the present

study was to compare self-reported non-attendance between adolescents with ADHD and neurotypical adolescents. The second aim related to the symptoms associated with SAP. Do neurotypical and adolescents with ADHD differ in symptom severity, and on which symptoms related to SAP that are most common?

Furthermore, it is unclear, if and to what extent the symptoms and difficulties actually contribute to or are the reason for the SAPs. The idea to differentiate between symptom and function has existed for a long time in the literature on SAP. [Kearney \(2008\)](#) postulated four functions of behavior: two functions relate to avoiding situations or people and two to obtaining something more desirable outside of school (activities, attention from parents). However, to the best of our knowledge, there is only one study: on the creation of the Inventory for School Attendance Problems-scale, combining the symptoms with the function of the SAP ([Knollmann et al., 2018](#)). The possibility to separate between symptom and reason is appealing, as the clinical relevance of each symptom might be different. Let us illustrate this with a hypothetical example: a young person (with or without ADHD), with a high degree of absence from school, reports about conflicts with peers and symptoms of anxiety related to test situations. Very likely both difficulties contribute to the young person feeling stressed and down. However, it might be that the reason for not attending school relates only to feeling anxious in relation to test situations. In this example, the conflicts with peers might not be perceived as a reason not to attend school, as the young person might have other friends at school, with whom he/she likes spending time. Therefore, in addition to measuring symptoms of different difficulties related to school absenteeism, it is important to also measure whether a reported symptom is also the reason (function) for not attending school. In the present study, adolescent self-reported functions for SAP are measured. However, it is important to keep in mind that perception of causes and symptoms differ between informants ([Keppens et al., 2019](#); [Knollmann et al., 2020](#)). Parents tend to rate, e.g., anxiety higher than children/youth themselves ([Knollmann et al., 2020](#)). Also, insight into one's wellbeing is a developing skill among adolescents. The third aim of the present study was to investigate the differences between adolescents with ADHD and neurotypical adolescents perceptions regarding functions of SAPs.

The hypotheses of the current study are:

1. Adolescents with ADHD will show a higher level of school non-attendance compared to neurotypical adolescents.
2. Adolescents with ADHD will have a higher level of the comorbid symptoms that are common among adolescents with ADHD compared to neurotypical youth: social anxiety, separation anxiety, depression, agoraphobia/panic, somatic complaints, and aggression. Adolescents with ADHD will have more problems with peers and/or teachers and/or parents.
3. Adolescents with ADHD will report that increased symptoms in the areas described in hypothesis 2 will also have an impact on their SAPs. No *a priori* hypotheses about

which symptoms relate more to SAPs, or how the groups differ were made, due to the lack of previous research addressing the question.

Materials and methods

Procedure

The current study was a part of the *School Absence in Finland* project. The project started with translating the instruments School Refusal Assessment Scale-Revised (SRAS-R; [Kearney, 2002](#)), the Inventory of School Attendance Problems (ISAP; [Knollmann et al., 2018](#)) and the School Non-Attendance Checklist (SNACK; [Heyne et al., 2019](#)) into Swedish, and SNACK into Finnish. The translated ISAP questionnaire was piloted with 15 adolescents. After feedback, some smaller changes were made. Only the ISAP questionnaire and background variables were used in the current study. Voluntary schools were recruited for the study, and they recruited participants among their pupils. A total of 15 schools decided to participate in the study. The schools were located both in southern and western Finland. The data from the adolescents were collected in the school during the school day, in May 2021. Parents were contacted and informed *via* the school's e-mail. The parents were also asked to fill out an informed consent for their adolescent below age 15 to participate in the study. The consent was collected and confirmed by the school staff at data collection. Personnel at schools participated in the data gathering process for students with a high level of school absence. Special aid teachers contacted students with high absence rates, and collected data in person, from both parents and the students.

Ethical considerations

The study was approved by the research ethics committee of Åbo Akademi University.

Sample

The final sample with complete responses was 1,569, consisting of 952 Swedish-speaking adolescents and 617 Finnish-speaking adolescents. The average age for the neurotypical adolescents ($N = 1,474$) was 14.9 ($SD = 0.85$) and for the adolescents with ADHD ($N = 95$) 15.0 ($SD = 1.01$). The total collected sample had $N = 2,137$ responses of which 568 were incomplete and thus excluded (see [Figure 1](#)). Twenty-five participants were excluded, because they had reported an age lower than 11 or higher than 18. Four hundred and eighty participants were excluded, since they had not completed the part of the survey necessary for analyses or had more than 30% missing data. Forty-eight participants who reported "none of the above" on highest education level of a parent were excluded,

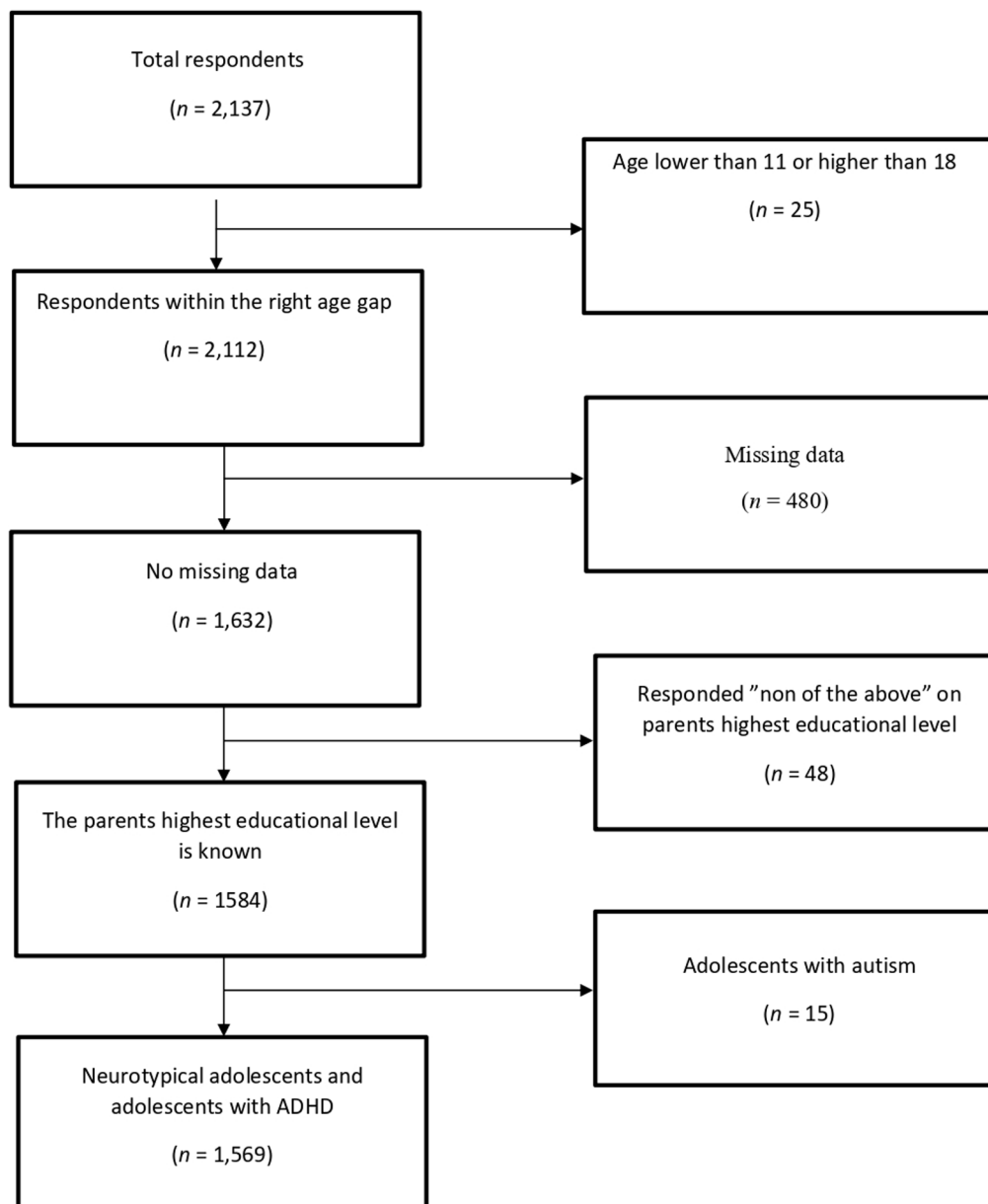


FIGURE 1

The process for the exclusion of the sample. The squares on the right side indicates the participants that were excluded from our analyses and the reason for their exclusion. The squares on the left side indicates the total sample left after the exclusion. The total sample for the study was 1,569.

since these values could not be multivariate imputed. Participants who had comorbid autism were excluded ($n = 15$), to enable comparisons between neurotypical and adolescents with ADHD.

Measures

The questionnaire included questions on the participants' age, gender (girl, boy, other), who the participant was living with (with both parents, with only one of them, with both alternately, or at a

residential childcare community) and the socioeconomical status of the family. The socioeconomical status factor was measured by the parents' highest educational level. The educational level was categorized into five separate groups, the highest being a university degree and the lowest to not have any type of degree after elementary school. The questionnaire also included questions about the participants other diagnoses, for example depression, cancer, asthma, and diabetes. Living status, gender, other diagnoses, highest level of education for the parent and age were included in all models, to account for variance explained by these background variables.

The inventory of school attendance problems

The measure for this study was The Inventory of School Attendance Problems (ISAP) questionnaire (Knollmann et al., 2018). ISAP was designed to function as a screening tool for identifying SAP at different levels of problem severity. The questionnaire contains 48 items, loading on 13 factors. The 13 factors are: problems with teachers, peers and parents, family-related problems, disapproval of the school the adolescent is in, symptoms of depression, performance anxiety, somatic complaints, aggression, social anxiety, separation anxiety, panic/agoraphobia, and having other attractive alternatives/school aversion. The ISAP questionnaire contains both a symptom scale (ISAP S) and a function scale (ISAP F). The symptom scale rates symptom severity whereas the function scale rates if and to what degree the symptom is the reason for the SAP. Both scales are answered on a 4-point Likert scale (from “0” = never to “3” = most of the time). Also, the ISAP questionnaire measures how often an adolescent has been absent from school during the last 12 weeks, both with and without permission. The following questions are examples of questions that are included in the questionnaire: “I worry that I might embarrass myself,” and “I am afraid to speak to other people or that others might speak to me” when measuring symptoms of social anxiety, and “I am afraid of exams,” and “I worry about my school grades” when measuring symptoms of performance anxiety. Internal consistency of the scale is deemed to be adequate ($0.75 \leq \alpha \leq 0.88$, 3 testlets/scale; Knollmann et al., 2018). In the present sample, factor structure seems to follow the 13 factor solution reported by Knollmann et al. (2018); for more information, contact authors.

Data analysis

All data preparation and analyses were performed in R version 4.0.2, utilizing R-Studio version 1.3. The R package *tidyverse* (Wickham et al., 2019) was used for data handling and plotting.

Final sample size for analyses was $N = 1,569$ for ISAP S and $N = 890$ for ISAP F. Missing data was handled using the *mice* package (Van Buuren and Groothuis-Oudshoorn, 2011). For the symptom scale (ISAP S) variables, in total, 889 (57%) participants had no missing data, 567 (36%) participants had missing data on one variable and 113 (7%) participants had missing data on 2–14 variables out of 58. Of the participants, 608 (39%) had not replied to ISAP question 29 (“I am afraid of tests”). Due to the key nature of this ISAP variable for calculating the factor scores, the variable was multivariate imputed and included, despite the large number of missing values. The variable with the second most missing values was age, missing for 52 (3%) of participants. Missing values were imputed using polytomous logistic regression for highest education, gender and age and predictive mean matching for all other variables, to create a complete data set. For the function scale (ISAP F) variables, only 890 complete answers could be obtained. These were analyzed separately from the sample described above.

Linear mixed effects models were used to compare neurotypical and neuroatypical adolescents on the thirteen

factors of ISAP symptoms and functions, using the *lmerTest* package (Kuznetsova et al., 2017). The school the adolescent attended was included as a random intercept, to control for variations between schools. The variance of the random effect of school was negligible, ranging from 0.00 to 0.04 (intraclass correlation, ICC: 0.00–0.07) for ISAP S and 0.00 to 0.002 (ICC: 0.00–0.01) for ISAP F. Thus, no substantial differences between schools could be found.

Results

Background variables and frequencies are presented in Table 1. There was a larger proportion of girls in the neurotypical sample, and a larger proportion of boys in the ADHD group. Most participants lived with both parents, whereas living with one parent was more common in the ADHD group. Parent educational level did not differ between groups.

Comparison of symptoms and functions between groups

Independent samples t-tests were performed to compare means between the groups for both symptoms (ISAP S) and function (ISAP F) for SAPs (see Tables 2,3). The highest mean for both groups on the ISAP questionnaire measuring symptoms (ISAP S) was school aversion/having other attractive alternatives ($M = 1.19$, $SD = 0.79$ for the ADHD group and $M = 0.95$, $SD = 0.72$ for the neurotypical adolescents). The differences between

TABLE 1 Descriptive data.

Group	Neurotypical adolescents		ADHD	
	<i>n</i>	%	<i>n</i>	%
Gender				
Boy	647	44	51	54
Girl	796	54	37	39
Other	31	2	7	7
Living arrangements				
Both parents	1,143	76	53	56
One parent	129	9	22	23
Both parents alternately	186	13	17	18
Residential childcare	8	0.5	2	2
community				
Other	8	0.5	2	1
Parents educational level				
University	919	62	58	61
High school	515	35	32	34
Secondary school	40	3	5	5

$N = 1,569$ (neurotypical adolescents, $n = 1,474$ and adolescents with ADHD, $n = 95$). The average age for the neurotypical adolescents was 14.9 ($SD = 0.85$) and for the adolescents with ADHD was 15.0 ($SD = 1.01$).

TABLE 2 Means, standard deviations and differences in symptom level between adolescents with or without attention deficit hyperactivity disorder (ADHD).

ISAP factor	Neurotypical		ADHD		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Depression	0.63	0.65	0.91	0.78	−3.5	0.001	0.40
Social anxiety	0.50	0.61	0.69	0.76	−2.4	0.019	0.27
Separation anxiety	0.31	0.46	0.43	0.54	−2.2	0.034	0.24
Performance anxiety	0.95	0.78	0.96	0.86	−0.18	0.855	0.02
Agoraphobia/Panic	0.21	0.43	0.46	0.62	−3.89	0.000	0.47
Somatic complaints	0.57	0.59	0.78	0.71	−2.75	0.007	0.31
School aversion/Attractive alternatives	0.95	0.72	1.19	0.79	−3.08	0.002	0.31
Aggression	0.64	0.68	1.08	0.87	−4.84	0.000	0.57
Problems with peers	0.33	0.52	0.51	0.60	−2.91	0.000	0.33
Problems with teachers	0.38	0.54	0.55	0.60	−2.45	0.016	0.28
Dislike of the specific school	0.40	0.64	0.62	0.79	−2.71	0.008	0.31
Problems within the family	0.29	0.57	0.59	0.81	−3.60	0.000	0.49
Problems with parents	0.23	0.490	0.51	0.78	−3.49	0.001	0.43

TABLE 3 Means, standard deviations and differences in function of symptom between adolescents with or without ADHD.

ISAP factor	Neurotypical		ADHD		<i>t</i>	<i>p</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Depression	0.27	0.48	0.48	0.66	−2.16	0.035	0.37
Social anxiety	0.18	0.40	0.34	0.59	−1.83	0.074	0.32
Separation anxiety	0.07	0.25	0.18	0.43	−1.69	0.098	0.30
Performance anxiety	0.24	0.53	0.36	0.70	−1.12	0.269	0.19
Agoraphobia/Panic	0.09	0.28	0.26	0.51	−2.32	0.025	0.42
Somatic complaints	0.42	0.55	0.56	0.68	−1.41	0.166	0.23
School aversion/Attractive alternatives	0.31	0.57	0.58	0.77	−2.35	0.023	0.40
Aggression	0.16	0.39	0.40	0.67	−2.52	0.015	0.46
Problems with peers	0.14	0.36	0.26	0.56	−1.45	0.154	0.25
Problems with teachers	0.15	0.35	0.28	0.49	−1.81	0.077	0.31
Dislike of the specific school	0.13	0.38	0.27	0.60	−1.57	0.124	0.28
Problems within the family	0.11	0.38	0.32	0.63	−2.20	0.033	0.39
Problems with parents	0.07	0.27	0.23	0.64	−1.68	0.100	0.32

N = 890 (neurotypical adolescents, *n* = 843 and adolescents with ADHD, *n* = 47). Smaller sample due to the lower response rate. Significant variables highlighted in bold.

adolescents with ADHD and neurotypical adolescents were significant on all the factors, except for the factor measuring performance anxiety.

The second part of the ISAP questionnaire measured if the symptom was the reason for the participants' SAPs (ISAP F). The highest mean for adolescents with ADHD was again school aversion/other attractive alternatives (*M* = 0.58, *SD* = 0.77), but the highest mean for the neurotypical group was somatic complaints (*M* = 0.42, *SD* = 0.55). The differences between groups were statistically significant on the factors measuring depression, agoraphobia/panic, school aversion/attractive alternatives, aggression, and problems within the family. The effect sizes for the group differences on ISAP S and ISAP F were small to moderate (Cohen's *d*: 0.19–0.57).

School absence, and the association between ISAP factors and school attendance problems when controlling for background variables

Sixteen percent of the adolescents with ADHD indicated that they had been absent from school at least 5–12 days during the last 12 weeks (equaling approximately 10% of school time), either with or without permission from parents and/or school. The corresponding percentage of neurotypical adolescents was 8%, meaning that the percentage of absence was twice as high among adolescents with ADHD.

Results also show that adolescents with ADHD had, compared to the neurotypical adolescents, a higher level of all the symptoms

TABLE 4 Comparison of the symptoms (ISAP S) between adolescents with ADHD and neurotypical adolescents per ISAP Factor in multivariate analyses.

Response variable: ISAP Factor	B	SE	95% CI		p
			LL	UL	
Depression	0.09	0.06	-0.03	0.20	0.15
Social anxiety	0.05	0.06	-0.06	0.18	0.36
Separation anxiety	0.05	0.05	-0.04	0.16	0.23
Performance anxiety	-0.12	0.08	-0.27	0.03	0.12
Agoraphobia/panic	0.16	0.05	0.07	0.25	0.001
Somatic complaints	0.06	0.06	-0.05	0.17	0.29
School aversion/attractive alternatives	0.12	0.08	-0.03	0.27	0.12
Aggression	0.30	0.07	0.16	0.44	<0.001
Problems with peers	0.11	0.05	0.00	0.21	0.05
Problems with teachers	0.08	0.06	-0.03	0.20	0.15
Dislike of the specific school	0.12	0.07	-0.01	0.25	0.08
Problems within the family	0.17	0.06	0.05	0.28	0.005
Problems with parents	0.20	0.05	0.09	0.30	<0.001

N = 1,569 (neurotypical adolescents, n = 1,474 and adolescents with ADHD, n = 95). LL = lower limits; UL = upper limits, b = neurotypical (0) vs. ADHD (1). Living status, gender, other diagnoses, highest level of education for the parent and age were included in all models, to account for variance explained by these background variables. Significant variables highlighted in bold.

TABLE 5 Comparison of the reasons (ISAP F) for SAP between adolescents with ADHD and neurotypical adolescents per ISAP Factor in multivariate analyses.

Response variable: ISAP Factor	b	SE	95% CI		p
			LL	UL	
Depression	0.12	0.07	-0.01	0.25	0.08
Social anxiety	0.11	0.06	-0.01	0.23	0.08
Separation anxiety	0.09	0.04	0.01	0.16	0.03
Performance anxiety	0.06	0.08	-0.09	0.22	0.44
Agoraphobia/panic	0.15	0.05	0.06	0.24	0.001
Somatic complaints	0.07	0.08	-0.08	0.23	0.37
School aversion/attractive alternatives	0.18	0.09	0.01	0.35	0.04
Aggression	0.21	0.06	0.09	0.33	<0.001
Problems with peers	0.07	0.06	-0.04	0.18	0.19
Problems with teachers	0.09	0.05	-0.02	0.19	0.10
Dislike of the specific school	0.11	0.06	-0.01	0.23	0.07
Problems within the family	0.17	0.06	0.05	0.29	0.004
Problems with parents	0.14	0.05	0.05	0.23	0.003

N = 890 (neurotypical adolescents, n = 843 and adolescents with ADHD, n = 47). LL = lower limits; UL = upper limits, b = neurotypical (0) vs. ADHD (1). Smaller sample due to the lower response rate. Living status, gender, other diagnoses, highest level of education for the parent and age were included in all models, to account for variance explained by these background variables.

(ISAP S), except on the factor measuring performance anxiety (see Table 4). Although the adolescents with ADHD had a higher level of symptoms on most of the factors (see Table 4), the results were statistically significant on the factors measuring agoraphobia/panic ($b = 0.16$; $SE = 0.05$; $p < 0.001$), aggression ($b = 0.30$; $SE = 0.07$; $p < 0.001$), problems within the family ($b = 0.17$; $SE = 0.06$; $p = 0.005$), and problems with parents ($b = 0.20$; $SE = 0.05$; $p < 0.001$). In the multivariate analyses, living status, age, gender, other diagnoses, and the socioeconomical status were controlled for.

Adolescents with ADHD also had higher points on every ISAP factor that showed if the symptom was the reason for their SAPs (ISAP F; see Table 5). In spite of higher points on every factor, the differences between adolescents with ADHD and the neurotypical adolescents were statistically significant only on the ISAP factors measuring separation anxiety ($b = 0.09$, $SE = 0.04$, $p = 0.032$), agoraphobia/panic ($b = 0.15$, $SE = 0.05$, $p = 0.001$), school aversion/attractive alternatives ($b = 0.18$, $SE = 0.09$, $p = 0.04$), aggression ($b = 0.21$, $SE = 0.06$, $p < 0.001$), problems within the family ($b = 0.17$, $SE = 0.06$, $p = 0.004$), and problems

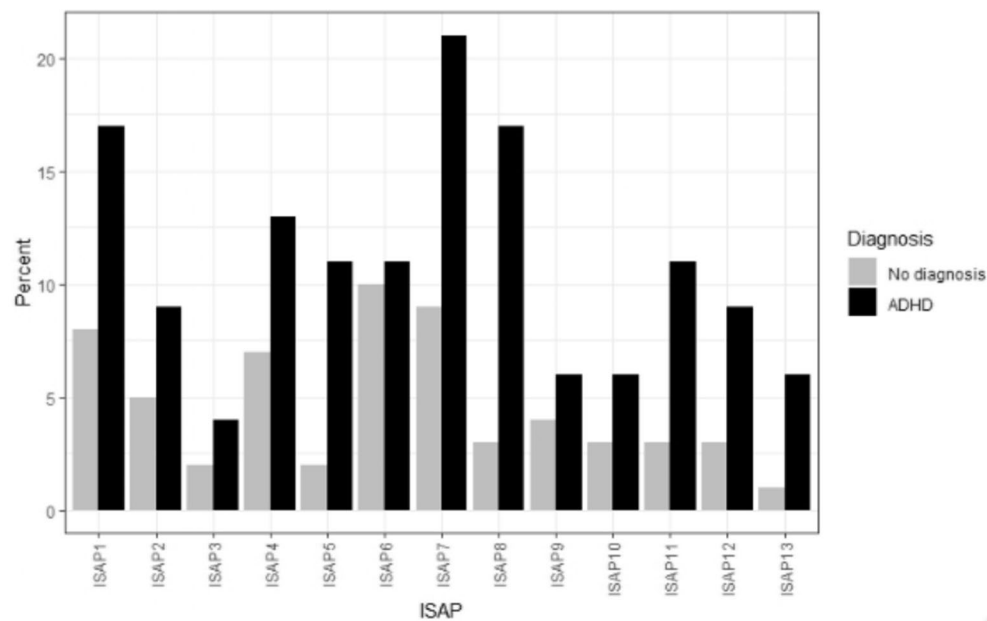


FIGURE 2

Scores indicating at least moderate influence on school attendance problems (SAP) for adolescents with and without attention deficit hyperactivity disorder (ADHD). The inventory of school attendance problems (ISAP) Function factors. The reasons for SAPs in percentages for each group per each factor in order from ISAP 1–ISAP 13: depression, social anxiety, separation anxiety, performance anxiety, agoraphobia/panic, somatic complaints, school aversion/alternatives, aggression, problems with peers, problems with teachers, dislike of the specific school, problems within the family, and problems with parents.

with parents ($b=0.14$, $SE=0.05$, $p=0.003$) as reasons for their SAPs.

Clinically significant scores as reasons for SAPs

To further disentangle the reasons for SAPs, we analyzed scores implicating at least moderate impact of each symptom on SAPs. This was done by exploring scores above 1 (i.e., “quite often a reason”) on the ISAP F scale, in both groups (Knollmann et al., 2018). Twenty-one percent of the ADHD group had answered more than 1 on the factor measuring school aversion/other attractive alternatives (ISAP 7) as the reason for their SAPs. The corresponding percentage for the neurotypical group was 9%. School aversion/other attractive alternatives was the most common reason for SAPs among adolescents with ADHD. The most common reason for SAPs for the group with neurotypical adolescents was somatic complaints (ISAP 6), with 10%. The corresponding percentage for the group with ADHD was 11%. The least influential factor for SAPs for adolescents with ADHD was separation anxiety (ISAP 3) with 4%, and the least influential factor for the neurotypical adolescents was problems with parents (ISAP 13) with 1%. The percentage of adolescents with ADHD reporting moderate impact was twice as large compared to neurotypical adolescents on most of the factors. All factor scores above one are presented below (see Figure 2).

Discussion

The present study aimed to investigate the differences between adolescents with ADHD and neurotypical adolescents regarding SAPs. It was hypothesized that adolescents with ADHD would have a higher level of school absenteeism compared to neurotypical adolescents. It was also hypothesized that adolescents with ADHD would have a higher level of those common ADHD and SAP-related symptoms, which were measured by the ISAP questionnaire. Furthermore, we expected that at least some of the symptoms would be perceived as the reason for the SAP. Data was gathered with the ISAP questionnaire from a total of 1,569 adolescents, aged 11–18 in different schools in Finland.

In accordance with our initial hypothesis and previous studies (Kent et al., 2010; Fleming et al., 2017; May et al., 2020), our results showed that a higher percentage of adolescents with ADHD were absent from school compared to the neurotypical adolescents. The percentage of those absent at least 5–12 days during the prior 12 weeks (equaling approximately 10% of school time) was twice as large for adolescents with ADHD (16% for ADHD and 8% for neurotypical). The cutoff we used for SAP was approximately 10% of the school time. The 10% cutoff has also been used in different contexts, for instance by the Department for Education (2019) in the UK. In our study, a significantly higher proportion of adolescents reported absence, than in the Määttä et al. (2020) study, in which Finnish professionals estimated 2–3% of middle school students were absent/had SAP. Our study likely captured emerging

SAPs, compared to more severe SAPs measured by Määttä et al. Also, the period for measured school absenteeism in ISAP was relatively long, 12 weeks. Such a long time period possibly limits accurately recalling own absence (Keppens et al., 2019).

The findings show that adolescents with ADHD had a higher level of almost all the symptoms on the ISAP questionnaire. Only the factor measuring performance anxiety was lower among adolescents with ADHD, although not to a statistically significant degree. The factors measuring agoraphobia/panic, aggression and problems with parents were statistically significantly higher, when controlling also for living status, age, gender, other diagnoses, and socioeconomical status. The results are, therefore, in line with the hypothesis and in accordance with previous research showing that it is common among adolescents with ADHD to also have agoraphobia/panic (Biederman et al., 1996, 1997), aggression (Murray et al., 2021), and problems with parents (Barkley et al., 1992; Edwards et al., 2001). Even if the other factors did not reach statistical significance, it seems that adolescents with ADHD may struggle with difficulties in many areas, when comparing to neurotypical adolescents.

The adolescents with ADHD also showed higher scores on every ISAP factor showing if the symptoms were the reason for their SAPs (ISAP F). The results were statistically significant on the factors measuring separation anxiety, agoraphobia/panic, school aversion/other attractive alternatives, aggression, problems within the family, and problems with parents. The results are in line with the hypothesis, that is, the symptoms that are common among adolescents with ADHD have an impact on their school attendance. The results also support previous research about how ADHD alone might not explain the SAP and that having comorbid symptoms can increase SAPs more than ADHD alone (Classi et al., 2012). This thought is supported also by the fact that the symptoms that are typical for SAP in neurotypical youth, are even more common among adolescents with ADHD, pointing to that ADHD in itself poses a risk factor for other difficulties, which in turn may be the reason for SAP. In the present study, only some of the reasons were statistically higher in the ADHD group, however, implying that special attention should be given to these reasons. However, as a tendency for higher scores on the other reasons for SAP in the ADHD group, also these reasons should be considered when investigating the school situation for youth. Also, when a young person presents with SAPs, the investigation of reasons should also include the possibility that the challenges are due to challenges related to the neuropsychiatric condition.

Agoraphobia/panic as a reason for SAPs is not surprising considering the clinical picture of SAPs. Agoraphobia is described as having a desire to avoid situations or places that one cannot easily escape (American Psychiatric Association, 2013). There might be fear of having a panic attack at a specific place (American Psychiatric Association, 2013), in this case, is the school. Feeling a need to avoid places and situations that trigger panic is a common feature in SAP (Kearney, 2008; Heyne et al., 2019). Anxiety/panic attacks as a comorbid syndrome to ADHD may explain the higher occurrence of this problem in the ADHD group, and has also previously been reported to increase absence among children with ADHD (Classi et al., 2012).

Aggressive behavior among adolescents with ADHD has been found in prior studies. Aggressive behavior could be related to being suspended from school, and hence, also to SAP. Also, aggression could be related to problems with peers and/or teachers, even if those factors were not significantly different between the groups. School aversion/other attractive alternatives could be interpreted as truancy, i.e., absence due to low motivation, and the desire to do something more rewarding outside of school, often without the knowledge of parents and/or school (Heyne et al., 2019). In addition, school aversion could be linked to the adolescent's inability to concentrate (American Psychiatric Association, 2013) and/or not getting the support needed in school. Insufficient support might lead to the desire to do something more enjoyable outside of school, i.e., becoming an issue of motivation. The results also showed that the most common reason for SAPs for the ADHD group was school aversion, with scores above one on the ISAP Function scale for 22% in the ADHD group (compared to 9% in the control group). A systematic review of interventions to address truancy showed, that interventions that aimed at heightening school engagement were effective in bringing students to school, in contrast to interventions, in which a punitive approach was the leading incitement (Keppens et al., 2019). Support for school engagements, especially for youth with ADHD, could be a focus for prevention of SAPs.

The significant results regarding separation anxiety were unexpected considering that children with ADHD have more problematic conflicts with their parents compared to neurotypical children (Barkley et al., 1992; Edwards et al., 2001) and that problems within the family (ISAP 12) and with parents (ISAP 13) were also significant in our study. The mean scores on separation anxiety were lower than for other factors, reflecting the adolescent developmental stage of the sample. Also, it could be speculated that adolescents with ADHD have ambivalent feelings towards their parents or that the problems between the adolescents and their parents might bring up a fear of losing them. Clearly, more research into the factors affecting SAP among neurotypical youth is needed.

Lastly, a note on self-report data. It is important to remember that adolescents might not fully understand their symptomatology and difficulties. Adolescents can have symptoms of depression or anxiety, but they might have a hard time recognizing, and putting their feelings into words. Therefore, the self-evaluation of symptoms should be made multiple times and/or together with a close adult for an increased understanding of the symptoms. It is also important to gather information from multiple informants, such as parents and school personnel.

Strengths and limitations

The current study comes with certain strengths and limitations. The study had 1,569 participants, and the relatively large sample size can be seen as a strength in the current study. However, the sample was not representative of the adolescent population in Finland. In addition, the ADHD group had only 95 participants, which might have led to the statistical power not being optimal, and some

differences did not reach statistical significance. The ADHD group's sample size also meant that the comparison between different subtypes of ADHD was not possible. However, the symptomatology between different subtypes may differ significantly, and future studies should analyze subgroups separately. Furthermore, the questionnaire was lengthy, possibly affecting willingness to complete it.

Another limitation is that all the participants did not answer all the questions in the questionnaire. The second part of the ISAP questionnaire (ISAP F), that is, the part that measures if the symptoms are the reason for the participants' SAPs, had a low response rate with answers only from 57% of the participants. Also, the item concerning being afraid of tests was not answered by 39% of participants, reflecting possible problems with this specific item. Because of the low response rate, the results regarding reasons for SAPs should be interpreted with caution. It can be speculated that the reason for the low response rate could be due to not understanding the instructions on how to fill in the questionnaire correctly, or that the participants found it difficult to evaluate if the symptoms were the reason for their SAPs. Also, a missing answer on the function scale could be interpreted as a zero, that is, no impact on school attendance, if the participant had replied not having the symptom in question.

Conclusion

In conclusion, the current study shows differences between adolescents with ADHD and neurotypical adolescents regarding SAPs. This study considers both symptoms that are linked to SAP and to what extent the symptoms are the reason for school attendance problems. The result of this study showed that adolescents with ADHD reported both more symptoms related to SAP, and that the symptom more often was the reason for the SAP. However, the associations reached statistical significance only for part of the symptoms and reasons. The symptoms agoraphobia/panic, aggression, and problems with parents were also perceived as reasons for SAPs. In addition, school aversion and problems with family and separation anxiety were statistically higher among adolescents with ADHD as reasons for SAPs.

Future research could examine differences between adolescents with different combinations of neuroatypicalities, such as ADHD in combination with autism spectrum disorder, and how additive diagnoses affect school attendance and possible SAPs. Future research should also examine which protective actions could be used to prevent school absenteeism in neuroatypical adolescents.

References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th Edn.* Washington, DC: American Psychiatric Publishing.
- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Absenteeism in the first decade of education forecasts civic engagement and educational and socioeconomic prospects in young adulthood. *J. Youth Adolesc.* 49, 1835–1848. doi: 10.1007/s10964-020-01272-4

Data availability statement

The datasets presented in this article are not readily available because the dataset is available after the end of the project period, starting 2024. Requests to access the datasets should be directed to katarina.alanko@abo.fi.

Ethics statement

The studies involving human participants were reviewed and approved by Åbo Akademi Ethical Board. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

KA is the principal investigator, responsible for design, data collection and revision of intellectual content. SN is responsible for drafting of the manuscript, and parts of statistical analyses. ML conducted statistical analyses and revised the manuscript for intellectual content. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- Ansari, A., and Pianta, R. C. (2019). School absenteeism in the first decade of education and outcomes in adolescence. *J. Sch. Psychol.* 76, 48–61. doi: 10.1016/j.jsp.2019.07.010

- Attwood, G., and Croll, P. (2006). Truancy in secondary school pupils: prevalence, trajectories and pupil perspectives. *Res. Pap. Educ.* 21, 467–484. doi: 10.1080/02671520600942446

- Attwood, G., and Croll, P. (2014). Truancy and well-being among secondary school pupils in England. *Educ. Stud.* 41, 14–28. doi: 10.1080/03055698.2014.955725
- Balkis, M., Arslan, G., and Erdinç, D. (2016). The school absenteeism among high school students: contributing factors. *Educ. Sci. Theory Pract.* 16, 1819–1831. doi: 10.12738/estp.2016.6.0125
- Barkley, R. A., Anastopoulos, A. D., Guevremont, D. C., and Fletcher, K. E. (1992). Adolescents with attention deficit hyperactivity disorder: mother-adolescent interactions, family beliefs and conflicts, and maternal psychopathology. *J. Abnorm. Child Psychol.* 20, 263–288. doi: 10.1007/BF00916692
- Barnow, S., Schuckit, M., Smith, T., and Freyberger, H. J. (2006). Predictors of attention problems for the period from pre-teen to early teen years. *Psychopathology* 39, 227–235. doi: 10.1159/000093923
- Biederman, J., Faraone, S. V., Marrs, A., Moore, P., Garcia, J., Ablon, S., et al. (1997). Panic disorder and agoraphobia in consecutively referred children and adolescents. *J. Am. Acad. Child Adolesc. Psychiatry* 36, 214–223. doi: 10.1097/00004583-199702000-00012
- Biederman, J., Faraone, S., Milberger, S., Guite, J., Mick, E., Chen, M., et al. (1996). A prospective 4-year follow-up study of attention-deficit hyperactivity and related disorders. *Arch. Gen. Psychiatry* 53, 437–446. doi: 10.1001/archpsyc.1996.01830050073012
- Biederman, J., Newcorn, J., and Sprich, S. (1991). Comorbidity of attention deficit hyperactivity disorder with conduct, depressive, anxiety, and other disorders. *Am. J. Psychiatry* 148, 564–577. doi: 10.1176/ajp.148.5.564
- Chavira, D. A., Stein, M. B., Bailey, K., and Stein, M. T. (2004). Comorbidity of generalized social anxiety disorder and depression in a pediatric primary care sample. *J. Affect. Disord.* 80, 163–171. doi: 10.1016/s0165-0327(03)00103-4
- Classi, P., Milton, D., Ward, S., Sarsour, K., and Johnston, J. (2012). Social and emotional difficulties in children with ADHD and the impact on school attendance and healthcare utilization. *Child Adolesc. Psychiatry Ment. Health* 6:33. doi: 10.1186/1753-2000-6-33
- Department of Education (2019). A guide to absence statistics. Haettu 10.1.2022 osoitteesta. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/787314/Guide_to_absence_statistics_21032019.pdf (Accessed January 1, 2022).
- DuPaul, G. J., Gormley, M. J., and Laracy, S. D. (2012). Comorbidity of LD and ADHD. *J. Learn. Disabil.* 46, 43–51. doi: 10.1177/0022219412464351
- Edwards, G., Barkley, R. A., Laneri, M., Fletcher, K., and Metevia, L. (2001). Parent-adolescent conflict in teenagers with ADHD and ODD. *J. Abnorm. Child Psychol.* 29, 557–572. doi: 10.1023/A:1012285326937
- Egger, H. L., Costello, J. E., and Angold, A. (2003). School refusal and psychiatric disorders: a community study. *J. Am. Acad. Child Adolesc. Psychiatry* 42, 797–807. doi: 10.1097/01.chi.0000046865.56865.79
- Ewe, L. P. (2019). ADHD symptoms and the teacher-student relationship: a systematic literature review. *Emot. Behav. Diffic.* 24, 136–155. doi: 10.1080/13632752.2019.1597562
- Fleming, M., Fitton, C. A., Steiner, M. F. C., McLay, J. S., Clark, D., King, A., et al. (2017). Educational and health outcomes of children treated for attention-deficit/hyperactivity disorder. *JAMA Pediatr.* 171:e170691. doi: 10.1001/jamapediatrics.2017.0691
- Gottfried, M. A. (2009). Excused versus unexcused: how student absences in elementary school affect academic achievement. *Educ. Eval. Policy Anal.* 31, 392–415. doi: 10.3102/0162373709342467
- Gottfried, M. A. (2014). Chronic absenteeism and its effects on students' academic and socioemotional outcomes. *J. Educ. Stud. Placed Risk* 19, 53–75. doi: 10.1080/10824669.2014.962696
- Graziano, P. A., and Garcia, A. (2016). Attention-deficit hyperactivity disorder and children's emotion dysregulation: a meta-analysis. *Clin. Psychol. Rev.* 46, 106–123. doi: 10.1016/j.cpr.2016.04.011
- Havik, T., Bru, E., and Ertesvåg, S. K. (2014). Assessing reasons for school non-attendance. *Scand. J. Educ. Res.* 59, 316–336. doi: 10.1080/00313831.2014.904424
- Havik, T., Bru, E., and Ertesvåg, S. K. (2015). School factors associated with school refusal- and truancy-related reasons for school non-attendance. *Soc. Psychol. Educ.* 18, 221–240. doi: 10.1007/s11218-015-9293-y
- Heyne, D., Gren-Landell, M., Melvin, G., and Gentle-Genitty, C. (2019). Differentiation between school attendance problems: why and how? *Cogn. Behav. Pract.* 26, 8–34. doi: 10.1016/j.cbpra.2018.03.006
- Ingul, J. M., Klöckner, C. A., Silverman, W. K., and Nordahl, H. M. (2011). Adolescent school absenteeism: modelling social and individual risk factors. *Child Adolesc. Mental Health* 17, 93–100. doi: 10.1111/j.1475-3588.2011.00615.x
- Kadesjo, B., and Gillberg, C. (2001). The comorbidity of ADHD in the general population of Swedish school-age children. *J. Child Psychol. Psychiatry* 42, 487–492. doi: 10.1111/1469-7610.00742
- Kearney, C. A. (2002). Identifying the function of school refusal behavior: a revision of the school refusal assessment scale. *J. Psychopathol. Behav. Assess.* 24, 235–245. doi: 10.1023/a:1020774932043
- Kearney, C. A. (2008). An interdisciplinary model of school absenteeism in youth to inform professional practice and public policy. *Educ. Psychol. Rev.* 20:257. doi: 10.1007/s10648-008-9078-3
- Kent, K. M., Pelham, W. E., Molina, B. S. G., Sibley, M. H., Waschbusch, D. A., Yu, J., et al. (2010). The academic experience of male high school students with ADHD. *J. Abnorm. Child Psychol.* 39, 451–462. doi: 10.1007/s10802-010-9472-4
- Keppens, G., Spruyt, B., and Dockx, J. (2019). Measuring school absenteeism: administrative attendance data collected by schools differ from self-reports in systematic ways. *Front. Psychol.* 10:2623. doi: 10.3389/fpsyg.2019.02623
- Knollmann, M., Reissner, V., and Hebebrand, J. (2018). Towards a comprehensive assessment of school absenteeism: development and initial validation of the inventory of school attendance problems. *Eur. Child Adolesc. Psychiatry* 28, 399–414. doi: 10.1007/s00787-018-1204-2
- Knollmann, M., Reissner, V., and Hebebrand, J. (2020). “Construction and validation of the parent version of the inventory of school attendance problems (ISAP)” in *Presentation at the 2nd Conference of International Network of School Attendance, 2020*.
- Kutuk, M. O., Tufan, A. E., Guler, G., Yalin, O. O., Altintas, E., Bag, H., et al. (2018). Migraine and associated comorbidities are three times more frequent in children with ADHD and their mothers. *Brain Dev.* 40, 857–864. doi: 10.1016/j.braindev.2018.06.001
- Kuznetsova, A., Brockhoff, P. B., and Christensen, R. H. (2017). lmerTest package: tests in linear mixed effects models. *J. Stat. Softw.* 82, 1–26. doi: 10.18637/jss.v082.i13
- Määttä, S., Pelkonen, J., Lehtisare, S., and Määttä, M. (2020). Kouluikäymättömyys Suomessa: Vaativan erityisen tuen VIP-verkoston tilannekartoitus. (School non-attendance in Finland: a survey by the VIP-network). *Ministry of Education*.
- Marlow, S. A., and Rehman, N. (2021). The relationship between family processes and school absenteeism and dropout: a meta-analysis. *Educ. Dev. Psychol.* 38, 3–23. doi: 10.1080/20590776.2020.1834842
- Martin, A. J. (2014). The role of ADHD in academic adversity: disentangling ADHD effects from other personal and contextual factors. *Sch. Psychol. Q.* 29, 395–408. doi: 10.1037/spq0000069
- May, F., Ford, T., Janssens, A., Newlove-Delgado, T., Emma Russell, A., Salim, J., et al. (2020). Attainment, attendance, and school difficulties in UK primary schoolchildren with probable ADHD. *Br. J. Educ. Psychol.* 91, 442–462. doi: 10.1111/bjep.12375
- McClelland, A. J., Morton, H. E., Gillis, J. M., and Romanczyk, R. G. (2020). Brief report: predictors of school refusal due to bullying in children with autism Spectrum disorder and attention-deficit/hyperactivity disorder. *J. Autism Dev. Disord.* 51, 1781–1788. doi: 10.1007/s10803-020-04640-y
- Meinzer, M. C., Pettit, J. W., and Viswesvaran, C. (2014). The co-occurrence of attention-deficit/hyperactivity disorder and unipolar depression in children and adolescents: a meta-analytic review. *Clin. Psychol. Rev.* 34, 595–607. doi: 10.1016/j.cpr.2014.10.002
- Munkhaugen, E. K., Gjevik, E., Pripp, A. H., Sponheim, E., and Diseth, T. H. (2017). School refusal behaviour: are children and adolescents with autism Spectrum disorder at a higher risk? *Res. Autism Spectr. Disord.* 41-42, 31-38. doi: 10.1016/j.rasd.2017.07.001
- Murray, A., Lavoie, J., Booth, T., Eisner, M., and Ribeaud, D. (2021). To what extent does emotional dysregulation account for aggression associated with ADHD symptoms? An experience sampling study. *Psychiatr. Res.* 303:114059. doi: 10.1016/j.psychres.2021.114059
- Polanczyk, G. V., Salum, G. A., Sugaya, L. S., Caye, A., and Rohde, L. A. (2015). Annual research review: a meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *J. Child Psychol. Psychiatry* 56, 345–365. doi: 10.1111/jcpp.12381
- Polanczyk, G. V., Willcutt, E. G., and Salum, G. A. (2014). Kieling C, Rohde L. A. (2014). ADHD prevalence estimates across three decades: an updated systematic review and meta-regression analysis. *Int. J. Epidemiol.* 43, 434–442. doi: 10.1093/ije/dyt261
- Sciberras, E., Lycett, K., Efron, D., Mensah, F., Gerner, B., and Hiscock, H. (2014). Anxiety in Children With Attention-Deficit/Hyperactivity Disorder. *Pediatrics* 133, 801–808. doi: 10.1542/peds.2013-3686
- Schmitz, M., Ludwig, H., and Rohde, L. A. (2010). Do hyperactive symptoms matter in ADHD-I restricted phenotype? *J. Clin. Child Adolesc. Psychol.* 39, 741–748. doi: 10.1080/15374416.2010.517170
- Thomas, R., Sanders, S., Doust, J., Beller, E., and Glasziou, P. (2015). Prevalence of attention-deficit/hyperactivity disorder: a systematic review and meta-analysis. *Pediatrics* 135, e994–e1001. doi: 10.1542/peds.2014-3482
- Van Buuren, S., and Groothuis-Oudshoorn, K. (2011). Mice: multivariate imputation by chained equations in R. *J. Stat. Softw.* 45, 1–67. doi: 10.18637/jss.v045.i03
- Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D. A., François, R., et al. (2019). Welcome to the Tidyverse. *J. Open Source Softw.* 4:1686. doi: 10.21105/joss.01686
- Yuce, M., Zoroglu, S. S., Ceylan, M. F., Kandemir, H., and Karabekiroglu, K. (2013). Psychiatric comorbidity distribution and diversities in children and adolescents with attention deficit/hyperactivity disorder: a study from Turkey. *Neuropsychiatr. Dis. Treat.* 9, 1791–1799. doi: 10.2147/ndt.s54283



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Revealing underlying factors of absenteeism: A machine learning approach

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Introduction: The basis of support is understanding. In machine learning, understanding happens through assimilated knowledge and is centered on six pillars: big data, data volume, value, variety, velocity, and veracity. This study analyzes school attendance problems (SAP), which encompasses its legal statutes, school codes, students' attendance behaviors, and interventions in a school environment. The support pillars include attention to the physical classroom, school climate, and personal underlying factors impeding engagement, from which socio-emotional factors are often the primary drivers.

Methods: This study asked the following research question: What can we learn about specific underlying factors of absenteeism using machine learning approaches? Data were retrieved from one school system available through the proprietary Building Dreams (BD) platform, owned by the Fight for Life Foundation (FFLF), whose mission is to support youth in underserved communities. The BD platform, licensed to K-12 schools, collects student-level data reported by educators on core values associated with in-class participation (a reported—negative or positive—behavior relative to the core values) based on Social-Emotional Learning (SEL) principles. We used a multi-phased approach leveraging several machine learning techniques (clustering, qualitative analysis, classification, and refinement of supervised and unsupervised learning). Unsupervised technique was employed to explore strong boundaries separating students using unlabeled data.

Results: From over 20,000 recorded behaviors, we were able to train a classifier with 90.2% accuracy and uncovered a major underlying factor directly affecting absenteeism: the importance of peer relationships. This is an important finding and provides data-driven support for the fundamental idea that peer relationships are a critical factor affecting absenteeism.

Discussion: The reported results provide a clear evidence that implementing socio-emotional learning components within a curriculum can improve absenteeism by targeting a root cause. Such knowledge can drive impactful policy and programming changes necessary for supporting the youth in communities overwhelmed with adversities.

KEYWORDS

absenteeism, school attendance problems, machine learning, socio-emotional learning, classification, multi-tiered systems of support

Introduction

In a seminal article on attendance differentiation documenting the evolution of the study of absenteeism over the last 100 years, Heyne et al. (2019) leading proponents in the field, shared the etiology and inconsistent presentation of several types of school attendance problems (SAPs; Heyne et al., 2019). The documentation of school refusal (Heyne, 1998), school avoidance, school withdrawal, truancy, and other types and differentiation have continued to inhibit national and international robust studies or evaluations. In fact, finding consistency in outcomes and interventions has also been negatively influenced. This inconsistency has been touted as one of the most challenging dilemmas in defining a clear path forward for attendance intervention (Epstein and Sheldon, 2002); (Heyne et al., 2019). Training educators, counselors, leaders, attendance officers, and other school personnel have been a constant aim (Franklin et al., 2008) as Franklin et al. (2008) pointed out in their school practitioners' companion to prevent dropouts and attendance problems. Obviously important, the other is in training data for effective outcomes. The training is in the collection and distilling of information and data for use. As such, alongside training and improvement in how to work within schools and respond to attendance problems, collecting and organizing student behavior to inform effective responses has dominated the field in the last 10 years (Ng et al., 2019). Leading scholars, Heyne et al. (2021) on what works and Kearney and Graczyk (2014) on the response to intervention (RTI) model espouse that growth in conceptualizing problematic absenteeism is still fraught with confusion and lack of consensus. In the United States, many states quickly adopted the multi-tiered systems of support (MTSS) approach advanced by Kearney and Graczyk [National Center for Education Statistics (NCES), 2020] but national data on outcomes are still forthcoming. Practitioner and research gaps continue to point to a need to leverage positive behavioral supports to guide behavior analysis (Johnston et al., 2006). MTSS is defined as an approach to response or instruction for which behavioral supports (e.g., Positive Behavioral Interventions and Supports or PBIS) are increasingly offered from intensive to individualized levels (e.g., response to intervention or RTI; IRIS Center, 2019). Kearney and Graczyk (2020) recommend new clusters in using the model to ensure implementation science is applied with the integration of the MTSS model, arguing that

“a multi-tiered system of supports (MTSS) framework emphasizes many aspects that match well with school attendance and its problems, including prevention and a

continuum of supports, screening, evidence-based assessment and intervention, problem-solving and data-based decision-making, implementation fidelity, and natural embedding into extant school improvement plans” (p. 316).

The literature spotlights where socio-emotional factors often impede engagement (Epstein and Sheldon, 2002; Rasasingham, 2015). This is because the contributing factors are wide and varied. Researchers have not been able to pinpoint the specific factors (Hocking, 2008) which consistently result in direct changes in engagement. The concern is worldwide, with countries (Mushtaq and Khan, 2012) including Jamaica, also seeking to understand root causes (Cook and Ezenne, 2010).

With this call to explore better and more effective ways to assess and intervene in school attendance problems (SAP)—its legal statutes, school codes, students' attendance behaviors, and interventions in a school environment, the following research question is proposed: What can we learn about specific underlying factors of absenteeism using machine learning approaches? To fulfill our goal, we conducted research in partnership with Fight for Life Foundation, Butler University, and Indiana University. We leveraged techniques in machine learning to develop an understanding of absenteeism with the mission to provide support to youth in underserved portions of our community. We report herein on a multi-phased approach to use several machine learning techniques to reveal an underlying pattern to absenteeism *via* Social and Emotional Learning (SEL) data collected on the FFLF Building Dreams platform.

The Fight for Life Foundation, founded in 2007, provides schools and counselors additional support for youth to develop the social and emotional qualities to be successful. Explicitly aimed at underserved communities, the foundation's mission has impacted hundreds of students across 15 different schools in central Indiana. FFLF leverages technology and a unique gamification system with the capability to integrate into a school's curriculum while simultaneously collecting behavioral data and providing online tools to allow educators and administrators immediate intervention plans and policies. The ability of the system to communicate across applications offers true interoperability. The result is the effortless exchange of data *via* defined data formats, agreed-upon nomenclature, and defined rules for interaction among applications. This relationship brings to light patterns that have the potential to go unnoticed. This data-driven awareness is the basis of the resources FFLF provides to schools to support social-emotional core values and to equip students with the skillsets needed to manage their emotions and relationships. Social and Emotional Learning is the core of

FFLF. The fundamental thesis of SEL is that students thrive when their socio-emotional needs are met. We believe that such knowledge can drive impactful policy and programming changes necessary to support the youth in communities overwhelmed with adversity.

Literature review

Inadequate education and assessment still plague the US with American students scoring lower than many other nations and parents shrugging shoulders in apathy and indifference to education (Bennett et al., 1998; Berliner, 2002; Roesch and Singer, 2013; Buckley et al., 2017). Bennett and colleagues report “A national still at risk” shared then that approximately 20 million high school seniors were unable to do basic math and graduated without knowing the essentials of US history, during a period where over 6 million dropped out of school altogether. As Berliner and Buckley and colleagues continue to affirm standardized testing has its role, but the US is losing its footing. For minority high school students, results were exponentially higher with many leaving without a high school diploma. School and education are essential drivers for a country’s economy. It ensures it has a skilled citizenry to contribute and one not riddled by predictors of antisocial behaviors (Gentle-Genitty, 2010). Therefore, the importance of being in some form of formal education is integral to a country (Balfanz and Byrnes, 2012). Absenteeism is at the heart of these findings (Kearney et al., 2019).

For decades, research has attempted to uncover all risk factors for why students do not persist, work that continues (Gentle-Genitty, 2010; Ngo et al., 2011; Roh and Marshall, 2018; Brouwer-Borghuis et al., 2019). Common aspects are school characteristics (Moscoso, 2000) and maltreatment of bullying (Slade and Wissow, 2007). Some researchers suggest that the impact is in early childhood (Vilsaint et al., 2013), parents and peers are direct drivers on this relationship (Deutsch et al., 2012), and community (Sheldon and Epstein, 2004) yet perceived and observed neighborhood factors and obesity (Ehlers et al., 2005) have been added too. Still, post-traumatic stress and other cognitive impairments play a role (King et al., 2003; Bokhorst et al., 2008). It is likely that even a teacher absence (Finlayson, 2009) and even the categorization of absences influence academic achievement and serve as risk or protective factors (Gottfried, 2009). As socio-ecological approaches spotlight cumulative risk and promotive factors which impact students even those who are non-delinquents (Laan et al., 2010; Roh et al., 2022), lack motivation (Tuan et al., 2005), and are still in early grades (Randle, 1997), we use socio-emotional as a catchall for the many variables which students may present in what impacts absenteeism (Mervilde, 1981; Rothman, 2001).

Large-scale studies involving over 90,000 youth, between kindergarten through the 12 grades, have shown the positive impacts of SEL programs on the improvement of academic

performance, reduction of drop-out rates, as well as lower reported cases of drug use and problematic conduct (Durlak et al., 2011; Taylor et al., 2017). The FFLF offers SEL-specific resources to schools to reinforce the criticality of social and emotional aspects within the classroom, especially where poverty is a factor (Ferguson et al., 2007); (Brooks-Gunn and Duncan, 1997). In such communities, the adversities surrounding a student’s daily life require additional support beyond the traditional curriculum (Sun and Shek, 2012). Good social-emotional learning programs do not operate in isolation but help students learn that their decisions determine their consequences while helping them foster skills in coping, self-awareness, and self-control thereby increasing their likelihood of school attendance and successful outcomes.

Absenteeism

Skedgell and Kearney (2016) reviewed socio-emotional factors and analyzed them in terms of dimensionality (0–100%) and categories (*greater internalizing, greater externalizing, and greater family conflict and active-recreational orientation*). Students who were absent for dimensionality for 15–60% of the time from school demonstrated higher presence of internalizing symptoms than those with less or greater absenteeism. The categorical data organized the clusters into:

1. Greater **Internalizing** symptoms
 - i. general anxiety, separation anxiety, social phobia, panic, obsessions and compulsions, and depression,
2. Greater **Externalizing** symptoms
 - ii. inattention/hyperactivity, rule-breaking behavior, and aggressive behavior, and
3. Greater **family conflict** and lower **active-recreational orientation** (Skedgell and Kearney, 2016).

Simply, dimensionality refers to two factors: (a) the isolation of influence on a studied variable and (b) the determination of incremental impact on a said variable if more or less of the item observed are added. For instance, though we know most students who are absent have some internalizing symptoms, using dimensionality we can learn which students are likely to have internalizing symptoms based on their number of absences. In this case, we know students who were absent 15–60% of the time had greater internalizing symptoms than compared to students with less than 15% of absences and those with higher than 60% of absences. Therefore, if we want to use SEL symptoms to determine when to intervene, based on attendance rates, we must be informed of the thresholds for prevention and intervention to effectively influence attendance behavior.

The findings suggest socio-emotional factors are pivotal to absenteeism; in fact, it is a public health issue for all of us (Kearney, 2008). Because we know truly little about some of the predictive factors like family and community involvement (Sheldon and Epstein, 2004), we continue to see rise in chronic absenteeism,

especially for students found to be under-resourced or in poverty (Zhang, 2003); (Reid, 2005). It is essential that we parse through the data collected to ascertain how we can effectively intervene in the understanding of excessive absences and school refusal behavior (Dube and Orpinas, 2009) using models like RTI and MSST to organize (Kearney and Graczyk, 2014) and modern technologies like machine learning (Domingos, 2012).

Machine learning

Machine learning is defined as the use of task completion through programming of statistical methods, algorithms, and trained or untrained data (Mitchell, 1997). Educators and social scientists are exploring this learning to better serve and respond to their students. Research is growing with the use of machine learning to reveal patterns and predictions in learning students (Gray and Perkins, 2019). In fact, there are studies using fingerprint recognition (Mishra and Trivedi, 2011), face-recognition techniques to track attendance *via* machine learning techniques (Chintalapudi et al., 2018; Rozario and Manjunatha, 2018) and the use of machine learning to assess what influences a student's perception of a subject being difficult (Suparwito, 2019) or gamification (Toprceanu, 2017).

When exploring other studies where machine learning was used to explore absenteeism, we found a few examining the relationship between asthma and absenteeism (Lary et al., 2019) predictive modeling of student performance (Ng et al., 2021), and attendance autistic students (Jarbou et al., 2022). More is surely available, but these give a glimpse into many types of opportunities for exploration using this method. Yet, as more and more studies emerge, we learn that the model is flexible, but they require good data and time to train. The work we present has taken over 3 years to refine, hypothesize, structure, and train to share the results we present herein. The right models around the right variables are needed to inform what and how we respond to absenteeism using the method. If we train and input only supervised data with little regard to extrapolating unsupervised patterns, then we limit our knowledge for prevention. We will glean only knowledge for what we already know.

Rastrollo-Guerrero et al. (2020) and Albreiki et al. (2021) both conducted comprehensive surveys of recent literature within the space of machine learning applied to data from academic environments. The papers reviewed were chosen from journals with high impact factors and conference proceedings from the most reputable professional conferences, including IEEE and ACM—considered among the “world's largest technical professional organization dedicated to advancing technology for the benefit of humanity” (IEEE, 2022). The authors reported significant high accuracies from predictive models used in forecasting academic performance; however, 70% of the papers conducted studies at the collegiate level. Furthermore, the authors discussed the high precision of artificial neural networks on behavioral data, as it relates to academic performance, but cited that these approaches constitute a small minority of the researched

models, whereas the most common models demonstrating promise were support vector machines (SVM) and naïve Bayes classifiers. Li et al. (2020) present further evidence of the effectiveness of the SVM model when used to predict academic performance; however, the approach is only demonstrated for a target consisting of two classes. These studies demonstrate the effectiveness of machine learning models; however, the evidence is exhibited for university students in the narrow field-of-view of academic performance and drop-out rates. Our proposed work broadens this focus to understand the connection between absenteeism, and other at-risk factors, for elementary school students, while considering the correlation of these factors with social and emotional behaviors. Moreover, we have not found any literature solely focused on the application of machine learning methodologies to the field of Socio-Emotional Learning for understanding absenteeism.

Theoretical development

Machine learning rests on how we think and organize thought and action. Learning theories inform the methods of machine learning. Cognitivism, in our evaluation, is the most common human behavior theory as it attempts to use observed data to define information retrieval—supervised and unsupervised learning—to organize, store, and learn (Teaching and Learning Cognitivism, 2022) recognizing sometimes cultural biases in instruction (Parrish and Linder-VanBershot, 2010) drives the extent of the action (Arponen, 2013). Other theories were social cognitive theory and behaviorism (Bandura, 2008; McLeod, 2018). These theories underscore that machines can only share what it has been programmed and must rely also on rational choice, a factor studied in criminology (Akers, 1990) and social work (Gowdy, 1994).

Socio-Emotional Learning SEL refers to an umbrella term for school programs used to support students in developing social and emotional skills and competencies. Their overarching goal is to enhance emotional intelligence and emotional literacy, support social relations, and decrease risks for future academic and social failures (Hoffman, 2009). SEL programs are growing (Elias et al., 2003) and after the pandemic, its growth suggests a national priority (Weissberg and Cascarino, 2013). There is little evidence on SEL's ability to identify, intervene, or curb specific variables like attendance.

In our proposed methodology, we employed both unsupervised and supervised machine learning models to analyze SEL data. The data were collected from students in kindergarten through sixth grade during the Fall term of the 2021/2022 school year. Supervised models learn the relationship between variables given a known outcome, whereas unsupervised models learn the outcome from inherent patterns. Both techniques are leveraged, first with unsupervised techniques to identify natural groupings. Thereafter, supervised learning methodologies for classifying the remaining data are employed.

The following section summarizes the data collected within the Building Dreams platform, created by the Fight for Life Foundation, and the models trained to identify students at risk for

increased absenteeism. We regard risk in terms of dimensionality. If the SEL models can predict or identify the groups of students who may miss or be absent from school prevention and intervention responses may be better deployed. More specifically, the aim of the models is to classify each student into one of three risk classes: red, yellow, and green, representing at-risk, medium-risk, and low-risk students, respectively. With a clear separation between classifications, one can study the factors defining each group to recognize key drivers in behavior and subsequently offer targeted support. For this work, we chose to focus on gaining insight into underlying factors of absenteeism.

Data collection

The data used in this study were acquired during the Fall 2021 term at a school in central Indiana. This school was selected because of the broad adoption of the Fight for Life Building Dreams platform across all grade levels. Twenty-six thousand seven hundred and forty-one datapoints were collected on 332, K-6, students, where each datapoint characterizes a reported behavior relative to the 10 core values summarized in Table 1. Core values, and the underlying reasons, are reported in either a positive or negative perspective by educators or administrators and are regarded as either in-class participation or related to individual behavior. All reports, positive or negative, are tied to a core value, resulting in an average of 4.2 reports per student per day, with most of all reports originating from teachers. There exists a one-to-many relationship between reported reasons and core values. Engagement with the FFLF program is accomplished through a unique gamification process where students earn or lose yards relative to the game of football. For instance, positive observation of core values is reported as a first down, while negatively recognized behavior is reported as a sack. In serious situations, a sack can result in a student being removed from class and is reported as a red zone. Furthermore, extra points and flags are reported when they demonstrate positive character traits or concerning behavior, respectively. SEL emphasizes the criticality of healthy peer relationships; therefore, core values associated with in-class participation are more heavily weighted since they reflect

interactions with others. Extra points and flags are weighted the least but still make an impact on a student's overall assessment. All educators who participate in the FFLF program undergo a training process for observing and reporting behaviors through the Building Dreams platform.

The dataset was used to create machine learning models for identifying at-risk, medium-risk, and low-risk students, labeled as red, yellow, and green groups, respectively. The following section summarizes the methodology used for developing a classifier capable of classifying students based on the proportions of reports relative to first downs, sacks, extra points, flags, and red zones. The dataset, $S \in \mathbb{R}^{26,741 \times 25}$ is mapped to a new domain, $S' \in \mathbb{R}^{332 \times 5}$, where each datapoint is defined by a feature vector for each student, s_i .

$$s_i = \left[x_i^{fd}, x_i^s, x_i^{ep}, x_i^f, x_i^{rz} \right]$$

$$x_i^{fp} = \frac{r_i^{fp}}{r_i}, x_i^s = \frac{r_i^s}{r_i}, x_i^{ep} = \frac{r_i^{ep}}{r_i}, x_i^f = \frac{r_i^f}{r_i}, x_i^{rz} = \frac{r_i^{rz}}{r_i}$$

$$r_i = r_i^{fp} + r_i^s + r_i^{ep} + r_i^f + r_i^{rz} \quad (1)$$

Where $r_i^{fp}, r_i^s, r_i^{ep}, r_i^f,$ and r_i^{rz} , denote the total reports of first downs, sacks, extra points, and red zones, respectively, for student s_i .

Methodology

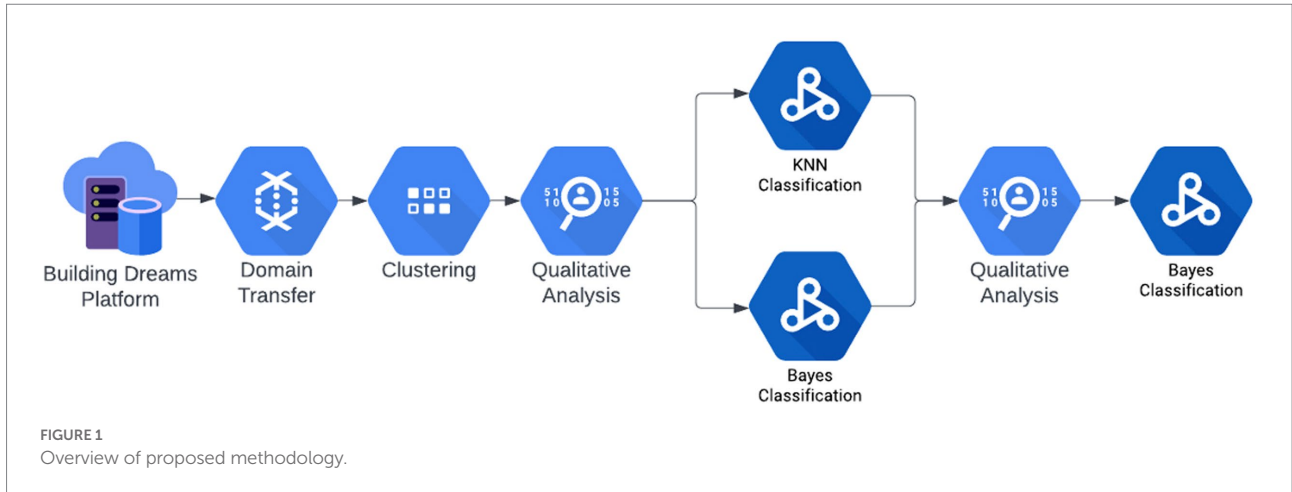
The proposed methodology is a coupling of unsupervised and supervised models, leading to a model for classifying students as at risk, medium risk, and low risk. Data reported by educators per student are unlabeled; therefore, an unsupervised technique is employed to explore strong boundaries separating students. Figure 1 illustrates the entire proposed methodology for developing an effective machine learning model for the classification of behavior data from the Building Dreams platform.

Clustering and initial label qualitative analysis

In this work, K-means clustering, and qualitative analysis, was leveraged at a classroom level for identifying three classes of students, $C = \{C_{LR}, C_{MR}, C_{HR}\}$, characterizing low-risk, medium-risk, and high-risk students, respectively. With this unsupervised model, no prior assumptions about outcome are made and are often used as an exploratory step in many machine learning methodologies. Three

TABLE 1 Reported core values.

Core Values	
Description	Code
Enthusiastic in class	CV1
Focused within class	CV2
Meet or exceed expectations on assignments	CV3
Demonstrates initiative	CV4
Follow directions	CV5
Respect other's space	CV6
Respect for physical settings	CV7
Demonstrate accountability	CV8
Respectful communication	CV9
Positive relationships	CV10



classes of risk were chosen to highlight two extremes, high vs. low risk, and identify remaining datapoints. The aim of any clustering model is to find natural groupings of data, called clusters, where each datapoint within a cluster is highly similar, yet datapoints between clusters are highly dissimilar.

Datapoints from each classroom are independently clustered into three clusters where K-means clustering aims to create K clusters by minimizing within-cluster distance. In this work, the Euclidean distance was used as the cost function to minimize. For a set of students in a classroom, $\Gamma_i = \{s_1, s_2, \dots, s_n\} \subseteq S'$, and set of three clusters, $G = \{G_1, G_2, G_3\}$, the iterative clustering algorithm is defined by the optimization problem,

$$\min_G \sum_{G_i} \sum_{\Gamma_i \in G} \Gamma_i - c_{G_i}^2$$

$$c_{G_i} = \left[\overline{x_i^{fd}}, \overline{x_i^s}, \overline{x_i^{ep}}, \overline{x_i^f}, \overline{x_i^{rz}} \right], \forall s_j \in G_i, \quad (2)$$

The cluster centers, c_{G_i} , are evaluated qualitatively to map $G_i \rightarrow C_j$, and all classroom-level clusters are assigned labels, $C_{LR}, C_{MR}, \text{ or } C_{HR}$. The process is repeated for all 15 classrooms, resulting in 45 feature vectors associated with the desired class labels. Of the 15 classrooms, nine clusters made sense from the qualitative analysis, with clear separation between the clusters. The resulting 27 cluster centers from those nine classrooms were used as training data for two classifier models used to predict the class label for the remaining six classrooms.

Classification

Classification models are trained in a supervised manner where a set of features are associated with a known class label. In this work, we examined the results of the clustering model that are then used to train a classifier model for associating a risk label to a student's feature vector, comprised of their percent reports from

each of the different report types of first downs, sacks, extra points, flags, and red zones. Each cluster is characterized by a vector defined in (2), and is associated with a risk label assigned in the previous phase.

After initial labels are determined, two classification models are trained on the cluster centers c_{G_i} that were successfully labeled in the previous phase. Naïve Bayes classifiers rely on the conditional probability that a given feature vector, s_i , belongs to C_j .

$$p(C_j | x_i^{fd}, x_i^s, x_i^{ep}, x_i^f, x_i^{rz}) \quad (3)$$

Since $\{s_i \in \mathbb{R} | 0 \leq s_i \leq 1\}$, the Gaussian Naïve Bayes classifier is used to estimate the likelihood component of Bayes theorem, highlighted in (4), relying on a Gaussian distribution defined from the mean and standard deviations of each feature in the training sets.

$$p(C_j | x_i^{fd}, x_i^s, x_i^{ep}, x_i^f, x_i^{rz}) = \frac{p(C_j) p(x_i^{fd}, x_i^s, x_i^{ep}, x_i^f, x_i^{rz}, C_j)}{p(x_i^{fd}, x_i^s, x_i^{ep}, x_i^f, x_i^{rz})} \quad (4)$$

Bayes classifiers operate on conditional probabilities defined by an entire training set, whereas K-nearest neighbor (KNN) classifiers assign class labels based on feature similarity within an evaluation set. A class label is defined by the most common label residing within the evaluation set of the K most similar datapoints. In this work, the Euclidean distance (5) was used as the similarity measure driving the decision process of the KNN classifier.

$$d(s_i, s_j) = \sqrt{(x_i^{fd} - x_j^{fd})^2 + (x_i^s - x_j^s)^2 + (x_i^{ep} - x_j^{ep})^2 + (x_i^f - x_j^f)^2 + (x_i^{rz} - x_j^{rz})^2} \quad (5)$$

The ideal neighborhood size, K , was found empirically by training and evaluating models over the entire viable range. For this work, a neighborhood size of five was found to produce the most accurate classifier for the available data.

Label refinement, qualitative analysis, and final classifier model

Both classifiers are trained on the high confidence data from the previous phase and then used to predict the class labels on the data with less confidence after the initial clustering and qualitative analysis. The resulting prediction from each classifier is compared where a label is assumed to be accurate when both classifiers agree in the outcome; however, when the two classifiers produced different predictions, a qualitative analysis of the data is performed to manually decide the appropriate label or decide if the cluster should be completely disregarded. The final cluster centers from all classrooms then become the training set for a generalized Bayes classifier used to label all current and future students.

Results and discussion

Figure 2 provides a visualization of the clustering results for a single classroom, illustrating the most critical features that differentiate the clusters, while Figure 3 summarizes the cluster centers for nine of the 15 classrooms. For the example shown, first downs, sacks, and red zones, appear to be strong differentiators of the clusters. This pattern is also observed in Figure 3, where C_{LR} is defined by values first downs and lower percent reports of sacks and red zones. Conversely, C_{HR} , is characterized by the lowest percent reports of first downs and highest occurrences of sacks and red zones. Visualizations for all classrooms were generated and evaluated to associate each classroom-level cluster with the most appropriate label, C_i . Clustering was performed on all classrooms, resulting in 45 datapoints from the three clusters for each of the 15 classrooms; however, nine of the 15 classrooms naturally fit into highly differentiated clusters. The highlighted features in Figure 3 were used to determine that clusters 1–3, exemplify low-risk, medium-risk, and high-risk students, respectively. We have found, and presented visually, a clear separation between low- and high-risk clusters.

Figure 4, as well as Tables 2, 3 summarize the results from the classification phase of the proposed methodology. The confusion matrices for Bayes and KNN classification steps demonstrate accuracies of 77.8 and 63.0%, respectively. After a second round of qualitative analysis is performed, accepting all labels where the two classifiers agreed, a total of four entries are rejected as outliers and discarded. Further analysis of this classroom data reveals inconsistent reporting behavior from the educators. For instance, as observed in Figure 4C, one classroom did not report any first downs and simply used the Building Dreams platform for recognizing two of the five categories. After completion of the second round of data classification,

it is apparent that some classrooms simply do not have three classifications of students, which is the primary disadvantage of the first step where the K-means algorithm attempts to create three distinct groups. We believe we have overcome this drawback by only accepting the clustering results that were observed to be obvious and then training classifiers to attempt to label the remaining data.

The resulting 41 cluster centers and associated labels were used to train a final Bayes classifier that was evaluated to be 90.2% accurate. This classifier, trained at the classroom level, was applied to student data from the end of the Fall 2021 term. Table 4 summarizes the number of students, in addition to the average feature for each class after employing the final model. In the subsequent section, we investigated how this classifier can be used to better understand underlying factors affecting absenteeism.

Application of the final classification model

The proposed methodology for training an effective classifier was pursued with the purpose of better understanding the needs of at-risk students. There are many areas that could benefit from understanding the difference between low- and high-risk students. We specifically focused on absenteeism, a major issue affecting youth in underserved communities. In this subsection, we will discuss the trends in the data after applying the classification model for identifying low-, medium-, and high-risk students. The goal was to uncover insights by comparing trends from data labeled as C_{LR} vs. C_{HR} . The labels generated by the trained classifier were applied to the original dataset then descriptive analytics was leveraged to analyze the original reported reasons and associated core values. The following observations were made while comparing distributions of reported core values, and their underlying reasons, of students in the C_{LR} and C_{HR} groups with the intention of understanding what differentiates each group and gain insights into commonalities that are actionable.

The first observation is the noticeable discrepancy of reported data directly tied to attendance. Comparing C_{LR} and C_{HR} groups, 99.6% of positive reports of a student attending class on time are labeled with C_{LR} . Similarly, for the positively observed behavior of “reporting to class prepared to learn,” 91.4% of the reports is associated the C_{LR} group, but only 8.6% of the reports is associated with the C_{HR} -labeled students. In terms of overall reports, across the entire dataset for all three groups, students attending class on time account for 6.3% of the positive reports for C_{LR} students, whereas only 1.7% in the C_{HR} group. Students in the C_{LR} group are notably characterized by the top three reports of following directions (9.8%), contributing to class discussions (7.74%), and reporting to class on time (6.3%), whereas the C_{HR} group is recognized for those same reasons infrequently, accounting for only 3.34, 3.1, and 1.7%, respectively, of total positive reports. The top three reported reasons in the C_{HR} group are negative observations for not following directions (10.3%), not follow rules (4.5%), and fighting (3.26%), where the same

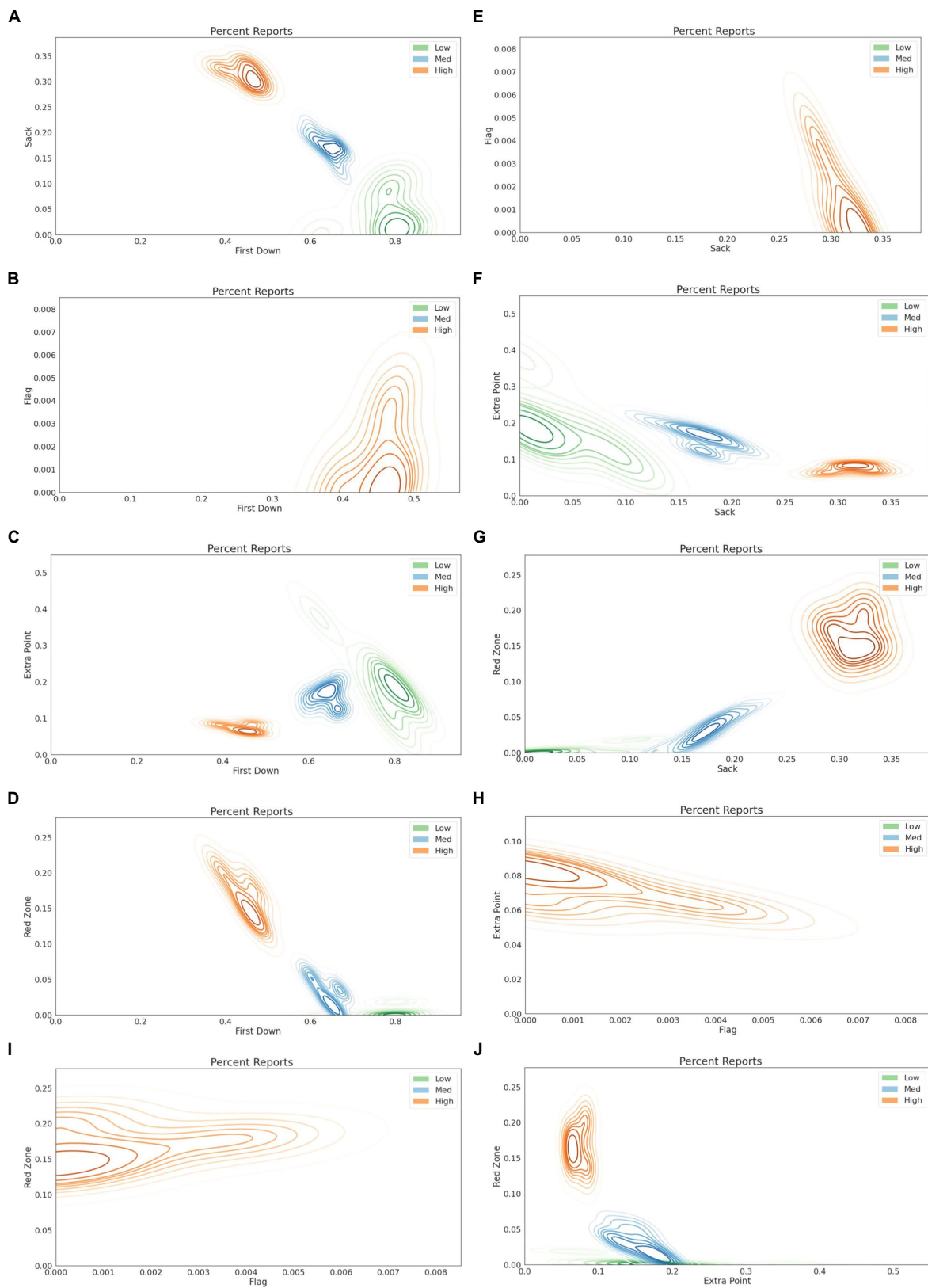


FIGURE 2

Sample clustering visualizations for a single classroom, showing distributions of percent reports for first down vs. sacks (A), first down vs. flags (B), first down vs. extra points (C), first down vs. red zones (D), sacks vs. flags (E), sack vs. extra points (F), sacks vs. red zones (G), flags vs. extra points (H), flags vs. flags (I), and extra points vs. red zones (J).

First Down	Extra Point	Sack	Flag	Red Zone	Class
99%	1%	0%	0%	0%	1
99%	1%	1%	0%	0%	1
93%	7%	0%	0%	0%	1
96%	3%	0%	0%	0%	1
97%	0%	2%	0%	1%	1
97%	2%	0%	0%	1%	1
97%	0%	2%	0%	1%	1
60%	36%	0%	4%	0%	1
91%	5%	4%	0%	0%	1
97%	1%	1%	0%	0%	2
97%	1%	2%	0%	0%	2
88%	10%	1%	0%	1%	2
94%	5%	1%	0%	0%	2
89%	0%	9%	0%	2%	2
90%	3%	4%	0%	3%	2
85%	4%	4%	0%	8%	2
14%	58%	2%	10%	16%	2
82%	7%	10%	0%	1%	2
93%	1%	5%	0%	1%	3
83%	1%	10%	0%	6%	3
81%	5%	13%	0%	1%	3
92%	3%	5%	0%	0%	3
78%	0%	19%	0%	2%	3
88%	2%	9%	1%	1%	3
60%	0%	11%	0%	28%	3
62%	4%	2%	22%	10%	3
68%	6%	19%	0%	7%	3

FIGURE 3
Average cluster centers per classroom.

observations in the C_{LR} group only accounts for 0.36%, 0.02%, and 0.01% of the total reports. We see from these distributions, by comparing reported reasons across C_{LR} and C_{HR} groups, as well as looking at reported reasons over the entire dataset, absenteeism is a differentiating factor for students labeled by the classifier as low or high risk.

Each reported reason is associated with one of the 10 core values reported in Table 1. A similar exercise was conducted to compare the labeled dataset but in terms of core values instead of reported reasons. In Figure 5, we see that the top three differences

between high-risk and low-risk student groups are the core values related to peer relationships. Furthermore, we looked at the underlying reasons reported along with the core values. Figure 6 summarizes the most common differences between C_{LR} and C_{HR} data, in terms of underlying reasons. Four of the six reported reasons for the high-risk group are related to peer relationships. Conversely, it is immediately apparent that the low-risk group's most reported reasons are a positive recognition of attendance, while the high-risk group is rarely recognized for the same behavior.

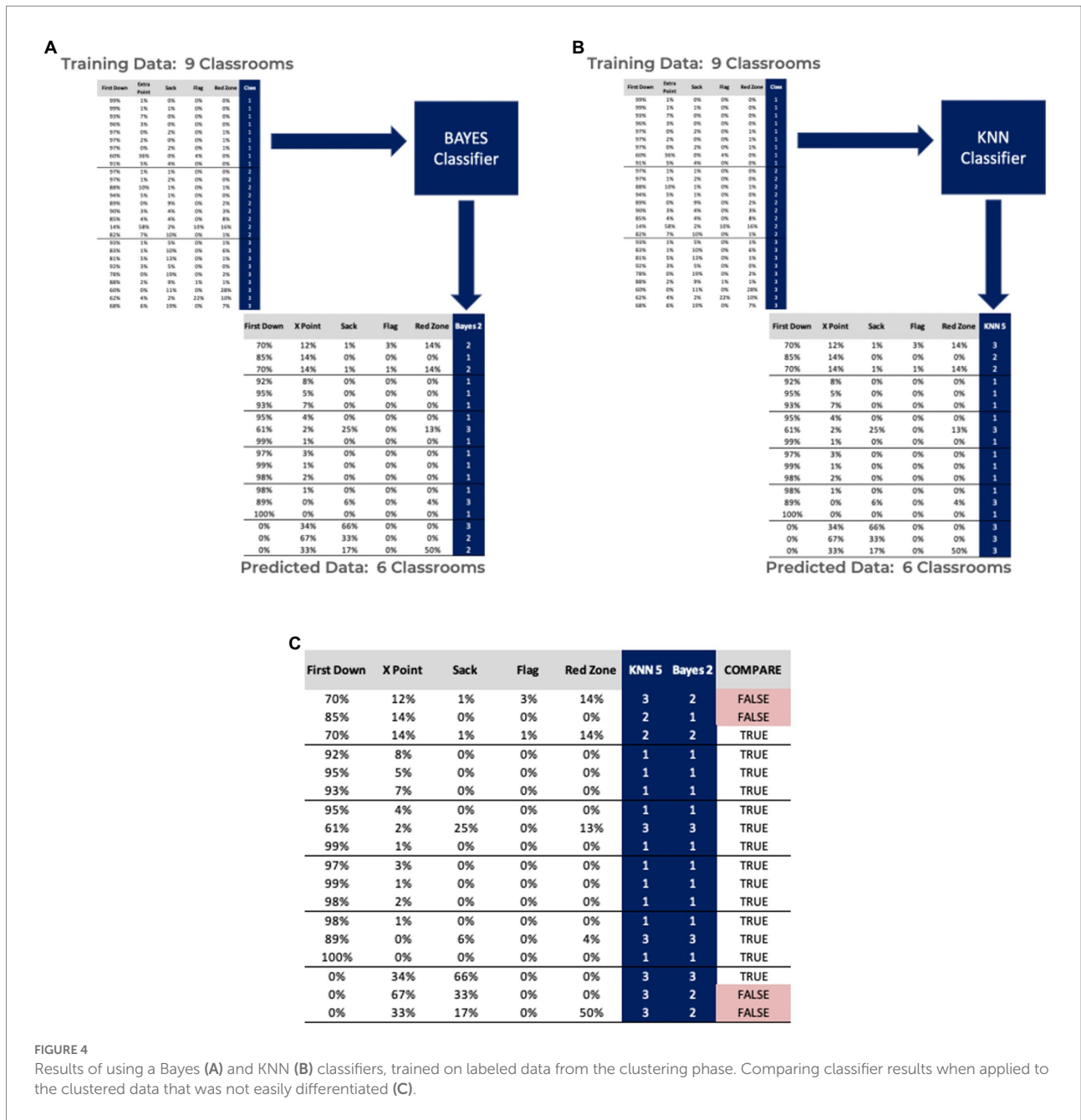


FIGURE 4 Results of using a Bayes (A) and KNN (B) classifiers, trained on labeled data from the clustering phase. Comparing classifier results when applied to the clustered data that was not easily differentiated (C).

TABLE 2 Confusion matrix for Bayes Classifier.

	C_{LR}	C_{MR}	C_{HR}
C_{LR}	8	0	1
C_{MR}	2	5	2
C_{HR}	0	1	8

TABLE 3 Confusion matrix for KNN Classifier.

	C_{LR}	C_{MR}	C_{HR}
C_{LR}	7	1	1
C_{MR}	1	6	4
C_{HR}	1	2	6

Academic performance was observed to be another key differentiator of high- and low-risk students. When analyzing reasons reported by the teachers, we noticed that there was a clear disparity in reasons directly tied to academic performance. These reasons are summarized in Figure 7, where one subset of reasons

could be recognized in either a positive or negative perspective, while another subset of reasons could only be interpreted as a negative report, in Figures 7A,B, respectively. The examples in Figure 7A illustrate how the low-risk group was reported for the same reasons as the high-risk group, but in a positive context

instead of a negative one, while Figure 7B provides example reasons that were only cited in a negative context and show a large discrepancy between opposing risk groups. The low-risk student groups were cited for having strong work ethics, contributing to class discussion, and completed course work per the instructions, while only being cited for not following directions 60% less than the high-risk groups. Conversely, the high-risk students were found to be cited for showing consistent work ethic, but in a negative perspective, as often as low-risk students are recognized in a positive way for the same reason. Both charts illustrate that the high-risk students are responsible for many of the reports related to accountability but were always negatively observed.

Discussion

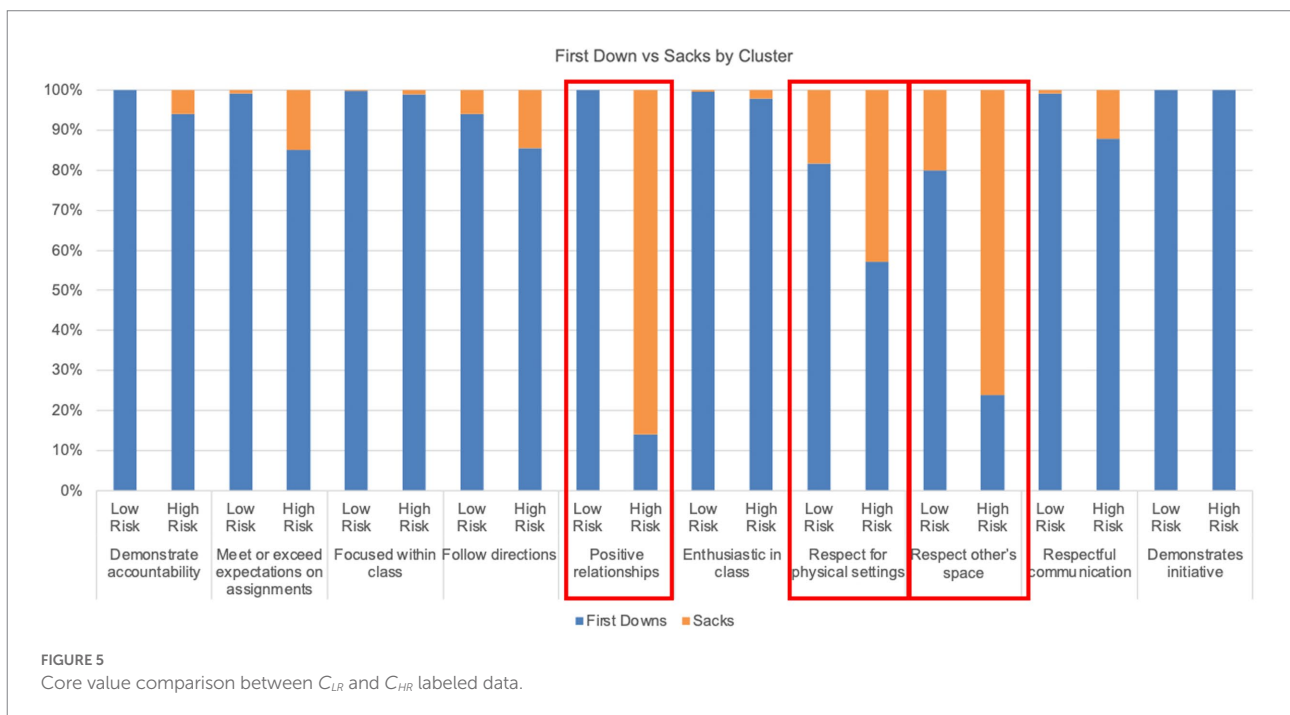
Even though the importance of understanding absenteeism and its impact on students' (Skedgell and Kearney, 2016) and even entire countries' economies have been widely studied (Cook and Ezenne, 2010; Mushtaq and Khan, 2012; IRIS Center, 2019; Kearney and Graczyk, 2020), there is a lack of consensus in specific factors contributing to absenteeism as well as coordinated assess

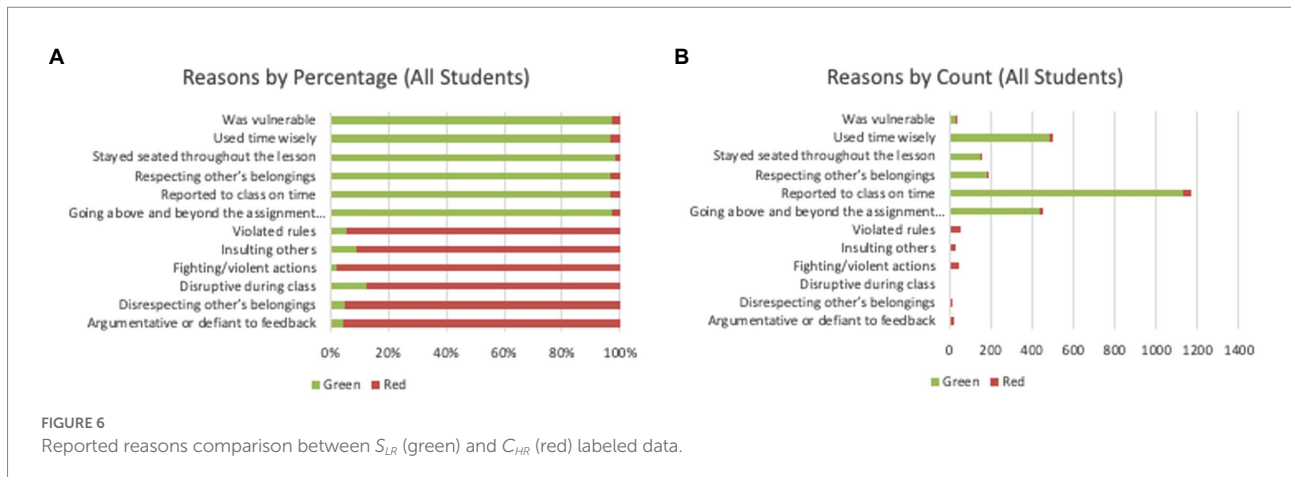
and interventions (Sheldon and Epstein, 2004; Hocking, 2008). Our work sheds light on this important issue by identifying specific underlying factors in students' behaviors connected to absenteeism. Our data-driven approach indicated with 90% accuracy that peer relationships are at the core of absenteeism underlying factors. These are relevant findings because the data supports the key idea that peer relationships are a critical factor affecting absenteeism and provides clear evidence that the implementation of socio-emotional learning components within a curriculum has the potential to improve absenteeism by targeting a root cause. The clear discrepancy between low- and high-risk students for reporting to class on time, and reporting to class prepared, exemplifies how each group of students differ in terms of attendance. Recognizing this difference but considering other differentiating factors, we observe that academic performance and peer relationships also distinctly separate the two groups. Academic performance differences are easily recognized through reported reasons while disparities in peer relationship reports are evident under the lens of core values, as illustrated in Figure 5. These are relevant findings because the data support the key idea that peer relationships are a critical factor affecting absenteeism.

We argue that although absenteeism has many driving factors, such as external socio-economic factors, we can narrow the focus to a specific set of problems from primary data collected on-site, such as peer relationships. Although not the only factor of absenteeism, peer relationships were brought into focus using the proposed machine learning methodologies. The reported reasons associated with peer relationship-based core values, such as being argumentative, fighting, disrespecting other's belongings, insulting one's peers, and threatening others, are commonly reported

TABLE 4 Average features per class after applying final classifier to students in a validation set.

Class	Student count	First down	Extra points	Sacks	Flags	Red zones
C_{LR}	210	96%	4%	1%	0%	0%
C_{MR}	68	89%	3%	7%	0%	1%
C_{HR}	54	63%	9%	21%	1%	6%





behaviors for students in the high-risk group, but rarely, if at all, are observed in the low-risk groups. These reports give a targeted direction for new SEL curriculum and school policy. The proposed methodology for classifying students was used as a tool to support the belief that absenteeism is also highly correlated with poor academic performance. Through the process of labeling the data with the classification system, we were able to find observed behavior, directly related to academic performance, for comparing at-risk and low-risk students. Work ethic and the ability of a student to follow directions are the two reported reasons directly affecting academic performance that helps define high- and low-risk student groups. Each of those reported reasons is reported heavily for both groups, but in opposite perspectives; first downs versus sacks. Furthermore, the low-risk students were found to ask questions, while no students in the high-risk group were ever cited for the same observation.

There are various studies on predicting attendance and relationships with academic performance. Many are based on data that researchers and educators have long held as hypotheses that have been proven. However, the current study aimed to get at whether we see those same outcomes from unsupervised data and patterns. We are happy to confirm that we do. It is affirming to see that relationships consistently are supported as predictors, thus supporting the role of SEL programs as the most effective at reducing absenteeism.

Limitations of machine learning techniques can be viewed in terms of the models used, data, and process. With unsupervised learning models, such as clustering algorithms, an outcome is unknown and often requires human intervention to interpret the results. As such, clustering algorithms are frequently used as an exploratory tool. Moreover, the decision process during clustering requires a metric for measuring similarity, with the Euclidean distance being the most common method; however, the choice of a similarity metric can affect the overall results. In this work, the separation of the clusters was analyzed visually (Figure 2) and each cluster was analyzed statistically (Table 4) to rationalize the effectiveness of the results

while using the Euclidean distance for identifying the appropriate clusters. In supervised learning algorithms, such as regression or classification, a known outcome is related to the variables. The choice of model can also influence the overall results. For instance, the K-Nearest Neighbor classifier relates the data label to the variables through a similarity metric, while the Bayes classifier predicts a label based on a conditional probability and the application of Bayes Theorem. Depending on the training set, both classifiers can offer different perspectives on a predicted label. In the proposed system, we combine both perspectives to identify risk labels. Other classifiers, including support vector machines, random forest classifiers, and neural networks, offer alternative approaches to accomplish the same task. Regardless of the model selection, the data are the most impactful limiting factor for machine learning. One must strive for large amounts of high-quality data, where high-quality broadly refers to data that accurately represent the population and are consistent over time. These two requirements rely on the proper processes and technology for data collection and curation. The Building Dreams platform is built on several years of development and deployed with a rigorous training program to achieve the accuracy and consistency needed to confidently train machine learning models.

Future work

In this work, we focused on a single term while looking at a specific area affecting the youth of a single school. Future work includes answering additional research questions about academic performance and drop-out rates, while applying and validating the models to additional data from future terms and other schools. We recognize that this student applies a classification model to produce data labels using primary data collected at the school. Future work will correlate external factors into the models. Lastly, additional classification models, such as support vector machines, random forest classifiers, and neural networks, may be explored and compared to the proposed methodologies.

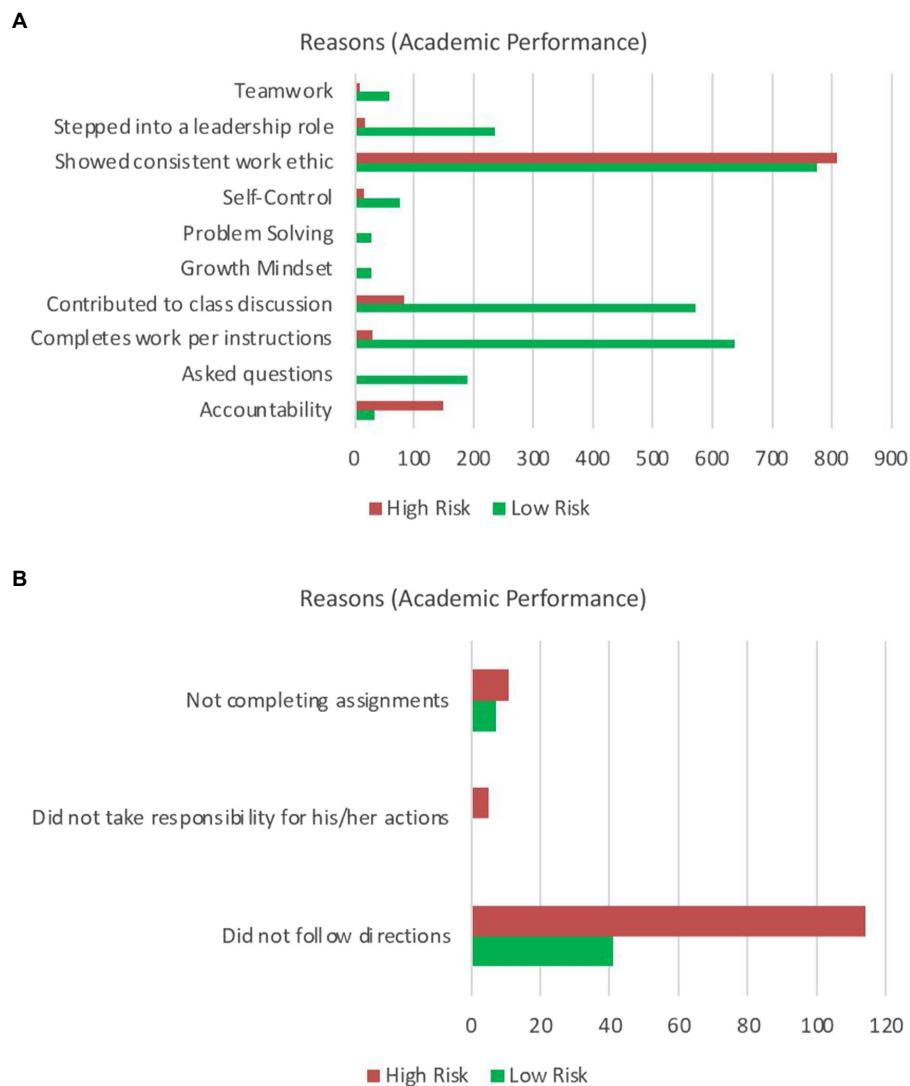


FIGURE 7

Reason related to academic performance that could be reported as either being positively or negatively observed as either a first down or sack, respectively (A), and reported reasons related to academic performance that are only negatively observed as sacks or red zones (B).

Conclusion

The work presented in this paper signifies the initial steps taken to leverage machine learning techniques on SEL data to better understand the areas that could make a relevant impact in the lives of children in underserved communities. In collaboration with the Fight for Life Foundation, we have developed a classification model that was used to examine absenteeism. The proposed multi-phased approach was evaluated to be 90.2% accurate in identifying three classes of students: low risk, medium risk, and high risk. Future work will focus on looking at other factors differentiating these groups, such as academic performance and drop-out rates with the ultimate mission of providing support in an effective and targeted manner.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

FB, CG-G, JS, and MJ contributed equally to the data, assessment, and production of the work submitted. All authors contributed to the article and approved the submitted version.

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References

- Akers, R. L. (1990). Rational choice, deterrence, and social learning theory in criminology: the path not taken. *J. Crim. Law Criminol.* 81:653. doi: 10.2307/1143850
- Albreiki, B., Zaki, N., and Alashwal, H. (2021). A systematic literature review of student performance prediction using machine learning techniques. *Education Sciences* 11:552.
- Arponen, V. P. (2013). The extent of cognitivism. *Hist. Hum. Sci.* 26, 3–21. doi: 10.1177/0952695113500778
- Balfanz, R., and Byrnes, V. (2012). The importance of being in school: A report on absenteeism in the Nation's public schools. Available at: http://new.avery1graduates.org/wp-content/uploads/2012/05/finalchronicabsenteeismreport_may16.pdf (Accessed April 3, 2022).
- Bandura, A. (2008). Social cognitive theory. Available at: <https://uky.edu/~eushe2/bandura/bandura1989acc.pdf> (Accessed April 3, 2022).
- Bennett, W. J., Fair, W., Finn, C. E., Flake, F. H., Hirsch, E. D., Marshall, W., et al. (1998). A nation still at risk. *Pol. Rev.* 90, 23–29.
- Berliner, B. J. (2002). Educational leadership: Beyond instructional leadership: Unequal school funding in the United States. Available at: <http://www.ascd.org/publications/educational-leadership/may02/vol59/num08/Unequal-School-Funding-in-the-United-States.aspx> (Accessed October 15, 2022).
- Bokhorst, C. L., Westenberg, P. M., Oosterlaan, J., and Heyne, D. (2008). Changes in social fears across childhood and adolescence: age-related differences in the factor structure of the fear survey schedule for children-revised. *J. Anxiety Disord.* 22, 135–142. doi: 10.1016/j.janxdis.2007.01.014
- Brooks-Gunn, J., and Duncan, G. J. (1997). The effects of poverty on children. *Futur. Child.* 7, 55–71. doi: 10.2307/1602387
- Brouwer-Borghuis, M. L., Heyne, D., Vogelaar, B., Sauter, F. M., and Scholte, R. H. (2019). The link: an alternative educational program in the Netherlands to reengage school-refusing adolescents with schooling. *Cognitive and Behavioral Practice* 26, 75–91. doi: 10.1016/j.cbpra.2018.08.001
- Buckley, J., Letukas, L., and Wildavsky, B. (2017). *Measuring Success: Testing, Grades, and the Future of College Admissions*, Johns Hopkins University Press.
- Chintalapudi, S. K., Reddy, P., and Tatapudi, K. S. (2018). Attendance using face recognition. *Int. J. Adv. Res. Comput. Sci.* 9, 49–51. doi: 10.26483/ijarcs.v9i6.6339
- Cook, L. D., and Ezenne, A. (2010). Factors influencing Students' absenteeism in primary schools in Jamaica: perspectives of community members. *Carib. Curric.* 17, 33–57.
- Deutsch, A. R., Crockett, L. J., Wolff, J. M., and Russell, S. T. (2012). Parent and peer pathways to adolescent delinquency: variations by ethnicity and neighborhood context. *J. Youth Adolesc.* 41, 1078–1094. doi: 10.1007/s10964-012-9754-y
- Domingos, P. (2012). A few useful things to know about machine learning. *Commun. ACM* 55, 78–87. doi: 10.1145/2347736.2347755
- Dube, S. R., and Orpinas, P. (2009). Understanding excessive school absenteeism as school refusal behavior. *Child. Sch.* 31, 87–95. doi: 10.1093/cs/31.2.87
- Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., and Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: a meta-analysis of school-based universal interventions. *Child Development* 82, 405–432.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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- Ehlers, S., Lehmann, J., Mossman, H., Alber, G., and Hölscher, C. (2005). Interleukin-12p40 mediates transient protection against *Mycobacterium avium* infection in the absence of interleukin-12. *Immunobiology* 210, 217–227. doi: 10.1016/j.imbio.2005.05.016
- Elias, M. J., Zins, J. E., Graczyk, P. A., and Weissberg, R. P. (2003). Implementation, sustainability, and scaling up of social-emotional and academic innovations in public schools. *School Psychology Review* 32, 303–319.
- Epstein, J., and Sheldon, S. (2002). Present and accounted for: improving student attendance through family and community involvement. *J. Educ. Res.* 95, 308–318. doi: 10.1080/00220670209596604
- Ferguson, H., Bovaird, S., and Mueller, M. (2007). The impact of poverty on educational outcomes for children. *Paediatr. Child Health* 12, 701–706. doi: 10.1093/pch/12.8.701
- Finlayson, M. (2009). The impact of teacher absenteeism on student performance: The case of the Cobb County School District. Available at: <https://digitalcommons.kennesaw.edu/etd/4> (Accessed April 3, 2022).
- Franklin, C., Harris, M., and Allen-Meares, P. (2008). *The School Practitioner's Concise Companion to Preventing Dropout and Attendance Problems*, Oxford University Press.
- Gentle-Genitty, C. (2010). Common predictors for explaining youth antisocial behavior: a perspective from ten longitudinal studies. *Soc. Work. Ment. Health* 8, 543–559. doi: 10.1080/15332980902983824
- Gottfried, M. A. (2009). Excused versus unexcused: how student absences in elementary school affect academic achievement. *Educ. Eval. Policy Anal.* 31, 392–415. doi: 10.3102/0162373709342467
- Gowdy, E. A. (1994). From technical rationality to participating consciousness. *Soc. Work* 39, 362–370.
- Gray, C. C., and Perkins, D. (2019). Utilizing early engagement and machine learning to predict student outcomes. *Comput. Educ.* 131, 22–32. doi: 10.1016/j.compedu.2018.12.006
- Heyne, D. (1998). Introduction to the special series on school refusal. *Behav. Chang.* 15, 3–4. doi: 10.1017/S0813483900005854
- Heyne, D., Brouwer-Borghuis, M., Vermee, J. Van, Helvoirt, C., and Aerts, G. J. W. (2021). *Knowing what works: A roadmap for school refusal interventions based on the views of stakeholders*. NRO Nationaal Regieorgaan Onderwijsonderzoek. Netherlands Initiative for Education Research. Available at: <https://www.nro.nl/sites/nro/files/media-files/Eindrapport%20Knowing%20what%20works%20%28nov.%202021%29.pdf>.
- Heyne, D., Gren-Landell, M., Melvin, G., and Gentle-Genitty, C. (2019). Differentiation between school attendance problems: why and how? *Cogn. Behav. Pract.* 26, 8–34. doi: 10.1016/j.cbpra.2018.03.006
- Hocking, C. (2008). The contributing factors to student absenteeism/truancy and the effectiveness of social services and interventions. Available at: http://digitalcommons.providence.edu/cgi/viewcontent.cgi?article=1017&context=social_wrk_students (Accessed April 3, 2022).
- Hoffman, D. M. (2009). Reflecting on social emotional learning: a critical perspective on trends in the United States. *Review of Educational Research* 79, 533–556.

- IEEE (2022). *IEEE (Institute of Electrical and Electronics Engineers)*. Available at: https://www.ieee.org/about/index.html?utm_source=dhtml_footer&utm_medium=hp&utm_campaign=learn-more
- IRIS Center (2019). *Definition: Multi-tiered system of support*. Nashville: IRIS
- Jarbou, M., Won, D., Gillis-Mattson, J., and Romanczyk, R. (2022). Deep learning-based school attendance prediction for autistic students. *Sci. Rep.* 12, 1–11. doi: 10.1038/s41598-022-05258-z
- Johnston, J. M., Foxx, R. M., Jacobson, J. W., Jacobson, J. W., Green, G., Green, G., et al. (2006). Positive behavior support and applied behavior analysis. *Behav. Anal.* 29, 51–74. doi: 10.1007/BF03392117
- Kearney, C. A. (2008). School absenteeism and school refusal behavior in youth: a contemporary review. *Clin. Psychol. Rev.* 28, 451–471. doi: 10.1016/j.cpr.2007.07.012
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. J. (2019). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 1). *Front. Psychol.* 10:2222. doi: 10.3389/fpsyg.2019.02222
- Kearney, C. A., and Graczyk, P. A. (2014). A response to intervention model to promote school attendance and decrease school absenteeism. *Child Care Q.* 43, 1–25. doi: 10.1007/s10566-013-9222-1
- Kearney, C., and Graczyk, P. (2020). A multidimensional, multi-tiered systems of support model to promote school attendance and address school absenteeism. *Clin. Child. Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- King, N. J., Heyne, D., Tonge, B. J., Mullen, P. E., Myerson, N., Rollings, S., et al. (2003). Sexually abused children suffering from post-traumatic stress disorder: assessment and treatment strategies. *Cogn. Behav. Ther.* 32, 2–12. doi: 10.1080/16506070310003620
- Laan, A. M., Veenstra, R., Veenstra, R., Bogaerts, S., Bogaerts, S., Verhulst, F. C., et al. (2010). Serious, minor, and non-delinquents in early adolescence: the impact of cumulative risk and Promotive factors. The TRAILS study. *J. Abnorm. Child Psychol.* 38, 339–351. doi: 10.1007/s10802-009-9368-3
- Lary, M., Allsopp, L., Lary, D., and Sterling, D. (2019). Using machine learning to examine the relationship between asthma and absenteeism. *Environ. Monit. Assess.* 191, 1–9. doi: 10.1007/s10661-019-7423-2
- Li, W., Bhutto, T. A., Xuhui, W., Maitlo, Q., Zafar, A. U., and Bhutto, N. A. (2020). Unlocking employees' green creativity: the effects of green transformational leadership, green intrinsic, and extrinsic motivation. *J. Cleaner Production* 255:120229.
- McLeod, S. (2018). B.F. Skinner—operant conditioning. Available at: <https://www.simplypsychology.org/operant-conditioning.html> (Accessed April 3, 2022).
- Mervile, J. (1981). Student absenteeism: Causes, effects, and possible solutions. Available at: <https://eric.ed.gov/?id=ed207157> (Accessed April 3, 2022).
- Mishra, R., and Trivedi, P. (2011). Student attendance system based on fingerprint recognition and one to many matching. Available at: <http://ethesis.nitrkl.ac.in/2214/1/thesis.pdf> (Accessed April 3, 2022).
- Mitchell, T. (1997). *Machine Learning*. Vol. 1. New York, NY: McGraw-Hill.
- Moscato, R. Y. (2000). The effects of school characteristics on student academic performance. Available at: <https://vtechworks.lib.vt.edu/handle/10919/27346> (Accessed April 3, 2022).
- Mushtaq, I., and Khan, S. N. (2012). Factors affecting Students' academic performance. *Glob. J. Manag. Bus. Res.* 12, 17–22.
- National Center for Education Statistics (NCES) (2020). Improving MTSS/RTI implementation through measurement. US Department of Education, Washington DC: NCES. Available at: https://ies.ed.gov/ncee/edlabs/regions/appalachia/blogs/blog26_improving-MTSS-RTI-through-measurement.asp (Accessed March 2020).
- Ng, H., Azha, A. B., Yap, T., and Goh, V. (2021). A machine learning approach to predictive Modelling of student performance. *F1000 Res.* 10:1144. doi: 10.12688/f1000research.73180.1
- Ng, V. V., Heyne, D., Kueh, Y. C., and Husain, M. (2019). The Malay self-efficacy questionnaire for school situations: development, reliability, and validity among early adolescents in primary school. *Eur. J. Educ. Psychol.* 12, 91–108.
- Ngo, F. T., Paternoster, R., Cullen, F. T., and MacKenzie, D. L. (2011). Life domains and crime: a test of Agnew's general theory of crime and delinquency. *J. Crim. Just.* 39, 302–311. doi: 10.1016/j.jcrimjus.2011.03.006
- Parrish, P., and Linder-VanBerscht, J. A. (2010). Cultural dimensions of learning: addressing the challenges of multicultural instruction. *Int. Rev. Res. Open Dist. Learn.* 11, 1–19. doi: 10.19173/irrodl.v11i2.809
- Roesch, M., and Singer, C. (2013). *Columbia University Work Life: Pros and Cons of Standardized Testing*. Available at: <https://www.everettsd.org/cms/lib07/WA01920133/Centricity/Domain/2847/Pros%20and%20Cons%20of%20Standardized%20Testing.pdf> (Accessed October 15, 2022).
- Randle, L. (1997). What is the effect of pre-school attendance on Reading achievement at the third grade? Available at: <https://eric.ed.gov/?id=ed404630> (Accessed April 3, 2022).
- Rasasingham, R. (2015). The risk and protective factors of school absenteeism. *Psychiatry* 5, 195–203. doi: 10.4236/ojpsych.2015.52023
- Rastrollo-Guerrero, J. L., Gómez-Pulido, J. A., and Durán-Domínguez, A. (2020). Analyzing and predicting students' performance by means of machine learning: a review. *Applied Sciences* 10:1042.
- Reid, K. (2005). The causes, views and traits of school absenteeism and truancy: an analytical review. *Res. Educ.* 74, 59–82. doi: 10.7227/RIE.74.6
- Roh, M., Cho, C. A. N. B., and Kim, J. J. K., & Gentle-Genitty, C. (2022). The impact of life domains on delinquent behaviors in five Caribbean countries: a partial test of Agnew's general theory of crime and delinquency. *Violence Vict.* 37, 3–25. doi: 10.1891/VV-D-20-00206
- Roh, M., and Marshall, I. H. (2018). A cross-cultural analysis of Agnew's general theory of crime and delinquency. Available at: <http://sshj.in/index.php/sshj/article/download/85/51> (Accessed May 25, 2022).
- Rothman, S. (2001). School absence and student background factors: a multilevel analysis. *Int. Educ. J.* 2, 59–68.
- Rozario, R. R., and Manjunatha, H. (2018). Automatic face tracking and attendance system using machine learning techniques. *Int. J. Tomogr. Simul.* 31, 57–69.
- Sheldon, S. B., and Epstein, J. L. (2004). Getting students to school: using family and community involvement to reduce chronic absenteeism. *Sch. Community J.* 14, 39–56.
- Skedgell, K., and Kearney, C. A. (2016). Predictors of absenteeism severity in truant youth: a dimensional and categorical analysis. *Am. Second. Educ.* 45, 46–58.
- Slade, E. P., and Wissow, L. S. (2007). The influence of childhood maltreatment on adolescents' academic performance. *Econ. Educ. Rev.* 26, 604–614. doi: 10.1016/j.econeduc.2006.10.003
- Sun, R. C., and Shek, D. T. (2012). Classroom misbehavior in the eyes of students: a qualitative study. *Sci. World J.* 2012:398482. doi: 10.1100/2012/607157
- Suparwito, H. (2019). Factors influencing the difficulty level of the subject: Machine learning technique approaches. Available at: <https://e-journal.usd.ac.id/index.php/ijasst/article/view/1869/1498> (Accessed March 4, 2022).
- Taylor, R., Oberle, E., Durlak, J., and Weissberg, R. (2017). Promoting positive youth development through school-based social and emotional learning interventions: a meta-analysis of follow-up effects. *Society for Research in Child Development* 88, 1156–1171. doi: 10.1111/cdev.12864
- Teaching and Learning Cognitivism (2022). Available at: <http://teachinglearningresources.pbworks.com/w/page/31012664/Cognitivism> (Accessed March 4, 2022).
- Topprceanu, A. (2017). Gamified learning. *Proc. Comp. Sci.* 112, 41–50. doi: 10.1016/j.procs.2017.08.017
- Tuan, H.-L., Chin, C.-C., and Shieh, S.-H. (2005). The development of a questionnaire to measure students' motivation towards science learning. *Int. J. Sci. Educ.* 27, 639–654. doi: 10.1080/0950069042000323737
- Vilsaint, C. L., Ayer, S. M., Wilson, M. N., Shaw, D. S., and Dishion, T. J. (2013). The ecology of early childhood risk: a canonical correlation analysis of Children's adjustment, family, and community context in a high-risk sample. *J. Prim. Prev.* 34, 261–277. doi: 10.1007/s10935-013-0305-4
- Weissberg, R. P., and Cascarino, J. (2013). Academic learning+social-emotional learning= national priority. *Phi Delta Kappan* 95, 8–13.
- Zhang, M. (2003). Links between school absenteeism and child poverty. *Past. Care Educ.* 21, 10–17. doi: 10.1111/1468-0122.00249



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Why are children absent from preschool? A nationally representative analysis of Head Start programs

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Introduction: Children who are absent from school, including preschool, do not make the same academic gains as their non-absent peers. However, we know little about what predicts absenteeism among preschool-attending children.

Methods: We used the Family and Child Experiences Study - 2009, a nationally representative sample of Head Start attendees ($n=2,842$), to test the associations between a comprehensive set of child, family, and center factors, and children's levels of absenteeism across the preschool year.

Results: Our findings highlight the multi-faceted nature of absenteeism. Family necessity, family routines, and center-level characteristics were all associated with absenteeism.

Discussion: Reducing preschool absenteeism requires a comprehensive approach as the factors that shape absences are varied. Our findings suggest that center-level strategies focused on outreach and classroom quality are important future directions.

KEYWORDS

absenteeism, preschool, Head Start, families, FACES 2009

Introduction

Preschool is an effective means to improving children's early learning and development, especially for children from low-income homes (Phillips et al., 2017). Given the mounting evidence supporting the benefits of preschool, large investments are being made into these programs across the country (Duncan and Magnuson, 2013). Despite these potential benefits of preschool enrollment, there is growing evidence to suggest that children do not reap the maximum benefit if they are not regularly present in school (Connolly and Olson, 2012; Ansari and Purtell, 2018; Ehrlich et al., 2018; Fuhs et al., 2018; Rhoad-Drogalis and Justice, 2018; Ansari et al., 2021). However, there has been little work on understanding why children are absent in the earliest years of schooling.

To address this gap in scientific knowledge, we use a nationally representative sample of newly enrolled Head Start attendees to examine a comprehensive set of factors that

we hypothesize will be associated with children's preschool absences. Understanding why children are absent in Head Start is an important policy question because it is the largest federally funded preschool program in the U.S., serving over 1 million children from low-income homes in 2019 alone (Office of Head Start, Administration for Children and Families, 2016). Head Start was created in 1965 as part of President Johnson's War on Poverty with the goal of minimizing the socioeconomic disparities in children's achievement. Interestingly, Head Start was designed as a two-generation program, meaning that it targeted both children and their parents (Zigler and Styfco, 2000). Thus, understanding how the family and school systems shape absenteeism in Head Start is particularly important.

There is far less information available on the prevalence of absenteeism in preschool than formal schooling, but studies from Baltimore (Connolly and Olson, 2012) and Chicago (Ehrlich et al., 2018) suggest that absenteeism is especially high during the years leading up to kindergarten. For example, in Chicago, preschoolers were absent for roughly 10–13% of the school year (Ehrlich et al., 2018). These averages indicate that a large share of children were chronically absent, meaning they missed more than 10% of the school year. Results from preschool programs in Baltimore reveal even higher levels of chronic absenteeism, with almost 27% of children being chronically absent (Connolly and Olson, 2012). These high rates of absences is troublesome because: (a) children who are absent from preschool do not make the same academic gains as their classmates who are less frequently absent (Connolly and Olson, 2012; Ansari and Purtell, 2018; Ehrlich et al., 2018; Fuhs et al., 2018; Rhoad-Drogalis and Justice, 2018); and (b) the more often children are absent in the early years, the more likely they were to be absent later on (Connolly and Olson, 2012; Dubay and Hollar, 2016; Gottfried, 2017; Ansari and Pianta, 2019). But, overall, these findings are not entirely surprising; the K-12 literature has long highlighted the negative educational and financial implications of school absences (Gottfried, 2009, 2010, 2011; Ready, 2010; Gershenson et al., 2015; Gottfried and Hutt, 2019).

To understand the consequences of absenteeism, and eventually to develop effective solutions to reduce it, requires a deeper understanding of the barriers to school attendance and which children are more likely to miss time from school. And even though there has been recent advances in trying to understand “why” children are absent in K-12 (e.g., Gottfried, 2015, 2017; Morrissey et al., 2014; Gottfried and Gee, 2017), there has been little effort to understand these dynamics among preschool-aged children. This is an important gap in knowledge because preschool differs from formal schooling in many ways that may contribute to both the higher rates of absenteeism and the reasons why children are absent.

Primarily, preschool in the United States is not mandated by law and because of its voluntary nature, some parents may view its role in promoting their children's development differently than formal schooling. Indeed, while most parents believe that school attendance is important, there is variation in whether parents ascribe these beliefs in relation to preschool, or only when their

children are older (Ehrlich et al., 2013). The potentially more varied beliefs about preschool may be one reason why there are higher levels of absences in preschool than later schooling (Dubay and Holla, 2015).

When studying absenteeism, children's health is often considered as the primary contributor to absenteeism (Ehrlich et al., 2013); however, there are multiple pathways that may lead to children missing school, especially in early childhood when schooling is not mandatory. Two theoretical models help to navigate this complex process. First, Bronfenbrenner's bioecological theory highlights the importance of multiple contexts in shaping children's development (Bronfenbrenner and Morris, 2006). Two tenets of this theory are particularly relevant. First, the concept of the mesosystem, which focuses on interrelations across contexts, highlights the interrelatedness of family and school environments. Applied here, it may be that experiences in the home prevent (or promote) children's preschool attendance. Second, this framework also emphasizes the role of the child in shaping their own home and school experiences. Thus, it may be that when a child (or parent) has positive experiences at preschool, they may be more motivated to go (or send their child), and in turn, reduce absenteeism.

The accommodations framework (Meyers and Jordan, 2006) also provides a useful lens through which to understand children's school absences. This economic framework was initially developed to explain how families make choices about childcare for their children and highlights the complex web of factors that influence these choices. Many of these factors may also influence preschool attendance. For example, need and necessity are highlighted as key factors that shape parents' decisions for childcare. When applied here, it may be that families with working parents have children with fewer absences because they need childcare so they can work; however, for families with mismatches between employment and preschool hours, absenteeism may be higher. This framework also highlights the importance of norms and values in parental decisions surrounding childcare. As discussed earlier, whether an individual parent values preschool in the same way society values later schooling is likely to have important implications for how likely they are to allow their child to miss extensive time from preschool.

Supporting these theories, the K-12 literature suggests that the reasons underlying children's school absences are complex and cut across different layers of the home and school systems in addition to the communities in which families reside (e.g., Baker et al., 2001; Epstein and Sheldon, 2002; Morrissey et al., 2014; Gottfried, 2015). Although a number of these features are likely to be important at the preschool level, it is important to consider the specific factors relevant to preschool absences, especially in the context of Head Start. In addition to serving children from lower-income families, Head Start has a longstanding focus on parent engagement which may shape absenteeism patterns in unique ways. Given that Head Start is the largest federal preschool program, understanding predictors of absenteeism in this context is critical.

We ground the factors we examine in these theories, the Head Start context, and their policy relevance. Understanding how

various factors shape absenteeism provides information that can be used to improve attendance in the future. We focus on both family- and classroom factors, as both are shaped by policy and practice. Although many of these factors have not been examined in the context of Head Start, we rely on research on absenteeism in elementary school to describe them below.

Family circumstance/necessity

Although children's health has been found to predict higher levels of absenteeism during the elementary and secondary school years (Allensworth and Easton, 2007; Ready, 2010; Childs and Lofton, 2021), other mechanisms, similar to those described in the accommodations framework have also been considered. For example, because parents sometimes consider preschool to be childcare, and less of an educational opportunity, how frequently their child attends may be driven by how much they need childcare and how frequently their need for care overlaps with the hours the program is open. Thus, family factors such as the other adults in the home and maternal employment may be associated with absenteeism.

Family stress and routines

. Other family factors, including the levels of stress and chaos within the home may make it more difficult for children to consistently attend preschool, as these challenges may make it difficult for families to get their child to school. Alternatively, these families may have a greater need for out of home care and thus, limit the number of times their child is absent. Family poverty is a related factor that has been documented as a consistent predictor of absenteeism, in part due to the reasons discussed above, but also because it is associated with poor neighborhood conditions and community violence, which make it more difficult for families to get to school (Chen et al., 2000; Allensworth and Easton, 2007; Gottfried, 2010; Ansari and Gottfried, 2020).

Children's academic and social-behavioral skills

In addition to the above family processes, another important dimension emphasized by bioecological theory includes the attributes and skills of children (Bronfenbrenner and Morris, 2006). These skills and behaviors can either support or impede children's experiences, including their school attendance. For example, children who demonstrate low skills or problematic behaviors may signal to their parents that they need more help, and thus, reduce the likelihood of absenteeism (i.e., compensatory effects). On the other hand, children who demonstrate more optimal skills and behaviors may encourage parents to continue to invest in their education and, consequently, parents may take extra efforts to make sure their

children are not absent from school (i.e., enrichment effects). Although both possibilities have received theoretical support, the evidence in the K-12 literature with respect to absenteeism has been mixed (e.g., Gottfried and Gee, 2017; Ansari et al., 2020).

Center and classroom processes

Despite the challenges faced by low-income families, the center itself also has the potential to influence the frequency of absenteeism. For example, centers that make an effort to meet with families or provide transportation and medical care may increase the ability of families to attend preschool regularly (e.g., Gottfried, 2013, 2017). Similarly, centers that make efforts to increase parents' beliefs in the importance of preschool for their children's future are also likely to reduce absenteeism (Ehrlich et al., 2013). Children's relationships with their teacher are also important to their overall schooling experience (Crosnoe et al., 2004). If a child has a close relationship with their teacher, and more generally, positive experiences within the classroom, they may be more likely to want to attend preschool. Likewise, if parents perceive the classroom as being a positive experience for their child, they may do more to ensure that their child is present as much as possible. These potential influences may be particularly relevant in preschool when parental beliefs are so variable.

Despite the clear rationale for hypothesizing that these cross-contextual factors would shape children's preschool absences, most have not been examined empirically. To push the early childhood field forward we need to test these hypotheses, which requires theoretically grounded and advanced research methods. Thus, we sought to fill these gaps by examining the reasons underlying children's preschool absences in a national sample of Head Start attendees. Because prior research has shown that one additional absence is not as detrimental for children's academic achievement, but rather it is the accumulation of multiple days missed, we examine predictors of chronic absenteeism in addition to overall absences. Similar to other studies, we define chronic absenteeism as missing at least 10% of the school year (Balfanz and Byrnes, 2012). Taken together, this study can identify factors that can be targeted in the future to increase children's preschool attendance, and ultimately, increase their kindergarten readiness.

Materials and methods

FACES 2009 followed a nationally representative sample of 3,349 3- and 4-year-old first time Head Start attendees across 486 classrooms (Moiduddin et al., 2012). For the purposes this investigation, we used data from the Head Start year (fall 2009 and spring 2010) and we excluded 444 children who did not have a valid longitudinal weight and 63 children who were in a home-based program, resulting in a final analytic sample of 2,842 children and families. On average, our final sample of children (50% female) were 3.84 years of age with the majority coming

TABLE 1 Weighted descriptive statistics for focal variables.

Variables	M	SD
Absenteeism		
Proportion of days child was absent	0.05	0.04
Child was chronically absent	0.12	
Family necessity		
Number of adults in the household	1.99	0.95
Number of children in the household	2.60	1.23
Parents marital status		
Married	0.29	
Single	0.18	
Not two parent household	0.53	
Mothers' employment status		
Full time	0.27	
Part time	0.21	
Unemployed	0.52	
Mother enrolled in classes	0.25	
Ratio of income to poverty	2.52	1.36
Other child care		
No other care	0.65	
Relative care in home	0.12	
Relative care out of home	0.14	
Center-based care	0.10	
Social support	2.52	0.50
Sources of social support ^a		
Child's father is helpful	0.64	
Child's father is not helpful	0.27	
Spouse is helpful	0.40	
Spouse is not helpful	0.06	
Child's grandparents are helpful	0.73	
Child's grandparents are not helpful	0.16	
Relatives are helpful	0.78	
Relatives are not helpful	0.19	
Friends are helpful	0.71	
Friends are not helpful	0.25	
Head Start is helpful	0.84	
Head Start is not helpful	0.14	
Other Head Start parents are helpful	0.39	
Other Head Start parents are not helpful	0.46	
Stress and routines		
Food insecurity	0.39	0.59
Adequacy of medical care	0.94	0.13
Residential instability	0.49	0.83
Receipt of government benefits	0.30	0.20
Receipt of child support	0.22	0.41
Number of days family eats dinner together	5.36	1.76
Mothers' depressive symptoms	4.89	5.82

(Continued)

TABLE 1 (Continued)

Variables	M	SD
Mom has poor health	0.17	
Child has poor health	0.05	
Child's hours of sleep	10.39	0.89
Child has regular sleep schedule	0.89	
Mothers' perception of neighborhood violence	0.73	1.23
Children's early skills		
Behavior problems	-0.06	0.96
Social skills	0.01	0.98
Academics	0.08	0.75
Center and classroom processes		
Frequency of home visits	2.17	1.48
Frequency of parent-teacher meetings	2.68	0.97
Services provided to families	0.76	0.15
Quality of teacher-child interactions (CLASS)	4.07	0.49
Child enjoys school	3.83	0.42
Parent feels welcome at school	3.78	0.48
Number of children chronically absent	1.66	0.65
Classroom behavior is good	3.39	0.81
Covariates		
Child race/ethnicity		
White	0.21	
Black	0.34	
Latine	0.36	
Asian/other	0.08	
Child gender (male)	0.50	
Child has a disability	0.06	
Mother born in the U.S.	0.71	
Program is full day	0.60	
Child 1 year away from kindergarten	0.43	
Child age (months)	46.09	6.65
Mothers' age (years)	28.83	5.89
Household language not English	0.24	
Mothers' education	1.99	0.92

^aProportions for social support will not sum to 1.00 because an additional dummy variable was included for families who reported "not applicable."

from ethnic minority households (36% Latine, 34% Black, 8% Asian/other). Table 1 presents full sample descriptives.

Missing data ranged from 0–17%, with an average of approximately 6% per indicator. In total, there were roughly 200 patterns of missing data. Approximately, 60% of children had complete case data. The most common pattern of missingness involved missing data on indicators of social support, employment, and absenteeism (7%). The next most common patterns involved missing data on classroom quality (5% of cases), maternal education (3% of cases), academic assessments (3% of cases), absenteeism (3% of cases), and maternal employment and

coursework (3%). All other patterns of missing data represented less than 1–2% of cases.

Measures

Below, we describe our focal measures.

Absenteeism

During the spring parents were asked, “Approximately how many days has [CHILD] been absent since the beginning of the school year?” Responses were continuously measured and ranged from 0 to 20. Because not all parents reported on their children’s absences at the same time point (52% in March; 28% in April; and 20% in May), and because programs operated for a different number of days per week, we created an indicator of the proportion of days missed as a fraction of the days children were enrolled in school. To do so, we used parents date of assessment during the spring to gauge how long children were enrolled in school and divided the number of days children were absent by the number of months they were enrolled. This measure provided us with the number of days children were absent per month. Next, we multiplied the number of days children were absent per month by nine (the months of the school year). Finally, we divided this estimate by the number of days the program was in operation, which provided us with the proportion of the year children were absent. Chronic absenteeism was defined as missing 10% or more of the school year (Balfanz and Byrnes, 2012).

Family circumstance/necessity

We included nine parent-reported measures of family circumstances that may influence children’s absenteeism. We included two measures of household composition: The number of adults and number of children in the household. We have three categories to describe parental marital status: Married, not married, and not a two-parent household (i.e., cohabitating). Mothers’ employment status was coded as full-time, part-time, or not employed. We also included an indicator for whether the mother was currently enrolled in classes. The family financial situation was captured by the income-to-poverty measure (1 = less than 50% of the Federal Poverty Line; 6 = above 200% of the Federal Poverty Line). We also included measures of other sources of childcare that children experienced before or after Head Start, which included: Relative or non-relative care in home, relative or non-relative care not in home, center-based care, or no other care. Each of the aforementioned indicators was measured at the beginning of the Head Start year.

Two aspects of social support were also included as part of families’ circumstances. These indicators were collected toward the end of the Head Start year. First, parents reported on six items that described how much social support they perceived having ($\alpha = 0.86$; 1 = never true; 3 = always true). Sample items included “help watch child when parent runs errands” and “others will loan emergency cash.” Second, parents reported on how helpful they

perceived the following sources to be in terms of helping with their children: child’s father, spouse, child’s grandparents, relatives, friends, Head Start, and other Head Start parents (1 = not very helpful; 2 = somewhat helpful; 3 = very helpful; 4 = not applicable). Due to the distribution of responses, we categorized responses into a dichotomous variable (0 = not very helpful, 1 = somewhat or very helpful) and included the not applicable response as a flag variable.

Family stress and routines

Parents also reported on several dimensions of family routines and stress, each of which was measured at the start of the Head Start year. First, family food insecurity was captured by a single item asking the frequency with which food runs out because of money (never true, sometimes true, often true). Adequacy of medical care was a sum of three items asking about whether the child had a doctor’s visit in the past year, a dental visit in the past year, and health insurance (Gershoff et al., 2007). Residential instability was the number of times the family moved in the past 12 months. Receipt of government benefits was the proportion of six benefits families received: TANF, unemployment insurance, Food Stamps, WIC, social security, and energy assistance. Mothers also reported on whether they received child support. Three items tapped into routines: The average number of hours the child slept, whether the child had at least 4 days a week that followed a regular sleep schedule, and the number of days per week the family ate dinner together. Two maternal health indicators were also included: mother’s depression, measured by 12 items from the CES-D ($\alpha = 0.86$; Radloff, 1977), and whether the mother reported poor or fair health. An indicator for poor or fair child health was also included. Finally, mothers reported on their exposure to neighborhood violence using 4 items that captured whether parents saw violent or non-violent crimes in their neighborhood and whether they knew someone that was—or they themselves were—a victim of a violent crime. Responses were categorized into a 5-point scale capturing the severity of neighborhood violence (0 = witnessed no crimes; 5 = experienced a violent crime).

Children’s early academic and social-behavioral skills

Children’s early academic and social-behavioral skills were measured at the beginning of the Head Start year. First, children’s early academic skills were based on direct assessments of their language, literacy, and math skills. Language was captured by the Peabody Picture Vocabulary Test (Dunn and Dunn, 1997; $\alpha = 0.97$), a measure of children’s receptive vocabulary. Literacy skills were captured through two subtests of the Woodcock-Johnson assessment, Letter-Word Identification ($\alpha = 0.85$) and Spelling Word ($\alpha = 0.79$; Woodcock et al., 2001). The two measures captured children’s ability to identify and write upper- or lower-case letters. Children’s math skills were also directly assessed with the

Woodcock-Johnson Applied Problems subscale ($\alpha = 0.87$; Woodcock et al., 2001). These measures were composited together to create an overall indicator of early academic achievement ($\alpha = 0.74$). Next, children's behavior problems were reported on by teachers using 14 items from the Personal Maturity Scale (Entwisle et al., 1987) and the Behavior Problems Index (Peterson and Zill, 1986), which captured children's aggressive hyperactive, and withdrawn behavior ($\alpha = 0.88$). Finally, as part of the data collection, teachers also reported on children's social skills (e.g., how often children followed directions, helped put things away, followed rules) using 12 items from the Personal Maturity Scale (Entwisle et al., 1987) and the Social Skills Rating System (Gresham and Elliott, 1990; $\alpha = 0.89$).

Center and classroom processes

To capture center and classroom processes, we leveraged data from parents, teachers, and administrators. First, toward the end of the Head Start year, the child's teacher reported on the frequency with which they performed home visits and their frequency of parent-teacher meetings. Next, at the beginning of the year, the center director reported on 15 different services provided to families (0 = *no*, 1 = *yes*), which were summed together ($\alpha = 0.72$; e.g., medical care, dental care, transportation, and education or job training). All Head Start classrooms were also observed and rated on the CLASS in the spring (Pianta et al., 2008), which provides a measure of the quality of teacher-child interactions. The CLASS is based on a 7-point Likert scale (1–2 = *low* to 6–7 = *high*) and measures instructional, social-emotional, and organizational aspects of the classroom. Next, in the end of the year surveys, teachers reported on the number of children in their classroom who were chronically absent (1 = *none*, 4 = 5 or more) and the overall behavior of the classroom (1 = *the group misbehaves very frequently and is almost always difficult to handle*, 5 = *the group behaves exceptionally well*). Finally, in the end of year surveys, parents provided their perceptions of the center through seven items (1 = *never*, 4 = *always*), which were used to create two scales: parents' feelings of welcomeness at the school ($\alpha = 0.74$; e.g., teacher is supportive of parent, parent feels welcome by teacher) and children's enjoyment of school ($\alpha = 0.64$; e.g., child feels safe at school; child is happy at Head Start).

Covariates

In addition to the focal predictors discussed above, we also included a number of covariates that were collected at the start of the Head start year, namely: Child race/ethnicity, child gender, child disability status, mothers' immigration status, whether the program was full day, whether the child was less than 1 year away from kindergarten, child and mother age, home language, and maternal education. Because of the large number of variables included, we examined all predictors for multi-collinearity issues and found none. Less than 1% of correlations among predictors were above 0.50.

Analysis plan

Two sets of analyses were estimated using (StataCorp, 2011). First, we estimated OLS models to examine the associations between the predictors and the continuous measure of absenteeism. For these models, we provide effect sizes that correspond with how many standard deviations (SDs) our dependent variables change per SD increase in our continuous predictors. Given the categorical nature of some of our predictors (where SDs are not meaningful), for those variables (e.g., employment), we provide effect sizes that correspond with the unstandardized regression coefficient divided by the SD of the dependent variable. Second, we estimated logistic regression models to examine the predictors of the dichotomous chronic absenteeism variable. To gauge the meaningfulness of these associations we provide odds ratios which capture the differences in chronic absenteeism given a one-unit change in the predictor. To facilitate interpretation across variables, we also provide a percent change in rates of chronic absenteeism given a one standard deviation change in all continuous variables. All models were clustered at the classroom level to account for dependence in child outcomes and weighted to be nationally representative. To account for missing data, we imputed 50 datasets using the chained equations method.

Additionally, because absenteeism is not distributed uniformly across schools and communities, we treat the above analytic framework as our primary specification and allow the variances in absenteeism to vary across different contexts. However, as an additional analysis, we also estimated additional models that implemented classroom fixed effects. In these models, we constrained the analysis to examining children *within* classrooms and, as such, we hold constant all classroom-level practices and processes. Thus, the classroom fixed effects models consider why some children are more (or less) likely to be absent than their classmates. Although not intended to be causal, classroom fixed effects provide a more rigorous estimation of how individual child and family factors are associated with absenteeism. We present both analytic specifications to provide a more balanced and nuanced portrait about absenteeism in Head Start. In doing so, it is important to note that classroom fixed effects models cannot be implemented with logistic regression and, consequently, when looking at chronic absenteeism as the outcome, we estimate a linear probability model. Coefficients for those models can be interpreted as the percentage change as a function of a one unit change in the predictor. Lastly, we estimated a robustness check using fractional response models for our OLS models due to the nature of our dependent variable.

Results

On average, children missed 5% of the school year and 12% were chronically absent.

Predictors of absenteeism

Our first model predicted the proportion of days a child was absent. Unstandardized and standardized coefficients are presented in the left two columns of [Table 2](#). To begin, we found that very few family necessity and social support factors predicted children's absences. However, the need for preschool (as captured by full-time employment), presence of siblings, and social support received, especially from other parents in the program, were linked with fewer school absences, with effect sizes ranging from roughly 5–15% of a *SD*. And even though children's early academic and social-behavioral skills at the start of Head Start were *not* linked with absenteeism, family stress and routines did matter. More specifically, children whose families received greater government assistance were absent more often, whereas children who experienced more frequent family dinners had fewer absences. Not surprisingly, children in poor health missed a considerable more amount of school ($ES = 33\%$ of a *SD*) and so did children who lived in neighborhoods perceived by their mother to be violent.

Moving beyond the home context, we also found that a number of center and classroom characteristics were linked with preschool absences. For example, children who enjoyed school were less frequently absent and so were children who attended classrooms that provided higher quality services. In contrast, there was evidence of spillover effects, whereby children were more frequently absent when they were enrolled in classrooms with a higher proportion of absent peers. Effect sizes for these associations ranged from approximately 5–10% of a *SD*.

And although not a focal study objective, in terms of covariates, we found that Black and Latine children had fewer absences than White children. In contrast, children born to immigrant mothers had fewer absences than those whose mothers were born in the U.S. and children who attended a full-day program were also absent less frequently than children in part-day programs.

Predictors of chronic absenteeism

Our second model predicted whether children were chronically absent from Head Start. Unstandardized coefficients and odds ratios are provided in final two columns of [Table 2](#). Overall, the patterns of results were similar to those documented above for absenteeism continuously measured, but there were a few notable differences.

When looking at family necessity, the three significant associations were the same as above: A greater number of children in the household, maternal full-time employment, and support from other Head Start parents were all predictive of a lower likelihood of chronic absences. In terms of family routines and stress, we again found that receipt of governmental benefits was associated with increased preschool absences; however, unlike our

models predicting overall levels of absences, when predicting chronic absences, we found that the adequacy of medical care was linked with a lower likelihood of chronic absenteeism. Poor child health was again a sizeable predictor of chronic absenteeism, but unlike our first model predicting overall levels of absences, children's sleep patterns was associated with chronic absenteeism. Specifically, children who had more hours of sleep per night were less likely to be chronically absent.

Like above, a similar pattern of center and classroom factors were also documented when examining how likely children were to be chronically absent, but many of the predictors were only marginally significant. And, in terms of covariates, the same patterns emerged. Black and Latine children (versus White children) were less likely to be chronically absent and children in full-day programs were less likely to be absent than those in half-day programs.

Classroom fixed effects

Our next set of analyses implemented classroom fixed effects (see [Table 3](#)). These results are presented in [Table 3](#). Results from these analyses were generally similar to those reported above, but fewer stress and routine variables were associated with absenteeism when comparing children with their classmates. Importantly, however, even though fewer factors were significantly linked with within classroom absenteeism, the effect sizes for the focal associations were comparable across both specifications, suggesting that the reasons children were absent are comparable when making both within and between classroom comparisons.

Fractional response models

As a robustness check, we ran our OLS models using fractional response modeling. Because we had not included bounds for our imputations, 1–2% of cases had values that fell below 0%. To estimate fractional response models, we estimated models that: (a) excluded these 1–2% of cases and (b) recoded their values as 0. In both instances, our results were substantively similar to the results presented in [Table 2](#) (results available from author upon request).

Discussion

Preschool absences are not uncommon. In fact, our results show that Head Start attendees miss approximately 5% of the school year on average and 12% of children are chronically absent. Because preschool attendance has been linked to improved academic achievement and later school attendance ([Connolly and Olson, 2012](#); [Ansari and Purtell, 2018](#); [Ehrlich et al., 2018](#); [Fuhs et al., 2018](#); [Rhoad-Drogalis and Justice, 2018](#)), it is critical to understand why children miss time from school. Resonating with both bioecological theory ([Bronfenbrenner and Morris, 2006](#)) and

TABLE 2 Results from regression models predicting absenteeism and chronic absenteeism.

	Absenteeism		Chronic absenteeism			
	B (SE)	β	B (SE)	OR	% Diff.	
Family necessity						
Number of adults in the household	-0.000 (0.001)	-0.01	-0.014 (0.081)	0.99	-1%	
Number of children in the household	-0.004 (0.001)	***	-0.218 (0.069)	**	0.80	-24%
Parents marital status						
Single	-0.000 (0.004)	-0.01	0.216 (0.300)	1.24	24%	
Not two parent household	-0.005 (0.003)	-0.12	-0.079 (0.242)	0.92	-8%	
Mothers' employment status						
Full time	-0.006 (0.003)	*	-0.496 (0.213)	*	0.61	-39%
Part time	-0.003 (0.003)		-0.242 (0.202)	0.79	-21%	
Mother enrolled in classes	-0.004 (0.002)		-0.262 (0.204)	0.77	-23%	
Ratio of income to poverty	0.001 (0.001)	0.03	0.031 (0.058)	1.03	4%	
Other child care						
Relative care in home	0.003 (0.003)	0.06	0.204 (0.268)	1.23	23%	
Relative care out of home	-0.001 (0.003)	-0.02	-0.157 (0.251)	0.85	-15%	
Center-based care	-0.003 (0.004)	-0.07	-0.172 (0.284)	0.84	-16%	
Social support	0.005 (0.002)	*	0.262 (0.196)	1.30	14%	
Sources of social support ^a						
Child's father is helpful	-0.001 (0.003)	-0.03	0.016 (0.192)	1.02	2%	
Spouse is helpful	0.004 (0.004)	0.09	0.083 (0.339)	1.09	9%	
Child's grandparents are helpful	-0.005 (0.003)	-0.12	-0.249 (0.230)	0.78	-22%	
Relatives are helpful	0.002 (0.003)	0.04	-0.186 (0.225)	0.83	-17%	
Friends are helpful	-0.001 (0.003)	-0.03	0.137 (0.211)	1.15	15%	
Head Start is helpful	0.000 (0.003)	0.01	0.089 (0.250)	1.09	9%	
Other Head Start parents are helpful	-0.006 (0.002)	**	-0.438 (0.172)	*	0.65	35%
Stress and routines						
Food insecurity	0.001 (0.002)	0.01	0.257 (0.133)	+	1.29	16%
Adequacy of medical care	-0.011 (0.008)	-0.03	-1.229 (0.489)	*	0.29	-15%
Residential instability	-0.000 (0.001)	-0.00	-0.016 (0.089)	0.98	-2%	
Receipt of government benefits	0.015 (0.005)	**	1.019 (0.403)	*	2.77	22%
Receipt of child support	-0.001 (0.003)	-0.03	-0.186 (0.203)	0.83	-17%	
Number of days family eats dinner together	-0.001 (0.001)	*	-0.064 (0.043)	0.94	-11%	
Mothers' depressive symptoms	0.000 (0.000)	+	0.001 (0.013)	1.00	6%	
Mom has poor health	0.002 (0.003)	0.05	0.098 (0.214)	1.10	10%	
Child has poor health	0.015 (0.005)	**	0.826 (0.267)	**	2.28	128%
Child's hours of sleep	-0.001 (0.001)	-0.03	-0.211 (0.098)	*	0.81	-17%
Child has regular sleep schedule	-0.003 (0.003)	-0.06	-0.426 (0.227)	+	0.65	-35%
Mothers' perception of neighborhood violence	0.002 (0.001)	**	0.151 (0.062)	*	1.16	20%
Children's early skills						
Behavior problems	-0.002 (0.001)	-0.04	-0.034 (0.108)	0.97	-3%	
Social skills	-0.002 (0.001)	-0.04	-0.050 (0.100)	0.95	-6%	
Academics	0.001 (0.002)	0.02	0.195 (0.152)	1.22	14%	
Center and classroom processes						
Frequency of home visits	-0.001 (0.001)	-0.03	-0.032 (0.057)	0.97	-4%	
Frequency of parent-teacher meetings	-0.001 (0.001)	-0.02	-0.028 (0.081)	0.97	-3%	
Services provided to families	-0.016 (0.008)	+	-0.998 (0.512)	+	0.37	-14%
Quality of teacher-child interactions (CLASS)	-0.004 (0.002)	*	-0.274 (0.163)	+	0.76	-13%
Child enjoys school	-0.009 (0.003)	**	-0.354 (0.197)	+	0.70	-14%
Parent feels welcome at school	0.002 (0.003)	0.03	0.046 (0.184)	1.05	2%	
Number of children chronically absent	0.006 (0.002)	***	0.342 (0.116)	**	1.41	25%

(Continued)

TABLE 2 (Continued)

	Absenteeism			Chronic absenteeism		
	B (SE)		β	B (SE)	OR	% Diff.
Classroom behavior good	0.001 (0.001)		0.02	0.151 (0.093)	1.16	13%
Covariates						
Child race/ethnicity						
Black	-0.020 (0.003)	***	-0.45	-0.931 (0.240)	***	-61%
Latine	-0.009 (0.004)	*	-0.19	-0.649 (0.257)	*	-48%
Asian/other	-0.010 (0.005)	*	-0.23	-0.487 (0.339)		-39%
Child gender (male)	0.002 (0.002)		0.05	-0.002 (0.161)		0%
Child has disability	-0.003 (0.005)		-0.08	-0.094 (0.315)		-9%
Mother born in the United States	0.010 (0.004)	*	0.22	0.168 (0.300)		18%
Program is full day	-0.009 (0.002)	***	-0.21	-0.698 (0.181)	***	-50%
Child 1 year away from kindergarten	0.003 (0.004)		0.08	0.042 (0.297)		4%
Child age	-0.001 (0.00)	+	-0.07	-0.029 (0.022)		-17%
Mothers' age	-0.000 (0.00)		-0.02	-0.024 (0.016)		-14%
Household language not English	0.001 (0.001)		0.02	0.049 (0.341)		5%
Mothers' education	0.000 (0.001)		0.00	0.040 (0.093)		4%

*Although not shown, an additional dummy variable was included for the social-support variables representing those who reported not applicable. O.R. is odds ratios. The O.R. results are not using standardized predictors and thus can be interpreted as one unit increase on the original scale metric. To present a more comparable metric across predictors, the % diff column corresponds to the percent change in rates of chronic absenteeism given a one standard deviation change in continuous predictors. *** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$. + $p < 0.10$.

models of preschool selection (Meyers and Jordan, 2006), our results highlight the multifaceted nature of preschool absences, with multiple factors across contexts contributing to the likelihood that children would miss time from preschool.

We found a number of family factors that were associated with children's absences. To start, children who had mothers that were employed full-time and children who were in a household with a greater number of children were both less likely to be absent and chronically absent. Families with multiple children and full-time employment may rely on preschool for childcare, and thus, be less likely to let their child miss significant time from school. The finding on number of children in the home is different from qualitative findings with elementary-aged children, where having a greater number of children in the household can make getting to school more challenging (Sugrue et al., 2016). Children whose families had more frequent routines were also absent less frequently than children whose families had fewer daily routines. Specifically, more family dinners were associated with fewer absences, and both the regularity and amount of children's sleep were also associated with fewer absences. That families that are more regular in their routines at home would also be more routine in their children's preschool experience is perhaps not surprising as more routines in the home are likely to mitigate stressors associated with absenteeism.

Similar to the existing literature on elementary school absences (e.g., Ready, 2010), we found that children's health was strongly associated with absences and chronic absenteeism in preschool. On the contrary, neither mothers' physical nor mental health played a role in their children's absences, although it is plausible that these characteristics shaped absenteeism through

their associations with family routines. Similar to prior research, a number of indicators of economic stressors were also associated with absenteeism and chronic absenteeism, including food insecurity, adequacy of medical care, and receipt of governmental assistance (Chang and Romero, 2008). These economic challenges are likely to be associated with day-to-day barriers to attendance, such as transportation, which is an important correlate of regular school attendance (Gottfried, 2017). Lastly, mothers who perceived their neighborhoods to be violent had children who were more frequently absent. It may be that this is operating as another marker of economic disadvantage, or it may be that living in dangerous neighborhoods poses a separate barrier to regular preschool attendance. Taken together, these findings suggest that social and economic disadvantages pose great challenges to high rates of attendance at Head Start. Programs focused on reducing absenteeism need to consider the complex circumstances families may be experiencing throughout the school year.

More hearteningly, we found a number of center- and classroom-level features that were associated with fewer preschool absences. For example, children who attended centers that provided more services to families were less likely to be absent. This suggests that a continued focus on family outreach may benefit children by increasing attendance, in addition to its other positive impacts on families (e.g., Barnett et al., 2020). Children's classroom experiences also played a role in the regularity of their attendance; specifically, children were less likely to be absent when their mothers' perceived them as enjoying school and when they attended classrooms that were rated as higher quality. Thus, positive child experiences in the classroom is a potential pathway to reduced absenteeism.

TABLE 3 Results from regression models predicting absenteeism and chronic absenteeism using classroom fixed effects.

	Absenteeism			Chronic absenteeism		
	B (SE)		β	B (SE)		β^b
Family necessity						
Number of adults in the household	0.001 (0.001)		0.01	0.003 (0.008)		0.00
Number of children in the household	-0.003 (0.001)	***	-0.09	-0.018 (0.007)	**	-0.02
Parents marital status						
Single	-0.000 (0.004)		-0.00	0.015 (0.034)		0.01
Not two parent household	-0.003 (0.004)		-0.07	0.005 (0.028)		0.00
Mothers' employment status						
Full time	-0.006 (0.003)	*	-0.13	-0.048 (0.021)	*	-0.05
Part time	-0.002 (0.003)		-0.04	-0.021 (0.023)		-0.02
Mother enrolled in classes	-0.004 (0.003)		-0.09	-0.037 (0.021)	+	-0.04
Ratio of income to poverty	0.001 (0.001)		0.03	0.007 (0.006)		0.01
Other child care						
Relative care in home	0.001 (0.003)		0.02	0.008 (0.028)		0.01
Relative care out of home	0.002 (0.003)		0.04	0.011 (0.023)		0.01
Center-based care	-0.001 (0.005)		-0.01	0.005 (0.033)		0.01
Social support	0.004 (0.003)		0.04	0.024 (0.021)		0.01
Sources of social support ^a						
Child's father is helpful	-0.002 (0.003)		-0.06	-0.000 (0.021)		-0.00
Spouse is helpful	0.006 (0.005)		0.14	0.039 (0.035)		0.04
Child's grandparents are helpful	-0.005 (0.003)		-0.12	-0.021 (0.029)		-0.02
Relatives are helpful	0.002 (0.003)		0.04	-0.024 (0.027)		-0.02
Friends are helpful	-0.001 (0.003)		-0.03	0.020 (0.025)		0.02
Head Start is helpful	0.000 (0.003)		0.01	0.006 (0.026)		0.01
Other Head Start parents are helpful	-0.006 (0.002)	**	-0.14	-0.046 (0.019)	*	-0.05
Stress and routines						
Food insecurity	0.001 (0.002)		0.01	0.031 (0.016)	+	0.02
Adequacy of medical care	-0.017 (0.008)	*	-0.05	-0.177 (0.067)	**	-0.02
Residential instability	0.000 (0.001)		0.01	0.003 (0.011)		0.00
Receipt of government benefits	0.015 (0.006)	**	0.07	0.113 (0.048)	*	0.02
Receipt of child support	-0.000 (0.003)		-0.01	-0.012 (0.022)		-0.01
Number of days family eats dinner together	-0.001 (0.001)	*	-0.06	-0.007 (0.005)		-0.01
Mothers' depressive symptoms	0.000 (0.000)	+	0.05	0.001 (0.002)		0.01
Mom has poor health	0.003 (0.003)		0.08	0.019 (0.026)		0.02
Child has poor health	0.010 (0.006)	+	0.24	0.061 (0.038)		0.06
Child's hours of sleep	-0.002 (0.001)		-0.03	-0.019 (0.011)	+	-0.02
Child has regular sleep schedule	-0.004 (0.004)		-0.10	-0.068 (0.028)	*	-0.07
Mothers' perception of neighborhood violence	0.002 (0.001)	*	0.06	0.013 (0.008)	+	0.02
Center and classroom processes						
Frequency of home visits	-		-	-		-
Frequency of parent-teacher meetings	-		-	-		-
Services provided to families	-		-	-		-
Quality of teacher-child interactions (CLASS)	-		-	-		-
Child enjoys school	-0.008 (0.004)	*	-0.07	-0.043 (0.027)		-0.02
Parent feels welcome at school	0.002 (0.003)		0.02	0.001 (0.023)		0.00
Number of children chronically absent	-		-	-		-
Classroom behavior good	-		-	-		-
Children's early skills						
Behavior problems	-0.001 (0.002)		-0.03	-0.007 (0.014)		-0.01
Social skills	-0.002 (0.002)		-0.04	-0.010 (0.014)		-0.01

(Continued)

TABLE 3 (Continued)

	Absenteeism		Chronic absenteeism	
	B (SE)	β	B (SE)	β^b
Academics	0.001 (0.002)	0.01	0.012 (0.017)	0.01
Covariates				
Child race/ethnicity				
Black	-0.011 (0.005)	*	-0.044 (0.036)	-0.04
Latine	-0.003 (0.005)		-0.033 (0.042)	-0.03
Asian/other	-0.005 (0.005)		-0.028 (0.045)	-0.03
Child gender (male)	0.002 (0.002)		-0.003 (0.018)	-0.00
Child has disability	-0.002 (0.005)		0.004 (0.038)	0.00
Mother born in the United States	0.008 (0.005)	+	0.011 (0.033)	0.01
Program is full day	-	-	-	-
Child 1 year away from kindergarten	0.002 (0.005)		-0.000 (0.038)	-0.00
Child age	-0.000 (0.000)		-0.002 (0.003)	-0.01
Mothers' age	-0.000 (0.000)		-0.002 (0.002)	-0.01
Household language not English	0.005 (0.006)		0.020 (0.040)	0.02
Mothers' education	0.001 (0.001)		0.004 (0.010)	0.00

^aAlthough not shown, an additional dummy variable was included for the social-support variables representing those who reported not applicable.

^bTo generate standardized estimates for chronic absenteeism, only continuous variables were standardized to have a mean of 0 and standard deviation of 1. Thus, coefficients can be interpreted as the percentage difference between categories or the percentage change as a function of a one standard deviation change in the predictor. *** $p < 0.001$. ** $p < 0.01$. * $p < 0.05$. + $p < 0.10$.

Interestingly, the other social support item that was associated with fewer school absences was parents' perceptions of support from other Head Start parents, suggesting that facilitating relationships between parents is another important way that centers may be able to reduce absenteeism. Despite these promising avenues for reducing preschool absences, we also found that the concentration of absences within a classroom was associated with individual children's absenteeism. Although speculative, it may be that a high concentration of absences in a classroom reflects a social norm, namely that preschool absences are okay (see also, Ehrlich et al., 2013; Gottfried et al., 2020).

Overall, our findings highlight the fact that no one mechanism stood out as the sole driver of absenteeism; but rather, there appeared to be many individual, family and center characteristics that shaped preschool absenteeism. This aligns with bioecological theory that suggests that multiple systems may shape absenteeism. Additionally, our findings provide support for multiple components of the accommodation's framework. For example, children whose families likely had higher need for childcare, as evidenced by full-time employment, were less likely to be absent. But other factors mattered too, providing evidence for the framework's assertion that parents' decision-making around childcare, and in this case, attendance, is complex, and shaped by numerous factors.

Accordingly, there are many routes to reduce absenteeism in the future—and focusing on one factor alone is unlikely to make drastic reductions in absenteeism. A holistic approach that tackles both family- and classroom-level processes is necessary to improve children's Head Start attendance. Having said that, there are successful models at other school levels that may be useful to future program development. One such successful elementary school

model assigned monitors to engage with both families and school staff to increase attendance; this type of model may be particularly useful in Head Start, which already strives to increase parent-center communication, but has not yet been tested in the preschool years (Lehr et al., 2004). Other work has revealed a number of promising strategies to reduce preschool absences. First, in line with our findings, Katz et al. (2016) note that home-school connections are critical to facilitate school attendance. Even so, it is important to acknowledge that these positive relationships may not be enough to reduce the barriers present for some families. Thus, having other resources, such as information about transportation and medical care referrals, easily accessible to families is critical to reducing preschool absences. Additionally, Katz et al. (2016) find that staff members commonly feel that parents do not understand the importance of preschool for their children's current and future learning. Finding successful ways to deliver this message to families requires continued attention, as parents' beliefs about preschool are likely key to reducing absenteeism.

Despite the fact that our study represents one of the first efforts to understand why children miss time from preschool at the national level, our findings need to be interpreted in light of a few limitations. The primary limitation of our work is our reliance on parental report of children's absences. Although the use of parent reports is common, administrative data that tracks children's absences could increase precision when examining the predictors and outcomes of preschool absences. Nonetheless, FACES 2009 is one of only two national datasets with information on children's preschool attendance (Mendez et al., 2016). Additionally, our data is limited to children attending Head Start and, thus, we cannot speak to the predictors of absenteeism in other types of preschool programs, which requires continued attention. Given that Head

Start serves children from low-income families, our findings may be more generalizable to this population. However, given Head Start's longstanding commitment to family and community engagement, our findings likely do not generalize beyond the program.

Given our large number of predictors, it is also important to note the potential for the Table 2 fallacy in our interpretation of our findings (Westreich and Greenland, 2013). Although the goal of this paper was to identify unique associations with children's absenteeism, it is plausible that some of our predictors (e.g., indicators of financial instability) are mechanisms through which other predictors (e.g., employment status) are associated with children's absenteeism. Understanding these pathways is an important direction for future research. It is also important to note that although we examined numerous predictors, there are still a number of potential factors not addressed that are key for future research. For example, more direct measures of transportation and logistical support are important to capture (Gottfried, 2017). Additionally, understanding parents' perspectives regarding the importance of attendance in the preschool years may be key to understanding absenteeism patterns (Ehrlich et al., 2013). Lastly, understanding predictors of absenteeism within demographic groups may be critical to developing potent interventions. For example, although we found that Black and Latine children were less likely to be absent than their White peers, understanding factors that shape absenteeism within these groups may be necessary to improve attendance in the future.

Absenteeism, and particularly, chronic absenteeism is diminishing the potential benefits of preschool (Connolly and Olson, 2012; Ansari and Purtell, 2018; Ehrlich et al., 2018; Rhoad-Drogalis and Justice, 2018), especially for children who are from low-income families who: (a) are more likely to benefit from preschool (Weiland and Yoshikawa, 2013), but (b) are more likely to be absent than their higher-income peers (Morrissey et al., 2014). In this study, we find that there is no one underlying reason for absenteeism; rather, there are a number of factors that cut across contexts are contributing to the high levels of absences in the United States among a sample of preschoolers from low-income homes. As such, there is possible value of a package of efforts that target the different causes of absenteeism. Addressing these factors, and

subsequently reducing absenteeism, is a critical pathway to increasing the school readiness of disadvantaged children.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: <https://www.icpsr.umich.edu/web/ICPSR/series/236>.

Ethics statement

The studies involving human participants were reviewed and approved by the Ohio State University IRB. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

AA led analysis and preparation of methods and results. KP led preparation of introduction and discussion. AA and KP authors conceptualized the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

- Allensworth, E. M., and Easton, J. Q. (2007). *What matters for staying on track and graduating in Chicago public high schools*. Chicago, IL: Consortium on Chicago School Research.
- Ansari, A., and Gottfried, M. A. (2020). Early childhood educational experiences and preschool absenteeism. *Elem. Sch. J.* 121, 34–51. doi: 10.1086/709832
- Ansari, A., Hofkens, T. L., and Pianta, R. C. (2020). Absenteeism in the first decade of education forecasts civic engagement and educational and socioeconomic prospects in young adulthood. *J. Youth Adolesc.* 49, 1835–1848. doi: 10.1007/s10964-020-01272-4
- Ansari, A., and Pianta, R. C. (2019). School absenteeism in the first decade of education and outcomes in adolescence. *J. School Psychol.* 76, 48–61. doi: 10.1016/j.jsp.2019.07.010
- Ansari, A., Pianta, R. C., Whittaker, J. V., Vitiello, V. E., Ruzek, E. A., and Zhang, J. (2021). Does the timing of kindergarten absences matter for children's early school success? *School Psychol.* 36, 131–141. doi: 10.1037/spq0000434
- Ansari, A., and Purtell, K. M. (2018). Absenteeism in head start and children's academic learning. *Child Dev.* 89, 1088–1098. doi: 10.1111/cdev.12800
- Baker, M. L., Sigmon, J. N., and Nugent, M. E. (2001). *Truancy reduction: Keeping students in school*. Rockville, MD: Juvenile Justice Bulletin.
- Balfanz, R., and Byrnes, V. (2012). *The importance of being in school: A report on absenteeism in the nation's public schools*. Baltimore: Johns Hopkins University Center for Social Organization of Schools.

- Barnett, M. A., Paschall, K. W., Mastergeorge, A. M., Cutshaw, C. A., and Warren, S. M. (2020). Influences of parent engagement in early childhood education centers and the home on kindergarten school readiness. *Early Child. Res. Q.* 53, 260–273.
- Bronfenbrenner, U., and Morris, P. A. (2006). “The bioecological model of human development” in *Handbook of child psychology: Theoretical models of human development*. Vol. 1. eds. R. M. Lerner and W. Damon (New York, NY: Wiley). 793–828.
- Chang, H. N., and Romero, M. (2008). Present, engaged, and accounted for: The critical importance of addressing chronic absence in the early grades. New York, NY: National Center for Children in Poverty. Available at: https://www.nccp.org/wp-content/uploads/2008/09/text_837.pdf
- Chen, L., Jennison, B. L., Yang, W., and Omaye, S. T. (2000). Elementary school absenteeism and air pollution. *Inhal. Toxicol.* 12, 997–1016. doi: 10.1080/08958370050164626
- Childs, J., and Lofton, R. (2021). Masking attendance: how education policy distracts from the wicked problem (s) of chronic absenteeism. *Educ. Policy* 35, 213–234. doi: 10.1177/0895904820986771
- Connolly, F., and Olson, L. S. (2012). *Early elementary performance and attendance in Baltimore city schools pre-kindergarten and kindergarten*. Baltimore, MD: Baltimore Education Research Consortium.
- Crosnoe, R., Johnson, M. K., and Elder, G. H. (2004). Intergenerational bonding in school: the behavioral and contextual correlates of student-teacher relationships. *Sociol. Educ.* 77, 60–81. doi: 10.1177/003804070407700103
- Dubay, L., and Holla, N. (2015). Absenteeism in DC public schools early education program. Available online at: <http://www.urban.org/sites/default/files/alfresco/publication-pdfs/2000082-Absenteeism-in-DC-Public-Schools-Early-Education-Program.pdf>
- Dubay, L., and Holla, N. (2016). Does attendance in early education predict attendance in elementary school? An analysis of DCPS's early education program. Available online at: https://www.urban.org/research/publication/does-attendance-early-education-predict-attendance-elementary-school-analysis-dcps-early-education-program/view/full_report
- Duncan, G. J., and Magnuson, K. A. (2013). Investing in preschool programs. *J. Econ. Perspect.* 27, 109–132. doi: 10.1257/jep.27.2.109
- Dunn, L. M., and Dunn, L. M. (1997). *Peabody Picture and Vocabulary Test: Examiner's Manual and Norms Booklet*. 3rd edn. Circle Pines, MN: American Guidance Service.
- Ehrlich, S. B., Gwynne, J. A., and Allensworth, E. M. (2018). Pre-kindergarten attendance matters: early chronic absence patterns and relationships to learning outcomes. *Early Child. Res. Q.* 44, 136–151. doi: 10.1016/j.ecresq.2018.02.012
- Ehrlich, S. B., Gwynne, J. A., Pareja, A. S., and Allensworth, E. M. (2013). *Preschool attendance in Chicago public schools: Relationships with learning outcomes and reasons for absences*. Chicago, IL: University of Chicago Consortium on Chicago School Research.
- Epstein, J. L., and Sheldon, S. B. (2002). Present and accounted for: improving student attendance through family and community involvement. *J. Educ. Res.* 95, 308–318. doi: 10.1080/00220670209596604
- Entwisle, D. R., Alexander, K. L., Cadigan, D., and Pallas, A. M. (1987). Kindergarten experience: Cognitive effects or socialization? *Am. Educ. Res. J.* 24, 337–364. doi: 10.3102/00028312024003337
- Fuhs, M. W., Nesbitt, K. T., and Jackson, H. (2018). Chronic absenteeism and preschool children's executive functioning skills development. *J. Educ. Stud. Placed Risk (JESPAR)* 23, 39–52. doi: 10.1080/10824669.2018.1438201
- Gershoff, E. T., Aber, J. L., Raver, C. C., and Lennon, M. C. (2007). Income is not enough: Incorporating material hardship into models of income associations with parenting and child development. *Child Dev.* 78, 70–95. doi: 10.1111/j.1467-8624.2007.00986.x
- Gershenson, S., Jackowitz, A., and Brannegan, A. (2015). Are student absences worth the worry in US primary schools?. Available online at: <http://ftp.iza.org/dp9558.pdf>
- Gottfried, M. A. (2009). Excused versus unexcused: how student absences in elementary school affect academic achievement. *Educ. Eval. Policy Anal.* 31, 392–415. doi: 10.3102/0162373709342467
- Gottfried, M. A. (2010). Evaluating the relationship between student attendance and achievement in urban elementary and middle schools an instrumental variables approach. *Am. Educ. Res. J.* 47, 434–465. doi: 10.3102/0002831209350494
- Gottfried, M. A. (2011). The detrimental effects of missing school: evidence from urban siblings. *Am. J. Educ.* 117, 147–182. doi: 10.1086/657886
- Gottfried, M. A. (2013). Quantifying the consequences of missing school: linking school nurses to student absences to standardized achievement. *Teach. Coll. Rec.* 115, 1–30. doi: 10.1177/016146811311500605
- Gottfried, M. A. (2015). Can center-based childcare reduce the odds of early chronic absenteeism? *Early Child. Res. Q.* 32, 160–173. doi: 10.1016/j.ecresq.2015.04.002
- Gottfried, M. A. (2017). Linking getting to school with going to school. *Educ. Eval. Policy Anal.* 39, 571–592. doi: 10.3102/0162373717699472
- Gottfried, M. A., and Gee, K. A. (2017). Identifying the determinants of chronic absenteeism: A bioecological systems approach. *Teach. Coll. Rec.* 119, 1–34. doi: 10.1177/016146811711900704
- Gottfried, M. A., and Hutt, E. L. (2019). *Addressing absenteeism: Lessons for policy and practice*. Stanford, CA: Policy Analysis for California Education, PACE.
- Gottfried, M. A., Kirksey, J. J., and Ozuna, C. S. (2020). Exploring the links between student and classroom chronic absenteeism. *Teach. Coll. Rec.* 122, 1–28. doi: 10.1177/016146812012201205
- Gresham, F. M., and Elliott, S. N. (1990). *The social skills rating system*. Circle Pines, MN: American Guidance Service.
- Katz, M., Johnson, M. C., and Adams, G. (2016). *Improving prekindergarten attendance: School-level strategies for messaging, engaging parents, and responding to absences in four DC public schools*. Washington, DC: Urban Institute.
- Lehr, C. A., Sinclair, M. F., and Christenson, S. L. (2004). Addressing student engagement and truancy prevention during the elementary school years: a replication study of the check and connect model. *J. Educ. Stud. Placed Risk* 9, 279–301. doi: 10.1207/s15327671espr0903_4
- Mendez, J., Crosby, D., and Helms, H. (2016). Using existing large-scale data to study early care and education among Hispanics: families' utilization of early care and education. Available online at: <http://www.childtrends.org/wp-content/uploads/2016/02/ECE-Series-Brief-No.-3.pdf>
- Meyers, M. K., and Jordan, L. P. (2006). Choice and accommodation in parental child care decisions. *Community Dev.* 37, 53–70. doi: 10.1080/15575330609490207
- Moiduddin, E., Aikens, N., Tarullo, L. B., West, J., and Xue, Y. (2012). *Child outcomes and classroom quality in FACES 2009*. Washington, DC: Office of Planning, Research, and Evaluation, U.S. Department of Health and Human Services.
- Morrissey, T. W., Hutchison, L., and Winsler, A. (2014). Family income, school attendance, and academic achievement in elementary school. *Dev. Psychol.* 50, 741–753. doi: 10.1037/a0033848
- Office of Head Start, Administration for Children and Families. (2016). Head start program facts, *Fiscal Year 2015*. Available online at: <https://edlkc.ohs.acf.hhs.gov/hslc/data/factsheets/2015-hs-program-factsheet.html>
- Peterson, J. L., and Zill, N. (1986). Marital disruption, parent-child relationships, and behavior problems in children. *J. Marriage Fam.* 295–307. doi: 10.2307/352397
- Phillips, D., Lipsey, M. W., Dodge, K. A., Haskins, R., Bassok, D., Burchinal, M. R., et al. (2017). *Puzzling it out: The current state of scientific knowledge on pre-kindergarten effects*. A consensus statement. Brookings Institution and the Center for Child and Family Policy.
- Pianta, R. C., La Paro, K. M., and Hamre, B. K. (2008). *Classroom assessment scoring system (CLASS)*. Baltimore: Paul H. Brookes Publishing Company.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Appl. Psychol. Meas.* 1, 385–401. doi: 10.1177/014662167700100306
- Ready, D. D. (2010). Socioeconomic disadvantage, school attendance, and early cognitive development: the differential effects of school exposure. *Sociol. Educ.* 83, 271–286. doi: 10.1177/0038040710383520
- Rhoad-Drogalis, A., and Justice, L. M. (2018). Absenteeism in Appalachian preschool classrooms and children's academic achievement. *J. Appl. Dev. Psychol.* 58, 1–8. doi: 10.1016/j.appdev.2018.07.004
- StataCorp. (2011). *Stata statistical software: Release 12*. College Station, TX: StataCorp LP.
- Sugrue, E., Zuel, T., and Laliberte, T. (2016). The Ecological Context of Chronic School Absenteeism in the Elementary Grades. *Child. Sch.* 38, 137–145. doi: 10.1093/cs/cdw020
- Weiland, C., and Yoshikawa, H. (2013). Impacts of a prekindergarten program on children's mathematics, language, literacy, executive function, and emotional skills. *Child Dev.* 84, 2112–2130. doi: 10.1111/cdev.12099
- Westreich, D., and Greenland, S. (2013). The table 2 fallacy: presenting and interpreting confounder and modifier coefficients. *Am. J. Epidemiol.* 177, 292–298. doi: 10.1093/aje/kws412
- Woodcock, R. W., McGrew, K. S., and Mather, N. (2001). *Woodcock-Johnson III tests of achievement*. Itasca, IL: Riverside Publishing.
- Zigler, E., and Styfco, S. J. (2000). Pioneering steps (and fumbles) in developing a federal preschool intervention. *Top. Early Child. Spec. Educ.* 20, 67–70. doi: 10.1177/02711240002000201



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Absenteeism prevention in preschools in Chile: Impact from a quasi-experimental evaluation of 2011–2017 Ministry of Education data

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Introduction: In 2007, to promote social equity, Chile expanded coverage and subsidies for early childhood education (ECE). Fundación Educacional Oportunidad (OFE) aimed to improve ECE quality through its professional development program for teachers and school leaders, Un Buen Comienzo (UBC). An experimental evaluation showed that high levels of absenteeism moderated UBC's impact: despite moderate to large positive impacts on preschool quality, only children who attended most frequently experienced positive impacts on targeted language and literacy skills. In 2012, OFE began prioritizing attendance promotion and chronic absenteeism prevention.

Methods: Using a Breakthrough Series Collaborative (BTS) that combines continuous quality improvement methods and networked peer learning, OFE tested a theory of change and several innovations, including Absenteeism Committees comprised of school teams and families; a new real-time data platform; and a set of universal and targeted strategies to apply with families at risk for chronic absenteeism. In 2014–2015, OFE expanded the UBC program to nineteen schools in Chile's VI Region, five of which prioritized attendance promotion. This study describes the intervention strategies and BTS implementation approach, and we use publicly available Ministry of Education databases to analyze rates of absences and chronic absenteeism in public preschools in Chile's VI region from 2011 to 2017 ($n=1,218$ children per year; 63,689 child-months of data), comparing rates between UBC schools that prioritized attendance ($n=5$), UBC schools that did not prioritize attendance ($n=14$), and non-UBC schools ($n=27$).

Results: Children missed, on average, 14.0%–14.4% of schooldays. Rates of chronic absenteeism were 50.9%–54.2%. Statistical Process Control charts show an initial increase in the percentage of days absent per child each month (13.4% to 16.3%) in UBC Schools prioritizing attendance, followed by a decrease to 12.9%. The percentage of children with chronic absenteeism decreased from 54.2% to 35%. Interrupted time series analyses suggest that these reductions can be attributed to UBC participation.

Discussion: This study (1) replicates findings from prior research indicating that absenteeism rates are sufficiently high among Chilean preschoolers to diminish ECE's potential benefits, and (2) demonstrates the effectiveness of multi-level

strategies implemented using continuous improvement methods and networked peer learning to promote attendance and reduce chronic absenteeism.

KEYWORDS

chronic absenteeism, school attendance, preschool education, Chile, absenteeism intervention, interrupted time series analysis, statistical process control, quality improvement

1. Introduction

High-quality early childhood education can improve children's development and learning in the short and long term and reduce inequality in society (Cunha and Heckman, 2007). Globally, many countries are making significant investments in early childhood education with high expectations of their academic, economic and social return (Myers, 2005; Britto et al., 2011; Engle et al., 2011; Yoshikawa and Kabay, 2014). Multiple factors affect the impact of early childhood education. The quality of services — including dimensions of structure and process — is key to obtaining the expected results (Camilli et al., 2010; Sachs and Weiland, 2010; Yoshikawa and Kabay, 2014; OECD, 2018). The United Nations included in Sustainable Development Goal 4.2: by 2030, ensure that all girls and boys have access to early childhood care and development services and quality preschool education (UN General Assembly, 2015). However, high-quality services may not have the expected impact if exposure to the program is low. In this context, preschool attendance has emerged as an important issue.

Decades of research across multiple disciplines illustrate the importance of school attendance and describe associations between absenteeism and poor child outcomes, including cognitive, academic, behavioral, health, judicial and economic outcomes (Monk and Ibrahim, 1984; Hibbett and Fogelman, 1990; Levine, 1992; Wang et al., 2005; Henry et al., 2012; Marchbanks III et al., 2014; Monahan et al., 2014; Latif et al., 2015; Lansford et al., 2016; Rocque et al., 2017; Mauro and Machell, 2019). The prevalence of absenteeism varies predictably by age and grade (Balfanz and Byrnes, 2012; Díaz et al., 2020). Absenteeism in preschool is often high and can reduce the effects of early education and reduce the return on investments in it (Balfanz and Byrnes, 2012; Ehrlich et al., 2014). An absenteeism rate of 10% or more of school days in kindergarten is defined as “early chronic absenteeism” and is associated with poor language and math skills in first and fifth grades (Chang and Romero, 2008).

Factors associated with absenteeism span child, family, school, and community-level characteristics (Baker et al., 2001; Epstein and Sheldon, 2002; Gottfried and Gee, 2017). Child characteristics associated with absenteeism include poor child health, behavioral issues, learning difficulties, negative attitudes toward school, higher internalizing behavior, and, among kindergarten children, no prior experience with non-kinship care (Fowler et al., 1985;

Allensworth and Easton, 2007; Chang and Romero, 2008; Gottfried and Gee, 2017; Gubbels et al., 2019). In low- and middle-income countries, children with disabilities are significantly more likely to exhibit chronic absenteeism (Mizunoya et al., 2018).

Family characteristics associated with higher absenteeism include poverty, single motherhood and teen motherhood, low maternal education, maternal unemployment, food insecurity, poor health, multiple siblings, non-nuclear family structure (e.g., parental divorce), and child abuse (Chang and Romero, 2008; Romero and Lee, 2008; Gubbels et al., 2019). A systematic review found that there was greater evidence of socioeconomic status's impact on absenteeism when measured at the family level, rather than the school level (Sosu et al., 2021). Lack of access to reliable transportation can also impede regular school attendance (Allen et al., 2018). In low- and middle-income countries, children may miss school if they have to earn income or participate in household chores and childcare (Evans and Acosta, 2021).

Schools with low quality education or facilities, poor pupil-teacher relationships, higher grade levels, inadequate attendance monitoring, and poor parent outreach experience higher absenteeism (Chang and Romero, 2008; Gubbels et al., 2019). Community factors associated with higher absenteeism include poverty, violence, and air pollution (Chen et al., 2000; Allensworth and Easton, 2007; Gottfried, 2011).

Less is known about how best to promote attendance and reduce absenteeism, especially across diverse contexts. Solutions have traditionally focused on student, family, school and community-level interventions separately, rather than in a systemic, coordinated manner (Eklund et al., 2022; Kearney and González, 2022). Most studies examine single intervention strategies, for example, text-based and mail-based interventions to motivate parents to improve their child's attendance (Robinson et al., 2018; Díaz et al., 2020; Kalil et al., 2021) or interventions addressing specific child health problems, like asthma (Guevara et al., 2003; Clark et al., 2004; Kim et al., 2020). A recent meta-analysis of 17 studies of evidence-based interventions targeting absenteeism within pre-K-12 public schools in the United States showed positive yet small effects [$g=0.25$ (95% CI, 0.14–0.36)]. The meta-analysis also examined effect sizes by the type of intervention, each of which demonstrated small positive effects as well [behavioral, $g=0.26$ (95% CI, 0.14–0.38); academic, $g=0.25$ (95% CI, 0.04–0.45); parental involvement, $g=0.09$ (95% CI,

−0.03 to 0.21)]. Just one study focused on preschool-aged children, and only four involved collaboration across students, families, and schools (Eklund et al., 2022). Two of these interventions also included community partners: one study of an intervention for truant students included police (Mazerolle et al., 2017); another study of Ohio elementary schools showed that schools that implemented school-family-community partnerships to increase student engagement (specifically, school outreach to families) improved attendance by an average of 0.5%, which was statistically significant (Sheldon, 2007).

Research suggests that multi-tiered, team-based strategies may address absenteeism more effectively (Reid, 2013; Kearney, 2016; Kearney and Graczyk, 2020), particularly when informed by data (Mandinach, 2012; Chu et al., 2019; Keppens et al., 2019). Attendance Works, a national leader in absenteeism prevention in the United States, recommends universal, prevention-oriented supports (Tier 1), more personalized outreach (Tier 2), and intensive individualized intervention (Tier 3). One example of a three-tiered intervention (“Positive Family Support”) to reduce middle school absenteeism implemented multiple supports across Tier 1 (e.g., publicized clear expectations around attendance), Tier 2 (e.g., emails and text messages home), and Tier 3 (parent support sessions, community referrals). The randomized control trial ($n=41$ schools) demonstrated small positive effects, though implementation challenges (e.g., funding cuts, turnover) were prevalent (Smolkowski et al., 2017). Another three-tiered intervention (“ATI-UP”) tested in 27 Oregon middle schools communicated the importance of attendance to students, school staff, and parents; established attendance goals, student incentives, and a “problem-solving team” which reviewed attendance data every 2 months; and engaged parents early on in problem solving their child’s absenteeism. The cluster randomized control trial showed some increase on average daily attendance and some reduction on chronic absenteeism; however, these differences were not statistically significant (Berg, 2018).

This study contributes to this literature by examining the effect of a multi-tiered strategy to promote attendance and prevent absenteeism in Chilean preschools that (a) included multiple interventions (child, family, school) and (b) was implemented using a Breakthrough Series Collaborative that combines continuous quality improvement methods and networked peer learning.

1.1. Study context and aim

Chile is a country in the western part of South America with a population of approximately 17.5 million people. In 2007, the Government of Chile established early childhood development (ECD) policy as a key priority: it created a national integrated system for early childhood protection (Chile Grows with You) and expanded free ECE opportunities for the poorest 40% of the population by increasing funding for public ECE centers and for vouchers to private subsidized centers (Memoria de la Instalación

del Sistema de Protección Integral a la Infancia, n.d.; Vegas and Santibanez, 2009; Peralta, 2011). By 2012, 73% of 4-year-olds and 93% of 5-year-olds were enrolled in preschool; most of this growth occurred in the poorest quintiles of the population that enrolled in prekindergarten and kindergarten classrooms within public and subsidized voucher primary schools (Ministerio de Educación, 2014).

While educational access in Chile is high, educational quality – although higher than other Latin American countries – is similar to low or average levels when compared to the other 36 member countries of the Organization for Economic Cooperation and Development (OECD) (Leyva et al., 2015; Schady et al., 2015; Adlerstein et al., 2016). Since 2007, Fundación Educacional Oportunidad (OFE) has worked to improve the quality of early childhood education through its professional development program for public school teachers, teachers’ aides, and school leaders, *Un Buen Comienzo* (UBC). UBC is a two-year intervention that combines didactic training with twice-monthly in-classroom coaching; a full description of the intervention has been published elsewhere (Yoshikawa et al., 2015). Results from the experimental evaluation of UBC showed moderate to large positive impacts on preschool classroom quality, null effects on the targeted child language and literacy skills on average for the full sample (Yoshikawa et al., 2015), and positive impact on two of four language outcomes among children who attended most frequently (Arbour et al., 2016).

Evidence that UBC was an effective intervention whose potential impact could be attained only if children received sufficient dosage – that is, if they attended school regularly – galvanized OFE to establish attendance promotion and absenteeism reduction as a new strategic priority and an area of intervention within UBC.

To raise awareness of the importance of preschool attendance and the prevalence of early chronic absenteeism in Chile, OFE sponsored large national seminars where they disseminated international research that defined and established the importance of early chronic absenteeism, along with its local findings: over 2 years, children enrolled in prekindergarten and kindergarten in 64 public preschools in the Metropolitan Region missed 21.7% of schooldays, on average. The prevalence of chronic absenteeism in the sample was 67%. Of children who were chronically absent in prekindergarten, 76% were chronically absent again in kindergarten (Arbour et al., 2016). In addition, OFE launched a publicity campaign (FunOportunidad, dir, 2015) and convened a working group of more than 10 public and private institutions to generate new proposals to combat chronic absenteeism in early education in Chile.

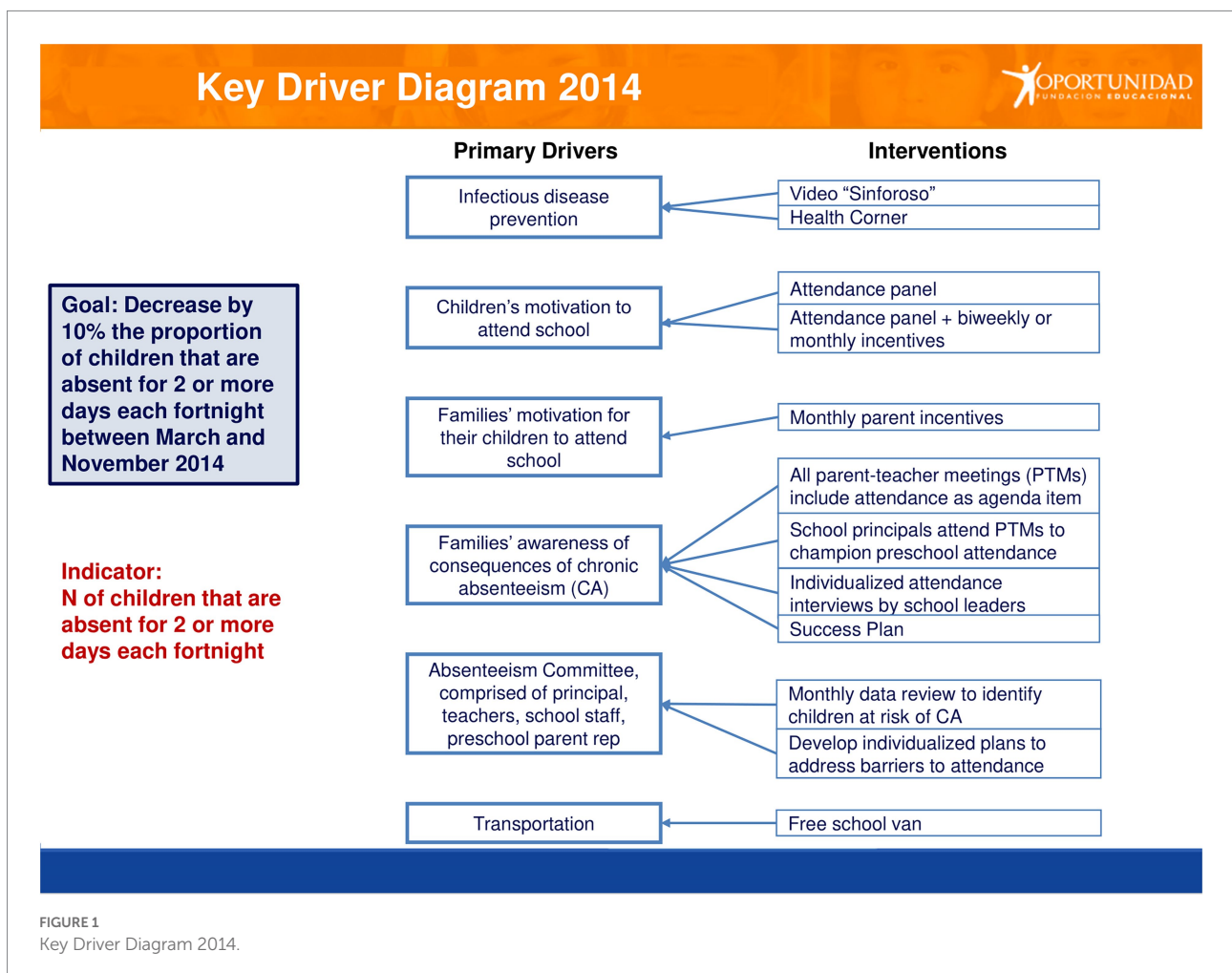
In addition to raising awareness, OFE engaged preschool leaders, teachers, and teachers’ aides to identify, develop, and test strategies to promote regular attendance and decrease chronic absenteeism in an expansion of the UBC program, using a Breakthrough Series Collaborative (BTS). This commonly used continuous quality improvement (CQI) model was designed to facilitate the uptake of innovations (Nolan et al., 2004). It recruits

teams of direct service providers and stakeholders to pursue one shared, specific aim during a defined period of time, typically 9 to 18 months, and creates a structure within which interested organizations can learn from each other and recognized experts. BTS has been applied successfully across a diverse array of topics in healthcare settings (Flamm et al., 1998; Kilo, 1998; Leape et al., 2000; Glasgow et al., 2002), public health (Ebert et al., 2012; Singh et al., 2016; Arbour et al., 2019; Tandon et al., 2020; Arbour et al., 2021), and more recently in education as “Networked Improvement Communities” (Bryk et al., 2011; Arbour et al., 2015; LeMahieu et al., 2017; Proger et al., 2017). One attendance-focused BTS collaborative increased the median attendance from 44.9 to 59.2% at seven early childhood education centers in New Zealand (Tyler et al., 2018). This study represents the first test of the BTS model in reducing absenteeism in Chilean preschools.

Following the BTS model, OFE began by developing a theory of change to reduce chronic absenteeism in the Chilean context for the 2014 school year (visualized in the Key Driver Diagram, see Figure 1). The theory of change aimed to address factors associated with absenteeism in the academic literature and from OFE’s own experience and research on absenteeism in Chilean preschools. UBC’s impact evaluation highlighted factors

associated with absenteeism in this study population, corroborating some of the child, family, school, and community-level factors seen in the literature. For example, children experiencing respiratory illness and those with no prior participation in center-based childcare were more likely to be absent. Family-level characteristics included lack of childcare for siblings, a depressed caretaker, low maternal education, maternal unemployment, and parents who felt unwelcome in their child’s classroom. Parents of children with high absenteeism were more likely to report that their children missed school due to oversleeping, cold and rain, or lack of transportation. These parents were also more likely to state that they preferred to keep the child at home sometimes, and that they believed the school’s main role was to keep their child safe and healthy, rather than encourage social or school skills. Finally, at the community level, municipalities with more socioeconomic vulnerability, colder weather, or worse air pollution predicted higher absenteeism (Arbour et al., 2016).

Drawing from Attendance Works, OFE adopted a multi-tiered approach and translated and adapted intervention resources available on the Attendance Works website that curated contributions from schools’ experiences in New York City, Los



Angeles, Rhode Island and beyond. Prior to the 2014 school year and as part of BTS model, OFE convened international, Chilean national and local experts (including school leaders, teachers, teachers' aides, and parents) to review the tiered model and translated intervention resources; to draft a driver diagram that summarized the factors driving absenteeism in Chilean preschools; to select interventions from among the translated resources; and to contribute additional intervention ideas to test with school-based teams in practice.

In 2014–2015, OFE expanded the UBC program to 19 schools in the VI Region of Chile. All participating schools received training in CQI methods and UBC's three main areas of intervention: Instructional Time, Effective Interactions, and Attendance. Participating schools selected one area to prioritize at their school; a subset of five schools with six preschool classrooms prioritized attendance promotion.

UBC program data and experience suggest that consistently applied strategies work: for example, programmatic data from one of the UBC schools showed that the percentage of children who missed more than 2 days in each fortnight fell from 28% during 2014 to 24.2% during the first semester of 2015 and to 13.1% during the second semester of 2015. However, these analyses have limitations, as official daily attendance data at the child level were not available.

In 2018, for the first time, the Ministry of Education made publicly available databases with individual-level daily attendance of all children enrolled in all public schools from 2011 to 2017 (MINEDUC, n.d.). This research uses this administrative data to answer two fundamental questions:

1. What were the rates of absences and chronic absenteeism in preschools in the VI region of Chile between 2011 and 2017?
2. Is there a difference in the evolution of absences and chronic absenteeism between three groups of schools?
 - a. Schools that did not participate in UBC (27 Comparison Schools),
 - b. Schools that participated in UBC in 2014 and 2015, but did not choose attendance as their priority intervention area (14 UBC Schools that did not prioritize attendance), and,
 - c. Schools that participated in UBC in 2014 and 2015 and chose attendance as their priority intervention area (5 UBC Schools that prioritized attendance).

This study contributes to the rapidly changing field of school attendance and absenteeism by examining the effect of *Un Buen Comienzo* (UBC) – a 2-year preschool professional development intervention that included a multi-tiered attendance promotion and absenteeism prevention strategy – on preschool attendance in Chile. By describing the BTS model that supported school teams to test and implement those attendance strategies, it also contributes to the literature on implementation science in education, which is a field of extreme relevance that still needs to

be developed in countries like Chile (Meneses et al., 2017). In addition, the analytic approach responds to the discourse on the importance of a robust and effective assessment of quality improvement initiatives in education and provides a model that combines methods that facilitate practice-based data-driven decision-making and methods with causal inference (Fretheim and Tomic, 2015; Gessa et al., 2022).

2. Materials and methods

2.1. Intervention

The UBC program's theory of change for improving attendance is visualized in a driver diagram with six primary drivers – that is, key determinants – that contribute to reaching the goal of reducing absenteeism (see Figure 1).

Primary Driver 1: Infectious Disease Prevention and its associated interventions aimed to prevent child illness – particularly respiratory illnesses – which were one of the most frequently reported reason for missing school (Arbour et al., 2016).

Strategy 1.1 “Health corner”: Teachers designated a physical space in the classroom with tissues, alcohol gel, and a waste basket for children to use as needed.

Strategy 1.2 “*Video Sinforoso*”: UBC provided and teachers used age-appropriate educational materials about the importance of personal hygiene for avoiding illness and attending school. Materials included a puppet show about “*Sinforoso*,” a bacterium that hates handwashing, and series of postcards that *Sinforoso* sent to the classroom periodically throughout the year about his misadventures and failures as children around the country used regular handwashing and other infection prevention strategies.

Primary Driver 2: Children's Motivation to Attend School addressed this child-level factor. Positive attitudes toward school are positively associated with school attendance (Gubbels et al., 2019), and Chilean parents reported that children oversleeping contributed to problematic absenteeism, which suggests this factor was relevant to the study context (Arbour et al., 2016).

Strategy 2.1 “Attendance panel”: UBC provided materials and classroom teams (i.e., teachers and aides) assembled and displayed on the classroom wall an attendance panel that contained the names of each child in the class and the dates for every day of class in the month. Every day, each child recorded his or her own attendance on the panel.

Strategy 2.2 “Attendance panel plus incentives”: Each class or school defined an attendance goal for each fortnight or month. In addition to having children register their daily attendance on the classroom wall, classrooms celebrated and gave prizes

to children who met the goal. For example, some classrooms gave children a crown to wear for the day or displayed a photograph of children who attended 100% of class days in the month in the school entryway. Some classrooms defined individual goals (e.g., attend 9 of 10 days in the fortnight, or 100% of class days in a month) and presented prizes to each child who met the goal. Others set a classroom goal (e.g., in a class of 16 children, the whole class would have no more than 5 days absent).

Parental attitudes toward education and their child's classroom contributed to absenteeism in UBC's impact evaluation, specifically their report that they sometimes kept them home out of personal preference, and they believed school's main role was to keep children safe and healthy, rather than encouraging social or school skills (Arbour et al., 2016). Therefore, Primary Drivers 3 and 4 aimed to increase parents' motivation to send their children to school (PD3) and raise awareness of the value of preschool education and consequences of chronic absenteeism (PD4), while also strengthening the parent-school relationship (Chang and Romero, 2008).

Primary Driver 3: Families' Motivation for their Children to Attend School.

Strategy 3.1 "Incentives for families": This strategy aimed to acknowledge and positively reinforce families whose children met the class's attendance goal. At customary monthly group meetings between the classroom teachers and parents, school leaders presented certificates to parents whose child attended 100% of the days of school during a month.

Primary Driver 4: Families' Knowledge and Understanding of Consequences of Absenteeism.

Strategy 4.1 "All parent-teacher meetings include attendance": Schools established attendance as a standing agenda item for all parent-teacher meetings and used a set of UBC-provided resources for teaching about the importance of attending classes and the effects of absenteeism on children's development.

Strategy 4.2 "School leaders champion preschool attendance": School principals attended the parent-teacher meetings to reinforce the importance of attending preschool, as well as his or her wish to see each of their children in school every day and willingness to help problem-solve barriers to regular attendance.

Strategy 4.3 "Individualized 'attendance interviews' by school leaders": School leaders met with families of children with repeated school absences, expressed his or her wish to see their child in school every day, and used a series of scripted questions to engage families in shared problem-solving.

Strategy 4.4 "Success Plan": Adapted from United States non-profit AttendanceWorks (Attendance Works, n.d.), the

Success Plan was a rubric that contained historical information on a child's absences and the number of days that would result in chronic absenteeism, should he or she miss them in the future. Schools used this approach in an individual or group interview with the parents of children at risk of chronic absenteeism to generate awareness and invite families to commit to a plan for overcoming common causes of their child's absences.

Primary Driver 5: Absenteeism Committee fostered schools' capacity to monitor attendance, a key tool in preventing absenteeism (Chang and Romero, 2008; Keppens et al., 2019).

Strategy 5.1 "Absenteeism Committee": Schools formed a team comprised of the principal, preschool teacher and teacher's aide, school staff (e.g., social worker, cafeteria worker, school administrator, etc.), and a preschool parent representative. The team met monthly to analyze attendance data, identify children at risk of chronic absenteeism, and develop an individualized approach for engaging each child and family in overcoming barriers to regular school attendance.

Primary Driver 6: Transportation provided children with school transportation via a free school van, addressing a parent-reported barrier to regular attendance (Arbour et al., 2016).

Strategy 6.1 "School van": School sponsored transportation for children with absences due to lack of transportation.

Table 1 lists the UBC schools that prioritized attendance and the strategies they tested each month. Table 2 shows the number of times each strategy was used per month in the UBC schools that prioritized attendance.

2.2. Implementation strategy

OFE delivered UBC using the Breakthrough Series Collaborative Model (BTS), a commonly used continuous quality improvement (CQI) model that recruits teams of direct service providers and stakeholders to pursue one shared, specific aim during a defined period of time, and creates a structure wherein interested organizations learn from each other and recognized experts (The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement, 2003). The model has three core elements: (1) learning sessions that bring teams together periodically for training and collaboration, separated by (2) 'action periods' during which teams test what they have learned in practice, using (3) Plan-Do-Study-Act cycles – a structured approach to rapid-cycle testing of innovations in practice (Figure 2).

Participating schools formed school-based teams comprised of school leadership (principals or curriculum directors), teachers, teachers' aides, and preschool parents. OFE convened

TABLE 1 UBC Schools that prioritized attendance and the strategies they tested each month.

UBC Schools that prioritized attendance	Mar 2014	Apr 2014	May 2014	Jun 2014	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Mar 2015	Apr 2015	May 2015	Jun 2015	Jul 2015	Aug 2015	Sept 2015	Oct 2015	Nov 2015	Dec 2015
School 1			1	1	1	1	1	1			1		1							
		2			2		2	2	2		2	2	2	2		2				
			3									3	3	3		3		3	3	
				4			4		4	4				4						
														5						
																6				
		7				7						7								
School 2			1	1	1				1		1		1							
		2			2			2	2		2	2								
			3									3	3			3	3	3	3	
				4									4	4						
																5	5	5		
																6				
							7					7								
School 3		1	1	1	1	1					1		1							
		2			2		2		2		2	2			2					
			3									3	3		3	3		3	3	
				4			4		4				4							
													5				5			
														6		6	6			
		7				7						7								
School 4			1	1	1	1			1			1	1	1	1	1				1
		2			2		2					2	2	2						
			3									3	3	3	3	3		3	3	
						4						4	4	4	4	4				4
																	5	5		
															6		6			
		7				7						7								
School 5			1	1	1	1		1	1			1	1							
		2			2	2		2	2			2			2		2			
			3									3	3		3		3			
				4					4			4	4							
																6				
		7				7						7								

Key to Table 1.

Number	Strategy
1	Attendance panel
2	Inclusion of the attendance issue in all parent-teacher meetings
3	Absenteeism Committee
4	Incentives for children
5	Incentives for families
6	Success Plan
7	Health Corner

TABLE 2 Number of times each strategy was used per month in the UBC Schools that prioritized attendance.

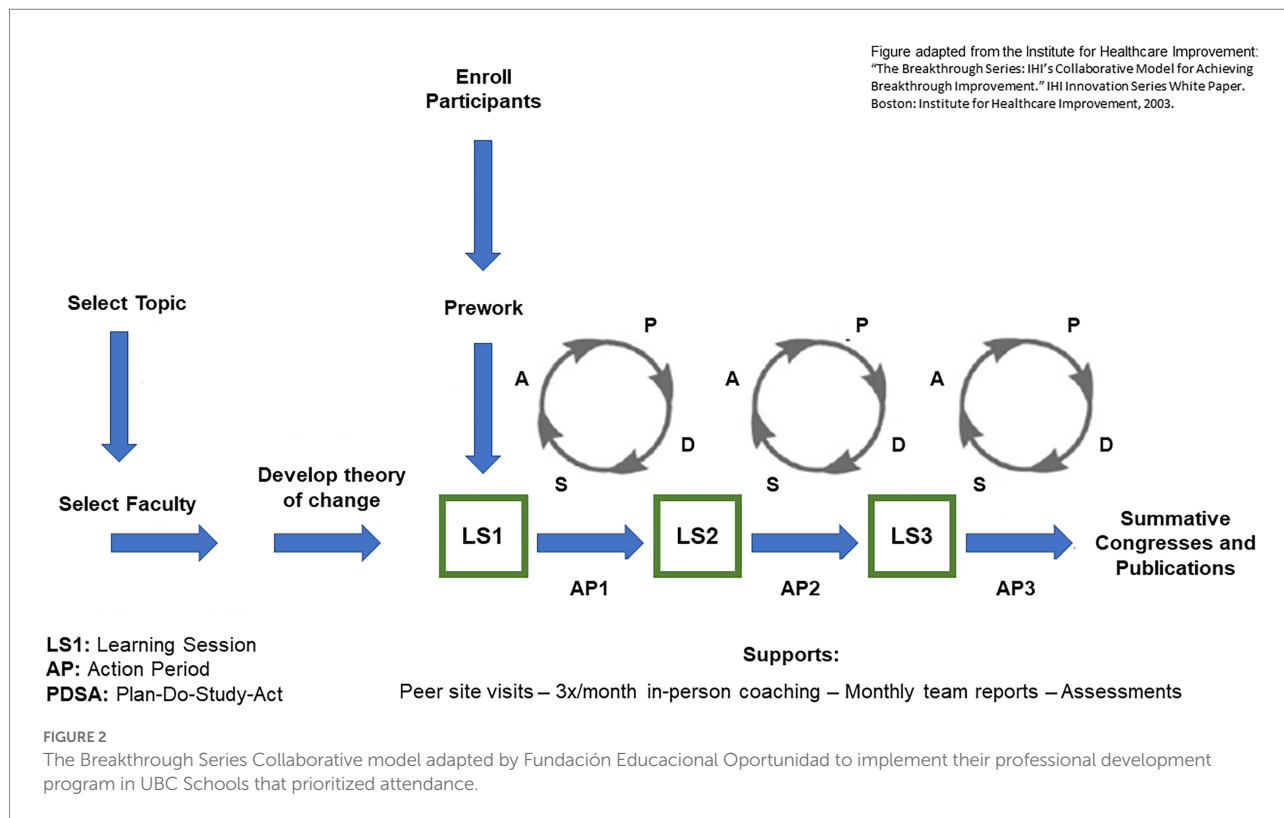
	March 2014	April 2014	May 2014	June 2014	July 2014	August 2014	September 2014	October 2014	November 2014	December 2014	March 2015	April 2015	May 2015	June 2015	July 2015	August 2015	September 2015	October 2015	November 2015	December 2015	
Attendance panel	1	5	5	5	5	4	1	2	3	3	2	5	5	1	1	1				1	
Parent-teacher meetings	5				5	1	2	4	4	2	2	5	2	2	2	1	1				
Absenteeism Committee			5									8	5	2	3	4	2	4		4	
Incentives for children						4		1	3			3	7	1	1	1				1	
Incentives for families				4	1							5	1			1	3	2			
Success plan													6	1	1	6					
Health corner					5																5

school-based teams at Learning Sessions three times during each school year to learn UBC’s theory of change and to form a peer Learning Network, where UBC Schools shared their learning, data, successes, and failures. In total, school teams met six times over 24 months. Three times in 2 years, OFE organized cross-school visits, in which 3–5 school-based teams visited a peer school selected by the OFE team to model their application of the intervention strategies, observed their work, and engaged in a reflection and feedback discussion. Each month, teams tested interventions using Plan-Do-Study-Act (PDSA) cycles, reported measures, and participated in UBC coaching.

Each UBC school received three on-site coaching sessions per month (April–June and August–November 2014 and 2015). Two coaching sessions focused on implementation of UBC language strategies; these 2-h sessions included a “pre” classroom session (Plan implementation of a UBC activity), followed by in-classroom observed activity implementation (Do), then a “post” classroom session where the teacher and coach reflected on what worked well and what to change the next time the teacher implemented that UBC strategy (Study and Act). The third coaching session each month focused on applying CQI methods to support implementation of each school’s priority area of intervention: coaches reviewed with teachers the interventions tested and supported data analysis—for example, examining graphs of daily attendance over time, noting when certain interventions were implemented, and observing trends and shifts in the data and their relationship to interventions tested.

UBC Field Coordinators delivered the coaching sessions. These were trained preschool teachers with Master’s degrees in Educational Leadership. Every 2 or 3 months, UBC Area Coordinators accompanied the Field Coordinators in coaching sessions to provide content expertise on the UBC strategies that schools were testing in their priority area of intervention. The Attendance Coordinator focused mostly on completion of PDSA cycles and data review to detect improvements in attendance and adjust implementation for individual children who were at risk for chronic absenteeism. The Attendance Coordinator was a social worker with a Master’s degree in Family Sciences and a certificate in CQI Methods. Field Coordinators and Area Coordinators used a modeling-to-scaffolding approach—for example, in the first coaching session of the month, a Field Coordinator might lead an intervention with support from the teacher and the teachers’ aide; then, during the second coaching session, the teacher or teachers’ aide would lead with support from the coach. Thus, the role of the UBC team evolved, as the school-based team practiced and developed greater comfort and capacity implementing the UBC intervention strategies.

To support data-driven decision-making in implementation, OFE developed an online attendance data platform. Recognizing that all schools in Chile are required to submit individual-level attendance data each month to the Ministry of Education *via* an online portal (described below, see Procedures and Definition of Variables), OFE contracted a software engineer to develop a digital platform that could read



the schools' MINEDUC attendance data reports and create a database that calculated the percent of schooldays attended to date for each child, marking in yellow the children who attended less than 90% of school days to date. OFE's CQI Coordinator, a sociologist with a Master in Social Research methodologies, defined the platform's capabilities and supervised the software engineer's work; the Attendance Coordinator tested the platform and refined its use cases. At first, the CQI Coordinator collected all the schools' MINEDUC reports from schools and uploaded them. In coaching sessions, the Attendance Coordinator supported school-based Attendance Committees in viewing and using the data to identify students in need of individualized intervention. Over time, schools saw that uploading the MINEDUC data was easy and useful, and they became responsible for managing their own data independently, with training and technical documents provided by OFE's CQI Coordinator.

OFE's Director of Implementation led UBC program implementation, including coordination between OFE staff and stakeholders from municipalities and schools. She is a former history teacher with a Masters in Educational Management and certificate in CQI methods. Beginning in 2013, she visited the Director of Educational Administration (*Director de Administracion Educacional Municipal*, DAEM) of every municipality in the VI Region. She offered UBC participation to all schools and explained that the UBC program is free of cost for municipalities and school leaders who committed to (a) provide classroom coverage so that teachers and teachers' aides can

participate in Learning Sessions and coaching sessions, and (b) apply measurement instruments and report data for CQI and program evaluation. Prior to UBC implementation, every DAEM with schools interested in participating in UBC signed an agreement committing to those conditions. During UBC implementation, every month, OFE's Director of Implementation met with each DAEM to monitor implementation and discuss any concerns – concerns raised by schools, challenges the Director of Implementation noted herself (e.g., regarding school-based teams not attending Learning Sessions or not submitting data), or feedback from UBC coaches. UBC Field Coordinators communicated directly with DAEMs to coordinate month-to-month activities with schools, including coaching sessions.

2.3. Intervention study

During the second half of 2013, all schools in the VI Region were offered the choice of receiving UBC professional development in 2014–2015. Twenty-seven schools did not participate.

Nineteen schools opted to participate in UBC; a subset of five schools with six preschool classrooms prioritized attendance. Thus, these schools paid special attention to the regular and rigorous application of the attendance-promoting strategies, and they received more intensive coaching in this area – for example, their third coaching session focused on applying CQI methods to implement attendance strategies and included support from the Attendance Coordinator every other month.

TABLE 3 Characteristics of the analytical sample.

2011–2017	UBC schools that prioritized attendance	UBC schools that did not prioritize attendance	Comparison schools	Total	p-Value ^d
N schools	5	14	27	46	
N rural schools	5	14	20	39	
N municipal schools	5	13	27	37	
N voucher schools	0	1	0	10	
N classrooms	6	19	42	67	
Average N preschool children ^a , total (range)	104 (83–126)	300 (274–317)	814 (742–865)	1,218 (1,099–1,308)	
Average N children per preschool classroom (range)	18 (5–39)	16 (4–45)	19 (1–44)	18 (1–45)	0.01
Average N matriculated children per school (range)	156 (77–254)	159 (72–363)	195 (16–825)	180 (16–825)	0.64
Average N students living in poverty ^b (range)	112 (44–166)	123 (59–252)	147 (11–565)	120 (11–565)	0.62
Average % students living in poverty ^b (range)	71.4 (57.1–80.6)	78.4 (64.0–92.2)	75.1 (58.1–86.1)	75.7 (57.1–92.2)	0.22
Average N students living in extreme poverty ^c (range)	65 (25–79)	80 (36–127)	94 (4–369)	87 (4–369)	0.57
Average % students living in extreme poverty ^c (range)	42.4 (29.9–52.3)	52.3 (34.8–72.9)	46.9 (24.1–65.0)	48.1 (24.1–72.9)	0.19
Pre-intervention (2011–2012) average % schooldays absent (range)	12.0 (0–86.7)	10.8 (0–90.3)	13.2 (0–82.5)	12.5 (0–90.3)	<0.001
Pre-intervention (2011–2012) average % of CA children	46.2	38.6	53.9	49.6	<0.001

IQR, interquartile range; %, Percentage; CA, chronically absent. ^aThese represent individual children in each year; the evolution of an individual child's attendance across the years cannot be examined. ^bStudents from families within the 20% most vulnerable. ^cStudents from families within the 5% most vulnerable. Citation: JUNAEB: Ministerio de Educación. "IVE." Government Website. Accessed September 13, 2022. <https://www.junaeb.cl/ive?lang=en>. ^dDifferences tested using ANOVA for all variables, except for the pre-intervention average percent of chronically absent children, which was tested using a Chi-square test.

2.4. Procedures and definition of variables

In Chile, data on attendance and absences for all students matriculated in public schools for preschool (prekindergarten and kindergarten), primary and secondary education are registered by teachers once a day. Schools submit individual student-level daily attendance data to a centralized database each month (the Ministry of Education's General Information System for Students; *Sistema de Informacion General de Estudiantes*, SIGE). The Ministry of Education's Study Center processes and compiles attendance data into national monthly databases that are available to the public (MINEDUC, n.d.). Each database contains individual, student-level data, including a unique identification number, gender, birthdate, and daily attendance, as well as the following variables: number of schooldays in the month, classroom, school, year, region, rurality, and administration (municipal, voucher, cooperative administration). Chile can be considered one of the forerunners in the world in systematically collecting individual-level school attendance and absenteeism data among all students who attend public schools. This innovation is consistent with a broader commitment to open data: MINEDUC's open data website offers the greatest access to disaggregated data in education among all OECD countries, with individual, de-identified data for students from prekindergarten through doctoral studies (MINEDUC, n.d.).

For this study, the attendance databases were downloaded for all months from March 2011 to December 2017 (MINEDUC, n.d.). It is important to note that, in Chile, the school year begins in March and ends in December. Monthly databases were reduced to include only schools in the VI Region with preschool classrooms and then merged to form a single database with individual-level daily attendance for all children matriculated in preschool in the VI Region between 2011 and 2017.

For each child, the percentage of days absent in each month and year was calculated by dividing the number of days absent by the number of school days in that month and year, respectively. The total number of school days was not an approximation; each school reported the exact number of school days monthly to MINEDUC via SIGE. The number of school days per year varied by school ($M = 162$ days, $SD = 23.7$), and there was a small (1–2 days) but significant difference between the average number of school days by group ($p = 0.04$, see Table 3). A child was classified with chronic absenteeism if he or she missed more than 10% of days in the year. For each child, days were counted from the first month the child attended until the child withdrew from school. A child was considered withdrawn if (a) he or she appeared with attendance at another school and did not return to the original school, or (b) he or she was absent four consecutive months and did not return. Thus, the population of children varies from month to month, incorporating children when they enter school and eliminating children when they leave, and the percentage of days absent is

based only on school days that occurred while the child was still enrolled. It was not possible to follow the behavior of the children from one year to another since each child's unique identifier is not retained from year to year.

For each school, the average of the percentage of days absent per child each month and for the year was calculated by dividing the sum of the number of days absent by the sum of the number of schooldays for all enrolled children. Children were classified as chronically absent if they were absent for more than 10% of the schooldays for which they were enrolled. The percentage of children with chronic absenteeism was calculated for each year.

2.5. Definition of the sample

All children were included in the analyses except 90 children who appeared to attend more than one school in the same month. Children who were enrolled for less than 4 months were examined to determine whether their limited data caused extreme values; they were included because they were not outliers and there were very few of them (e.g., out of 1,485 children with data in 2011, 8 children were enrolled for fewer than 80 days).

Schools were included that had preschool classrooms with pre-intervention data (from 2011 and/or 2012), intervention period data (2014–2015), and post-intervention data (2016–2017). Data from 2013 were not considered, as the MINEDUC databases lacked data for the first 5 months of the school year. There were no other exclusion criteria. All schools were from Chile's VI region and were classified according to their exposure to the UBC Program implemented in 2014–2015: "UBC schools that prioritized attendance" participated in UBC and selected attendance as their priority area. "UBC schools that did not prioritize attendance" participated in UBC but selected other UBC areas as their priority area, and "Comparison schools" did not participate in UBC. Eight schools that had some classrooms that participated in UBC and other classrooms that did not participate in UBC were excluded from the analyses, for a cleaner comparison.

To examine how similar the three groups of schools were before the intervention, we compared data from the beginning of 2014 for the average number of students per preschool classroom, the number and proportion of students living in poverty (20% most vulnerable), and the number and proportion of students living in extreme poverty (5% most vulnerable; IVE, n.d.). These data are from the National System of Assignment with Equity (*Sistema Nacional de Asignación con Equidad*, SINA), which measures a vulnerability index for every household using data from public social support programs that the government provides to families with limited income, such as public health insurance and cash assistance (i.e., "the Ethical Family Income"; *¿Cómo Funciona El Sinae?*, n.d.). These data are matched to the student body of each classroom at the beginning of each school year and are published by September each year; they approximate pre-intervention time. Moreover, school-level vulnerability

indices vary very little (less than two percentage points) between 2013 and 2014 (IVE, n.d.). We also compare the average number of schooldays per year, and the pre-intervention (2011–2012) absenteeism rate and percent of children with chronic absenteeism.

Table 3 describes the characteristics of the analytical sample, which includes attendance data for an average of 1,218 children per year; the exact number varied between 1,099 and 1,308 children per year between 2011 and 2017. These children attended 46 schools: 5 UBC Schools that prioritized attendance, 14 UBC Schools that did not prioritize attendance, and 27 Comparison Schools.

Most of the schools were rural (39 of 46 schools, or 83%). All UBC Schools that prioritized attendance were rural, and all but one of the UBC Schools that did not prioritize attendance were rural. All UBC schools that prioritized attendance and Comparison Schools were municipal public schools, as well as 13 of the 14 UBC Schools that did not prioritize attendance. The one remaining UBC School that did not prioritize attendance was a voucher school (see Table 3).

There were no differences between groups in the number of matriculated students, the proportion of students living in extreme poverty, nor the proportion of students living in poverty. Of note, in all three groups, approximately half of students were living in extreme poverty and three quarters were living in poverty.

There were small but significant differences between the groups' average number of children per classroom (range = 16–19 children) and the average number of school days per year (range = 162.4–164.2 days). There were also differences between groups' pre-intervention absenteeism and chronic absenteeism. On average, for UBC Schools that prioritized attendance, UBC Schools that did not prioritize attendance, and Comparison Schools, absenteeism rates were 12.0, 10.8, and 13.2%, respectively, and the percent of children with chronic absenteeism rates was 46.2, 38.6 and 53.9%, respectively.

2.6. Analysis

To answer the first research question – what was the rate of absences and chronic absenteeism in preschools in the VI region between 2011 and 2017? – we calculated the average days absent per child and the proportion of children with chronic absenteeism for all schools together and for each subgroup separately: Comparison Schools, UBC Schools that did not prioritize attendance, and UBC Schools that prioritized attendance. We tested for differences in averages across groups using ANOVA and Chi-square tests.

To examine differences in the evolution of absences and chronic absenteeism between UBC Schools that prioritized attendance, UBC Schools that did not prioritize attendance, and Comparison Schools (research question 2), data were analyzed in time series using two methods: Statistical Process Control charts and Interrupted Time Series Analysis.

Statistical Process Control (SPC) chart (also called Shewhart charts) are well-established methods that can identify changes that are unlikely due to chance alone and allow inferences to be drawn from the temporal relationships of interventions and results (Shewhart, 1930; Deming, 1986; Provost, 2011; Provost and Murray, 2011b; Green et al., 2012; Gessa et al., 2022; Sivena and Nikolaidis, 2022). SPC charts plot time series data with three lines: a central line representing the expected mean value, and regression-based control limits (CLs) that bound expected variation, typically set at 3 standard deviations (SDs) above and below the mean. The central line is based on data before the intervention; in this case, mean baseline absenteeism was calculated from 18 datapoints from 2011 and 2012. The standard deviation is calculated from the baseline mean and the denominator, using the formula appropriate to the type of data and its distribution – in this case, child-school days in each month and the binomial distribution (for each day, each child is either present or absent). Thus, the CLs are stepped because they reflect changes in the sample sizes, and they control for differences in sample size between groups and over time. The CLs are set 3SDs above and below the mean so that standard rules can be applied to identify changes in the data that have a less than 5% probability of occurring by chance alone: one or more point outside the CL, eight or more points in a row above or below the mean (“shift”), five consecutive points increasing or decreasing (“trend”), and two of three points outside 2SDs (Perla et al., 2011). Following best practices, when shifts occurred, we calculated the average of the eight points and extended that new mean absenteeism central line into the future to be used for identification of any further changes.

SPC chart interpretation involves comparing changes in the data with timing of UBC attendance promotion and absenteeism prevention strategies from Tables 1, 2, which allows inferences to be drawn about which strategies or combination of strategies are associated with changes in absenteeism, as well as inferences about how long the UBC intervention needs to be implemented before an effect may be seen. In addition, creating separate SPC charts for UBC Schools that prioritized attendance, UBC Schools that did not prioritize attendance, and Comparison Schools facilitates comparison of the evolution of absences and chronic absenteeism across groups and consideration of whether detected changes might be due to secular changes that occurred simultaneously, but not related, to the intervention. However, SPC methods lack causal inference.

Therefore, as a secondary approach to assess UBC’s impact on absenteeism, we also conducted Interrupted Time Series (ITS) analysis for multiple group comparisons. ITS is a strong quasi-experimental design that accounts for pre-existing and secular trends in the outcome (EPOC, n.d.; Penfold and Zhang, 2013; Bernal et al., 2017). ITS uses statistical models to estimate and compare the preintervention to postintervention intercepts (i.e., comparison of levels) and preintervention to postintervention slopes (i.e., comparison of trends). A change in level (a jump or drop in the outcome after the intervention) represents an abrupt intervention effect; a change in trend (an increase or decrease in the slope of the segment after the intervention) represents a

gradual change in the value of the outcome (Linden, 2015). ITS can estimate the effects of multiple treatment periods (Linden, 2015, 2017).

We estimated an ordinary least squares (OLS) regression model with percent absent as the dependent variable and time, intervention period (pre versus post), and the time-by-period interaction as the independent variables. Calendar month was used as the unit of time. Because UBC was implemented over 2 years with some intervention strategies deployed in year one (2014) and different intervention strategies added in year two (2015) and considering that the SPC charts demonstrated an upward shift in 2014 for UBC schools that did not prioritize attendance and a downward shift in 2015 for UBC schools that did prioritize attendance, we used an ITS model to estimate the effects of two treatment periods. We compared 18 months of pre-intervention data (2011–2012) with 9 months of year 1 intervention data (March–November 2014) and 27 months of post-year-two intervention data (2015–2017). To account for autocorrelation, we used Newey–West standard errors, and we set lag to 9 (inclusive of all data in a school year, March through November) because attendance data within a school year is known to be correlated (Balfanz and Byrnes, 2012). A Cumby-Huizinga test suggested that this model could correctly account for autocorrelation structure (Cumby and Huizinga, 1992).

To analyze the effect of UBC on chronic absenteeism (CA), neither SPC charts nor ITS analysis could be applied due to the limited number of datapoints: since CA is defined based on a full school year’s data, there are only six CA datapoints in this sample. ITS typically requires 8 pre-intervention and 8 post-intervention datapoints (Penfold and Zhang, 2013); SPC charts calculate baseline mean from 12 to 20 datapoints (Provost and Murray, 2011a). Therefore, chronic absenteeism was analyzed using time series run charts with a central line only, and they are interpreted using visual analysis alone (Provost and Murray, 2011a).

Database preparation, descriptive analyses and ITS analyses were performed using the software package STATA SE, version 14.2 (StataCorp, College Station, TX). All tests were two-tailed, and alpha was set at 0.05. SPC charts were constructed using QIMacros (Arthur, n.d.).

3. Results

Research question 1: What were the rates of absences and chronic absenteeism in preschools in the VI region between 2011 and 2017?

Table 4 shows that between 2011 and 2017, children enrolled in Region VI preschools were absent for 14.2% of school days, on average. Average rates for that period were similar across the three subgroups: children were absent for 14.4% of school days in Comparison Schools, 14.0% in UBC Schools that did not prioritize attendance, and 14.2% in UBC Schools that prioritized attendance. There was more variation among the UBC Schools that prioritized attendance: in the school with the lowest absenteeism, the children were absent for 10.4% of the school days, while in the school with

TABLE 4 Average percent of days absent per child and the percent of children with chronic absenteeism in preschools in the VI Region.

Average, 2011–2017	Total	Comparison schools	UBC schools that did not prioritize attendance	UBC schools that prioritized attendance
Percent of days absent per child	14.2 (10.4–17.3)	14.4 (12.1–16.3)	14.0 (10.8–15.3)	14.2 (10.4–17.3)
Percent of children with chronic absenteeism	52.1 (33.5–68.9)	50.9 (33.5–68.9)	51.2 (40.3–57.1)	54.2 (35.3–62.0)

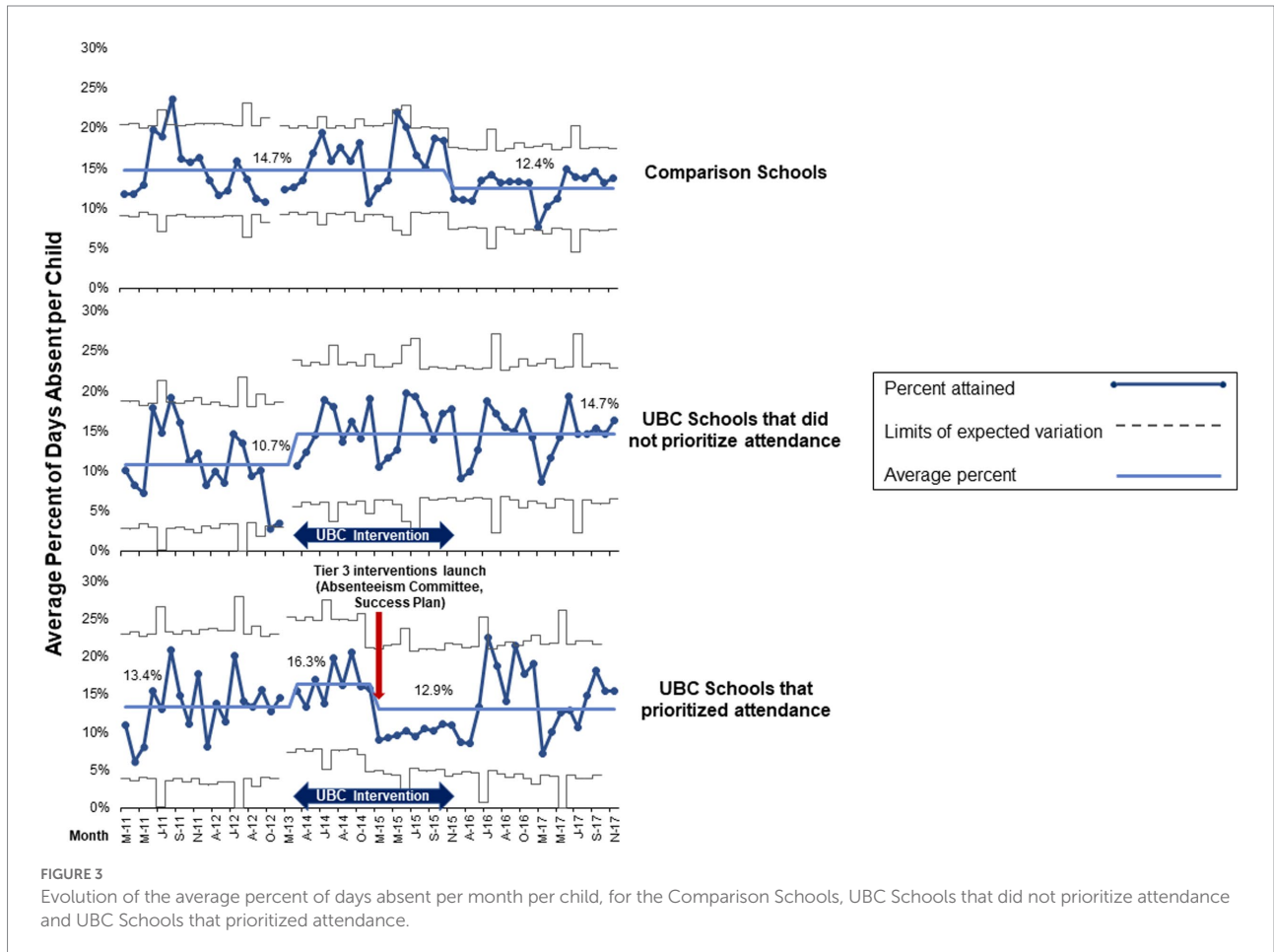


FIGURE 3 Evolution of the average percent of days absent per month per child, for the Comparison Schools, UBC Schools that did not prioritize attendance and UBC Schools that prioritized attendance.

the highest absenteeism, the children were absent for 17.3% of the school days.

On average between 2011 and 2017, the percentage of children with chronic absenteeism – those who missed more than 10% of school days – was 52.1% for the whole sample. In Comparison Schools, 50.9% of children were chronically absent. In UBC Schools that did not prioritize attendance, 51.2% of children were chronically absent, and in UBC Schools that prioritized attendance, 54.2% of children were chronically absent (see Table 4).

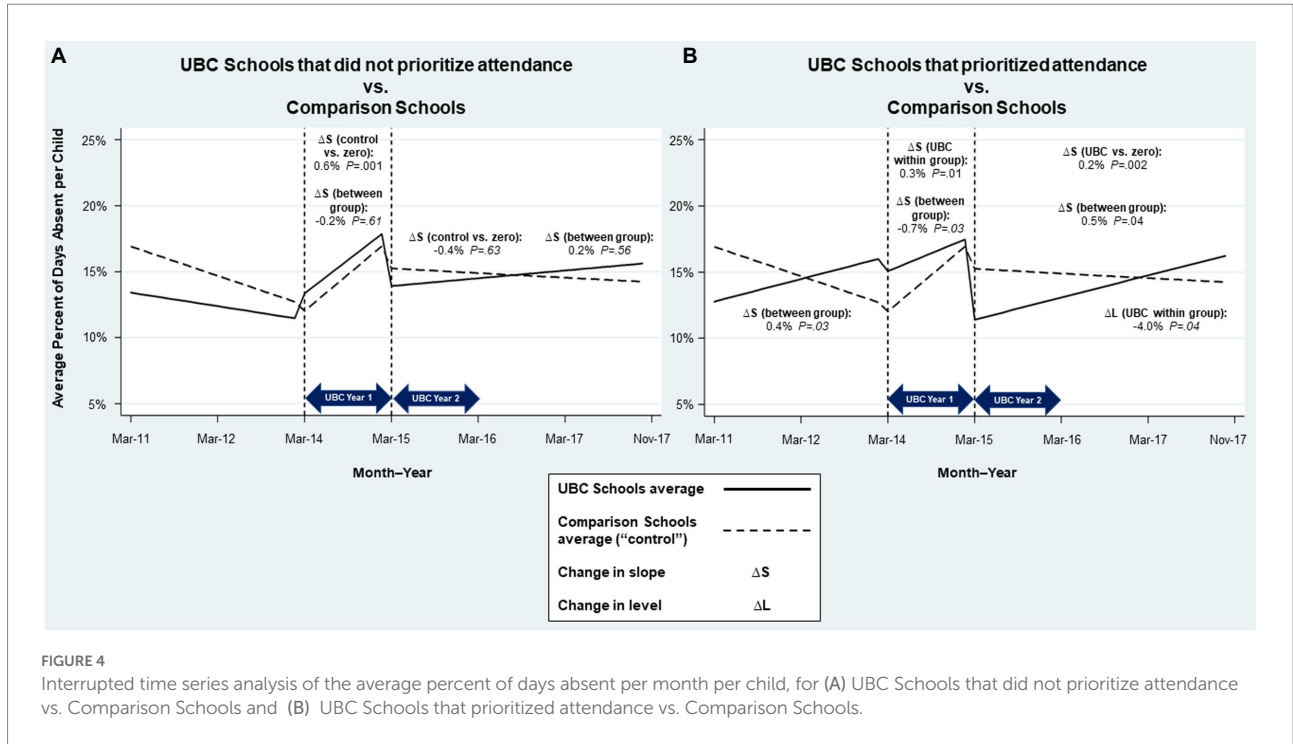
Research question 2: Is there a difference in the evolution of absences and chronic absenteeism between these three groups of schools?

- a. Schools that did not participate in *Un Buen Comienzo* (27 Comparison Schools),

- b. Schools that participated in *Un Buen Comienzo* in 2014 and 2015 but did not choose attendance as their priority area (14 UBC Schools that did not prioritize attendance), and.
- c. Schools that participated in *Un Buen Comienzo* in 2014 and 2015 and chose attendance as their priority area (5 UBC Schools that prioritized attendance).

Figure 3 illustrates the evolution of the average percentage of days absent per child each month from 2011 through 2017 using Statistical Process Control charts.

In the Comparison Schools, children were absent an average of 14.7% of school days between 2011 and 2012 (baseline) and throughout 2014–2015. Beginning in April 2016, there is a downward shift– i.e., a series of eight points in a row below the



baseline – with a new average value of 12.4% that was sustained through the end of the study period (2017).

In UBC Schools that did not prioritize attendance, children were absent for an average of 10.7% of school days between 2011 and 2012. Beginning in March 2014, there is an upward shift to 14.7% that remained stable through the end of 2017.

In UBC Schools that prioritized attendance, children were absent for an average of 13.4% of school days between 2011 and 2012. Beginning in March 2014, there is an upward shift to 16.3% that lasts through November 2014. Beginning in March 2015, there is a downward shift to 12.9% that is sustained through the end of 2017.

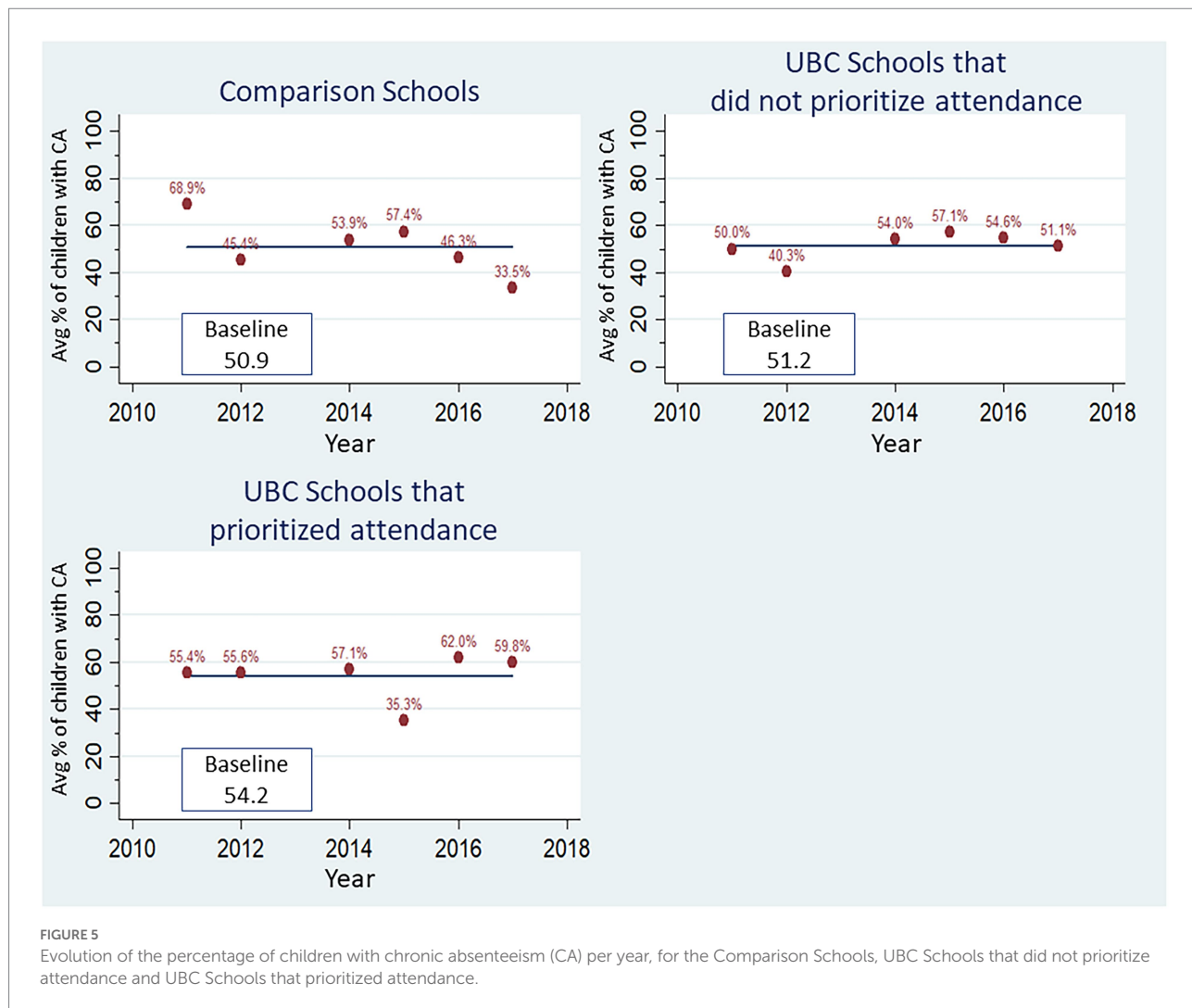
Figure 4 presents the results of Interrupted Time Series analyses. Comparison schools (Figures 4A,B) prior to the intervention had baseline absence level of approximately 16.9% and a downward slope that was not statistically significant ($-0.035, p = 0.13$). At the first year of intervention, Comparison Schools had no change in absence level ($-0.004, p = 0.75$) but demonstrated an upward change in slope that was statistically significantly different from pre-intervention slope ($0.009, p = 0.003$) and different from zero ($0.006, p = 0.001$). This means that during 2014, Comparison schools' absence rates were rising by 0.6% each month. At the second year of intervention, Comparison Schools again exhibit no change in absence level ($-0.023, p = 0.18$). There is a decrease in slope that was statistically significantly different from their own 2014 slope ($-0.007, p = 0.002$) but indistinguishable from zero ($-0.004, p = 0.63$).

Comparing UBC Schools that did not prioritize attendance to Comparison Schools (Figure 4A), there were no differences in baseline level of absence ($-0.035, p = 0.16$) nor pre-intervention slope ($0.001, p = 0.55$). There were no differences in change in absence levels nor slopes between these two groups at the first year

of intervention ($0.024, p = 0.19$ and $-0.002, p = 0.61$, respectively) nor at the second year of intervention ($-0.022, p = 0.26$ and $0.002, p = 0.56$, respectively). Like the Comparison Schools, at the first year of intervention, UBC Schools that did not prioritize attendance had no change in absence level ($-0.0044, p = 0.75$) and a statistically significant upward slope ($0.006, p < 0.001$) that reversed at the second year of intervention and was not different from zero ($0.001, p = 0.18$).

In other words, Comparison Schools and UBC Schools that did not prioritize attendance had similar and stable absence rates before 2014 and again 2015–2017. In 2014, absence rates rose for both groups by approximately 0.6 percentage points each month ($p < 0.01$ for both).

Figure 4B presents the ITS comparison of UBC Schools that prioritized attendance versus Comparison Schools. There was no difference in baseline level of absence ($0.023, p = 0.07$). There is a small, statistically significant difference in pre-intervention slope ($0.004, p = 0.03$), indicating that absences were rising over time in the UBC Schools that prioritized attendance by roughly 0.4 percentage points per month. In the first year of intervention, UBC Schools that prioritized attendance had no change in absence level ($-0.007, p = 0.70$), but there is a change in slope that represents a small increase compared to their own pre-intervention rising trend ($0.003, p = 0.01$) but is negative when compared to the Comparison Schools' change in slope ($-0.007, p = 0.03$). In other words, during the first year of the intervention, absence rates in the UBC Schools that prioritized attendance were rising more quickly than they had been prior to 2014, but significantly less quickly than the rise in absence rates in Comparison Schools. In the second year of intervention, UBC schools that prioritized attendance experienced a statistically significant drop in absence



level ($-0.041, p=0.04$). They continued to demonstrate positive slope that was different from zero ($0.002, p=0.002$) and different from the Comparison Schools' 2015–2017 slope ($0.005, p=0.04$).

In summary, before 2014, absence rates in UBC Schools that prioritized attendance were similar in level to the other two groups, but they were rising. In 2014 (UBC's first year), absence rates rose less quickly in UBC schools that prioritized attendance than the other schools, and in 2015 (UBC's second year), absence rates dropped by 4 percentage points. However, from 2015 to 2017, absence rates in UBC schools that prioritized attendance were rising again, while those of the other two groups stabilized.

Figure 5 shows the evolution of the average percentage of children with chronic absenteeism in each group of schools. From 2011 to 2017, the average percentage of children with chronic absenteeism was 50.9% in Comparison Schools and 51.2% in UBC Schools that did not prioritize attendance. The evolution over time has a similar shape in these two groups: lower in 2012 than 2011, higher in 2014, rising in 2015 and lower in 2016 and 2017. The UBC Schools that prioritized attendance had an average of 54.2% of children with chronic absenteeism from 2011 to 2017, and the

evolution over time is quite stable, except for 2015, when the percentage of children with chronic absenteeism was 35.0%.

4. Discussion

Since discovering high rates of chronic absenteeism among Chilean preschool children and the moderating effect of absenteeism on the UBC program's impact, Fundación Educacional Oportunidad has played a leading role in raising awareness in Chile's early childhood community about the importance of regular attendance, and in developing and testing strategies to promote attendance and prevent absences and chronic absenteeism. This study is the first to analyze the effects of these innovations using national Ministry of Education data of 7,310 children enrolled in public preschool in Region VI over 7 years (totaling 63,689 child-months of data). It replicated two important findings from earlier UBC-related research (Arbour et al., 2016) and reports two new findings. First, the percentage of school days missed by children enrolled in prekindergarten and kindergarten in Chilean municipal schools is,

on average, higher than the threshold that affects skill development in the medium term and that can reduce or eliminate the impact of high-quality early childhood education. Second, more than half of the children enrolled in prekindergarten and kindergarten are absent for more than 10% of school days. Third, these analyses provide, for the first time, evidence that it is possible to reduce the school days lost to absences and reduce the percentage of children with chronic absenteeism with rigorous and systematic application of strategies that, on one hand, promote regular attendance by all children and, on the other, address the specific causes of absences of individual children at risk of chronic absenteeism. Finally, obtaining and sustaining improvements in attendance can be supported using networked peer learning and continuous improvement methodology (i.e., Breakthrough Series Collaborative).

Between 2011 and 2017, children enrolled in preschools in Region VI were absent, on average, for 14% of school days – more than the 10% associated with poorer school performance in first and fifth grade (Chang and Romero, 2008), and higher than the level that hindered the positive impact that UBC can have on children's learning (Arbour et al., 2016). The magnitude of absences and chronic absenteeism across all schools (Comparison Schools, UBC Schools that did not prioritize attendance, and UBC Schools that prioritized assistance) indicates that this problem is widespread and enduring. These findings are consistent with one study from Uruguay that reported that one third of children enrolled in preschool were absent for more than 15% of school days (Díaz et al., 2020). Data from around the world about daily attendance by preschoolers is scant (most studies have focused on preschool attendance as a binary variable, more reflective of preschool access and uptake; Gong et al., 2015; Boo, 2016; Delprato et al., 2016; Woldehanna, 2016; Sun et al., 2018; Su et al., 2020). This study and emergent literature suggest that levels of absences among children enrolled in early childhood education in the global majority may be high and reinforces that efforts to achieve the United Nation's Sustainable Development Goal 4.2 (i.e., by 2030, ensure that all children have access to quality early childhood development, care and pre-primary education so they are prepared for primary education) should include attention to attendance promotion and absenteeism prevention (UN General Assembly, 2015).

The results of this study also offer insights into how to promote attendance and address absenteeism, given the differences in the evolution of the percentage of days absent per child. Prior to and throughout UBC implementation, Comparison schools demonstrated stably high absenteeism levels (14.7% with no shift on SPC charts, 16.9% with no change in level by ITS). UBC Schools that did not prioritize attendance—despite lower baseline absence rates (10.7% in 2011 and 2012)—experienced a shift and subsequently matched Comparison school rates (14.7% from 2014 to 2017 on SPC charts, no differences identified by ITS).

In contrast, the UBC Schools that prioritized attendance show a favorable evolution of the percentage of days absent per child. They began with an intermediate level of absenteeism (13.4%), which rose to 16.3% in March 2014 and then dropped to 12.9% in March 2015 and continues through the end of 2017. ITS analyses identified a similar reduction (four percentage points) and suggest

that it can be attributed to UBC participation. This represents an average of 7 fewer days absent per child during that year. The percentage of children with chronic absenteeism in UBC Schools that prioritized attendance also decreased in 2015 to 35.0% of children, from more than 50% of children who were chronically absent in 2011 and 2012. This means that 16 additional children (of the 104 children enrolled in UBC Schools that prioritized attendance) reached the attendance threshold at which the UBC Program was shown to confer a positive impact on language development (Arbour et al., 2016).

These effects are larger than those of some other promising interventions in the emergent early absenteeism literature that apply a single strategy. Text-based interventions have been shown to reduce chronic absenteeism from 63 to 55.3% of children enrolled in Head Start classrooms in Chicago (Kalil et al., 2021), and from 26 to 13% of children enrolled in kindergarten in Pittsburgh (Smythe-Leistico and Page, 2018). A text-based intervention for parents of children enrolled in prekindergarten and kindergarten in Uruguay increased attendance by 0.32–0.68 days over the 13-week period among children whose baseline attendance was in the 25th, 50th and 75th quantiles (Díaz et al., 2020). A mail-based intervention decreased chronic absenteeism from 5.5 to 4.6% of children in 10 preschools in California (Robinson et al., 2018). Although these interventions had smaller impacts than those of UBC, they are significantly less costly than the set of interventions described in this study and may prove more feasible for certain contexts.

The reductions in absences and chronically absent children occurred in the second year of UBC implementation and coincide with an increase in the number and types of attendance strategies that were applied. As seen in Tables 1, 2, during 2014, 65 of the 70 tests focused on raising awareness or motivating all children and guardians through the application of the Attendance Panel, the parent-teacher meetings, the Health Corner, and incentives for children and/or families.

During 2015, UBC Schools that prioritized attendance continued applying these strategies and added 46 tests of two strategies focused on children at risk of chronic absenteeism: the Success Plan and the Attendance Committee. The Success Plan, adapted from Attendance Works in the United States (Attendance Works, n.d.), was an instrument that showed families their child's absences and the number of absences that remained before they developed “chronic absenteeism,” and then asked the family to outline a plan with goals and strategies to prevent chronic absenteeism. The Attendance Committee, a school-level, multidisciplinary team, aimed to accompany children at risk of chronic absenteeism in a personalized way. Attendance Committees met monthly to review data, identify children at risk for chronic absenteeism, discuss suspected causes of those absences, and design specific strategies for working with each child and family.

Both of these strategies incorporated several best practices reported in the literature (Reid, 2013; Kearney, 2016; Chu et al., 2019): they analyzed and made use of their collected attendance data, identified causes of absenteeism, and provided attendance feedback to key stakeholders, including principals, counselors and

parents. Prior research has described that the extent to which schools maximize the potential of attendance data depends on certain preconditions, including data literacy (Mandinach, 2012; Keppens et al., 2019). UBC coaches supported teams to develop data literacy skills and processes for effective cross-hierarchical teamwork: they modeled facilitation of the first meetings, provided resources such as sample meeting agendas and slide decks, and gradually transitioned responsibilities to local school leaders. The standing agenda provided structure for the Committee to review data, identify children at-risk for chronic absenteeism and ask, “what happened?”: for each child, the Committee sought to identify the root cause(s) of his or her absences and select an intervention strategy to address the root cause(s). Regular monthly meeting times facilitated the use of evaluative and iterative strategies, including setting clear goals for individual families, testing a specific strategy with that family to overcome a specific barrier to attendance, and soliciting feedback from families about what worked or why something failed. By including parents and other school staff who were often members of the child and family’s community (e.g., cafeteria worker), discussions in Attendance Committee meetings often surfaced information that teachers and principals might not know was instrumental in shaping the approach to working with the family – in one case, one parent worked nights during specific seasons; in another, intrafamilial violence contributed to a child’s absences. The Attendance Committee exemplifies an incremental, iterative, data-driven, and family-centered approach to attendance promotion and absenteeism prevention that has been proposed in the past (Cook et al., 2019; Lyon et al., 2019).

In addition to increasing and diversifying strategies, the UBC Learning Network, modeled after the Breakthrough Series Collaborative, provided a forum where UBC Schools that prioritized attendance supported one another and shared their learning, data, successes, and failures. The opportunities for collaborative work provided through the network were intended to advance their common goal: “to promote school attendance and reduce chronic absenteeism. In the years after participating in the UBC intervention, in UBC Schools that prioritized attendance, chronic absenteeism returned to levels similar to other schools and to their own pre-intervention rates, and absence rates demonstrated less stability (greater variation on SPC charts and continued trend to rise by 0.2 percentage points per month, according to the ITS analysis). These findings – that the reductions in absenteeism observed in 2015 do not persist over time – suggest that the BTS implementation strategy played an important role in supporting the teams to achieve improvements. It is well-established in the literature that coaching in addition to didactic professional development is more effective than didactic instruction alone (Landry et al., 2009; Neuman and Cunningham, 2009; Zaslow et al., 2010; Egert et al., 2018; Kraft et al., 2018). This initiative integrated UBC’s coaching-based professional development with BTS’ continuous quality improvement and collaborative learning: it is doubtful that the same results would be attained if these same multi-tiered intervention components were introduced without the structured implementation strategy.

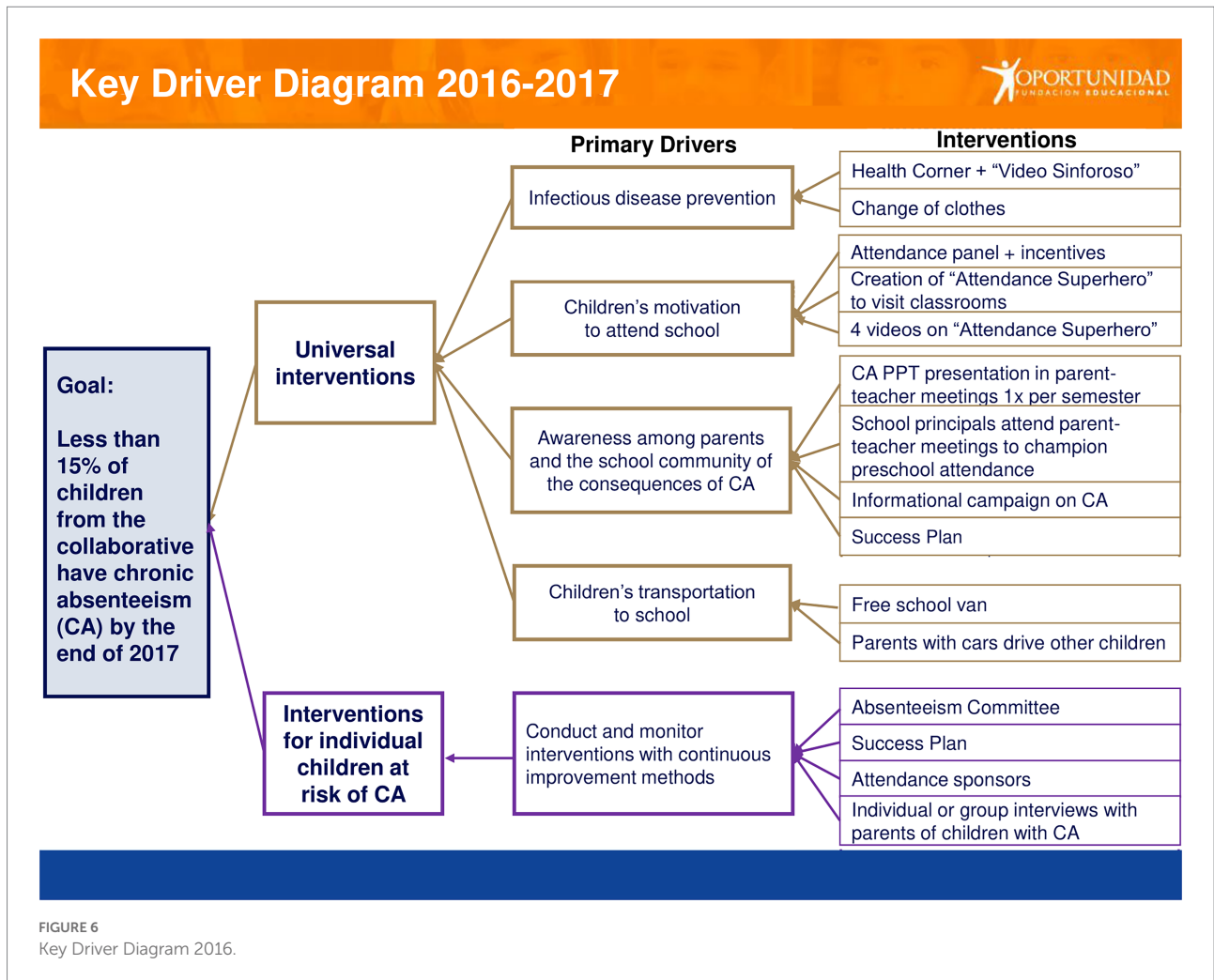
Two unexpected findings warrant comment. First, UBC Schools that did not prioritize attendance demonstrated an upward shift in

absence from 10.7% in 2011–2012 to 16.7% 2014–2017. ITS analyses suggest that this is secular trend, not related to UBC implementation: all three groups’ absence rates had a positive slope during 2014, and there was no difference between this group and the Comparison schools. It is possible that this represents regression toward the mean: this group of schools had the lowest absenteeism among schools in our sample prior to UBC implementation in the VI Region, and perhaps relatedly, they prioritized one of the other two UBC intervention areas (Effective Interactions or Instructional Time). A related hypothesis is that asking school teams to identify a single priority area within the UBC intervention unintentionally causes a ‘trade off’ – a deprioritization of attendance that resulted in increased absenteeism in schools that focused on effective interactions or instructional time. In fact, data from the UBC Program show that UBC Schools that did not prioritize attendance applied few attendance strategies, and with less frequency and intensity than the UBC Schools that prioritized attendance.

The second unexpected finding was that Comparison schools experienced a downward shift in absenteeism that began in April 2016 and continued through 2017. The present analyses cannot elucidate causes of this observed decrease, nor speculate about why UBC schools were not affected similarly.

4.1. Future learnings and innovations

Based on the achievements obtained by the UBC Schools that prioritized attendance, at the end of 2015, Fundación Educacional Oportunidad refined the driver diagram to incorporate the key learnings for new schools in an ongoing expansion in 2016–2017 (see Figure 6). First, they made explicit that it is essential to work on “Universal” strategies that aim to improve the attendance of all children and “Individual” strategies that aim to work with children at risk of chronic absenteeism – identifying the causes and designing with the family specific strategies to support them (Kearney et al., 2019). This modification aligns with a multi-tiered system of support model that has been used in education for many years, an adaptation of which was developed and proposed for school attendance and absenteeism in 2019. Second, the diagram was simplified to include only the most proven and effective strategies, resulting in a set of five successful strategies known to promote preschool attendance and reduce chronic absenteeism in Chile. UBC teams also added interventions for future testing, which emerged from the literature or frontline teams. Third, although all the schools that participated in UBC worked to promote attendance, previous studies and the present analyses confirm that reducing chronic absenteeism requires the rigorous and systematic application of attendance strategies reinforced by regular monitoring of real-time data and team-based problem-solving, and that hard-won improvements will disappear over time without intentional support for implementation (Chu et al., 2019; Cook et al., 2019; Lyon et al., 2019). Moreover, even the lower absenteeism rates among UBC Schools that did not prioritize attendance exceeded the levels associated with poorer academic performance. Therefore, beginning in 2016, OFE revised its



implementation strategy so that all participants of the UBC Program must work on attendance using the continuous improvement methodology as an integral and essential part of the intervention. Lastly, in 2017, OFE partnered with municipal leadership to create and administer the UBC Learning Network which invites all schools that graduate from 2 years of intensive intervention in the UBC Program to participate in an ongoing community of schools that aims to maintain gains and foster a spirit of continuous and collaborative learning.

4.2. Limitations

The selection of volunteer sites to implement UBC limits generalizability. Differences in baseline absence rates is controlled for by SPC and ITS methods, but there was a difference in the pre-intervention slope of absence rates of UBC Schools that prioritized attendance and Comparison Schools. This likely contributed to the choice these schools made to prioritize attendance; it also raises concern for selection bias. There were

no known simultaneous attendance interventions for preschools in the VI Region at the time of the UBC intervention, and in their absence, we would expect rising absence rates to bias our findings toward the null. Nonetheless, differences in baseline trends in absence rates introduces some uncertainty in the causal inference provided by ITS. Another study limitation is the inability to tease apart which intervention strategies were most responsible for the decreased absenteeism. From SPC charts and ITS models with two intervention periods, it appears that the interventions added in 2015 have a greater impact on attendance; however, it is not possible to know how much of the 2015 impact is due to added interventions versus lagged impact of the intervention strategies introduced in 2014. The implementation strategy, as applied in this case, represents a high-intensity and higher-cost intervention than many single-tier attendance interventions in the literature. It is important to recognize that UBC aims to improve other outcomes alongside attendance (i.e., instructional time and effective interactions), and that its infrastructure supports other intervention elements as well. Nonetheless, this approach may not be affordable in all contexts.

5. Conclusion

UBC's innovations demonstrate what can happen when key leaders – from an early childhood education foundation and its partners in national and local government and within schools – commit to discovering new ways to promote attendance and prevent problematic absences. OFE curated a theory of change with universal and targeted strategies and developed a data platform that used data the schools already collected to create an early detection system, analyzing individual-level attendance data in real-time. School-based attendance committees brought together school leaders, teachers, and families to review data together monthly, to activate universal strategies and deploy targeted strategies with individual families at-risk for chronic absenteeism, which began with identifying root causes of student absences — i.e., beginning with ‘what happened?’ All of this led to measurable improvements in attendance among children enrolled in public preschools that participated in UBC and applied continuous quality improvement methods to improve children's attendance and maximize their opportunities for learning.

In addition, through its Learning Network, OFE created a community and a movement focused on improving presence and participation in preschool that persists. The Learning Network not only invited schools to pursue a shared goal using a common theory of change and measures, but importantly, it facilitated learning between peers and across traditional hierarchies. At Learning Network convenings, school-based teams shared failures and successes with other teams and with local and national Chilean stakeholders, they encouraged one another, and they contributed to refinement and further dissemination of the theory of change. The ongoing UBC Learning Network, co-administered by OFE and its municipal partners, supports a community of schools to maintain gains and foster continuous and collaborative learning. It may serve as an example for others who seek to partner with parents and other stakeholders to support student engagement in their education.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and

institutional requirements. Written informed consent from the participants' legal guardian/next of kin was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

MA, SA, PM, and MM designed and planned the study. MA, SA, CS, YA, and PM structured and analyzed the data. MA wrote the manuscript. All authors interpreted the data, took responsibility for the integrity and accuracy of the data analysis and the decision to submit this manuscript for publication, read and approved the final manuscript.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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References

Adlerstein, C., Manns, P., and Gonzalez, A. (2016). El Ambiente Físico de Aprendizaje Como Tercer Educador.

Allen, C. W., Diamond-Myrsten, S., and Rollins, L. K. (2018). School absenteeism in children and adolescents. *Am. Fam. Physician* 98, 738–744.

- Allensworth, E. M., and Easton, J. Q. (2007). "What matters for staying on-track and graduating in Chicago Public High Schools: a close look at course grades, failures, and attendance in the freshman year" in *Consortium on Chicago School Research* (Chicago, IL: Consortium on Chicago School Research, The University of Chicago)
- Arbour, M., Mackrain, M., Cano, C., Atwood, S., and Dworkin, P. (2021). National home visiting collaborative improves developmental risk detection and service linkage. *Acad. Pediatr.* 21, 809–817. doi: 10.1016/j.acap.2020.08.020
- Arbour, M. C., Mackrain, M., Fitzgerald, E., and Atwood, S. (2019). National Quality Improvement Initiative in home visiting services improves breastfeeding initiation and duration. *Acad. Pediatr.* 19, 236–244. doi: 10.1016/j.acap.2018.11.005
- Arbour, M. C., Yoshikawa, H., Atwood, S., Duran, F. R., Godoy, F., Trevino, E., et al. (2015). Quasi-experimental study of a learning collaborative to improve public preschool quality and Children's language outcomes in Chile. *BMJ Qual. Safte.* 24, 727.1–727.727. doi: 10.1136/bmjqs-2015-ihlabstracts.11
- Arbour, M. C., Yoshikawa, H., Willett, J., Weiland, C., Snow, C., Susana Mendive, M., et al. (2016). Experimental impacts of a preschool intervention in Chile on Children's language outcomes: moderation by student absenteeism. *J. Res. Educ. Effect.* 9, 117–149. doi: 10.1080/19345747.2015.1109013
- Arthur, J. (n.d.). *QI Macros User Guide. QI Macros*. Denver, CO: KnowWare international, Inc.
- Attendance Works (n.d.) Attendance Works. Available at: <https://www.attendanceworks.org/> (Accessed December 13, 2021).
- Baker, M. L., Sigmon, J. N., and Nugent, M. E. (2001). "Truancy reduction: keeping students in school" in *Juvenile Justice Bulletin NCJ-188947* (Washington, DC: Department of Justice, Office of Juvenile Justice and Delinquency Prevention)
- Balfanz, R., and Byrnes, V. (2012). *The Importance of Being There: A Report on Absenteeism in the Nation's Public Schools*. Baltimore, MD: Johns Hopkins University Center for Social Organization of Schools.
- Berg, T. A.-R. (2018). *Can We Increase Attendance and Decrease Chronic Absenteeism with a Universal Prevention Program? A Randomized Control Study of Attendance and Truancy Universal Procedures and Interventions*. Oregon: University of Oregon.
- Bernal, J. L., Cummins, S., and Gasparrini, A. (2017). Interrupted time series regression for the evaluation of public health interventions: a tutorial. *Int. J. Epidemiol.* 46, 348–355. doi: 10.1093/ije/dyw098
- Boo, F. L. (2016). Socio-economic status and early childhood cognitive skills: a mediation analysis using the young lives panel. *Int. J. Behav. Dev.* 40, 500–508. doi: 10.1177/0165025416644689
- Britto, P. R., Yoshikawa, H., and Boller, K. (2011). Quality of early childhood development programs in global contexts: rationale for investment, conceptual framework and implications for equity and commentaries. *Soc. Policy Rep.* 25, 1–31. doi: 10.1002/j.2379-3988.2011.tb00067.x
- Bryk, A. S., Gomez, L. M., and Grunow, A. (2011). "Getting ideas into action: building networked improvement communities in education" in *Frontiers in Sociology of Education*. ed. M. T. Hallinan (Dordrecht: Springer Netherlands), 127–162.
- Camilli, G., Vargas, S., Ryan, S., and Steven Barnett, W. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teach. Coll. Rec.* 112, 579–620. doi: 10.1177/016146811011200303
- Chang, H. N., and Romero, M. (2008). *Present, Engaged, and Accounted for: The Critical Importance of Addressing Chronic Absence in the Early Grades*. New York: National Center for Children in Poverty, Columbia University.
- Chen, L., Jennison, B. L., Yang, W., and Omaye, S. T. (2000). Elementary school absenteeism and air pollution. *Inhal. Toxicol.* 12, 997–1016. doi: 10.1080/08958370050164626
- Chu, B. C., Guarino, D., Mele, C., O'Connell, J., and Coto, P. (2019). Developing an online early detection system for school attendance problems: results from a research-community partnership. *Cogn. Behav. Pract.* 26, 35–45. doi: 10.1016/j.cbpra.2018.09.001
- Clark, N. M., Brown, R., Joseph, C. L. M., Anderson, E. W., Liu, M., and Valerio, M. A. (2004). Effects of a comprehensive school-based asthma program on symptoms, parent management, grades, and absenteeism. *Chest* 125, 1674–1679. doi: 10.1378/chest.125.5.1674
- ¿Cómo Funciona El Sinae? (n.d.) Government website. JUNAEB: Ministerio de Educación. Available at: <https://www.junaeb.cl/como-funciona-el-sinae?lang=en> (Accessed December 13, 2022).
- Cook, C. R., Lyon, A. R., Locke, J., Waltz, T., and Powell, B. J. (2019). Adapting a compilation of implementation strategies to advance school-based implementation research and practice. *Prevent. Sci.* 20, 914–935. doi: 10.1007/s11211-019-01017-1
- Cumby, R. E., and Huizinga, J. (1992). Testing the autocorrelation structure of disturbances in ordinary least squares and instrumental variables regressions. *Econometrica* 60, 185–195. doi: 10.2307/2951684
- Cunha, F., and Heckman, J. (2007). The technology of skill formation. *AEA Papers Proc.* 97:17.
- Delprato, M., Dunne, M., and Zeitlyn, B. (2016). Preschool attendance: a multilevel analysis of individual and community factors in 21 low and middle-income countries. *Int. J. Quantitat. Res. Educ.* 3:1. doi: 10.1504/IJQRE.2016.073633
- Deming, W. E. (1986). *Out of the Crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.
- Díaz, M. M., Luna, L. B., Hernández-Agramonte, J. M., López, F., Alfaro, M. P., and Echeverría, A. V. (2020). Nudging Parents to Increase Preschool Attendance in Uruguay. *Working Paper, IDB Working Paper Series*. Inter-American Development Bank.
- Ebert, L., Amaya-Jackson, L., Markiewicz, J. M., Kisiel, C., and Fairbank, J. A. (2012). Use of the breakthrough series collaborative to support broad and sustained use of evidence-based trauma treatment for children in community practice settings. *Adm. Policy Ment. Health Ment. Health Serv. Res.* 39, 187–199. doi: 10.1007/s10488-011-0347-y
- Egert, F., Fukkink, R. G., and Eckhardt, A. G. (2018). Impact of in-service professional development programs for early childhood teachers on quality ratings and child outcomes: a meta-analysis. *Rev. Educ. Res.* 88, 401–433. doi: 10.3102/0034654317751918
- Ehrlich, S. B., Gwynne, J. A., Pareja, A. S., Allensworth, E. M., Moore, P., Jagesic, S., et al. (2014). *Preschool Attendance in Chicago Public Schools: Relationships With Learning Outcomes and Reasons for Absences*. University of Chicago Consortium on Chicago School Research. Chicago, IL.
- Eklund, K., Burns, M. K., Oyen, K., DeMarchena, S., and McCollom, E. M. (2022). Addressing chronic absenteeism in schools: a meta-analysis of evidence-based interventions. *Sch. Psychol. Rev.* 51, 95–111. doi: 10.1080/2372966X.2020.1789436
- Engle, P. L., Fernald, L. C. H., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., et al. (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet (London, England)* 378, 1339–1353. doi: 10.1016/S0140-6736(11)60889-1
- EPOC (n.d.) "What study designs should be included in an EPOC review and what should they be called?" Cochrane effective practice and organisation of care. Available at: <https://epoc.cochrane.org/sites/epoc.cochrane.org/files/public/uploads/EPOC%20Study%20Designs%20About.pdf> (Accessed December 13, 2022).
- Epstein, J. L., and Sheldon, S. B. (2002). Present and accounted for: improving student attendance through family and community involvement. *J. Educ. Res.* 95, 308–318. doi: 10.1080/00220670209596604
- Evans, D. K., and Acosta, A. M. (2021). *How to Measure Student Absenteeism in Low- and Middle-Income Countries, Working Paper 600*. Washington, DC: Center for Global Development.
- Flamm, B. L., Berwick, D. M., and Kabcenell, A. (1998). Reducing cesarean section rates safely: lessons from a 'breakthrough series' collaborative. *Birth* 25, 117–124. doi: 10.1046/j.1523-536x.1998.00117.x
- Fowler, M. G., Johnson, M. P., and Atkinson, S. S. (1985). School achievement and absence in children with chronic health conditions. *J. Pediatr.* 106, 683–687. doi: 10.1016/S0022-3476(85)80103-7
- Fretheim, A., and Tomic, O. (2015). Statistical process control and interrupted time series: a Golden opportunity for impact evaluation in quality improvement. *BMJ Qual. Safte.* 24, 748–752. doi: 10.1136/bmjqs-2014-003756
- FunOportunidad, dir (2015). Basta de Yo No Fui – Ausentismo Crónico Temprano. Available at: <https://www.youtube.com/watch?v=U9jsu-QbNHM> (Accessed September 30, 2022).
- Gessa, A., Marin, E., and Sancha, P. (2022). A practical application of statistical process control to evaluate the performance rate of academic Programmes: implications and suggestions. *Qual. Assur. Educ.* 30, 571–588. doi: 10.1108/QAE-03-2022-0065
- Glasgow, R. E., Funnell, M. M., Bonomi, A. E., Davis, C., Beckham, V., and Wagner, E. H. (2002). Self-management aspects of the improving chronic illness care breakthrough series: implementation with diabetes and heart failure teams. *Ann. Behav. Med.* 24, 80–87. doi: 10.1207/S15324796ABM2402_04
- Gong, X., Di, X., and Han, W.-J. (2015). Household income and preschool attendance in China. *Child Dev.* 86, 194–208. doi: 10.1111/cdev.12294
- Gottfried, M. A. (2011). The detrimental effects of missing school: evidence from urban siblings. *Am. J. Educ.* 117, 147–182. doi: 10.1086/657886
- Gottfried, M. A., and Gee, K. A. (2017). Identifying the determinants of chronic absenteeism: a bioecological systems approach. *Teach. Coll. Rec.* 119, 1–34. doi: 10.1177/016146811711900704
- Green, K. W., Toms, L., and Stinson, T. (2012). Statistical process control applied within an education services environment. *Acad. Educ. Leader J.* 16:33.
- Gubbels, J., van der Put, C. E., and Assink, M. (2019). Risk factors for school absenteeism and dropout: a meta-analytic review. *J. Youth Adolesc.* 48, 1637–1667. doi: 10.1007/s10964-019-01072-5

- Guevara, J. P., Wolf, F. M., Grum, C. M., and Clark, N. M. (2003). Effects of educational interventions for self Management of Asthma in children and adolescents: systematic review and meta-analysis. *BMJ* 326, 1308–1309. doi: 10.1136/bmj.326.7402.1308
- Henry, K. L., Knight, K. E., and Thornberry, T. P. (2012). School disengagement as a predictor of dropout, delinquency, and problem substance use during adolescence and early adulthood. *J. Youth Adolesc.* 41, 156–166. doi: 10.1007/s10964-011-9665-3
- Hibbett, A., and Fogelman, K. (1990). Future lives of truants: family formation and health-related behaviour. *Br. J. Educ. Psychol.* 60, 171–179. doi: 10.1111/j.2044-8279.1990.tb00934.x
- IVE. (n.d.) Government website. JUNAEB: Ministerio de Educación. Available at: <https://www.junaeb.cl/ive/?lang=en> (Accessed December 13, 2022).
- Kalil, A., Mayer, S. E., and Gallegos, S. (2021). Using behavioral insights to increase attendance at subsidized preschool programs: the show up to grow up intervention. *Organ. Behav. Hum. Decis. Process.* 163, 65–79. doi: 10.1016/j.obhdp.2019.11.002
- Kearney, C. A. (2016). *Managing School Absenteeism at Multiple Tiers: An Evidence-Based and Practical Guide for Professionals*. Oxford: Oxford University Press.
- Kearney, C. A., and González, C. (2022). Unlearning school attendance and its problems: moving from historical categories to postmodern dimensions. *Front. Educ.* 7:977672. doi: 10.3389/feduc.2022.977672
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. J. (2019). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 1). *Front. Psychol.* 10:2222. doi: 10.3389/fpsyg.2019.02222
- Kearney, C. A., and Graczyk, P. A. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child. Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Keppens, G., Spruyt, B., and Dockx, J. (2019). Measuring school absenteeism: administrative attendance data collected by schools differ from self-reports in systematic ways. *Front. Psychol.* 10:2623. doi: 10.3389/fpsyg.2019.02623
- Kilo, C. M. (1998). A framework for collaborative improvement: lessons from the Institute for Healthcare Improvement's breakthrough series collaborative. *Qual. Manag. Health Care* 6, 1–14. doi: 10.1097/00019514-199806040-00001
- Kim, C. H., Lieng, M. K., Rylee, T. L., Gee, K. A., Marcin, J. P., and Melnikow, J. A. (2020). School-based telemedicine interventions for asthma: a systematic review. *Acad. Pediatr.* 20, 893–901. doi: 10.1016/j.acap.2020.05.008
- Kraft, M. A., Blazar, D., and Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: a meta-analysis of the causal evidence. *Rev. Educ. Res.* 88, 547–588. doi: 10.3102/0034654318759268
- Landry, S. H., Anthony, J. L., Swank, P. R., and Monseque-Bailey, P. (2009). Effectiveness of comprehensive professional development for teachers of at-risk preschoolers. *J. Educ. Psychol.* 101, 448–465. doi: 10.1037/a0013842
- Lansford, J. E., Dodge, K. A., Pettit, G. S., and Bates, J. E. (2016). A public health perspective on school dropout and adult outcomes: a prospective study of risk and protective factors from age 5 to 27 years. *J. Adolesc. Health* 58, 652–658. doi: 10.1016/j.jadohealth.2016.01.014
- Latif, A., Choudhary, A. I., and Hammayun, A. A. (2015). Economic effects of student dropouts: a comparative study. *J. Glob. Econ.* 3:137. doi: 10.4172/2375-4389.1000137
- Leape, L. L., Kabacennell, A. I., Gandhi, T. K., Carver, P., Nolan, T. W., and Berwick, D. M. (2000). Reducing adverse drug events: lessons from a breakthrough series collaborative. *Joint Comm. J. Qual. Improv.* 26, 321–331. doi: 10.1016/S1070-3241(00)26026-4
- LeMahieu, P. G., Grunow, A., Baker, L., Nordstrum, L. E., and Gomez, L. M. (2017). Networked improvement communities: the discipline of improvement science meets the power of networks. *Qual. Assur. Educ.* 25, 5–25. doi: 10.1108/QAE-12-2016-0084
- Levine, J. R. (1992). The effect of different attendance policies on student attendance and achievement. Available at: <https://eric.ed.gov/?id=ED348762> (Accessed September 30, 2022).
- Leyva, D., Christina Weiland, M., Barata, H. Y., Snow, C., Treviño, E., and Rolla, A. (2015). Teacher-child interactions in Chile and their associations with prekindergarten outcomes. *Child Dev.* 86, 781–799. doi: 10.1111/cdev.12342
- Linden, A. (2015). Conducting interrupted time-series analysis for single- and multiple-group comparisons. *Stata J.* 15, 480–500. doi: 10.1177/1536867X1501500208
- Linden, A. (2017). A comprehensive set of Postestimation measures to enrich interrupted time-series analysis. *Stata J.* 17, 73–88. doi: 10.1177/1536867X1701700105
- Lyon, A. R., Cook, C. R., Locke, J., Davis, C., Powell, B. J., and Waltz, T. J. (2019). Importance and feasibility of an adapted set of implementation strategies in schools. *J. Sch. Psychol.* 76, 66–77. doi: 10.1016/j.jsp.2019.07.014
- Mandinach, E. B. (2012). A perfect time for data use: using data-driven decision making to inform practice. *Educ. Psychol.* 47, 71–85. doi: 10.1080/00461520.2012.667064
- Marchbanks, M. P., III, Blake, J. J., Smith, D., Seibert, A. L., Carmichael, D., Booth, E. A., et al. (2014). More than a drop in the bucket: the social and economic costs of dropouts and grade retentions associated with exclusionary discipline. *J. Appl. Res. Child.* 5:71.
- Mauro, C. F., and Machell, K. A. (2019). “Chapter 20- when children and adolescents do not go to school: terminology, technology, and trends” in *Pediatric Anxiety Disorders*. eds. S. N. Compton, M. A. Villabó and H. Kristensen (Cambridge, MA: Academic Press), 439–460.
- Mazerolle, L., Antrobus, E., Bennett, S., and Eggins, E. (2017). Reducing truancy and fostering a willingness to attend school: results from a randomized trial of a police-school partnership program. *Prev. Sci.* 18, 469–480. doi: 10.1007/s1121-017-0771-7
- Memoria de la Instalación del Sistema de Protección Integral a la Infancia. (n.d.). CUATRO AÑOS CRECIENDO JUNTOS: Memoria de La Instalación Del Sistema de Protección Integral a La Infancia, Chile Crece Contigo 2006–2010. Santiago: Chile Crece Contigo. Available at: <https://cesfamsi.files.wordpress.com/2010/04/memoria-chile-crece-contigo.pdf> (Accessed December 13, 2021).
- Meneses, A., Rodino, A. M., and Mendive, S. (2017). “Lessons from Costa Rica and Chile for early literacy in Spanish-speaking Latin American countries,” in *The Routledge International Handbook of Early Literacy Education, 1st Edn.* eds. N. Kucirkova, C. E. Snow, V. Grover and C. McBride (Milton Park: Routledge), 124–138.
- MINEDUC (n.d.) “Asistencia Declarada Mensual por Año · MINEDUC.” Ministerio de Educación. Available at: <http://datos.mineduc.cl/dashboards/19844/asistencia-declarada-mensual-por-ano/> (Accessed December 13, 2021).
- Ministerio de Educación (2014). *Estado Del Arte De La Educación Parvularia En Chile*. Santiago: Ministerio de Educación.
- Mizunoya, S., Mitra, S., and Yamasaki, I. (2018). Disability and school attendance in 15 low- and middle-income countries. *World Dev.* 104, 388–403. doi: 10.1016/j.worlddev.2017.12.001
- Monahan, K. C., VanDerhei, S., Bechtold, J., and Cauffman, E. (2014). From the school yard to the squad car: school discipline, truancy, and arrest. *J. Youth Adolesc.* 43, 1110–1122. doi: 10.1007/s10964-014-0103-1
- Monk, D. H., and Ibrahim, M. A. (1984). Patterns of absence and pupil achievement. *Am. Educ. Res. J.* 21, 295–310. doi: 10.3102/00028312021002295
- Myers, R. G. (2005). In Search of Quality in Programmes of Early Childhood Care and Education (Ecce). In: *Background Paper, EFA Global Monitoring Report 2005, The Quality Imperative*. Paris: UNESCO.
- Neuman, S. B., and Cunningham, L. (2009). The impact of professional development and coaching on early language and literacy instructional practices. *Am. Educ. Res. J.* 46, 532–566. doi: 10.3102/0002831208328088
- Nolan, T., Resar, R., Haraden, C., and Griffin, F. A. (2004). “Improving the reliability of health care” in *IHI Innovation Series White Paper* (Boston: Institute for Healthcare Improvement)
- OECD (2018). *Engaging Young Children: Lessons from Research About Quality in Early Childhood Education and Care. Starting strong*. Paris: OECD.
- Penfold, R. B., and Zhang, F. (2013). Use of interrupted time series analysis in evaluating health care quality improvements. *Acad. Pediatr.* 13, S38–S44. doi: 10.1016/j.acap.2013.08.002
- Peralta, M. V. (2011). Early childhood education and public care policies in Chile: a historical perspective to analyze the present. *Int. J. Child Care Educ. Policy* 5, 17–27. doi: 10.1007/2288-6729-5-1-17
- Perla, R. J., Provost, L. P., and Murray, S. K. (2011). The run chart: a simple analytical tool for learning from variation in healthcare processes. *BMJ Qual. Saf.* 20, 46–51. doi: 10.1136/bmjqs.2009.037895
- Proger, A. R., Bhatt, M. P., Cirks, V., and Gurke, D. (2017). *Establishing and Sustaining Networked Improvement Communities: Lessons from Michigan and Minnesota*. Washington, D.C.: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest.
- Provost, L. P. (2011). Analytical studies: a framework for quality improvement design and analysis. *BMJ Qual. Saf.* 20, 192–196. doi: 10.1136/bmjqs.2011.051557
- Provost, L. P., and Murray, S. (2011a). *The Health Care Data Guide: Learning from Data for Improvement*. San Francisco, CA: Jossey-Bass.
- Provost, L. P., and Murray, S. (2011b). *The Health Care Data Guide: Learning from Data Improvement*. Hoboken, NJ: John Wiley & Sons.
- Reid, K. (2013). *Managing School Attendance: Successful Intervention Strategies for Reducing Truancy*. Milton Park: Routledge.
- Robinson, C. D., Lee, M. G., Dearing, E., and Rogers, T. (2018). Reducing student absenteeism in the early grades by targeting parental beliefs. *Am. Educ. Res. J.* 55, 1163–1192. doi: 10.3102/0002831218772274

- Rocque, M., Jennings, W. G., Piquero, A. R., Ozkan, T., and Farrington, D. P. (2017). The importance of school attendance: findings from the Cambridge study in delinquent development on the life-course effects of truancy. *Crime Delinq.* 63, 592–612. doi: 10.1177/0011128716660520
- Romero, M., and Lee, Y.-S. (2008). "The influence of maternal and family risk on chronic absenteeism in early schooling" in *National Center for Children in Poverty* (New York, NY: National Center for Children in Poverty)
- Sachs, J., and Weiland, C. (2010). Boston's rapid expansion of public school-based preschool: promoting quality, lessons learned. *Young Child.* 65, 74–77.
- Schady, N., Behrman, J., Araujo, M. C., Azuero, R., Bernal, R., Bravo, D., et al. (2015). Wealth gradients in early childhood cognitive development in five Latin American countries. *J. Hum. Resour.* 50, 446–463. doi: 10.3368/jhr.50.2.446
- Sheldon, S. B. (2007). Improving student attendance with school, family, and community partnerships. *J. Educ. Res.* 100, 267–275, 328. doi: 10.3200/JOER.100.5.267-275
- Shewhart, W. A. (1930). Economic quality control of manufactured Product1. *Bell Syst. Tech. J.* 9, 364–389. doi: 10.1002/j.1538-7305.1930.tb00373.x
- Singh, K., Brodish, P., Speizer, I., Barker, P., Amenga-Etego, I., Dasoberi, I., et al. (2016). Can a quality improvement project impact maternal and child health outcomes at scale in northern Ghana? *Health Res. Policy Syst.* 14:45. doi: 10.1186/s12961-016-0115-2
- Sivena, S., and Nikolaidis, Y. (2022). Improving the quality of higher education teaching through the exploitation of student evaluations and the use of control charts. *Commun. Stat. Simulat. Comput.* 51, 1289–1312. doi: 10.1080/03610918.2019.1667390
- Smolkowski, K., Seeley, J. R., Gau, J. M., Dishion, T. J., Stormshak, E. A., Moore, K. J., et al. (2017). Effectiveness evaluation of the positive family support intervention: a three-tiered public health delivery model for middle schools. *J. Sch. Psychol.* 62, 103–125. doi: 10.1016/j.jsp.2017.03.004
- Smythe-Leistico, K., and Page, L. C. (2018). Connect-text: leveraging text-message communication to mitigate chronic absenteeism and improve parental engagement in the earliest years of schooling. *JESPAR* 23, 139–152. doi: 10.1080/10824669.2018.1434658
- Sosu, E. M., Dare, S., Goodfellow, C., and Klein, M. (2021). Socioeconomic status and school absenteeism: a systematic review and narrative synthesis. *Rev. Educ.* 9:e3291. doi: 10.1002/rev3.3291
- Su, Y., Lau, C., and Rao, N. (2020). Early education policy in China: reducing regional and socioeconomic disparities in preschool attendance. *Early Child. Res. Q.* 53, 11–22. doi: 10.1016/j.ecresq.2020.02.001
- Sun, J., Zhang, L., Chen, E., Lau, C., and Rao, N. (2018). Preschool attendance and executive function mediate early academic achievement gaps in East Asia and the Pacific. *Early Educ. Dev.* 29, 1039–1060. doi: 10.1080/10409289.2018.1498999
- Tandon, D., Mackrain, M., Beeber, L., Topping-Tailby, N., Raska, M., and Arbour, M. C. (2020). Addressing maternal depression in home visiting: findings from the home visiting collaborative improvement and innovation network. *PLoS One* 15:e0230211. doi: 10.1371/journal.pone.0230211
- The Breakthrough Series: IHI's Collaborative Model for Achieving Breakthrough Improvement (2003). *IHI Innovation Series White Paper*. Boston, MA: Institute for Healthcare Improvement.
- Tyler, J., Davies, M., and Bennett, B. (2018). Increasing early childhood education enrolment and attendance rates in South Auckland, New Zealand. *N. Z. Int. Res. Early Child. Educ.* 21, 99–111. doi: 10.3316/informit.263276641913828
- UN General Assembly (2015). Transforming our world: the 2030 agenda for sustainable development. *Refworld* 21:2015.
- Vegas, E., and Santibanez, L. (2009). *The Promise of Early Childhood Development in Latin America*. Washington, D.C.: The World Bank.
- Wang, X., Blomberg, T. G., and Spencer, D. L. (2005). Comparison of the educational deficiencies of delinquent and nondelinquent students. *Eval. Rev.* 29, 291–312. doi: 10.1177/0193841X05275389
- Woldehanna, T. (2016). Inequality, preschool education and cognitive development in Ethiopia: implication for public investment in pre-Primary Education. *Int. J. Behav. Dev.* 40, 509–516. doi: 10.1177/0165025415627700
- Yoshikawa, H., and Kabay, S. B. (2014). The Evidence Base on Early Childhood Care and Education in Global Contexts. In: *Background Paper, UNESCO 2015 Global Monitoring Report on Education for All*. UNESCO. Available at: <https://nyuscholars.nyu.edu/en/publications/the-evidence-base-on-early-childhood-care-and-education-in-global> (Accessed September 30, 2022).
- Yoshikawa, H., Leyva, D., Snow, C. E., Ernesto Treviño, M., Barata, C., Weiland, C., et al. (2015). Experimental impacts of a teacher professional development program in Chile on preschool classroom quality and child outcomes. *Dev. Psychol.* 51, 309–322. doi: 10.1037/a0038785
- Zaslow, M., Tout, K., Halle, T., Whittaker, J. V., and Lavelle, B. (2010). *Toward the Identification of Features of Effective Professional Development for Early Childhood Educators. Literature Review*. Washington, DC: Office of Planning, evaluation and policy development, U.S. department of education.



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Rates of chronic absenteeism in Montessori and non-Montessori Title 1 schools

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In this study, we asked whether Montessori schools, which tend to have high student engagement, are associated with lower average rates of chronic absenteeism and/or smaller racial disparities therein relative to non-Montessori schools. Using data from the Civil Rights Data Collection, we identified a sample of Title 1 Montessori and non-Montessori schools with propensity score matching, and we used multilevel modeling to compare racial disparities in chronic absenteeism rates across school types. There was no significant difference in the average overall rates of chronic absenteeism across school types; nor were there sizable or significant differences in average racial disparities in the rates of chronic absenteeism between Black and White or Hispanic and White students, though Montessori schools had slightly lower average rates for White students. We discuss how shortcomings in the way chronic absenteeism data are collected limit intervention work by preventing researchers from answering questions about *why* students are chronically absent.

KEYWORDS

racial disparities, chronic absenteeism, Montessori education, multilevel modeling, Title 1 schools

Introduction

Nationwide, 10–15% of students in K–12 education are chronically absent, meaning that they have missed at least 10% of the school year (Balfanz and Byrnes, 2012). There are a number of reasons why a student might miss school, including excused absences, like illness or family emergency, and unexcused absences, like skipping school to avoid a bully. In any case, chronic absenteeism is problematic because it is associated with lower academic performance for both the chronically absent student and their classmates, whose learning could be delayed when teachers must spend time catching up one student on material they missed (Gottfried, 2019). Chronic absenteeism may also perpetuate racial disparities in academic achievement; for example, one report found that being chronically absent was especially detrimental to Hispanic students' reading achievement (Chang and Romero, 2008).

1 This article, along with others cited in this manuscript, originally used the term Latino as a racial category to describe participants. The dataset used in our study used the term Hispanic. For consistency, we use the term Hispanic throughout our article, as a 2018 Pew Survey found that the majority of Latino/Hispanic individuals have no preference between the two terms, and Pew themselves, along with other similar organizations, use the terms interchangeably (Lopez et al., 2022).

In this paper, we asked whether a specific alternative system of education, Montessori, is associated with (a) lower average overall rates of chronic absenteeism and/or (b) reduced racial disparities in chronic absenteeism. To date, only one other study has investigated attendance in Montessori schools specifically, and it reported that Montessori students tend to have higher attendance rates than their non-Montessori counterparts (Culclasure et al., 2018). This article is the first to compare chronic absenteeism rates between school types and to consider racial disparities therein. In answering our research questions, we used the same approach as in LeBoeuf et al. (in press) to succinctly analyze racial disparities in count outcomes using multilevel modeling with school-level data. Finally, we discuss the limitations of publicly available data for answering important questions related to chronic absenteeism—namely, *why* students are chronically absent.

Chronic absenteeism

Students with adverse childhoods, students with poor health or disabilities, and economically disadvantaged students are all more likely to be chronically absent (Balfanz and Byrnes, 2012; Gottfried and Gee, 2017; Stempel et al., 2017; Gee, 2018). Because each of these factors disproportionately impact students of color (relative to White students), rates of chronic absenteeism tend to be higher among Black students than White students (Gee, 2018). Racially disparate disciplinary practices may also help explain racial disparities in chronic absenteeism; students of color are suspended at disproportionately high rates (relative to White students), and these missed days are often recorded as unexcused absence (Davis et al., 2019). Nationwide, Black and Hispanic students are, respectively, 1.40 times and 1.17 times more likely than White students to be chronically absent (US Department of Education, 2019). Rates of chronic absenteeism tend to be highest in urban, low-income schools, which serve predominantly Black and Hispanic students (Balfanz and Byrnes, 2012). The effects of poverty, including worse health outcomes, lack of access to reliable transportation, etc., likely explain a large portion of why chronic absenteeism rates tend to be highest in low-income schools (Gee, 2018), which motivates research on this particular population of students.

Many of the risk factors associated with chronic absenteeism (poverty, illness, etc.) are well beyond what a school or district can control, which complicates intervention efforts. However, some districts have reported success in promoting attendance through incentive programs, like a school dance for students whose attendance is above a specified threshold (Epstein and Sheldon, 2002; Balfanz and Byrnes, 2012). Additionally, students with more positive attitudes toward school and with more involved parents tend to have higher attendance rates (Gottfried and Gee, 2017). Effective communication from schools to parents has also been linked to higher daily attendance rates and lower rates of chronic absenteeism (Epstein and Sheldon, 2002). Given these relations, a logical question is whether specific alternative education systems or pedagogies are especially adept at increasing student and family engagement, and thereby at encouraging school attendance. Moreover, knowing which students are most likely to miss school and *why they do* could reveal more avenues for targeted intervention. Effective interventions for lowering rates of chronic absenteeism must focus on both the overall rates and the racial disparities therein (Gee, 2018). As such, research evaluating an

intervention targeting chronic absenteeism must consider whether it is appropriately lowering rates for all student demographic groups.

Montessori

Montessori schools are the most common alternative system of education worldwide (Lillard, 2019). They follow a model—including pedagogy, classroom materials, lessons, and teacher training—originally developed by physician/educator Maria Montessori in Italy early in the 20th century (Montessori, 1912). Montessori classrooms are known for having high levels of student self-determination and individualized instruction (Lillard, 2019). Montessori students exercise free-choice over what they work on and whether they work individually or with peers for 2.5–3-h work periods. Classrooms are mixed-age, with students spanning three-year age ranges, and students have the same teacher for three consecutive years. Every aspect of the classroom, including the schedule, the materials used, and lesson delivery, were thoughtfully designed by Maria Montessori with the goal of maximizing students' interest, concentration, and intrinsic motivation (Montessori, 1912).

Attendance in Montessori schools

Montessori students, relative to conventional-school students, report feeling a stronger sense of community at school (Rathunde and Csikszentmihalyi, 2005; Lillard and Else-Quest, 2006) and enjoying schoolwork more (Lillard et al., 2017). Adults who attended Montessori schools also report remembering liking school more than adults who attended non-Montessori schools (Snyder et al., 2022). Based on these findings, one might expect Montessori students to be more motivated to attend school and thus be less likely to be chronically absent, given that higher student engagement is associated with lower chronic absenteeism (Gottfried and Gee, 2017). Montessori schools are also associated with lower average suspension rates (LeBoeuf et al., in press; Culclasure et al., 2018). Suspensions are typically recorded as unexcused absences, so for students who are suspended multiple days in a given school year, days missed for suspension might push them over the threshold into being considered chronically absent (Davis et al., 2019). It's possible that the lower suspension rates in Montessori schools also lead to fewer chronically absent students.

Parent engagement and communication is also related to chronic absenteeism (Epstein and Sheldon, 2002; Gottfried and Gee, 2017). Montessori wrote explicitly about the importance of parental involvement, and she placed high emphasis on this in her original schools (Montessori, 1912). To whatever extent current Montessori schools are still prioritizing parental involvement, we might expect to see lower rates of chronic absenteeism as a result. Research on parental involvement of Montessori students is limited, but Black and Hispanic parents of Montessori students report satisfaction with their children's schools (Golann et al., 2019). Parents in this study also reported attending multiple parent-education sessions at their children's school to learn about Montessori pedagogy. These types of session are common in Montessori schools because the Montessori system is likely different from what many parents experienced in school unless they attended a Montessori school themselves. These sessions may

also function to improve rapport and communication between parents and schools. However, some Montessori parents also reported wanting more regular assurance that their children were reaching academic milestones and feeling uncertain of the school's academic rigor (Golann et al., 2019), which may be a sign of a lack of communication. If parents are invested in the Montessori method and have consistent communication with the school, they might go to greater lengths to ensure that their children attend school, but if they question the academic program, they might be more permissive of their children missing school.

We know of only one study on attendance in Montessori schools (Culclasure et al., 2018). This study compared attendance rates of all public Montessori students in South Carolina to a sample of demographically matched non-Montessori students. Montessori students in the sample had significantly higher attendance rates than the non-Montessori students, after controlling for family income, race, gender, ESL status, special education status, and grade. The authors included race as a covariate in their OLS model, but they were not investigating potential racial disparities in attendance, so they did not report any results related to racial identity.

Montessori self-selection

Of the nearly 500 public Montessori schools in the United States, the vast majority are school-choice programs (Debs, 2016), meaning that they are either a charter or magnet school. The majority of Montessori parents, then, have either sought out a Montessori school specifically or selected a nearby Montessori school over their neighborhood's public school. This decision might be driven by any number of factors (e.g., convenience, standardized test scores, word of mouth, etc.), but it might reflect characteristics of Montessori parents that differ, on average, from parents who do not opt for a Montessori school, and those differences could relate to school attendance. To date, only a couple of studies have attempted to measure differences between Montessori and non-Montessori parents with American samples (Fleege et al., 1967; Dreyer and Rigler, 1969), and neither reported observing differences. Both studies included parent questionnaires about general parenting practices, and both reported finding no differences between the two groups of parents. For instance, one study reports that “[n]o differences were found between the parents in these schools on such measures of social and parental attitudes and behavior as: achievement orientation, traditional family ideology, dogmatism, anomie, parent control behavior, or task oriented vs. person oriented values” (Dreyer and Rigler, 1969, p. 411). These two roughly 50-year-old studies are not sufficient evidence that there are no unobserved variables related to self-selection into a Montessori school that could confound results when comparing Montessori and non-Montessori students. Self-selection in Montessori schools, therefore, must be considered when comparing the two samples. Here, we use propensity score matching with school-level data to identify a sample of Montessori and non-Montessori schools that are statistically similar on a number of school characteristics related to chronic absenteeism (including school choice status) to compare school-level rates of chronic absenteeism. Propensity score matching is a useful option for reducing the risk of selection bias when other quasi-experimental methods and random assignment are not applicable (Fan and Nowell, 2011).

Method

Sampling and propensity score matching

We followed the same sampling and propensity score matching process as in LeBoeuf et al. (in press), using data from Civil Rights Data Collection's (CRDC) 2017 survey. The CRDC considers a student chronically absent if they have missed 15 or more school days. The CRDC collects data biennially through a survey of every public school in the country—data is reported at the school-level, and completion of the survey is required by the Office of Civil Rights.

We were primarily interested in chronic absenteeism among students from low-income families, as they are more likely to be chronically absent than students from more affluent families (Gottfried and Gee, 2017). Public Montessori schools tend to enroll more economically advantaged students relative to their surrounding districts (Debs, 2016), so socioeconomic status (SES) presents a potential confound in this study. To limit the possibility for SES differences to bias results, we limited our sample to only include schools classified as receiving Title 1 funding, thereby increasing the likelihood that the student SES composition is similar across the two school types. The CRDC also only provides school-level data, which meant we could not identify specific students from low-income families, but focusing on Title 1 schools also made it easier to identify schools that had higher proportions of students from low-income families. Additionally, because we were interested in comparing rates across racial groups, we only included schools that had 5% or more White students and 5% or more Black students and/or 5% or more Hispanic students in order to reduce the likelihood that we would be comparing chronic absenteeism rates representing small numbers of students (these are the same diversity criteria as used in LeBoeuf et al., in press). We searched the CRDC database for schools with names containing the string “Montessori” that were classified as receiving Title 1 funding. This initial search yielded 151 schools. From the initial 151 schools, we made the following removals: 20 were removed because they did not meet our cutoffs for racial diversity; two were removed because their names on their school websites differed from their names in the CRDC datafile; 10 were removed because they were missing chronic absenteeism data; and three were removed because they were missing free or reduced-price lunch (FRPL) data (which we needed for our propensity score matching process). All of which left us with 116 Montessori schools in our sample.

We then identified non-Montessori comparison schools with propensity score matching. We assumed that students who live in the same area are likely to have access to the same public transportation system (or lack thereof), which could relate to school attendance. So our pool of potential matches included all schools in the CRDC's database that were in the same ZIP Codes as the Montessori schools. We initially identified a pool of 1,268 non-Montessori schools. From this pool, 620 schools were removed because they either were not Title 1 schools or were below the racial-diversity threshold described previously; 17 schools were removed because they were missing free and reduced-price lunch data; three schools were removed because they were missing chronic absenteeism data; two schools were removed because they had unique programs or student populations (one school was entirely virtual and the other specifically served deaf and blind students). The final pool of potential matches included 626 schools.

As in LeBoeuf et al. (in press), we then estimated propensity scores (following Stuart, 2010) predicting status as a Montessori or non-Montessori school. The propensity score matching process was iterative, and we used a wide range of covariates: In lieu of extensive previous research indicating specific covariates associated with self-selection into Montessori schools, we followed the “kitchen sink” approach described in Steiner et al. (2015). We estimated propensity scores using the *MatchIt* R package (v4.2.0; Ho et al., 2011) multiple times using different combinations of the following variables (the same variables as used in LeBoeuf et al., in press): binary predictors indicating whether each school offered each grade from preschool to twelfth (since rates of chronic absenteeism vary by grade level (US Department of Education, 2019); the number of students in each school; the proportion of Black, White, Hispanic, and FRPL-qualifying students; the proportion of students with disabilities included in the Individuals with Disabilities Education Act (IDEA) and the proportion of students with disabilities protected by Section 504 of the Rehabilitation Act (504); and binary variables indicating magnet and charter school classification. We used nearest-neighbor matching without replacement, resulting in an equal number of Montessori and non-Montessori schools on each iteration. Within each iteration’s matched sample, we evaluated the standardized mean difference between the Montessori and matched non-Montessori schools on each of the variables listed above. Given that we (a) matched schools on the proportion of students who are Black, White, Hispanic, and FRPL-qualifying and (b) pulled non-Montessori matches from a pool of exclusively Title 1 schools from the same ZIP Codes as the Montessori schools, we argue that socioeconomic status is unlikely to be a meaningful source of bias in the results because average school SES is strongly associated with the surrounding neighborhood and the school’s racial demographics (Orfield and Frankenberg, 2014). Our final non-Montessori sample had no significant standardized mean difference from our Montessori sample on any of the variables listed above except for the proportion of schools that offered sixth grade).

We retrieved chronic absenteeism data for each school in the final sample based on the most recent available CRDC data (survey year: 2017). Our final sample included 232 schools (116 Montessori), representing 94,584 students. Table 1 shows the descriptive statistics of the sample prior to and after the matching process.

Analysis plan

Chronic absenteeism data from the CRDC include the raw count of students who were chronically absent, disaggregated by race, disability status, and gender. The CRDC defines chronic absenteeism as missing 15 or more school days. On average, ~90% of students in each school in our sample were Black, Hispanic, or White, and other racial groups were small, so we focused our analysis on chronic absenteeism of Black, White, and Hispanic students so as to avoid potentially noisy estimates for other racial groups. We summed the number of chronically absent Black, Hispanic, and White students to calculate the total number of chronically absent students in a school. Our resulting variable for total number of chronically absent students does not strictly refer to the *absolute total* number of chronically absent students at each school, because some schools had chronically absent students from other racial groups (albeit very few). Ten schools (seven Montessori; three non-Montessori) had no Black students, and two schools (one Montessori; one non-Montessori) had no Hispanic

students. For these schools, the total number of chronically absent students was calculated based on data for White and Hispanic or White and Black students alone. The CRDC also reports the total number of students in a school and the percentage of students who fall into each racial category. We used these values to compute the total number of students in each racial group at each school.

We were interested in answering the following research questions: (1) whether overall rates of chronic absenteeism differ between school types and (2) whether racial disparities in chronic absenteeism rates differ between school types. To examine whether overall rates of chronic absenteeism differed, we ran the following negative binomial model [as is appropriate with count outcomes (Hilbe, 2014)] predicting counts of chronically absent students and using the log number of students within a school as an offset to account for differences in school size:

$$\log(\text{chronically absent students})_i = \eta_i = \beta_0 + \beta_1 \text{Montessori}_i + \log(\text{racial group size}_i) \quad (1)$$

In this model, *Montessori* is a binary variable indicating whether a school is a Montessori school. *Montessori* refers to the average difference in log counts of chronically absent students between the Montessori and non-Montessori schools, and this value can be exponentiated to be interpreted as the multiplicative difference in the rates (i.e., a *Montessori* coefficient of -0.69 , exponentiated to 0.50 , would suggest the Montessori schools, on average, have 50% fewer chronically absent students as the non-Montessori schools).

To examine whether racial disparities in chronic absenteeism rates between racial groups varied across Montessori and non-Montessori schools, we used a multilevel negative binomial model as in LeBoeuf et al. (in press). We treated the number of chronically absent students in each racial group within a school as multiple nested measurements. We then constructed a multilevel model predicting the number of chronically absent students from dummy variables for Black and Hispanic (with White treated as the reference category), Montessori classification (with non-Montessori treated as the reference category), and the two-way interaction between Montessori classification and each race variable, fitting a random intercept for each school to account for dependencies in schools’ multiple measurements. We included the log count of students in each racial group within a school as an offset to account for differences in the sizes of each group:

$$\log(\text{chronically absent students})_{ij} = \eta_{ij} = \gamma_{00} + \beta_1 \text{Montessori}_j + \beta_2 \text{Hispanic}_{ij} + \beta_3 \text{Black}_{ij} + \beta_4 (\text{Montessori}_j * \text{Hispanic}_{ij}) + \beta_5 (\text{Montessori}_j * \text{Black}_{ij}) + \log(\text{racial group size}_{ij}) + \mu_{0j}, \quad (2)$$

where i indexes measurements within schools, j indexes schools, and μ_{0j} is the random intercept for the j th school. As before, *Montessori* is a binary variable indicating whether a school is a Montessori school. The main effects of *Hispanic* and *Black* in Model 2 refer to the estimated average differences in the log count of chronically absent Hispanic/Black students and the log count of chronically absent White students at non-Montessori schools. The interaction terms capture differences in those differences when

considering Montessori instead of non-Montessori schools. This model compares chronic absenteeism rates between school types, and it compares rates of Black and Hispanic student rates to White student rates within school type. It therefore allowed us to estimate differences in racial disparities between multiple racial groups in one model. White students were made the reference category because White students typically have the lowest rates of chronic absenteeism of the three groups, and we were interested in probing racial disparities in those rates (Gee, 2018).

Although the matched sets of Montessori and non-Montessori schools did not significantly differ on a number of variables (see Table 1), propensity score matching cannot perfectly or completely account for differences on those or additional unmeasured variables between Montessori and non-Montessori schools. We therefore ran Models 1 and 2 as written above, as well doubly robust versions of the models that included controls for charter and magnet classification, school size, percentages of Black, White, and Hispanic students, and school-level percentages of students with disabilities and FRPL-qualifying students. We found that some estimates varied between the non-doubly robust and the doubly robust models; to try and account

for possible confounds as much as possible, we report the doubly robust results. In estimating both doubly robust models, we also bootstrapped the sample 5,000 times and estimated bias-corrected 95% confidence intervals around coefficients (and around predicted values for the multilevel model) by re-estimating the model on each resample. We bootstrapped schools to retain the clustered structure of the data. Not every school had three observations associated with it, so the sample sizes of bootstrap replicates varied slightly from resample to resample; the range of *N*s (at the within-school racial-group measurement level) was from 665 to 693, with a median of 683 and an interquartile range of 4 [681, 685]. Models were estimated using the glmmTMB package (v1.1.4; Brooks et al., 2017) in R. Below, we report the observed coefficients from our model as well as the bias-corrected 95% confidence intervals around coefficients.

Results

Table 2 shows the average percent of chronically absent students in each group across school types. Full results from Model 1 are shown

TABLE 1 Sample demographics.

	Pre-matching			Montessori (<i>N</i> =116)	Post-matching			<i>d</i>
	Non-Montessori (<i>N</i> =626)				Non-Montessori (<i>N</i> =116)			
	<i>M</i>	<i>SD</i>	<i>d</i>		<i>M</i>	<i>SD</i>	<i>M</i>	
Total students	562.94	409.24	-0.44***	391.36	240.57	424.02	220.55	-0.14
% Black	24.94	23.08	-0.01	24.60	23.69	28.29	24.92	-0.15
% Hispanic	34.40	27.79	-0.43***	22.92	21.74	22.10	21.13	-0.03
% White	30.66	24.43	0.48***	42.36	24.68	38.08	27.83	0.16
% IDEA	16.98	16.89	-0.35***	11.51	7.21	12.57	7.45	-0.09
% 504	2.11	2.55	0.29**	2.88	3.37	2.39	2.48	0.17
% FRPL	66.50	22.04	-0.74***	50.21	22.90	53.47	26.43	-0.13
Preschool	38.82	-	0.60***	68.10	-	64.66	-	0.07
Kindergarten	61.18	-	0.70***	93.10	-	88.79	-	0.15
First	62.30	-	0.67***	93.10	-	88.79	-	0.15
Second	61.98	-	0.66***	92.24	-	87.93	-	0.14
Third	61.98	-	0.64***	91.38	-	85.34	-	0.19
Fourth	61.02	-	0.58***	87.93	-	82.76	-	0.15
Fifth	60.06	-	0.54***	85.34	-	82.76	-	0.07
Sixth	37.06	-	0.65***	68.10	-	49.14	-	0.39**
Seventh	29.39	-	0.37***	46.55	-	42.24	-	0.09
Eighth	29.55	-	0.31**	43.97	-	40.52	-	0.07
Ninth	21.88	-	-0.36***	7.76	-	12.07	-	-0.14
Tenth	21.88	-	-0.41***	6.03	-	10.34	-	-0.16
Eleventh	21.88	-	-0.41***	6.03	-	9.48	-	-0.13
Twelfth	21.41	-	0.37***	6.90	-	9.48	-	-0.09
Magnet	17.89	-	0.37***	32.76	-	38.79	-	-0.13
Charter	13.42	-	0.90***	45.69	-	35.34	-	0.21

IDEA, students protected by the Individuals with Disabilities Education Act. 504, students protected by Section 504 of the Rehabilitation Act. FRPL, students who qualify for free or reduced-price lunch. *d*, standardized mean difference. Means for all variables from preschool down indicate the percentages of schools that offer each grade or are magnet/charter schools. ** indicates *p* < 0.01. *** indicates *p* < 0.001.

in Table 3. Exponentiating the Montessori coefficient from the doubly robust model indicated that the chronic absenteeism rate at Montessori schools was, on average, 0.84 times the rate at non-Montessori schools, magnet and charter school classification as well as the percents of Black, White, Hispanic, IDEA, and FRPL-qualifying students. However, the confidence interval for the Montessori coefficient includes zero, indicating this is not statistically significant difference. Charter schools were associated with higher rates of chronically absent students.

Using a multilevel model (Model 2) in which we clustered counts of chronically absent Black, White, and Hispanic students within schools (i.e., a school with complete data had three associated measurements), we examined how disparities in chronic absenteeism rates between racial groups differed between Montessori and non-Montessori schools. Full results for the multilevel models are shown in Table 4. In Table 4, the coefficient for *Montessori* reflects the average difference in log counts of chronically absent White students (the reference group) across school types; exponentiating the coefficient of -0.20 indicated that, on average, the White Montessori student chronic absenteeism rate was 0.82 times that of White non-Montessori students. The main effects for *Black* and *Hispanic* reflect the estimated average differences in the log counts of chronically absent students from each of those groups and the log counts of chronically absent White students at non-Montessori schools. Exponentiating the coefficients for these terms indicated that 1.25 times and 1.31 times as many Black and Hispanic students were chronically absent in non-Montessori schools relative to White students. The interactions reflect differences in those disparities at Montessori schools. The differences between Black and White students and Hispanic and White students were not significantly different at Montessori vs. non-Montessori schools, meaning that the racial disparities in chronic absenteeism rates were not significantly different between the two school types. As shown in Figure 1, average chronic absenteeism rates for Black and Hispanic students were nearly identical across the two school types, though slightly lower for White students in Montessori schools.

Discussion

Rates of chronic absenteeism

Overall, we estimate that chronic absenteeism rates for Black, White, and Hispanic students taken together are 18% percent lower at Montessori than non-Montessori schools. We did not estimate a significant difference in the overall rates of chronic absenteeism between the two school systems, contra our hypothesis. However, as can be seen in Figure 1 and based on results from our multilevel model, rates of chronic absenteeism were slightly lower in the Montessori schools for White students specifically. We do not know why we did not observe a larger difference in the average rates of chronic absenteeism for all students across school sites. Other research has shown that Montessori implementation fidelity, or the degree to which a Montessori classroom adheres to Maria Montessori’s original vision, is associated with improved outcomes for students (Lillard, 2012; Lillard and Heise, 2016), and implementation can vary widely between Montessori schools (Daoust, 2004; Lillard, 2019). We did not

TABLE 2 Average percent of chronically absent students by school type.

	Montessori	Non-Montessori
Overall	13.25	17.31
Black students	16.85	19.49
Hispanic students	16.12	20.34
White students	11.41	15.43

TABLE 3 Overall rates of chronic absenteeism across school types and bootstrapped (5000x) 95% bias-corrected confidence intervals.

	B	95% bias-corrected bootstrapped CI
Intercept	-2.40	[-3.09, -1.56]
Montessori	-0.17	[-0.37, 0.01]
Charter	0.43	[0.20, 0.67]
Magnet	0.04	[-0.17, 0.27]
% Black	-0.00	[-0.01, 0.00]
% Hispanic	-0.01	[-0.02, -0.00]
% White	-0.01	[-0.02, 0.00]
% IDEA	0.03	[0.02, 0.05]
% FRPL	0.01	[0.01, 0.02]

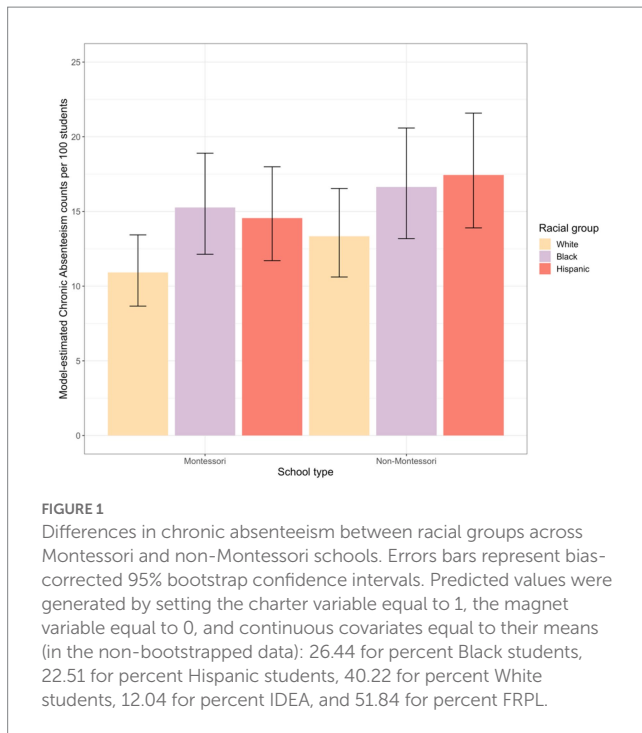
IDEA, students protected by the Individuals with Disabilities Education Act. 504, students protected by Section 504 of the Rehabilitation Act. FRPL, students who qualify for free or reduced-price lunch.

TABLE 4 Chronic absenteeism disparities between racial groups across Montessori and non-Montessori schools and bootstrapped (5000x) 95% bias-corrected confidence intervals for multilevel model.

	B	95% bias-corrected bootstrapped CI
Intercept	-2.65	[-3.38, -1.85]
Black	0.22	[0.11, 0.33]
Hispanic	0.27	[0.17, 0.37]
Montessori	-0.20	[-0.41, 0.01]
Black × Montessori	0.11	[-0.05, 0.28]
Hispanic × Montessori	0.02	[-0.13, 0.18]
Charter	0.35	[0.09, 0.59]
Magnet	0.01	[-0.22, 0.23]
% Black	-0.01	[-0.01, 0.00]
% Hispanic	-0.01	[-0.02, -0.00]
% White	-0.01	[-0.01, 0.00]
% IDEA	0.03	[0.01, 0.05]
% FRPL	0.01	[0.01, 0.02]

IDEA, students protected by the Individuals with Disabilities Education Act. 504, students protected by Section 504 of the Rehabilitation Act. FRPL, students who qualify for free or reduced-price lunch.

have a measure of fidelity of implementation within these schools, so it’s possible that average fidelity was low in this particular sample; future work may want to consider whether fidelity of implementation at a Montessori school is associated with improved student attendance and lower rates of chronic absenteeism for students of all racial identities.



However, differences in fidelity of implementation would likely not explain why we observed a slight difference for White students specifically and yet almost no differences for Black and Hispanic students. Students of color are more likely to be chronically absent, due to racial disparities in other characteristics like socioeconomic status and health, making it particularly important that attendance interventions reduce racial disparities as well (Gee, 2018). The mean rates of chronic absenteeism observed in this sample are comparable with the national average (Balfanz and Byrnes, 2012), but even higher rates have been observed elsewhere in urban schools serving predominantly low-income students (McCluskey et al., 2004; Chang and Romero, 2008; Balfanz and Byrnes, 2012; Lenhoff and Pogodzinski, 2018). Montessori schools may benefit from providing additional attendance support to Black and Hispanic students both to shrink the disparities and because doing so would support the majority of public Montessori students—who are students of color (Debs, 2016). It is also noteworthy that the average rates of chronic absenteeism for Black and Hispanic students (across both school types) differed minimally. This similarity makes the slightly lower rates for White students stark, and it underscores the need for support for Black and Hispanic student attendance. Ultimately these findings reaffirm the importance of attending to both overall rates of chronic absenteeism and rates of specific groups of students when evaluating the efficacy of any attendance intervention (Gee, 2018).

Limitations and future directions

As described previously, characteristics associated with families who self-select into Montessori schools could impact school attendance, so self-selection bias a concern when comparing Montessori and non-Montessori student outcomes. It was impossible with these data to account for all variables related to Montessori self-selection, but by

overrepresenting magnet and charter schools in our non-Montessori sample (relative to the population rate of magnet and charter schools) and by controlling for charter/magnet classification, we aimed to account for as much of the variance related to school choice (regardless of what type of school was chosen) as possible.

These data do not support any claims about why the Montessori schools did not have lower average rates of chronic absenteeism than the non-Montessori schools. Previous research indicates that chronic absenteeism can be reduced through effective school and family communication, incentive programs, and student engagement (Epstein and Sheldon, 2002; Balfanz and Byrnes, 2012; Gottfried and Gee, 2017). Montessori students tend to report higher school engagement and enjoyment (Rathunde and Csikszentmihalyi, 2005; Lillard et al., 2017), but these differences did not translate to lower chronic absenteeism in this sample.

More generally, these data also reveal nothing about why some students are chronically absent. Without knowing why many students are chronically absent, developing an effective intervention to meet those students' needs is difficult. Improved record-keeping of why students miss school—while respecting students' and families' privacy—would aid this effort. For instance, schools could also track the number of days missed by students due to different reasons (health, transportation, etc.) and create targeted interventions based on which reasons are most frequent. It is also possible that many of the chronically absent students reflected in this data set were chronically absent in part because of days missed due to suspension, and counterproductively, in some cases, they may have been suspended for missing school (Davis et al., 2019). Students of color are suspended at disproportionately high rates, despite a lack of evidence that their behavior warrants suspension more often than White children (Skiba et al., 2002). Researchers interested in chronic absenteeism and discipline disproportionality would benefit from more detailed data collection about why students miss school to determine if racial disparities in absenteeism and disciplinary outcomes are related. Future research would also benefit from student-level data that allows for in-depth analysis of which students are at highest risk of being chronically absent and why (Gee, 2018).

Despite these limitations, this paper offers a first look at chronic absenteeism in Montessori contexts. Additionally, this paper models an approach to compare racial disparities in chronic absenteeism across school types or levels of an intervention.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: <https://github.com/leboeuf77/Title1-Montessori>.

Author contributions

LL came up with the research question, conducted the propensity score matching process, collected the data, and wrote the abstract, introduction, and discussion sections of the manuscript. JGG came up with the analysis plan and wrote the analysis code. JGG and LL wrote the analysis plan and results sections of the manuscript. AL provided feedback and guidance throughout the project. All authors contributed to the article and approved the submitted version.

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References

- Balfanz, R., and Byrnes, V. (2012). Chronic Absenteeism: Summarizing What We Know From Nationally Available Data. Baltimore: Johns Hopkins University Center for Social Organization of Schools. *Educ. Digest* 78, 4–9.
- Brooks, M. E., Kristensen, K., van Benthem, K. J., Magnusson, A., Berg, C. W., Nielsen, A., et al. (2017). glmmTMB balances speed and flexibility among packages for zero-inflated generalized linear mixed modeling. *R. Journal* 9, 378–400. doi: 10.32614/RJ-2017-066
- Chang, H. N., and Romero, M. (2008). Present, engaged, and accounted for: The critical importance of addressing chronic absence in the early grades. Report. National Center for Children in Poverty. New York, NY: Columbia University.
- Culclasure, B., Fleming, D. J., Riga, G., and Spriggs, A. (2018). *An Evaluation of Montessori Education in South Carolina's Public Schools*. Greenville, SC: The Riley Institute at Furman University.
- Daoust, C. J. (2004). An examination of implementation practices in Montessori early childhood education. Doctoral Dissertation. University of California, Berkeley.
- Davis, K. A., Allen-Milton, S., and Coats-Boytton, S. (2019). Making the case for results-based accountability as an intervention for chronic absenteeism in schools to improve attendance. *Race Justice* 9, 46–59. doi: 10.1177/2153368718816500
- Debs, M. C. (2016). Racial and economic diversity in US public Montessori schools. *J. Montessori Res.* 2, 15–34. doi: 10.17161/jomr.v2i2.5848
- Dreyer, A. S., and Rigler, D. (1969). Cognitive performance in Montessori and nursery school children. *J. Educ. Res.* 62, 411–416. doi: 10.1080/00220671.1969.10883885
- Epstein, J. L., and Sheldon, S. B. (2002). Present and accounted for: improving student attendance through family and community involvement. *J. Educ. Res.* 95, 308–318. doi: 10.1080/00220670209596604
- Fan, X., and Nowell, D. L. (2011). Using propensity score matching in educational research. *Gift. Child Q.* 55, 74–79. doi: 10.1177/0016986210390635
- Fleege, U. H., Black, M., and Rackauskus, J. (1967). Montessori pre-school education (ED017320). ERIC. Available at: <https://files.eric.ed.gov/fulltext/ED017320.pdf>
- Gee, K. A. (2018). Minding the gaps in absenteeism: disparities in absenteeism by race/ethnicity, poverty and disability. *JESPAR* 23, 204–208. doi: 10.1080/10824669.2018.1428610
- Golann, J. W., Debs, M., and Weiss, A. L. (2019). “To be strict on your own”: Black and Latinx parents evaluate discipline in urban choice schools. *Am. Educ. Res. J.* 56, 1896–1929. doi: 10.3102/0002831219831972
- Gottfried, M. A. (2019). Chronic absenteeism in the classroom context: effects on achievement. *Urban Educ.* 54, 3–34. doi: 10.1177/0042085915618709
- Gottfried, M. A., and Gee, K. A. (2017). Identifying the determinants of chronic absenteeism: a bioecological systems approach. *Teach. Coll. Rec.* 119, 1–34. doi: 10.1177/016146811711900704
- Hilbe, J. (2014) *Modeling Count Data*. Cambridge University Press, Cambridge
- Ho, D. E., Imani, K., King, G., and Stuart, E. A. (2011). MatchIt: nonparametric preprocessing for parametric causal inference. *J. Stat. Softw.* 42, 1–28. doi: 10.18637/jss.v042.i08
- LeBoeuf, L., Goldstein-Greenwood, J., and Lillard, A. S. (in press). Multilevel modeling resolves ambiguities in analyses of discipline disproportionality: A demonstration comparing Title I Montessori and non-Montessori schools. *J. Res. Educ. Eff.*
- Lenhoff, S. W., and Pogodzinski, B. (2018). School organizational effectiveness and chronic absenteeism: implications for accountability. *JESPAR* 23, 153–169. doi: 10.1080/10824669.2018.1434656
- Lillard, A. S. (2012). Preschool children's development in classic Montessori, supplemented Montessori, and conventional programs. *J. Sch. Psychol.* 50, 379–401. doi: 10.1016/j.jsp.2012.01.001
- Lillard, A. S. (2019). Shunned and admired: Montessori, self-determination, and a case for radical school reform. *Educ. Psychol. Rev.* 31, 939–965. doi: 10.1007/s10648-019-09483-3
- Lillard, A. S., and Else-Quest, N. (2006). Evaluating Montessori education. *Science* 313, 1893–1894. doi: 10.1126/science.1132362
- Lillard, A. S., and Heise, M. J. (2016). An intervention study: removing supplemented materials from Montessori classrooms associated with better child outcomes. *J. Montessori Res.* 2, 16–26. doi: 10.17161/jomr.v2i1.5678
- Lillard, A. S., Heise, M. J., Richey, E. M., Tong, X., Hart, A., and Bray, P. M. (2017). Montessori preschool elevates and equalizes child outcomes: a longitudinal study. *Front. Psychol.* 8:1783. doi: 10.3389/fpsyg.2017.01783
- Lopez, M. H., Krogstad, J. M., and Passel, J. S. (2022). Who is Hispanic. Available at: <https://www.pewresearch.org/fact-tank/2022/09/15/who-is-hispanic/>
- McCluskey, C. P., Bynum, T. S., and Patchin, J. W. (2004). Reducing chronic absenteeism: an assessment of an early truancy initiative. *Crime Delinq.* 50, 214–234. doi: 10.1177/0011128703258942
- Montessori, M. (1912). *The Montessori Method*. Frederick A. Stokes Company.
- Orfield, G., and Frankenberg, E. (2014). Increasingly segregated and unequal schools as courts reverse policy. *Educ. Adm. Q.* 50, 718–734. doi: 10.1177/0013161X14548942
- Rathunde, K., and Csikszentmihalyi, M. (2005). Middle school students' motivation and quality of experience: a comparison of Montessori and traditional school environments. *Am. J. Educ.* 111, 341–371. doi: 10.1086/428885
- Skiba, R. J., Michael, R. S., Nardo, A. C., and Peterson, R. L. (2002). The color of discipline: sources of racial and gender disproportionality in school punishment. *Urban Rev.* 34, 317–342. doi: 10.1023/A:1021320817372
- Snyder, A., LeBoeuf, L., and Lillard, A. S. (2022). “My name is Sally Brown, and I hate school”: a retrospective study of school liking among conventional and Montessori school alumni. *Psychol. Sch.* 60, 541–565. doi: 10.1002/pits.22777
- Steiner, P. M., Cook, T. D., Li, W., and Clark, M. H. (2015). Bias reduction in quasi-experiments with little selection theory but many covariates. *J. Res. Educ. Effect.* 8, 552–576. doi: 10.1080/19345747.2014.978058
- Stempel, H., Cox-Martin, M., Bronsert, M., Dickinson, L. M., and Allison, M. A. (2017). Chronic school absenteeism and the role of adverse childhood experiences. *Acad. Pediatr.* 17, 837–843. doi: 10.1016/j.acap.2017.09.013
- Stuart, E. A. (2010). Matching methods for causal inference: a review and a look forward. *Stat. Sci.* 25, 1–21. doi: 10.1214/1098-5399-1313
- US Department of Education. (2019). Chronic absenteeism in the nation's schools: a hidden educational crisis. Available at: <https://www2.ed.gov/datastory/chronicabsenteeism.html>

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The effect of COVID-19 pandemic on college enrollment: How has enrollment in criminal justice programs been affected by the pandemic in comparison to other college programs

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The COVID-19 pandemic has affected various aspects of our lives. For many, it has affected their ability to attend school. While some have switched to online classes, others have had to drop or delay college until later. Using official enrollment data for 12 public universities in the State of Texas, this study explores the impact the COVID-19 pandemic has had on student enrollment in criminal justice programs. A series of statistical techniques, including t-tests comparing pre- and post-pandemic enrollment numbers and panel data analysis models, are utilized to investigate the trends and changes in the program enrollments between 2009 and 2021. While in alignment with the existing research on the effect of the COVID-19 pandemic on college enrollment in general the authors have found a negative statistically significant effect of the pandemic on total college enrollment for all universities in the sample, no statistically significant effect of the pandemic was found on enrollment in criminal justice programs at 12 public universities. The effect was also non-existent for engineering and all social science programs combined. In contrast to all other programs studied herein, enrollment in natural science programs was found to be positively associated with the pandemic. Authors offer an explanation for these findings as well as suggest ideas for future research.

KEYWORDS

COVID-19, coronavirus, college enrollment, student enrollment, criminal justice programs, natural science programs, social science programs, higher education

1. Introduction

While some believe that at the time of economic difficulties more people choose to get back to or start college to make themselves more marketable for employers when the economic downturn is over (Long, 2004; Bell and Blanchflower, 2011), others claim that as income levels drop, people tend to be more concerned with being able to make enough money for basic necessities rather than go to college (Scafidi et al., 2021). Although these beliefs may have been true for various economic downfalls of the past, the effect of the COVID-19 pandemic, as well as the associated economic problems, on college enrollment has proven to be a more complex problem requiring a more elaborate explanation. As the literature review below will demonstrate,

although a great deal of research effort has been invested into studying the overall effect of COVID-19 on schools and students, very limited attention has been given to specific educational programs. The purpose of this research is to fill this gap by exploring the effects of the pandemic on enrollment rates for various types of college educational programs in order to assist administrators and policymakers in the field of education in making data-driven and research-informed decisions addressing the impact of the pandemic.

Prior to discussing COVID-19 pandemic's impact on college enrollment, it should be noted that a few studies have been carried out examining the effect of the pandemic on K-12 school enrollment. They have found that the numbers of students in public schools declined during the pandemic and post-pandemic periods, while the private schools saw an increase in students (Flanders, 2021; Kamssu and Kouam, 2021; Ogundari, 2022). It appears that the shift from public to private schools for some K-12 students was due to certain school districts' policy of mandatory virtual learning during the pandemic-related lockdowns which some parents viewed as less effective than the traditional face-to-face learning (Flanders, 2021; Ogundari, 2022). These findings may provide some context behind changing college enrollment trends during the pandemic and in the period immediately succeeding the pandemic.

As to the college enrollment, it appears that generally it has declined in the period of the COVID-19 pandemic and immediately thereafter (Belfield and Brock, 2020; Chatterji and Li, 2021; National Center for Education Statistics, 2021; Prescott, 2021). According to October 2022 data from the National Student Clearinghouse Research Center (2022), the overall enrollment decline persists in 2022, albeit at a slower rate than in 2021 compared to 2020. From Fall 2020 to Fall 2022, the two-year decline for both undergraduate and graduate programs was 4.2% (National Student Clearinghouse Research Center, 2022). The one-year decline among four-year public institutions from Fall 2021 to Fall 2022 was 1.6% (compared to 2.7% the previous year), while enrollment at four-year private nonprofit institutions declined 0.9% (compared to 0.2% the previous year) (National Student Clearinghouse Research Center, 2022). The sharp post-pandemic decline in community college enrollment has also slowed, with enrollment down 0.4% as compared to a 5.0% decline in the previous year (National Student Clearinghouse Research Center, 2022). It is worth noting here that the above-referenced statistics suggest that private colleges have seen a lesser decline in enrollment numbers compared to public institutions of higher education. This trend is somewhat similar to the trend that we witnessed during the pandemic in K-12 education as discussed in the previous paragraph.

Interestingly, while enrollment declined from Fall 2020 to Fall 2022 at four-year public institutions located in towns (−7.5%), cities (−3.5%), suburban (−5.2%), and rural (−5.5%) areas, primarily online institutions have experienced a 3.2% increase in enrollment during the same period (National Student Clearinghouse Research Center, 2022). It should be noted that this is contrasting with research on K-12 enrollment which suggested that public school districts that switched to fully online learning saw a significant decline in the number of students who chose to go to schools with more traditional face-to-face learning (Flanders, 2021; Ogundari, 2022). Most likely this difference in enrollment statistics between K-12 and college education is due to the inherent differences between education for minors vs. adults, e.g., due to the ability of adults to study independently or the need for adults to work while studying.

Similarly to fully online schools, some largely in-state public institutions, such as the University of Massachusetts and University of Tennessee at Knoxville, saw large increases in enrollments (10 and 4.9% respectively, Kamssu and Kouam, 2021) which can be explained by the desire to cut down on costs on the part of students who originally targeted prestigious out-of-state schools but had to change their plans due to uncertainty caused by the pandemic (Korn, 2020; SimpsonScarborough, 2020).

The overall decline in college enrollment rates from Fall 2019 (pre-pandemic) to Fall 2020 (pandemic) period was partly explained by an increased number of deferments (Kamssu and Kouam, 2021). Krantz and Fernandes (2020) reported that in Fall 2020, Harvard and MIT saw an increase in admission deferments from 1 to 20 and 8%, respectively. Not less importantly, the COVID-19 pandemic had started outside the United States at the end of 2019 (i.e., much sooner than it became a major concern in the United States) which has clearly reduced the number of incoming international students which had been declining for 3 consecutive years even preceding the pandemic (Crawford et al., 2020; Fischer, 2020; Toquero, 2020). Therefore, it is important to keep in mind that whatever changes in enrollment trends we are seeing these days are not solely due to the pandemic. Some had existed prior to the pandemic and remained during the pandemic, some have been exacerbated by the pandemic, and others, although caused by the pandemic, could very well be of temporary nature.

Several qualitative studies have been conducted with the aim of understanding the factors driving the decline in college enrollment rates from the perspective of students. Steimle et al. (2022) surveyed 398 students majoring in industrial engineering regarding their intentions to enroll in Fall 2020 semester. They divided their sample into three groups based on their personal level of concern regarding COVID-19. Most students were classified as moderately concerned and indicated they planned to enroll provided there was a mixture of face-to-face and online classes available and that safety measures to mitigate COVID-19 transmission were in place. Students who were classified as highly concerned indicated a likelihood to enroll only if online courses were available. The group of not very concerned students indicated a preference for face-to-face classes, with only some interest in mitigation measures of masking and testing. Interestingly, students reported higher levels of confidence that they would follow safety protocols than they attributed to other students. While this study provides a valuable look at the factors students may have considered regarding enrollment during the pandemic, as we move further out of the height of the pandemic, concern about the pandemic may or may not be as influential in student decision-making.

Schudde et al. (2022) examined 56 participants involved in a longitudinal study of educational trajectories. The interviews conducted in Fall 2020 were the sixth year of interviews, but did allow for researchers to examine how COVID-19 had impacted the educational trajectories of the participants, all of whom had been enrolled in community college at the first wave of interviews in Fall 2015, with intentions to transfer to a four-year institution. Eight of the interviewees were classified as "optimizers," meaning that they were able to maintain their original course toward their occupational and educational goals. These participants were differentiated from the others by having access to a safety net, to include being financially secure, having family support, and/or experiencing

working from home as an improvement of their working conditions. For these students, the pandemic did not negatively impact their educational trajectory and may have even improved that trajectory through more flexible course format as well as more flexible work experiences.

The largest group ($n=32$) of interviewees was classified as “satisficers,” meaning that they were able to continue their pursuit of higher education, but not in an ideal situation. Satisficers also reported access to a safety net, but did not view themselves as moving forward as much as stagnating. These participants reported postponing making changes to their current employment or educational situation, although that situation might not be ideal. Many of the satisficers reported that online coursework allowed them to continue their pursuit of higher education. Lastly, “strugglers” ($n=16$) were not able to sustain the employment or educational trajectories there were on prior to the pandemic. These participants did not have access to a strong safety net and instability in their occupational experience negatively impacted their continued pursuit of higher education. While this is a small study and we should be cautious of generalizing from it, this study does highlight the importance of examining the pandemic’s impact on students’ ability to pursue higher education.

The above literature review underscores the importance of continued exploration of the impact of the COVID-19 pandemic on universities and their students. While several studies have been carried out to examine the effect of the pandemic and pandemic-related shutdowns on college enrollment in general, the authors have been unable to find any studies diving deep into the investigation of how individual educational programs have been affected and whether the pandemic effect has been similar on different programs. Specifically, no studies exploring the impact of the pandemic on college enrollment for criminal justice programs have been identified. Exploring the pandemic’s impact on enrollment in criminal justice programs is important in the context of general decline in enrollment rates for criminal justice programs that has been seen in the past 2 years ([National Student Clearinghouse Research Center, 2022](#)). It is important for researchers, school administrators, and policymakers to understand if the decline in enrollment is caused by the pandemic (i.e., temporary) or well-publicized incidents involving police misconduct (e.g., the killings of George Floyd and Breonna Taylor) which can have a longer-lasting effect. To address this gap in the existing literature, this study examines criminal justice program enrollment numbers for various universities in the period from 2009 to 2021. It further compares the enrollment trends in the aforementioned period seen in criminal justice programs to all social science programs combined as well as programs outside of the field of social sciences (specifically, engineering and natural sciences) to get a sense of how different majors might have been affected by the pandemic.

This study aims to explore the following two research questions:

- (1) What effect has the COVID-19 pandemic had on college enrollment for criminal justice programs?
- (2) Has the impact of COVID-19 pandemic on college enrollment been different for criminal justice programs from the impact of the pandemic on college enrollment in other educational programs?”

2. Materials and methods

2.1. Data sources

To answer the research questions, authors have used enrollment and program data on 12 public universities in the State of Texas for the period from 2009 to 2021. All of the participating universities are members of the Texas A&M University System. While not a random sample of universities allowing to make generalizations on all public universities in the United States, this dataset is suitable for this study due to the following reasons. First, with rare exceptions that are discussed below, all Texas A&M universities consistently submit their data to the Texas A&M System administrators on a regular basis which has allowed the authors to carry out panel data analysis analyzing 13 years of data. This is particularly valuable for a study examining the effect of the COVID-19 pandemic on college enrollment as no longitudinal data analysis exploring this research question has been conducted to date. Second, this dataset is comprised of universities that possess diverse characteristics. As it can be seen from [Table 1](#) below, schools ranging from the average of 2,361 to 57,560 students during the period of study are included in the sample. As it will be seen from descriptive analysis below, all of the universities in the sample also possess other diverse characteristics beyond their size differences. Such diversity across universities included in the sample ensures that the characteristics of the universities studied herein are representative of the characteristics of all or most public universities in the United States which, in turn, warrants that the findings obtained from the analysis of these data are important and meaningful for research and policymaking purposes. In the absence of a study, or an ability to conduct a study, which would do a longitudinal analysis of enrollment counts for a large and randomly selected sample of colleges across the country, this study offers unique insight into how the pandemic has affected enrollment in various educational programs in US institutions of higher education.

The above-referenced data were obtained by the authors from two sources: (1) the official website of the Texas A&M University System¹ which makes enrollment counts for all Texas A&M universities available to the general public and (2) the Texas A&M University System administration which has provided additional data on schools and programs in response to a written request.

2.2. Measurement

To answer the research questions about the impact of the COVID-19 pandemic on college enrollment for criminal justice and other educational programs, the authors use enrollment counts as the primary dependent variable and a set of independent variables. Since the original dataset provided by the Texas A&M University System is tracking enrollment by using the Classification of Instructional Programs (CIP) codes—a code system used by the United States Department of Education to classify various educational programs ([Mau, 2016; Leider et al., 2018](#))—the authors

1 <https://www.tamus.edu/system/total-texas-am-university-system-enrollment/>

TABLE 1 Information on enrollment counts for the 12 universities sampled for this study.

University abbreviated name	University name	Mean enrollment count	Minimum enrollment count	Maximum enrollment count
PVAMU	Prairie View A&M University	8,765.77	8,250	9,516
TAMIU	Texas A&M International University	7,487.23	6,419	8,305
TAMU	Texas A&M University	57,559.92	48,702	66,057
TAMUC	Texas A&M University Commerce	1,1337.15	9,075	12,487
TAMUCC	Texas A&M University Corpus Christi	1,1028.85	9,468	12,234
TAMUCT	Texas A&M University Central Texas	2,361.15	2,096	2,619
TAMUG	Texas A&M University Galveston	1,995.46	1,644	2,324
TAMUK	Texas A&M University Kingsville	7,643.77	5,892	9,277
TAMUSA	Texas A&M University San Antonio	5,045.46	2,343	6,858
TAMUT	Texas A&M University Texarkana	1,927.39	1,597	2,161
Tarleton	Tarleton State University	11,803.15	8,598	14,022
WTAMU	West Texas A&M University	9,061.08	7,769	10,060

TABLE 2 The Classification of Instructional Programs (CIP) codes used to construct various majors for the purpose of data analysis.

Program classification	CIP Code(s)	CIP Code description
Criminal justice	43.01	Criminal Justice and Corrections
	43.03	Homeland Security
	43.04	Security Science and Technology
	45.04	Criminology
Social sciences	45	Social Sciences
Engineering	14	Engineering
	15	Engineering-related Technologies/Technicians
Natural sciences	26	Biological and Biomedical Sciences
	40	Physical Sciences

have had to combine certain CIP codes to generate specific majors (i.e., criminal justice, social sciences, engineering, and natural sciences). All majors analyzed as part of this study are listed in Table 2 below with corresponding CIP codes. It should be noted that the enrollment counts for each year from 2009 to 2021 that are analyzed in this study are actually enrollment counts for the fall semester of every given year rather than a combined or mean enrollment count over the course of all semesters in a calendar or academic year.

The independent variables include COVID-19 pandemic as the primary predictor and several control variables. The main predictor is a binary yes/no variable with negative values (i.e., “no”) for the years 2009 to 2019 and positive values (i.e., “yes”) for 2020–2021.

The control variables used in this study include the number of students who are (1) first-time, (2) transfer, (3) foreign, (4) in-state, (5) doctoral, (6) masters, (7) part-time, and (8) female students. All of the control variables are continuous discrete variables that can only have integer values ranging from 0 to infinity. Each control variable’s value represents the number of students of a certain type enrolled in the educational program.

2.3. Statistical analysis

This study uses Stata 16 to conduct a two-part statistical analysis consisting of a series of t-tests and panel data regression analysis. T-tests are used to check for the significance of the differences in enrollment counts in certain time periods across all universities in the sample. The idea is to see if enrollment counts pre-pandemic and during the pandemic are statistically significantly different. First, the authors conduct three separate t-tests comparing mean enrollment numbers for 2019 vs. 2020 (1 year before the pandemic and a year into the pandemic), 2018–2019 vs. 2020–2021 (2 years pre-pandemic and 2 years into the pandemic), and 2009–2019 vs. 2020–2021 (the entire 13-year period including 11 years of data pre-pandemic and two years of data into the pandemic). Upon checking for the differences in enrollment counts pre-pandemic vs. into the pandemic for all universities and educational programs, the authors perform the same series of t-tests for each program of study of interest separately (i.e., criminal justice, social sciences, engineering, and natural sciences).

The second part of the statistical analysis includes panel data regression analysis using fixed effects and random effects regression models with post-hoc tests helping the authors to determine which model provides best model fit (Andreß, 2013). Panel data include information on multiple entities (people, organizations, countries, etc.) for a period of time (Torres-Reyna, 2007). Panel data are sometimes referred to as multiple-entity longitudinal data or cross-sectional time-series data (Hsiao, 2003; Park, 2011). Panel data analysis allows the researchers to analyze differences within and between different entities in the sample over a period of time while controlling for unobserved variables (Torres-Reyna, 2007).

Similarly to the t-test analysis approach, the first set of panel data analysis models tests the pandemic’s impact on total enrollment counts across all universities and educational programs. The second set of models is then used to determine the effects of the pandemic on enrollment in each individual program (i.e., criminal justice, social sciences, engineering, and natural sciences). For each set of panel data analysis models, the authors run fixed and random effects models followed by a post-hoc Hansen’s J test which assists the researchers in determining which model is best fit for the data at hand (Green, 2007).

3. Results

The COVID-19 pandemic has had a substantial effect on the educational institutions across the world (World Bank, 2020). Through a series of *t*-tests and panel data regression analysis models, this study aims to determine whether the pandemic has affected enrollment in criminal justice programs in institutions of higher education in the United States, and how the impact that criminal justice programs have experienced compares to other educational programs, such as all social science combined, natural science, and engineering programs.

3.1. Descriptive analysis

As discussed previously, Table 1 above lists the universities that are the subject of this study together with their mean, minimum, and maximum enrollment counts over the period of time from 2009 to 2021. Texas A&M University Texarkana and Texas A&M University at Galveston have the lowest mean enrollment counts of 1,927 and 1,995, respectively, while Texas A&M University has the highest mean enrollment count of 57,560 students. Most schools (8 out of 12) fall somewhere in the range between 5,000 and 12,000 students. Table 3 below demonstrates total enrollment counts across all institutions and all programs in each year from 2009 to 2021. It is clear from the table that overall universities have seen a steady growth in enrollment numbers with only two “dropbacks”—in 2019 (essentially the fall semester immediately preceding the beginning of the COVID-19 outbreak in the United States) enrollment went down to pre-2017 numbers, and in 2021 the total enrollment count dropped by a little over 500 students compared to the previous year.

Figure 1 provides a visual representation of enrollment numbers for all programs under study (i.e., criminal justice, social sciences, engineering, and natural sciences). Overall, all programs have seen a steady growth over the period of time under study. The visual examination of enrollment trends does not appear to suggest that the COVID-19 pandemic has had any substantial impact on enrollment for the universities in the sample.

A close examination of line charts depicting enrollment counts for each specific program at each of the 12 universities (not included here for the sake of space but available *via* request from the authors) suggests that some universities do not have reliable enrollment data on specific programs. This is also evidenced by mean enrollment counts for each program type across all schools in the sample for the period from 2009 to 2021 listed in Table 4 below. A quick look at the table reveals problems with enrollment data for certain programs at some schools in the sample which warrants the removal of certain schools from the analyses involving programs for which such universities do not possess reliable data. As such, Texas A&M University and Texas A&M University Galveston are removed from the analysis of the impact of COVID-19 on enrollment in criminal justice programs; Texas A&M University Galveston is removed from the analysis of enrollment numbers for all social science programs combined; and Texas A&M International University, Texas A&M University Central Texas, Texas A&M University San Antonio, Texas A&M University Texarkana, and Texas A&M University Galveston are removed from the analysis of natural science programs’ enrollment counts. Further, all of these schools are removed from the analysis of the overall impact of the pandemic on all educational programs.

TABLE 3 Enrollment counts for all programs under study across all universities in the sample.

Year	Combined	Mean	Minimum	Maximum
2009	112,433	9,369.417	1,597	48,702
2010	117,948	9,829	1,803	49,129
2011	120,310	10,025.833	1,907	49,861
2012	123,180	10,265	1,903	50,227
2013	128,826	10,735.5	1,805	53,219
2014	135,460	11,288.333	1,812	56,507
2015	140,151	11,679.25	1,839	58,515
2016	145,668	12,139	1,993	60,435
2017	149,112	12,426	1,998	62,802
2018	149,732	12,477.667	1,806	63,694
2019	147,756	12,313	1,644	63,859
2020	149,116	12,426.333	1,653	65,272
2021	148,521	12,376.75	2,078	66,057

The removal of certain schools from the analysis reduces the number of universities in the sample to 11 for the analysis involving all social science programs, 10 for the analysis involving criminal justice enrollment counts, 7 for natural sciences, and 6 for all educational programs. The analysis of enrollment counts pre- and post-pandemic for engineering programs continues to be based on data from all 12 schools in the original sample as no issues with the data have been identified for this specific program.

3.2. Inferential analysis

To determine if the COVID-19 pandemic has had any effect on the criminal justice program enrollment and how that effect compares to the pandemic’s impact on enrollment in other educational programs, the researchers conducted two types of inferential analysis: a series of *t*-tests and panel data analysis.

3.2.1. T-tests

Prior to conducting *t*-test analysis, the researchers performed the Levine’s test for homogeneity of variance to ensure that the data are suitable for such analysis. A non-significant result for each of the models indicated the homogeneity of variances which is the main assumption of the *t*-test. Further, the histograms for each dependent variable have been examined to ensure that the dependent variable’s distribution is close to normal. Using 2020 as the year when the COVID-19 pandemic started, a series of *t*-tests has been conducted testing for the significance of the differences in enrollment counts across all programs for different time periods: (1) 2009–2019 vs. 2020–2021, (2) 2018–2019 vs. 2020–2021, and (3) 2019 vs. 2020. Then, in a similar fashion, the researchers conducted *t*-tests for each individual educational program comparing the same three time periods. The results of these tests are presented in Table 5 below.

Table 5 presents the results of three separate *t*-tests (in columns) for all educational programs as well as each of the individual programs of interest for this study (in rows). Comparing the means and standard deviations for each educational program of interest

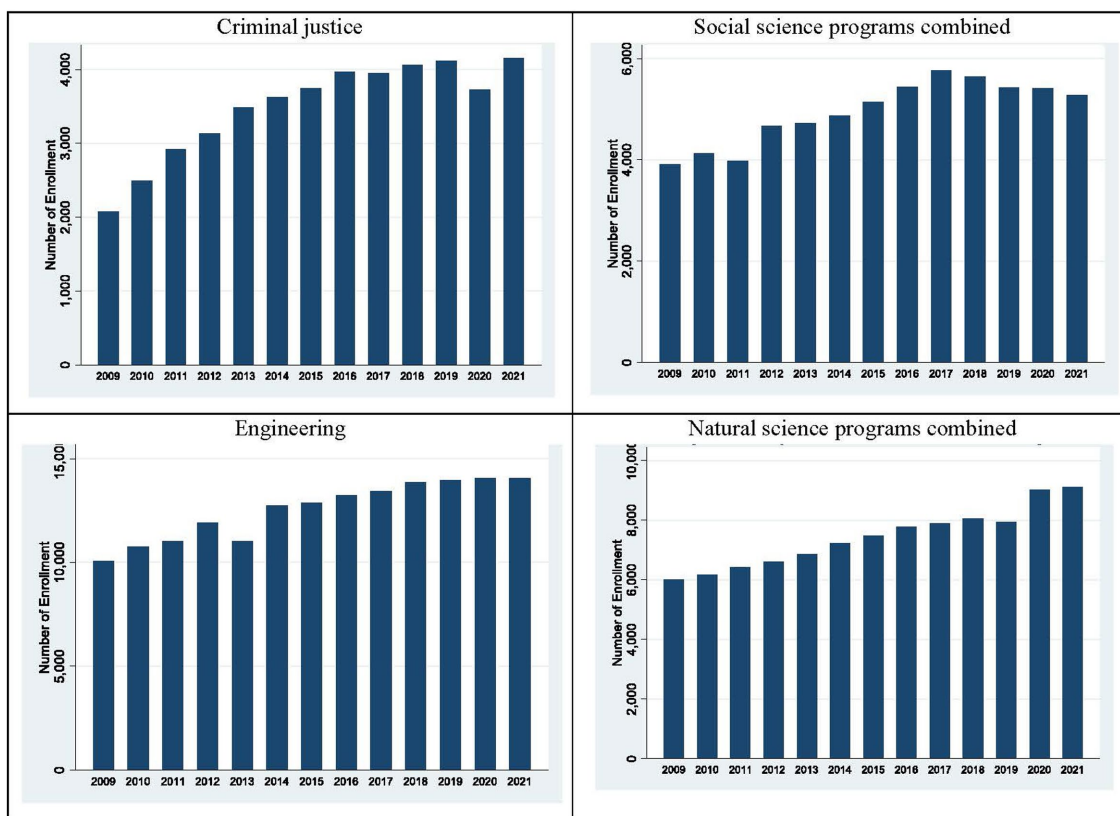


FIGURE 1 Enrollment count trends from 2009 to 2021 for each individual program type.

TABLE 4 Mean enrollment counts for each program type under the study across all universities from 2009 to 2021.

University name	Mean enrollment count*			
	Criminal justice	Social sciences	Natural sciences	Engineering
PVAMU	404.462	138.846	220.462	601.231
TAMIU	707.769	187.154	0	645.077
TAMU	0	3,153.692	4,077.231	6,656.923
TAMUC	372.769	213.231	355.231	422.769
TAMUCC	307.077	152.750	17.083	1,383.583
TAMUCT	144	70	0.538	31.769
TAMUG	0	0.154	0.385	597.385
TAMUK	326.692	334	562.846	653.462
TAMUSA	297.923	504.417	0	340.083
TAMUT	75.615	40.538	0	145.077
Tarleton	637.923	108.769	1,421.538	604.538
WTAMU	222.538	102.231	769.385	588.769

*See the Data Analysis section for the discussion of how problems with enrollment data for certain programs at some universities have been addressed by the authors.

over different time periods makes it clear that pre- and post-pandemic values are very similar. Predictably, mean enrollment counts, for the most part, are slightly lower in 2020 and 2021 compared to the pre-pandemic numbers from 2018–2019. Aligning with the impression that one could get from simply eyeballing these enrollment counts come the results of the significance testing—none

of the 15 models show any statistically significant differences in enrollment counts pre-pandemic vs. post-pandemic. While this could have been the end of the analysis, but considering the nature of the data at hand, a more elaborate type of analysis—panel data analysis—can be carried out. It is warranted here for two reasons. First, *t*-test does not account for unobserved variance (Hsiao, 2003).

Second, *t*-test by its nature cannot account for individual heterogeneity (Torres-Reyna, 2007). In other words, *t*-test does not take into account how enrollment rates vary within each school for each of the educational programs studied herein. Lastly, *t*-test is merely a test of statistical significance, while panel data analysis makes use of measures of association. In contrast to the simple *t*-test, panel models account allow for controlling for certain known factors, account for unobserved variance, and measure the effect size for the relationship in question.

3.2.2. Regression analysis

As mentioned in the materials and methods section above, for this part of statistical analysis, the authors have run two sets of fixed and random effects regression models. Prior to running the main models, the researchers tested the model assumptions by conducting the Wald and Wooldridge tests for homoskedasticity and autocorrelation, respectively. In all of the panel analysis models either one of the two assumptions was violated which prompted the researchers to run fixed and random effects models with the “robust” option to overcome the problems stemming from the aforementioned assumption violations (Roodman, 2009). First, fixed and random effects models were conducted testing the relationship between the COVID-19 pandemic and enrollment in all educational programs. Then, they were followed by a series of models testing for the effect of the pandemic on enrollment counts in each individual program (i.e., criminal justice, social sciences, engineering, and natural sciences). Hansen’s *J* post-hoc test was used to assist the researchers in the determination of which analysis results in best model fit. If Hansen’s *J* shows correlation between the unobserved heterogeneity and independent variables, then the fixed effects regression should be used; if there is no correlation, random effects is the choice (Park, 2011). Hansen’s *J* was selected by the researchers over the more conventional Hausman test due to the Hausman test’s inability to work with the panel models that are run with the “robust” option in Stata (Drukker, 2003; Yaffee, 2003; Hoechle, 2007).

Table 6 presents the panel data analysis regression results. The R^2 values representing the amount of variation in the dependent variable explained by the model are above 95% for the models analyzing the effect of the COVID-19 pandemic on enrollment in all educational programs, all social science programs, and engineering programs. The models with criminal justice programs only and natural science programs only have lower, but still very high, R^2 values (41 and 77% respectively). At the very same time, COVID-19 pandemic, as the primary predictor used in this study, has a statistically significant association with enrollment counts only in two out of five models. In the model analyzing enrollment counts for all educational programs, the primary independent variable was found to have a statistically significant negative effect on the dependent variable ($B = -133.89$; $p = 0.01$). This can be interpreted as “on average, all educational programs in institutions of higher education in the United States have seen a decrease in enrollment by 133.89 students during the pandemic period.” The other model that found a statistically significant relationship between the pandemic and enrollment counts was the natural sciences model which unexpectedly suggested that the pandemic has a positive statistically significant effect on the dependent variable ($B = 134$; $p = 0.03$).

4. Discussion

This study has examined the effect of COVID-19 pandemic on enrollment in criminal justice and compared it to the effects of the pandemic on enrollment in such programs as engineering, natural sciences, social sciences, as well as all educational programs combined. The examination has been carried out in two stages. First, a series of *t*-tests have been used to test for the significance of the differences between the pre-pandemic and post-pandemic periods of time measured in three different ways: 2019 vs. 2020; 2018–2019 vs. 2020–2021; and 2009–2019 vs. 2020–2021. None of the *t*-tests have shown any statistically significant differences in enrollment counts for any of the educational program types. This was perhaps unsurprising because a simple eyeballing of the bar charts showing enrollment trends (Figure 1), as well as the table listing enrollment numbers for every year from 2009 to 2021 (Table 2), suggests that changes in enrollment in 2020–2021 were not “out of line” compared to the changes in enrollment trends from 2009 to 2019.

At the same time, being merely a test of statistical significance, *t*-test is a fairly simplistic form of statistical analysis that does not account for individual heterogeneity and unobserved variance. Furthermore, it does not allow the researchers to estimate the effect size for the relationship of interest. Since the data at hand allowed for a more elaborate panel data analysis, the authors conducted a series of panel data analyses using both fixed and random effects models. These more elaborate statistical analyses have suggested that the COVID-19 pandemic has had a statistically significant negative effect on enrollment in all educational programs across the universities in the sample. This negative effect is not very large ($B = -133.89$) but certainly intuitive since it perhaps would be reasonable to assume that the pandemic has negatively impacted overall college enrollment. Thus, it can be said that this finding is both statistically significant (i.e., not likely to be due to random chance) and important. Based on the existing research overviewed in the literature review above that has come to the same finding, the reasons for the reduction in overall college enrollment due to the COVID-19 pandemic likely include the uncertainty about the future, lack of resources to start or continue education, and the lack of interest in online classes that have become the norm during the pandemic and remained in the curriculum of most colleges thereafter. The relatively small effect size of the pandemic’s impact on overall college enrollment aligns well with the existing research overviewed in the literature review section above. Clearly, those researchers who claim that as income levels drop, people tend to be more concerned with being able to make enough money for basic necessities rather than go to college (Scafidi et al., 2021) were slightly ahead of those who predicted that during the times of economic uncertainty, such as the uncertainty caused by the pandemic, people tend to go back to school to improve their job marketability (Long, 2004; Bell and Blanchflower, 2011). At the same time, it is likely that non-traditional students who are getting back to school to become more competitive on the job market have reduced the negative impact of the pandemic on enrollment for recent high school graduates who might have been in more economically disadvantaged position. Future research should examine more closely the differential effects of the pandemic on enrollment for recent high school graduates versus non-traditional students.

Somewhat counterintuitively, panel data analysis carried out here has also revealed that enrollment in natural science programs has been

TABLE 5 A series of *t*-tests comparing enrollment counts for various pre- and post-COVID-19 time periods.

	2019		2020		<i>t</i>	<i>p</i>	2018–2019		2020–2021		<i>t</i>	<i>p</i>	2009–2019		2020–2021		<i>t</i>	<i>p</i>
	M	SD	M	SD			M	SD	M	SD			M	SD	M	SD		
All programs	10,456.83	2,068.73	10,446.67	2,382.21	0.01	0.99	10,661.83	1,845.58	10,306.42	2,329.34	0.41	0.68	9,873	1,794.99	10,306.42	2,329.34	-0.73	0.47
Criminal Justice	411.90	251.59	372.80	297.51	0.32	0.75	408.90	237.23	393.95	278.07	0.18	0.86	341.63	200.20	393.95	278.07	-1.01	0.32
Social Sciences	493.64	1,004.16	492	1,018.33	0.003	1.00	503.41	988.25	486.18	983.91	0.06	0.95	451.43	867.75	486.18	983.91	-0.17	0.87
Engineering	1,163.25	1,956.75	1,170.58	1,989.54	-0.01	0.99	1,158.75	1,877.06	1,171	2,002.97	-0.02	0.98	1,037.62	1,703.22	1,171	2,002.97	-0.34	0.73
Natural Sciences	1,133	1,361.38	1,288.43	1,609.89	-0.2	0.85	1,140.79	1,342.63	1,294.71	1,540.23	-0.28	0.78	1,031.13	1,286.65	1,294.71	1,540.23	-0.68	0.50

p* < 0.05, *p* < 0.01, ****p* < 0.001.
M, Mean; SD, Standard Deviation.

positively associated with the pandemic. The effect size is also not very large (*B* = 134), but this finding is perhaps less intuitive than the overall negative effect of the pandemic on all educational programs. The statistically significant increase in enrollment in natural science programs can perhaps be explained by the combination of shortages among healthcare occupations and an improved “prestige” of healthcare jobs in the eyes of people seeing that healthcare professionals selflessly fight the pandemic thereby saving lives of hundreds of thousands of people.

The remaining panel data analysis models examined the effect of the COVID-19 pandemic on enrollment in criminal justice, all social science programs combined, and engineering programs. No statistically significant relationships between the primary independent variable and dependent variables have been found here suggesting that whatever changes in enrollment counts we are observing in those programs may very well be due to random chance. This may indicate that either there was not enough data on these specific programs (as mentioned previously, not every panel data analysis model included all 12 universities for the entire period from 2009 to 2021) or there simply has not been a statistically effect on enrollment in these specific programs from the pandemic. Until more studies testing this association are done, these findings should be interpreted with caution.

To sum up the findings, the part of this analysis that essentially replicates existing research of the effect of the pandemic on overall college enrollment has come to the same conclusion as previous research—the pandemic has negatively impacted college enrollment. At the same time, the part of this research that represents the first attempt to examine the effect of the pandemic on enrollment in specific programs provides somewhat unexpected results—while natural science programs have seen growth as a result of the pandemic, all social science programs and criminal justice program individually, as well as engineering programs, have seen no statistically significant change in enrollment as a result of the COVID-19 pandemic.

4.1. Limitations

In the absence of research examining the coronavirus pandemic’s impact on enrollment counts in specific educational programs, this study offers unique value by giving the first insight into how various educational programs have been affected by the pandemic and laying the foundation for future research. At the same time, being the first article of its kind, this study has certain limitations that should be acknowledged. First and foremost, this research is based on a non-randomly selected sample of universities. All of the universities in the sample belong to the same university system (and therefore are governed by the same Texas A&M University System administrators) and are located in the same state. It might be that Texas A&M System universities possess characteristics different from other US institutions of higher education which may have resulted in a more or less significant impact that the COVID-19 pandemic has had on their enrollment. Official statistics suggest that the overall enrollment in Texas from Fall 2020 to Fall 2022 declined by 1.1%, which is 3.1% (or nearly four times) lower than the 4.2% decline seen across all public universities in the nation (National Student Clearinghouse Research Center, 2022). This underscores the importance of analyzing enrollment data from universities outside of Texas.

TABLE 6 Fixed and random effects model outputs for all educational programs and each individual type of educational program of interest.

Effect	Estimate	SE	95% CI		p
			LL	UL	
<i>All Educational Programs – Fixed & Random effects* (R²=0.98)</i>					
Intercept	438.98	179.64	-22.80	900.76	0.06
COVID-19	-133.89	32.60	-217.69	-50.10	0.01
First-time student status	0.29	0.07	0.10	0.47	0.01
Transfer student status	0.19	0.12	-0.12	0.50	0.18
Foreign student status	0.52	0.08	0.32	0.73	0.001
In-State student status	0.36	0.09	0.12	0.60	0.01
Doctoral student status	-1.24	0.37	-2.18	-0.29	0.02
Master's student status	0.26	0.08	0.05	0.47	0.02
Part-time student status	-0.1	0.05	-0.23	0.04	0.12
Number of female students	0.65	0.1	0.40	0.90	0.001
<i>Criminal Justice—Fixed effects (R²=0.41)</i>					
Intercept	-274.76	86.37	-470.13	-79.39	0.01
COVID-19	9.53	37.49	-75.27	94.33	0.80
First-time student status	-0.004	0.05	0.11	0.10	0.93
Transfer student status	0.01	0.06	-0.13	0.16	0.82
Foreign student status	-0.04	0.05	-0.16	0.09	0.49
In-State student status	0.08	0.06	-0.06	0.22	0.23
Doctoral student status	-0.22	0.27	-0.82	0.38	0.43
Master's student status	0.05	0.06	-0.09	0.19	0.41
Part-time student status	-0.08	0.06	0.22	0.05	0.20
Number of female students	0.05	0.06	-0.08	0.18	0.39
<i>Social Sciences—Fixed effects (R²=0.95)</i>					
Intercept	-222.91	223.92	-721.83	276	0.34
COVID-19	-29.65	36.84	-111.73	52.43	0.44
First-time student status	0.05	0.05	-0.07	0.17	0.35
Transfer student status	0.09	0.06	-0.05	0.23	0.17
Foreign student status	0.10	0.12	-0.16	0.37	0.41
In-State student status	0.005	0.05	-0.11	0.11	0.93
Doctoral student status	0.09	0.26	-0.48	0.66	0.73
Master's student status	-0.08	0.07	-0.23	0.08	0.30
Part-time student status	-0.02	0.07	-0.17	0.13	0.80
Number of female students	-0.01	0.12	-0.26	0.25	0.95
<i>Engineering—Fixed effects (R²=0.97)</i>					
Intercept	202.81	190.51	-216.51	622.13	0.31
COVID-19	5.41	18.77	-35.90	46.72	0.78
First-time student status	-0.05	0.10	-0.27	0.17	0.66
Transfer student status	-0.18	0.12	-0.43	0.08	0.16
Foreign student status	0.09	0.07	-0.06	0.25	0.22
In-State student status	0.18	0.07	0.03	0.33	0.02
Doctoral student status	-0.16	0.39	-1.01	0.70	0.69
Master's student status	-0.12	0.07	-0.27	0.04	0.12
Part-time student status	-0.08	0.07	-0.24	0.07	0.25
Number of female students	0.06	0.09	-0.14	0.25	0.52

(Continued)

TABLE 6 (Continued)

Effect	Estimate	SE	95% CI		p
			LL	UL	
<i>Natural Sciences—Fixed effects (R²=0.77)</i>					
Intercept	−9.34	132.35	−333.19	314.50	0.95
COVID-19	134	45.81	21.90	246.09	0.03
First-time student status	−0.10	0.06	−0.25	0.05	0.16
Transfer student status	−0.08	0.11	−0.34	0.18	0.47
Foreign student status	−0.05	0.11	−0.33	0.22	0.65
In-State student status	0.05	0.06	−0.11	0.20	0.50
Doctoral student status	0.10	0.22	−0.44	0.64	0.67
Master’s student status	0.02	0.08	−0.17	0.20	0.83
Part-time student status	0.05	0.06	−0.10	0.20	0.42
Number of female students	0.19	0.04	0.08	0.29	0.004

*Both fixed and random effects models produced identical results. SE, Standard Error; CI, confidence interval; LL, lower limit; UL, upper limit.

Second, this study is using a relatively small sample size. Although partly compensated by having 13 years’ worth of data, this research only uses data from 6 to 12 universities for each statistical analysis model (the actual number of universities varies because not all universities have accurate enrollment records for all educational programs studied herein). While having 13 years of records is beneficial for the statistical analysis used in this research, it is not the same as having access to data on a larger sample of universities (this study is analyzing up to 11 years of data pre-pandemic and only 2 years into the pandemic). Having data on more universities for a shorter period of time could likely provide more reliable findings on the effect of the pandemic on college enrollment.

Lastly, although panel data analysis generally accounts for unobserved variance, it is still recommended to incorporate ‘important’ factors as control variables into the regression analysis. Due to the nature of the dataset analyzed herein, this study had limited access to potential control variables which could be incorporated into the analysis. It would be beneficial to include into the analysis variables controlling for the political environment in the state and city/town where each of the universities are located as well as the political environment on campus. As existing literature has found more than once, political environment often is more important than actual danger from the virus or even perceived threat/fear on the part of people (Flanders, 2021; Kamssu and Kouam, 2021; Ogundari, 2022). Similarly, for the same reasons, it would be important to incorporate into analysis such characteristics of universities as the percentage of courses available online, percentage of online students, or a measure of success in adapting to the new circumstances which have been brought about by the COVID-19 pandemic.

4.2. Future research

Having acknowledged the limitations of this study, it is important to offer recommendations for future research. First of all, future research should focus on verifying the generalizability of these findings by analyzing enrollment data from other, preferably representative sample

of, universities in the United States. Second, other studies should explore the pandemic’s effect on enrollment counts or rates in other educational programs which would provide university administrators and policymakers with a better understanding of which programs may be more prone to substantial declines in enrollment at the times of a healthcare crisis. Third, this line of research should be expanded into private universities, community colleges, technical schools, etc. This would help the education administrators and policymakers to better understand if the pandemic has similar effect on enrollment in all types of schools or some are more vulnerable than others. Lastly, using a mixed-method approach and including a qualitative component into an otherwise similarly designed study would allow the researchers to get an insight from school administrators and students on why in the specific schools/programs selected for research certain trends are observed (e.g., a stakeholders’ perspective on why there is a positive effect of the pandemic on enrollment in natural science programs or no statistically significant effect on criminal justice enrollment). Lastly, it would be very beneficial to explore the impact of the COVID-19 pandemic on retention of students and determine what presents a bigger threat to the educational institutions—the lack of new students or problems retaining the ones that have already enrolled into the school but have been impacted by the pandemic.

5. Conclusion

While the COVID-19 era declines in enrollment seem to be leveling off, there are still issues of concern regarding enrollment that will need to be addressed by university administrators to ensure that US universities are prepared to operate in the “pandemic mode,” whether it is because of the current COVID-19 pandemic or any other healthcare crisis. At this time, we do not know how long-lasting coronavirus-related issues may continue impacting college enrollment. Although it is clear that researchers will study the COVID-19 pandemic’s various effects on education in the United States and across the globe for many decades ahead, it is important to prioritize research on the most pressing issues. This study’s objective was to provide education administrators

and policymakers with a much-needed understanding of the differential effects of the pandemic on various educational programs. Based on the analysis of enrollment data from 12 universities comprising the Texas A&M University System, the authors have found that the pandemic did in fact impact enrollment counts differently for various programs. Natural science programs have been found to have benefitted from the pandemic, while all educational programs combined were found to have been negatively impacted by the crisis. While it is important to keep in mind the findings of statistical significance, it is as important to understand the effect size of each association. The overall effects in both of the above-referenced relationships were found to be relatively small. The overall reduction in enrollment caused by the pandemic for all educational programs is only approximately 134 students. The increase in enrollment seen in natural science programs is very similar in size.

Using the findings from this study as the foundation, researchers should continue exploring the differential effects of the pandemic on various educational programs thereby assisting school administrators and policymakers in managing the process of adaptation of universities to the new realities.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

References

- Andreß, H. J., Golsch, K., and Schmidt, A. W. (2013). *Applied Panel Data Analysis for Economic and Social Surveys*. Berlin, Heidelberg: Springer Science & Business Media.
- Belfield, C., and Brock, T. (2020). *Behind the Enrollment Numbers: How COVID has Changed Students' Plans for Community College*. New York, NY: Community College Research Center.
- Bell, D. N., and Blanchflower, D. G. (2011). Young people and the great recession. *Oxf. Rev. Econ. Policy* 27, 241–267. doi: 10.1093/oxrep/grr011
- Chatterji, P., and Li, Y. (2021). Effects of COVID-19 on school enrollment. *Econ. Educ. Rev.* 83:102128. doi: 10.1016/j.econedurev.2021.102128
- Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., et al. (2020). COVID-19: countries' higher education intra-period digital pedagogy responses. *J. Appl. Learn. Teach.* 3, 1–20. doi: 10.37074/jalt.2020.3.1.7
- Drukker, D. M. (2003). Testing for serial correlation in linear panel-data models. *Stata J.* 3, 168–177. doi: 10.1177/1536867X0300300206
- Fischer, K. (2020). Confronting the seismic impact of COVID-19: the need for research. *J. Int. Stud.* 10, i–ii. doi: 10.32674/jis.v10i2.2134
- Flanders, W. (2021). Opting out: enrollment trends in response to continued public school shutdowns. *J. School Choice* 15, 331–343. doi: 10.1080/15582159.2021.1917750
- Greene, W. H. (2007). *Fixed and Random Effects Models for Count Data*. New York, NY: New York University Stern School of Business.
- Hoehle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *Stata J.* 7, 281–312. doi: 10.1177/1536867X0700700301
- Hsiao, C. (2003). *Panel Data Analysis*. Cambridge University Press: Cambridge.
- Kamssu, A. J., and Kouam, R. B. (2021). The effects of the COVID-19 pandemic on university student enrollment decisions and higher education resource allocation. *J. High. Educ. Theory Pract.* 21, 143–153. doi: 10.33423/jhetp.v21i12.4707
- Korn, M. (2020). Choosing a college during coronavirus: how four students decided. *Wall Street J.* Available at: <https://www.wsj.com/articles/choosing-a-college-during-coronavirus-how-four-students-decided-11600315318>
- Krantz, L., and Fernandes, D. (2020). *At Harvard, Other Elite Colleges, More Students Deferring their First Year*. Boston, MA: Boston Globe.
- Leider, J. P., Plepys, C. M., Castrucci, B. C., Burke, E. M., and Blakely, C. H. (2018). Trends in the conferral of graduate public health degrees: a triangulated approach. *Public Health Rep.* 133, 729–737. doi: 10.1177/0033354918791542
- Long, B. T. (2004). How have college decisions changed overtime? An application of the conditional logistic choice model. *J. Econ.* 121, 271–296. doi: 10.1016/j.jeconom.2003.10.004
- Mau, W. C. J. (2016). Characteristics of US students that pursued a STEM major and factors that predicted their persistence in degree completion. *Univ. J. Educ. Res.* 4, 1495–1500. doi: 10.13189/ujer.2016.040630
- National Center for Education Statistics (2021). Impact of the coronavirus pandemic on fall plans for postsecondary education. Available at: https://nces.ed.gov/programs/coe/pdf/2021/tpb_508c.pdf
- National Student Clearinghouse Research Center. (2022). *COVID-19: Stay Informed with the Latest Enrollment Information*. Herdon, VA: National Student Clearinghouse Research Center.
- Ogundari, K. (2022). A note on the effect of COVID-19 and vaccine rollout on school enrollment in the US. *Interchange* 53, 233–241. doi: 10.1007/s10780-021-09453-1
- Park, H. M. (2011). Practical guides to panel data modeling: a step-by-step analysis using Stata. *Public Manag. Policy Analysis Program, Graduate School Int. Relations, Int. Univ. Japan* 12, 1–52.
- Prescott, B. T. (2021). Post-COVID enrollment and postsecondary planning. *Magazine High. Learn.* 53, 6–13. doi: 10.1080/00091383.2021.1906132
- Roodman, D. (2009). How to do xtabond2: an introduction to difference and system GMM in Stata. *Stata J.* 9, 86–136. doi: 10.1177/1536867X0900900106
- Scafidi, B., Tutterow, R., and Kavanagh, D. (2021). This time really is different: the effect of COVID-19 on independent K-12 school enrollments. *J. School Choice* 15, 305–330. doi: 10.1080/15582159.2021.1944722
- Schudde, L., Castillo, S., Shook, L., and Jabbar, H. (2022). The age of satisficing? Juggling work, education, and competing priorities during the COVID-19 pandemic. *Socius* 8:23780231221088438. doi: 10.1177/23780231221088438
- SimpsonScarborough. (2020). The Impact of COVID-19 on Higher Education. Available at: <https://impact.simpsonscarborough.com/covid/>
- Steimle, L. N., Sun, Y., Johnson, L., Besedes, T., Mokhtarian, P., and Nazzal, D. (2022). Students' perceptions for returning to colleges and universities during the COVID-19 pandemic: a discrete choice experiment. *Socio Econ. Plan. Sci.* 82, 101266–101219. doi: 10.1016/j.seps.2022.101266

Author contributions

SK took ownership of the introduction, literature review, methodology, results, discussion, and conclusion sections. RD provided general guidance on the project, offered education administrator insights on the research topic, assisted with the interpretation of the findings and contributed to the literature review, and discussion sections of the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Toquero, C. M. (2020). Challenges and opportunities for higher education amid the COVID-19 pandemic: the Philippine context. *Pedagogical Res.* 5, 1–5. doi: 10.29333/pr/7947

Torres-Reyna, O. (2007). *Panel Data Analysis Fixed and Random Effects using Stata (v. 4.2, Vol. 112)* Princeton, NJ: Data & Statistical Services, Princeton University, 49.

World Bank (2020). *The COVID-19 Pandemic: Shocks to Education and Policy Responses*. Washington, D.C.: World Bank.

Yaffee, R. (2003). A primer for panel data analysis. *Connect Information Technol.* NYU 8, 1–11.



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Umbrella systematic review finds limited evidence that school absence explains the association between chronic health conditions and lower academic attainment

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Introduction: Absence from school is more frequent for children with chronic health conditions (CHCs) than their peers and may be one reason why average academic attainment scores are lower among children with CHCs.

Methods: We determined whether school absence explains the association between CHCs and academic attainment through a systematic review of systematic reviews of comparative studies involving children with or without CHCs and academic attainment. We extracted results from any studies that tested whether school absence mediated the association between CHCs and academic attainment.

Results: We identified 27 systematic reviews which included 441 unique studies of 7, 549, 267 children from 47 jurisdictions. Reviews either covered CHCs generally or were condition-specific (e.g., chronic pain, depression, or asthma). Whereas reviews found an association between a range of CHCs (CHCs generally, cystic fibrosis, hemophilia A, end-stage renal disease (pre-transplant), end-stage kidney disease (pre-transplant), spina bifida, congenital heart disease, orofacial clefts, mental disorders, depression, and chronic pain) and academic attainment, and though it was widely hypothesized that absence was a mediator in these associations, only 7 of 441 studies tested this, and all findings show no evidence of absence mediation.

Conclusion: CHCs are associated with lower academic attainment, but we found limited evidence of whether school absence mediates this association. Policies that focus solely on reducing school absence, without adequate additional support, are unlikely to benefit children with CHCs.

Systematic review registration: https://www.crd.york.ac.uk/prospero/display_record.php?RecordID=285031, identifier: CRD42021285031.

KEYWORDS

chronic health conditions, school absence, academic attainment, academic achievement, mediation, meta-review

1. Introduction

On average, children with chronic health conditions (CHCs) are less likely to perform well in school exams than their healthy peers (1–4), a factor which is a particular concern for children and young people (5), their parents (6), teachers (7, 8) and policymakers alike (9–11). One possible mechanism that explains poorer average academic attainment among such children is absence from school related to their CHC. Although school absence is extremely common, it is particularly prevalent among children with CHCs (3), who are more likely to be absent due to illness and healthcare usage (4). Absence from school is assumed to cause lower attainment partly due to the strong association reported in a national analysis by the UK Department for Education (12), which found that every extra day missed from school was associated with lower attainment (13).

Evidence that absence causes lower attainment is critical to guide how schools respond to absence among children with CHCs. CHCs are common: Van Cleave et al. (14) estimated that, between ages 8 and 14 years, the cumulative prevalence of having a parent-reported CHC was between 13% and 27% depending on the year of birth and case definition. The Department for Education study did not explore whether absence caused low attainment, particularly among children with CHCs. Analyses that distinguish whether absence mediates the effect of CHCs on school attainment need to take into account common causes of CHCs, increased absence, and reduced attainment (Figure 1). For example, the health condition itself, or its clinical management, may be a cause of school absence, especially symptom-related absence, and independently, a cause of reduced attainment, particularly for conditions linked to cognitive or behavioral deficits. Socioeconomic factors may also be a common cause of CHCs, absence, and attainment given well-known links between poorer socioeconomic status and health as well as school absence (15) and lower attainment (16).

In England, the Children’s Commissioner, an influential official responsible for promoting the views and interests of children, has called for a reduction of school absence to zero percent (11). Official government guidance, reflecting statutory provisions, does not mandate a reduction of absence to zero but instead emphasizes

the legal duty incumbent on parents to ensure that their child, when enrolled in a school, attends school every day. The guidance also recognizes that children with long-term health conditions face additional barriers to attendance which must be addressed to ensure that they can enjoy their right to full-time education (13). Policies aimed at reducing absence to zero could benefit children with CHCs if school absence is the mechanism, or mediator, through which CHCs reduce academic attainment. However, if the relationship between absence and attainment is because CHCs, or other factors linked to CHCs (such as socioeconomic circumstances), are a common cause of increased absence and reduced attainment, then focusing on reducing absence may not be helpful and could be harmful, especially if not accompanied by adequate resources to meet the needs of children with CHCs in schools.

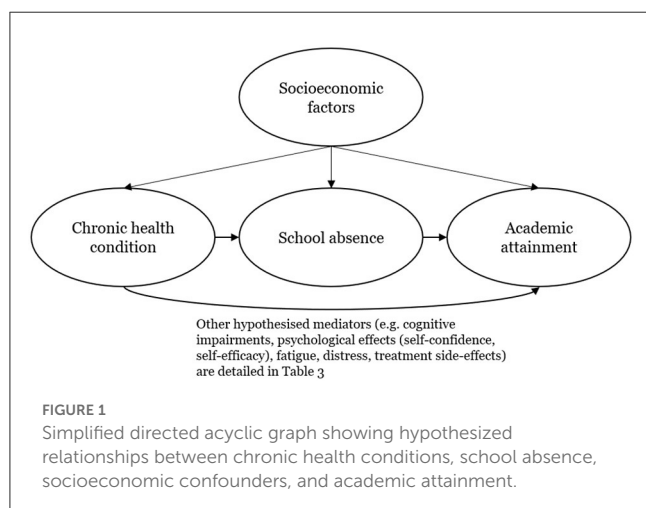
Policies that focus on reducing absence can have adverse consequences for children and young people with a CHC. In preparation for our programme of work on CHCs and education, we consulted a group of 22 children and young people with and without CHCs (November 2021) and a separate group of six parents of affected children (May 2022). Some reported feeling alienated by school practices around attendance and discipline, such as strict behavior policies and parents and children being labeled a “problem” in relation to frequent absence. Others mentioned the pressure to explain and justify their illness, evidence a diagnosis, which is sometimes not possible, and to return to school before full recovery. Some students and parents felt there was inflexibility from the school, such as setting arbitrary attendance targets, and lack of understanding of learner needs leading to difficulties in the classroom. These potential harms underline the need for clear evidence of the benefit of absence reduction policies on student attainment, health, and wellbeing.

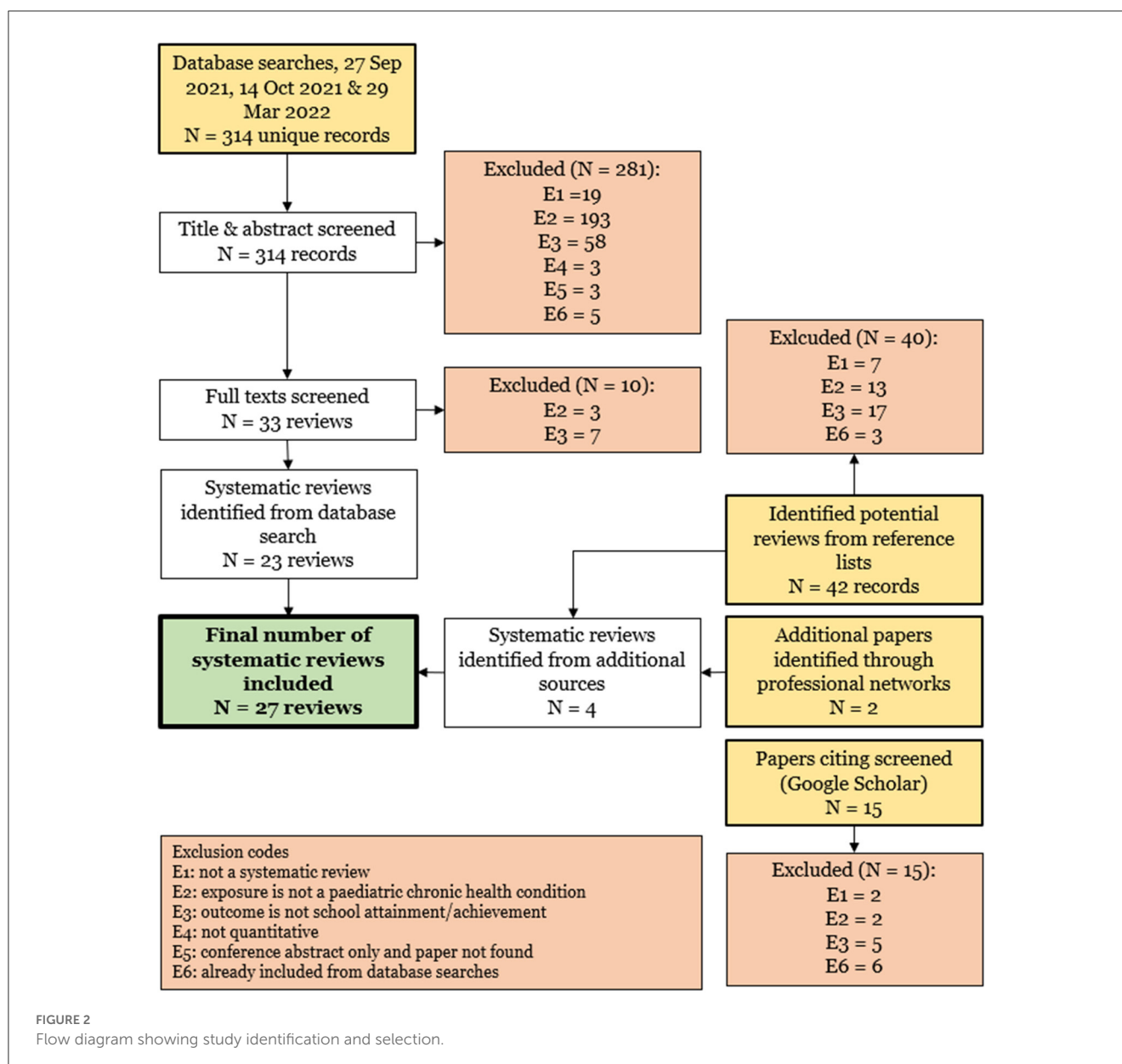
This umbrella review (i.e., a systematic review of systematic reviews) aimed to inform policy responses to school absence by reviewing the evidence for absence being the mechanism mediating the association between CHCs and academic attainment. We (a) reviewed evidence from systematic reviews that presented evidence of an association between CHCs and academic attainment and (b) we examined the subset of studies that tested whether absence mediated the association between CHCs and academic attainment by exploring what the results were and how the studies accounted for confounding. We report results separately for different CHCs because the causes, treatments, and effects on academic attainment may differ. For example, some conditions or treatments may cause direct cognitive impairments such as central nervous system tumors and their treatment, whereas other conditions, such as asthma, would not.

2. Materials and methods

2.1. Protocol registration

We, *a priori*, developed a protocol and registered it with the PROSPERO register of systematic reviews (CRD42021285031). This review is reported according to the PRISMA statement (Supplementary File 1).





2.2. Inclusion criteria

We included any systematic review of comparative, quantitative studies of any design that quantified the association between a CHC in childhood and academic attainment. CHC status (different types or levels of severity or CHC vs. none) had to be considered as the exposure and a measure of academic attainment as the outcome. Academic attainment could be measured based on these factors: school grades, administered standardized tests of, for example, reading or mathematical ability, whether children graduated from compulsory schooling, or whether they experienced grade retention (i.e., “held back” a year). We included these measures whether they were labeled as academic attainment, achievement, or some other construct but refer to them in this study collectively as academic attainment. Reviews were excluded if they were not a published systematic review (e.g., a narrative review or conference abstract only and no associated, published systematic review could

be found and the authors could not be reached) or the review was not peer-reviewed.

2.3. Information sources and search strategy

On 27 September 2021, one author (MAJ) searched MEDLINE, Embase, and PsycINFO *via* Ovid. MAJ also searched the Education Resource Information Center (ERIC) and the Education Database, both *via* ProQuest, on 14 October 2021. On 22 March 2022, MAJ further searched all the above databases for reviews related to chronic gastroenterological conditions as keywords for these were omitted from our initial searches. Full search terms and numbers of hits are available in [Supplementary File 2](#). In summary, titles and abstracts were searched for keywords first relating to

TABLE 1 Overview of reviews and studies on chronic health conditions, school absence, and school achievement or attainment.

Condition	# Reviews	# Studies*	Overall review conclusions on association with academic attainment	# Reviews hypothesizing absence mediation	Mediation by school absence
Multiple					
Generic / multiple	3 (1, 22, 33)	41	-ve	3	1 study: no mediation by absence (asthma and cancer/diabetes/epilepsy [as one variable]).
Major structural congenital anomalies	1 (27)	31	-ve	1	1 study: no mediation by absence (orofacial clefts).
Mental disorders	1 (2)	35	-ve	0	Not tested.
Condition-specific					
Asthma	2 (19, 38)	20	1 review: -ve 1 review: none	2	2 studies: no mediation by absence.
Attention problems	1 (37)	15	-ve	0	Not tested.
Cancer	4 (29, 32, 36, 40)	38	-ve for CNS tumors (in all four reviews) Mixed for other cancers (3 reviews)	1	Not tested.
Chronic kidney disease	1 (24)	11	-ve	1	Not tested.
Chronic pain	2 (23, 35)	23	-ve	2	Not tested.
CHD	1 (26)	32	-ve	1	Not tested.
Depression	2 (25, 42)	51	-ve	2	Not tested.
Epilepsy	3 (20, 28, 43)	42	Mixed though -ve for children with poor prognosis	1	Not tested.
Obesity	4 (17, 31, 39, 41)	89	None or minimal, but more evident among girls. +ve in some studies	2	3 studies: no mediation by absence.
Type 1 diabetes	2 (30, 34)	13	1 review: none or +ve 1 review: -ve (but weak)	2	Not tested.
Total	27	441		18 (67%)	7 (2%) (none finding mediation by absence)

CHCs (using both generic terms such as “chronic condition*” and specific conditions such as “asthma”) combined with a detailed list of terms for educational outcomes adapted from Caird et al. (17). MAJ and another author (DSE) also scanned reference lists of included reviews for further eligible systematic reviews, and we used Google Scholar to search for systematic reviews citing the systematic reviews included. No language, country, or date limitations were specified.

2.4. Selection process

The results from the database searches were downloaded as *.RIS files and imported into the Mendeley reference management software. Using a Google Form, which was piloted on the first 50 records, two authors (MJ and DS-E) independently screened all titles and abstracts for eligibility. The same two authors then independently screened the full texts of potentially eligible studies, including those identified from the reference list and Google Scholar searches. Disagreements were resolved through

discussion with reference to a third reviewer (RG) necessary in one instance.

2.5. Data extraction and effect measures

One author (MJ) examined all included studies and extracted into Microsoft Excel the following information about each review: its authors, year of publication, outcomes studied, language and year limits, inclusion criteria, the number of studies examining academic attainment out of the total number of studies included, whether the review authors hypothesized or assumed that absence was a mediator in any association between CHCs and academic attainment, and any other hypothesized mediators. Whether a particular factor was considered a mediator by the review authors was determined from the language used throughout each manuscript indicating a hypothesized or assumed causal relationship among the CHC, absence, and academic attainment. The review authors did not have to use terms such as “mediator” or “mediation.”

From each review, the following were also extracted for the subset of studies examining academic attainment (i.e., ignoring studies included in the review that examined other outcomes, such as receipt of special educational services): sample sizes of the studies, their countries, comparison groups, overall results on academic attainment, whether the study empirically tested whether the absence was a mediator and, if so, the results of that test. Where mediation was analyzed, we also collected details about the analysis used including statistical methods used, and whether the analyses were adjusted for confounding variables (and, if so, which variables).

2.6. Risk of bias assessment

Two authors (MJ and DS-E) both independently used the Risk of Bias in Systematic Reviews (ROBIS) tool to assess the risk of bias in the reviews. The ROBIS assesses systematic reviews on four domains (study eligibility criteria, identification and selection of studies, data collection and study appraisal, and synthesis and findings) and results in an overall assessment of the risk of bias. For each domain and the overall assessment, a review can be rated as low, high, or unclear risk. Disagreements were resolved through discussion.

2.7. Synthesis

The systematic reviews were described narratively in terms of target conditions, outcomes, language and year limits, inclusion criteria, number of studies included, sample sizes of included studies, comparison groups, overall results on attainment, and risk of bias. The individual studies within the reviews were described quantitatively in terms of the conditions studied, countries, years, and whether the sample was drawn from a clinical or community population. As some individual studies were included in more than one review, it was necessary to deduplicate the database of individual studies prior to analysis. A study was only considered a duplicate if it was cited in more than one systematic review for the same condition. For example, the individual study by Austin et al. (18), which examined asthma and epilepsy, was cited by both Milton et al. (19) (on asthma) and Wo et al. (20) (on epilepsy). Since different analyses were used in reviews of different conditions, this was not considered a duplicate. Where a study was cited by a review of CHCs generally and by a more specific review (e.g., Fletcher (21), which was cited by Esch et al. (2) (mental disorders) and Hale et al. (22) and McKinley Yoder and Cantrell (1) (both of CHCs generally), the study was counted under the more specific condition.

Finally, we identified the hypothesized causal mechanisms proposed by the review authors. We calculated the number and proportion of reviews within which school absence was a hypothesized or assumed mediator. We calculated the number and proportion of individual studies within which absence mediation was empirically tested, and we present the results of these analyses separately as well as their strengths and limitations in relation to study design and statistical analysis.

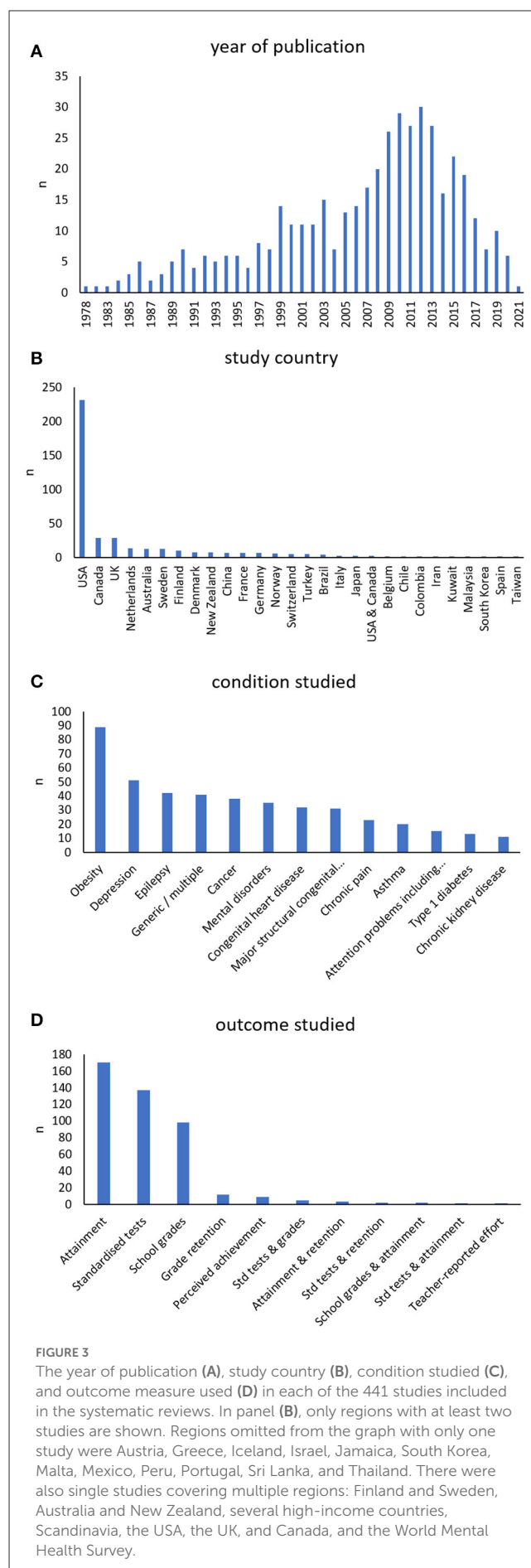


FIGURE 3

The year of publication (A), study country (B), condition studied (C), and outcome measure used (D) in each of the 441 studies included in the systematic reviews. In panel (B), only regions with at least two studies are shown. Regions omitted from the graph with only one study were Austria, Greece, Iceland, Israel, Jamaica, South Korea, Malta, Mexico, Peru, Portugal, Sri Lanka, and Thailand. There were also single studies covering multiple regions: Finland and Sweden, Australia and New Zealand, several high-income countries, Scandinavia, the USA, the UK, and Canada, and the World Mental Health Survey.

TABLE 2 Results of analyses of school absence mediation in the association between chronic health conditions and school achievement or attainment.

Study [review]	Condition, sample size	Location (data source)	Statistical method	Results of mediation analyses	Conclusion	Strengths	Limitations
Crump et al. (48) [Schneider (38)]	Asthma, 22, 730	San José, California, USA (novel survey linked to school records)	Generalized estimating equations on the odds of achieving “basic or below” on California standard tests. Step 1: unadjusted. Step 2: adjusted for age, gender, ethnicity, language, grade level, special education, participation in the Free or Reduced Price Lunch program, and parental education. Step 3: same as step 2 + school absence.	Step 1: odds of achieving basic or below results were 1.45 times higher (95% CI 1.36, 1.56) among those with any CHC versus no CHC. Step 2 (confounder adjustment): OR 1.25 (1.16, 1.36). Step 3 (further adjusting for absence): OR to 1.22 (1.12, 1.32).	No evidence of mediation via absence.	Educational data obtained from school records. Health measured prior to outcomes. Representative of the community.	Parental self-report of child's health condition based on a survey with pre-specified options (e.g., asthma, seizures, any other condition).
Kohen (49) [Schneider (38)]	Asthma, 4, 616	Canada (National Longitudinal Survey of Children and Youth)	Logistic regression of low scores on standardized mathematics and reading tests. Step 1: adjusted for age, sex, maternal age, female family headship, maternal education, and household income. Step 2: same as step 2 + school absence.	Step1: odds of achieving low scores on maths tests were associated with asthma (low severity: OR 1.39 [1.00, 1.92]; moderate: 1.62 [1.17, 2.25]; severe: 1.62 [1.17, 2.25]) and other chronic conditions (1.75 [1.43, 2.14]) versus no CHC. Step 2: ORs attenuated only minimally (asthma, low 1.36; moderate 1.84, severe 1.59; other conditions 1.72). Results for reading tests were similar.	No evidence of mediation via absence.	Educational outcomes based on standardized tests administered in the classroom. Nationally representative.	Asthma measured by reported past-year wheezing or whistling in the chest and regular use of inhalers. Health data and data on school absence reported by the mother or another person (not the child).
Champaloux and Young (50) [Schneider (38) and McKinley Yoder and Cantrell (1)]	Chronic conditions (generic), 6, 795	Canada (National Longitudinal Survey of Children and Youth)	Logistic regression of non-completion of a high school diploma. Step 1: adjusted for age, gender, race/ethnicity, parental education, and whether one or two parents in the household. Step 2: same as step 1 + school absence.	Step 1: Asthma and cancer/ diabetes/ epilepsy (analyzed as one binary variable) were associated with not completing high school versus no CHC. Asthma: OR 1.63 (1.31, 2.02); cancer/diabetes/epilepsy: 1.96 (1.13, 3.37). Step 2 (absence adjustment): OR 1.66 (1.33, 2.07) and 1.82 (0.99, 3.35), respectively. Heart conditions and other conditions were not associated in step 1 and ORs did not differ when further adjusting for absence.	No evidence of mediation via absence.	Health measured prior to educational outcomes. Nationally representative.	Cancer/ diabetes/ epilepsy were entered into the model as one variable, though these may have very different causal relationships with school absence and educational outcomes. Health self- or parent-reported and educational outcome self-reported.

(Continued)

TABLE 2 (Continued)

Study [review]	Condition, sample size	Location (data source)	Statistical method	Results of mediation analyses	Conclusion	Strengths	Limitations
Fitzsimons et al. (44) [Glinianaia et al. (27)]	Orofacial clefts, 3, 253	England, UK (National Pupil Database linked to clefts registry and hospital administrative data)	Logistic regression of achieving expected standard on Key Stage 1 assessments (age 6/7 years). Step 1: unadjusted. Step 2: adjusted for school absence. Step 3: same as step 2 + sex, area-based deprivation, free school meal eligibility.	Step 1: cleft palate only associated with lower odds of achieving the expected standard compared to children with cleft lip only (OR 0.70 [95% CI 0.58, 0.84]). Children with cleft lip and palate also had lower odds (0.70 [0.58, 0.85]). Step 2: Adjusting for absence did not alter this association (cleft palate only OR 0.72 [0.60, 0.88]; cleft lip and palate OR 0.76 [0.63, 0.92]). Step 3 (confounder adjustment): OR 0.64 (0.52, 0.78) and 0.77 (0.63, 0.94), respectively.	No evidence of mediation via absence.	Uses all-of-England administrative data. Objective measures of orofacial cleft, absence, and educational outcomes obtained from health and school records. Nationally representative.	Absence adjusted for before control variables. No measure of association against children without orofacial clefts. Limited to early primary school assessments of seven year-old children. At this age, children are teacher-assessed (i.e., no blind marking).
Black et al. (47) [Segal et al. (41)]	Obesity, 4, 983	Australia (Longitudinal Study of Australian Children)	Z-scores on mathematics and literacy tests were examined using ordinary least squares, value added models, and fixed effects models. Step 1: unadjusted correlations. Step 2: adjusted for 19 variables including age, number of younger/older siblings, rurality, school type, school readiness, teacher's experience in teaching, main language, maternal age, parental education, maternal work status, and household income. Step 3: adjust for often or always being absent in the previous month because of not feeling well.	Because associations between obesity and mathematics and literacy scores among girls were non-significant once adjusting for confounders, these analyses were only conducted for boys. For both literacy and mathematics scores, obesity was associated with lower achievement across a range of model specifications, including adjusting for confounders. Further adjusting for absence did not change the coefficient estimates.	No evidence of mediation via illness-related absence.	Education outcomes measured by linkage to school records. Child's weight and height measured by a trained interviewer. Nationally representative.	Limited to absence due to not feeling well in the past month (parent-reported), though children with CHCs may be absent for other reasons such as attending appointments and the effects of absence may be longer-lasting.

(Continued)

TABLE 2 (Continued)

Study [review]	Condition, sample size	Location (data source)	Statistical method	Results of mediation analyses	Conclusion	Strengths	Limitations
Sabia (46) [Segal et al. (41) and Caird et al. (17)]	Obesity, 5, 129	USA (National Longitudinal Study of Adolescent Health)	Linear regression first difference models of grade point averages among white females only (no association had been found for non-white females or for males). Step 1: adjusted for aspirations to attend university, whether had sexual intercourse, whether in a romantic relationship, parental involvement in schoolwork, parent's labor market participation, alcohol consumption, religious attendance, athletic activity, and parental setting of weekend time limits. Step 2: step 1 + school absence.	Step 1: a unit increase in Body Mass Index was associated with a -0.031 (95% CI $-0.0604, -0.002$) reduction in grade point average. Step 2: Further adjusting for absence did not affect this association (-0.033 [$-0.0604, -0.0056$]).	No evidence of mediation via absence.	Nationally representative.	All measures self-reported.
Veldwijk et al. (45) [Santana et al. (39) and Martin et al. (31)]	Obesity, 1, 543	The Netherlands (Prevention and Incidence of Asthma and Mite Allergy birth cohort)	Linear regression of standardized test z-scores. Step 1: unadjusted. Step 2: adjusted for parental education level, skipping breakfast, and screen time (other confounders excluded based on statistical significance). Step 3: step 2 + being bullied. Step 4: step 2 + mental health inventory score. Step 5: step 2 + health problems that affect school performance. Step 6: step 3 + school absence. Step 7: step 4 + school absence. Step 8: step 5 + school absence.	Step 2: After adjusting for parental education, skipping breakfast, and screen time, overweight was associated with a 0.16 reduction in test z-scores (95% CI $-0.32, 0.00$). Further adjustments did not significantly attenuate this coefficient (steps 3 to 5): being bullied (-0.13 [$-0.29, 0.03$]), mental health inventory score (-0.13 [$-0.29, 0.03$]), mental health problems (-0.16 [$-0.32, 0.00$]). Further adjusting for school absence likewise did not attenuate the associations (steps 6 to 8): being bullied and school absenteeism (-0.14 [$-0.29, 0.02$]), mental health inventory score and school absenteeism (-0.13 [$-0.29, 0.03$]) and mental health problems and school absenteeism (-0.16 [$-0.32, -0.00$]).	No evidence of mediation via absence.	Height and weight measured by a trained research assistant at age 8. Nationally representative. Health measured prior to educational outcomes.	School performance at age 12, as well as height and weight at age 12, were reported by parents. Confounders were included in models based on statistical significance rather than theory.

CHC, chronic health condition; CI, confidence interval; OR, odds ratio.

TABLE 3 Mediators hypothesized in the 27 reviews.

Author	Health conditions	Hypothesized mediators (other than absence)	Hypothesized in review that absence mediated differences in attainment?
Generic or multiple			
McKinley Yoder and Cantrell (1)	Generic / multiple: Chronic condition or disability	Other hypothesized mediating factors included low parental education, cognitive effects of disease due to chronic anemia and limited access to education and other resources. Epilepsy can cause brain cell death due to hypoxia, affecting a student's ability to engage in learning in addition to the effects of medication.	Yes, absence due to pain, fatigue, and crisis was hypothesized to mediate the relationship between disability and poor educational outcomes.
Hale et al. (22)	Generic / multiple: Chronic conditions	Poor health may "tax resources" resulting in insufficient time and energy devoted to school. Poor physical and mental health may result in social exclusion, which themselves are associated with lower attainment. Many mental health conditions may be associated with deficits in academic ability, behavioral difficulties, and substance use and abuse (e.g., ADHD and conduct disorders). Poor mental health may also affect skills such as verbal and other cognitive abilities. Bidirectional pathways are hypothesized.	Yes.
Moser et al. (33)	Generic / multiple: Cystic fibrosis, hemophilia A, end-stage renal disease and end-stage liver disease	The burden of hemophilia (higher number of bleeds) was posited as one cause of poorer results. End-stage renal disease and end-stage liver disease were hypothesized to affect early brain development.	Yes.
Glinianaia et al. (27)	Major structural congenital anomalies	Mediation from exposure to neurotoxic anesthetic agents resulting in neurodevelopmental and cognitive impairments was hypothesized. However, there is accumulating evidence that delayed intrauterine brain maturation, white matter injury resulting from impaired fetal hemodynamics, consequent brain immaturity at birth and longer time to surgery are the primary causes of hypoxic brain injury and subsequent poorer neurodevelopment after surgery. Psychological factors including self-confidence and self-efficacy in school were also suggested as potential mediating pathways.	Yes.
Esch et al. (2)	Mental disorders	Most psychiatric disorders present symptom patterns that can cause emotional, cognitive, and social impairment, involving a downward spiral of negative school experiences, resulting in early school leaving. Externalizing may be represented as "trouble making." Children with reduced conceptual and procedural competencies may experience more difficulties and frustrations regarding educational success, thus engaging in externalizing behaviors whereas children with reduced social skills may adopt an internalizing coping style which is less strongly associated with school dropout. Other mediating factors may include school climate and family functioning.	No.
Condition-specific			
Milton et al. (19)	Asthma	Other possible causal pathways are not explicated in the paper.	Yes.
Schneider (38)	Asthma	There may be direct effects of asthma due to physical constraints affecting daily routines and overall quality of life. Compromised cognitive ability (cause unspecified by the authors), fatigue, and social distress might also contribute to a student's failure to achieve their potential.	Yes. The authors state that given absenteeism was higher among children with uncontrolled asthma or asthma of increasing severity, then addressing asthma management and control are key in bridging the achievement gap between children with and without asthma, implicitly postulating a causal link between asthma, absenteeism, and achievement.
Polderman et al. (37)	Attention problems including ADHD	Educational attainment may be affected by impaired cognitive function (e.g., regulatory control, memory, learning) or lower IQ in children with ADHD. Additionally, failure to develop basic skills in the early years because of ADHD may affect later achievement. School factors may also be important, for example the role that capable teachers have to play in creating a positive learning environment. ADHD is often comorbid with other conditions that may affect achievement, such as conduct disorder and mood and anxiety disorders.	No.

(Continued)

TABLE 3 (Continued)

Author	Health conditions	Hypothesized mediators (other than absence)	Hypothesized in review that absence mediated differences in attainment?
Schulte et al. (40)	Cancer: Central nervous system tumor survivors	The treatments of CNS cancers (surgery, chemotherapy, and radiation therapy) may cause structural and functional changes in the brain that adversely affect targeted and surrounding tissues and organ systems.	No.
Langevald et al. (29)	Cancer: Survivors of childhood cancer	Treatments may cause debilitating deficits.	No.
Molcho et al. (32)	Cancer: Survivors of childhood cancer	Due to toxicity of treatment, survivors may experience adverse late effects, including physical, social, and emotional problems. Alongside pain, emotional problems, and impaired mental health, survivors may experience neurocognitive dysfunction affecting educational outcomes. Exposure to cranial radiation may explain why children with CNS tumors have lower attainment. Studies that found no difference or favorable outcomes among survivors might be explainable based on extra provision made for these children or differences in treatments (not reported in the studies).	Yes, particularly absence due to treatment. Absence has been shown to be highest immediately following treatment initiation but irregular school attendance may persist for years.
Saatci et al. (36)	Cancer: Survivors of childhood cancer	Particularly in the case of central nervous system tumors, brain involvement, and resultant cognitive functioning may explain lower attainment. Not taking measures to ensure successful school re-entry may also be a factor.	No.
Chen et al. (24)	Chronic kidney disease	Metabolic, biochemical, and neurodegenerative mechanisms (e.g., through neurotoxic demyelination caused by increased plasma levels of uremic solutes) may lead to lower intellectual function. Treatment may also affect academic performance, e.g., through sleep disturbance leading to day-time impaired concentration or side effects of medication.	Yes, absenteeism due to on-going dialysis sessions and recovery from transplant surgeries is hypothesized to result in potential loss of interest, withdrawal from school, and poor school progression.
Alsaggaf and Coyne (23)	Chronic pain	In qualitative studies, it was stated that academic difficulties stemmed from academic competence, difficulties with concentration, time and effort getting schoolwork done, and comprehension and memory. Accommodations and collaboration with parents discussed as important in improving school function. Lack of knowledge of school personnel on how to manage chronic pain or its biopsychosocial nature were cited as barriers. Review authors conclude, based on conflicting findings as to academic achievement, that success may be impaired when pain has an impact on cognition whereas when support is received, the young person performs better.	Yes. One study reported that 68% of experienced teachers and 58% of student teachers perceived attendance to be an obstacle to academic success.
Ragnarsson et al. (35)	Chronic pain	Recurrent pain results in poorer sleep which may cause tiredness and hamper ability to keep up with schoolwork. Children with chronic pain are also prone to concentration problems, impaired executive function and impaired school functioning. These in turn may affect achievement/attainment at school. The association may be bidirectional with difficulties at school exacerbating pain problems though this was only tested in one study in the review (no association between achievement and pain observed).	Yes, and the authors state that school success among children with recurrent pain may be enhanced by minimizing school absenteeism and providing homework support.
Cocomello et al. (26)	Congenital heart disease	Exposure to neurotoxic factors affecting brain development, such as cyanosis and neurotoxicity related to cardiopulmonary bypass and hypothermic circulatory arrest in children undergoing heart surgery. Chromosomal abnormality, such as Down's syndrome, is often associated with CHD and may contribute to lower attainment. Incidence of psychological and psychiatric disorders has been reported to be higher in patients with congenital heart disease and these may affect academic performance.	Yes, particularly absence due to recurrent chest infection, endocarditis, cardiac arrhythmias, or repeated surgeries.
Clayborne et al. (25)	Depression	Depression is associated with functional impairment, which may have negative effects on comprehension and ability to complete schoolwork. Adolescents with depression may leave school earlier due to disinterest, functional impairment and/or truancy. Although the present study attempted to rule out reverse causation by including studies where depression was measured at least 12 months before the outcome, reverse causality between poor attainment and depression cannot be ruled out.	Yes, depression hypothesized to affect attendance and, therefore, attainment and peer relationships.

(Continued)

TABLE 3 (Continued)

Author	Health conditions	Hypothesized mediators (other than absence)	Hypothesized in review that absence mediated differences in attainment?
Wickersham et al. (42)	Depression	The pathway between depression and attainment potentially comprises a wide range of pupil-, parent-, teacher- and school-level factors. Reduced energy, motivation, and concentration may affect engagement, attendance, and performance at school. From mediation analyses of the included studies, the authors further hypothesized that lack of social support may also be a mechanism. Other possible factors include socioeconomic position, relative age in year, teacher support, pupil engagement, school involvement and academic self-sufficiency. The association may be bi-directional.	Yes.
Puka et al. (43)	Epilepsy	Neurological, cognitive and psychiatric problems are cited as potential causes of poorer outcomes in people with epilepsy. However poor outcomes have also been found in people with epilepsy who do not have such comorbidities. Targets for further research include person- and environment-level factors and their interactions. Disease-related factors such as seizure frequency, anti-epileptic drug use, whether seizures are controlled may be relevant as may access to transportation or driving, family environment, mental health problems, extent of perceived and/or enacted stigma and external vs internal locus of control.	No.
Wo et al. (20)	Epilepsy	Children with epilepsy may, due to the disease itself or its treatment, have specific learning problems such as inattention and working memory that influence classroom learning and academic achievement. Psychomotor impairment and impairment of affective domains might also affect learning. Family factors may also contribute to academic difficulties, as may parental mental health, including anxiety, problems. The child's attitude to their illness, self-esteem and motivation have also been cited as potential causes as have teachers' involvement.	No.
Lah et al. (28)	Epilepsy (temporal lobe)	Seizure focus is often not restricted to the hippocampus but also the temporal neocortex, an integral part of the reading network. Seizures can interfere with knowledge and skills acquisition. Neurocognitive deficits could contribute to reading difficulties, such as deficits with episodic or semantic memory, learning and recall.	Yes.
Caird et al. (17)	Obesity	Other potential mechanisms identified included mediation through poor mental health, discrimination/stigmatization, sleep, cardiovascular risk (mechanism unspecified), and micronutrient deficiency leading to lower cognitive ability. Some studies also hypothesized that obesity may lead to decreased physical activity and socializing, which in turn lead to more time studying and hence higher attainment.	Yes. A previous literature review suggested that, inter alia, increased absenteeism may explain an observed correlation between obesity and lower academic performance. One study included in this review explicitly posited school absence as a mediator but did not test this pathway.
Martin et al. (31)	Obesity	Mechanisms proposed were: "direct" mechanisms through cognitive ability and "indirect" mechanisms including obesity-related psychological distress, depression and internalizing behavior, stigmatization, self-efficacy, age at menarche, poor sleep due to obesity-related disordered breathing, cardio-metabolic comorbidities, nutritional intake and low levels of physical activity or fitness. Weight-related bullying of girls, in particular, may lead to lower academic achievement. In focus groups conducted by the review authors, adolescent girls stated that they generally have a positive attitude to school and often outperform healthy-weight peers except in physical education. Respondents reported that they may have better grades due to lack of friends and absence of good peer relationships.	Yes. The authors hypothesize that obesity-related adverse mental and physical health may lead to increased school absenteeism and lower achievement.
Santana et al. (39)	Obesity	Some studies have shown that obesity is associated with lower IQ and that those with obesity exhibit poorer executive function, memory, attention and motor skills. Adiposity may directly affect cognition. Alternatively, weight-related bias and discrimination may influence self-esteem by internalizing and externalizing behavior problems. Anxiety/depression may also play a mediating role in the obesity-academic performance relationship.	No.

(Continued)

TABLE 3 (Continued)

Author	Health conditions	Hypothesized mediators (other than absence)	Hypothesized in review that absence mediated differences in attainment?
Segal et al. (41)	Obesity	The authors propose that adolescence may be a critical period for obesity to produce negative effects or that the detrimental effects of obesity may accumulate across childhood, explaining the findings that obesity was most consistently associated with poorer attainment at older ages. However, they do not propose specific pathways.	No.
Milton et al. (30)	Type 1 diabetes	Poor glycemic control may lead to episodes of hypoglycaemia affecting the developing nervous system, especially in younger children. Adolescents may exhibit deteriorating metabolic control.	Yes, stress, poor metabolic control and diabetic complications may affect school attendance, in turn affecting performance.
Oakley et al. (34)	Type 1 diabetes	Diabetes complications include hypo- and hyperglycaemia and ketoacidosis, which especially if recurrent, have the potential to impact educational attainment via altered cognitive function.	Yes, attendance may be affected by the need for acute treatment, in turn affecting attainment.

3. Results

3.1. Review selection

Our database searches identified 314 unique records, of which 281 were excluded by initial screening (Figure 2). Of the 33 full texts screened, 10 were excluded, resulting in 23 reviews identified from database searches. An additional four reviews were identified from reference lists (two reviews) and professional networks (two reviews). No additional reviews were identified from Google Scholar forward citation searches. The final number of reviews included was therefore 27 (1, 2, 17, 19, 20, 22–43).

3.2. Characteristics of reviews and studies

An overview of the reviews, their results on academic attainment, and the results on absence mediation are given in Table 1. Further details on the reviews (health conditions, outcomes, language limits, years covered, inclusion criteria, number of studies, countries, sample sizes, comparison groups, and overall results) are given in Supplementary File 3. Further information on absence mediation is presented below.

Five reviews focused on CHCs in general or multiple CHCs (2, 22, 27, 33). Two of these included any chronic condition (1, 22), one included studies on cystic fibrosis, hemophilia A, end-stage renal disease, or end-stage liver disease (33), one included various major structural congenital anomalies (27), and one included mental disorders (2). The remaining 22 reviews were condition-specific covering asthma (19, 38), attention problems (37), cancer (29, 32, 36, 40), chronic kidney disease (24), chronic pain (23, 35), congenital heart disease (26), depression (25, 42), epilepsy (20, 28, 43), obesity (17, 31, 39, 41), and type 1 diabetes (30, 34). Most reviews ($n = 21$) only included studies written in English (1, 17, 19, 20, 22, 23, 25, 27–34, 38–43). One included studies in English, French, or German (2), one included studies in English or Swedish (35), and four specified no language limits (24, 26, 36, 37). Supplementary File 3 also shows year limits imposed by the reviews, study inclusion criteria, number of studies included per review, their sample sizes, and comparison groups. In some

instances, reviews required a healthy comparison group though this was not universal, and some reviews included studies with population norms as the comparator or children with different stages of disease (e.g., children on renal dialysis vs. those who had received a renal transplant).

Before deduplication, the 27 reviews included 472 studies. After deduplication, there were 441 studies covering a total of 7, 549, 267 children from 47 regions. Of the 441 studies, 268 (61%) drew their samples from community populations (or were analyses of whole-population administrative data or registries) and the remaining 173 studies (39%) used clinical samples. The years of publication of the individual studies, as well as their countries, conditions studied, and outcome measures are shown in Figure 3. Most of the included research was published since the turn of the millennium (Figure 3A) and research from the USA dominated, with 231 (52%) studies from that country (Figure 3B). The top five conditions studied the most were obesity in 89 (20%) studies, followed by depression, epilepsy, chronic conditions generally, and cancer (Figure 3C). Studies used a range of educational measures, most commonly attainment of a particular level of education (170 studies, 39%), followed by administration of standardized tests (137 studies, 31%) and school grades (98 studies, 22%) as shown in Figure 3D. Twelve studies examined grade retention, nine examined perceived achievement, and one used a teacher-reported effort score. The rest of the studies used a mix of attainment, grades, grade retention, and standardized tests.

3.3. Risk of bias assessment of reviews

The results from the risk of bias analysis using the ROBIS tool are presented in Supplementary File 4.

3.4. Results on achievement or attainment

Most reviews concluded that CHCs were associated with lower academic attainment (Table 1 and Supplementary File 3). Associations between having a CHC and lower academic attainment were reported for CHCs generally, cystic fibrosis,

hemophilia A, end-stage renal disease (pre-transplant), end-stage kidney disease (pre-transplant), spina bifida, congenital heart disease, orofacial clefts, mental disorders, depression, and chronic pain (1, 2, 22–27, 33, 35, 42). The results for asthma were mixed with one review (19) concluding that asthma was not associated with lower academic attainment, except possibly severe asthma, whereas in another review (38), five out of eight studies found lower academic attainment in children with asthma. In terms of cancer, association with central nervous system tumors was most persistently observed (29, 32, 36, 40). Evidence for poorer academic attainment among survivors of other cancers was mixed and weaker. Similarly, evidence as to epilepsy was mixed (20, 28, 43) though children with epilepsy with poor prognosis had significantly poorer results in one review (43). Conclusions from the reviews of obesity were that, if there is an association, it is likely not of clinical significance (17, 31, 39, 41). Evidence for type 1 diabetes was mixed and weak (30, 34). Finally, attention problems were associated with lower academic attainment in a review of 15 studies (37), but in 2 studies at low risk of bias, there was no association once IQ and socioeconomic status were adjusted for.

3.5. Absence mediation

Table 1 shows that in 18 of the 27 reviews (67%), it was hypothesized that school absence was a mediator. However, this was tested in only 7 of 441 studies (2%) (44–50). Details for these studies, which examined asthma, obesity, orofacial clefts, and cancer/diabetes/epilepsy (analyzed as one, binary variable), on the one hand, and academic attainment, on the other, are shown in detail in Table 2. Comparisons, as detailed in Table 2, were either with children without CHCs or between different levels of severity of CHCs. In six of the seven studies (45–50), multiple regression modeling was used to first adjust for confounding factors, and then additionally adjust for school absence. In all six studies, there was no evidence that school absence was a mediator in the association between each CHC and academic attainment. In the seventh study of orofacial clefts (44), multiple regression was also used, but school absence was adjusted for first, and then confounders were entered into the model. In both steps, the model coefficients were the same. Therefore, from all seven studies, no evidence of absence mediation was found.

These seven studies were all affected by limitations (Table 2). Most commonly, the studies relied on self- or parent-reported measures of health or educational outcomes (or both) and so may have been affected by recall or social desirability bias in addition to selection and attrition bias inherent in longitudinal surveys. Only one study (of orofacial clefts) used measures of health and education not reported by participants or parents (44). This study instead used data from administrative health and education records linked to a national cleft registry (comparing children with cleft palate or cleft lip and palate with cleft lip only), thereby also limiting the risk of selection or attrition bias. However, this study was limited to children with orofacial clefts, and it did not include a non-symptomatic control group.

Details of other mediators hypothesized by review authors, many of which are condition-specific, are given in Table 3.

4. Discussion

We found evidence of strong associations between CHCs and educational attainment but a lack of evidence that this association is mediated by school absence. Our umbrella review of 27 systematic reviews (1, 2, 17, 19, 20, 22–43), covering 441 unique research studies of 7.5 million participants from 47 regions, found evidence that children with CHCs generally, or with major structural congenital anomalies, mental disorders, attention problems, central nervous system tumors, chronic kidney disease, chronic pain, congenital heart disease, and depression, were more likely than peers without the relevant CHCs to have lower academic attainment. Evidence for children with asthma, epilepsy, and obesity was mixed with studies finding either very weak associations with lower academic attainment, no associations, or even associations with higher academic attainment.

Only 7 of 441 studies (2%) empirically tested the hypothesis that absence from school is a mediator in this relationship (44–50). Of these seven, which included analyses of asthma, obesity, orofacial clefts, and cancer/diabetes/epilepsy (as one variable), none found any evidence that absence was a mediator. We, therefore, conclude that whereas there is strong evidence that a range of CHCs is associated with lower academic attainment, the hypothesized mediating pathway between CHCs, school absence, and academic attainment (Figure 1) currently has no strong empirical foundation in either direction.

The strengths of our umbrella review are the broad search and inclusion of a large number of studies. Although many of the reviews only included English-language studies, our finding that only 2% of 441 studies explored the extent to which absence mediates the association between CHCs and academic attainment shows a clear gap in the evidence about the mechanism through which CHCs might lead to lower attainment. A limitation is the varied types of comparator groups and varied adjustments for confounding factors. The wide range of conditions and study designs meant that meta-analysis was inappropriate; however, qualitatively, there were consistent findings on the associations between a range of CHCs (*vs.* none or different levels of CHC severity) and academic attainment. Additionally, our review did not aim to examine whether other possible mediators (such as those documented in Table 3) do in fact mediate the association between CHCs and academic attainment. Given the heterogeneous nature of the conditions under study, future CHC-specific studies will be required to further elucidate these factors.

Intervening to improve the educational outcomes of children with CHCs requires understanding the root causes of absence in these children, which likely differ between different CHCs and among children without CHCs. CHCs are very common, affecting up to 27% of young people in early adolescence (14). In England, absence from school is also common and, of all absences, the majority (73% in 2018/19) are authorized and, of these, 63% are due to either illness or needing to attend healthcare services (51). Among children with CHCs, the root causes of absence may relate to the condition itself, its

management, or the need to attend healthcare appointments. There may be a common cause, for example, times of acute illness may prevent school attendance while also undermining cognitive function. School attendance and absence policies should therefore view absence as a potential health issue and respond flexibly, in accordance with equalities legislation, and provide sufficient resources to enable the affected young person to stay engaged with education both in and out of school.

The findings from this review have implications for policy and research. First, policies that solely target reductions in absence might not improve attainment and could be harmful to children with CHCs. However, operating different policies for children with and without CHCs would require asking questions of children and their parents about their health conditions. This could be experienced as intrusive and stigmatizing and undermine relationships with school staff. Identification of CHCs could also drive demand for unnecessary health investigations or evidence from medical staff, which could breach patient confidentiality. The implication for policy is that any efforts that address the common causes, whether rooted in health or social needs, may be more effective for increasing participation in school, in turn improving attainment and wellbeing, and avoid alienation and stress, particularly for children with CHCs.

More research is needed to identify potential interventions to support participation in education and attainment of children with CHCs. Studies using administrative data can help to plug the current evidence gap (52), including comparisons between jurisdictions with different approaches in schools and/or healthcare. There is an urgent need for randomized-controlled trials of interventions, developed with the input of children and young people and their families, within education and/or healthcare services, to identify approaches that promote child wellbeing and improve participation in education and attainment among children with CHCs.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

References

- McKinley Yoder CL, Cantrell MA. Childhood Disability and educational outcomes: a systematic review. *J Pediatr Nurs.* (2019) 45:37–50. doi: 10.1016/j.pedn.2019.01.003
- Esch P, Bocquet V, Pull C, Couffignal S, Lehnert T, Graas M, et al. The downward spiral of mental disorders and educational attainment: a systematic review on early school leaving. *BMC Psychiatry.* (2014) 14:1–13. doi: 10.1186/s12888-014-0237-4
- Suris JC, Michaud PA, Viner R. The adolescent with a chronic condition. Part I: developmental issues. *Arch Dis Child.* (2004) 89:938–42. doi: 10.1136/adc.2003.045369
- Lum A, Wakefield CE, Donnan B, Burns MA, Fardell JE, Marshall GM. Understanding the school experiences of children and adolescents with serious chronic illness: a systematic meta-review. *Child Care Health Dev.* (2017) 43:645–62. doi: 10.1111/cch.12475
- Children's Commissioner. *The Big Answer.* (2022). Available online at: <https://www.childrenscommissioner.gov.uk/the-big-answer/> (accessed October 27, 2022)
- Dalziel D, Henthorne K. *Parents'/carers' Attitudes Towards School Attendance.* (2005). Available online at: <https://dera.ioe.ac.uk/5548/1/RR618.pdf> (accessed September 12, 2022).
- Reid K. The views of head teachers and teachers on attendance issues in primary schools: *Res Educ.* (2004) 72:60–76. doi: 10.7227/RIE.72.5
- Reid K. An evaluation of the views of secondary staff towards school attendance issues. *Oxf Rev Educ.* (2006) 32:303–24. doi: 10.1080/03054980600775557

Author contributions

MJ designed the study to which all authors contributed and deduplicated the articles and carried out initial synthesis and article drafting to which all the authors contributed. MJ and DS-E carried out article eligibility assessment and data extraction as documented in the methods section of this manuscript. All the authors contributed to the manuscript revision and read and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1122769/full#supplementary-material>

9. Department for Education. *School attendance: guidance for schools*. (2020). Available online at: <https://www.gov.uk/government/publications/school-attendance> (accessed February 17, 2020).
10. Ofsted. *Securing Good Attendance and Tackling Persistent Absence*. (2022). Available online at: <https://www.gov.uk/government/publications/securing-good-attendance-and-tackling-persistent-absence/securing-good-attendance-and-tackling-persistent-absence> (accessed September 12, 2022).
11. Children's Commissioner. *Back Into School: New Insights Into School Absence*. (2022). Available online at: <https://www.childrenscommissioner.gov.uk/wp-content/uploads/2022/07/cc-new-insights-into-school-absence.pdf> (accessed October 27, 2022).
12. Department for Education. *The Link Between Absence and Attainment at KS2 and KS4 2013/14 Academic Year*. (2016). Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/509679/The-link-between-absence-and-attainment-at-KS2-and-KS4-2013-to-2014-academic-year.pdf (accessed September 12, 2022).
13. Department for Education. *Working Together to Improve School Attendance: Guidance for Maintained Schools, Academies, Independent Schools, and Local Authorities*. (2022). Available online at: <https://www.gov.uk/government/publications/working-together-to-improve-school-attendance> [Accessed November 22, 2022]
14. van Cleave J, Gortmaker SL, Perrin JM. Dynamics of obesity and chronic health conditions among children and youth. *JAMA*. (2010) 303:623–30. doi: 10.1001/jama.2010.104
15. Sosu EM, Dare S, Goodfellow C, Klein M. Socioeconomic status and school absenteeism: A systematic review and narrative synthesis. *Rev. Educ.* (2021) 9:e3291. doi: 10.1002/rev3.3291
16. Sirin SR. Socioeconomic status and academic achievement: a meta-analytic review of research. *Rev Educ Res.* (2016) 75:417–53. doi: 10.3102/00346543075003417
17. Caird J, Kavanagh J, O'Mara-Eves A, Oliver K, Oliver S, Stansfield C, et al. Does being overweight impede academic attainment? A systematic review. *Health Educ J.* (2014) 73:497. doi: 10.1177/0017896913489289
18. Austin JK, Huberty TJ, Huster GA, Dunn DW. Academic achievement in children with epilepsy or asthma. *Dev Med Child Neurol.* (1998) 40:248–55. doi: 10.1111/j.1469-8749.1998.tb15457.x
19. Milton B, Whitehead M, Holland P, Hamilton V. The social and economic consequences of childhood asthma across the lifecycle: a systematic review. *Child Care Health Dev.* (2004) 30:711–28. doi: 10.1111/j.1365-2214.2004.00486.x
20. Wo SW, Ong LC, Low WY, Lai PSM. The impact of epilepsy on academic achievement in children with normal intelligence and without major comorbidities: a systematic review. *Epilepsy Res.* (2017) 136:35–45. doi: 10.1016/j.eplepsyres.2017.07.009
21. Fletcher JM. Adolescent depression: diagnosis, treatment, and educational attainment. *Health Econ.* (2008) 17:1215–35. doi: 10.1002/hec.1319
22. Hale DR, Bevilacqua L, Viner RM. Adolescent health and adult education and employment: a systematic review. *Pediatrics.* (2015) 136:128–40. doi: 10.1542/peds.2014-2105
23. Alsagoff F, Fatimah C, Imelda AI. A systematic review of the impact of chronic pain on adolescents' school functioning and school personnel responses to managing pain in the schools. *J Adv Nurs.* (2020) 76:2005–22. doi: 10.1111/jan.14404
24. Chen K, Didsbury M, van Zwieten A, Howell M, Kim S, Tong A, et al. Neurocognitive and educational outcomes in children and adolescents with CKD: A systematic review and meta-analysis. *Clin J Am Soc Nephrol.* (2018) 13:387–97. doi: 10.2215/CJN.09650917
25. Clayborne ZM, Varin M, Colman I. Systematic review and meta-analysis: adolescent depression and long-term psychosocial outcomes. *J Am Acad Child Adolesc Psychiatry.* (2019) 58:72. doi: 10.1016/j.jaac.2018.07.896
26. Cocomello L, Dimagli A, Biglino G, Cornish R, Caputo M, Lawlor DA. Educational attainment in patients with congenital heart disease: a comprehensive systematic review and meta-analysis. *BMC Cardiovasc Disord.* (2021) 21:1–20. doi: 10.1186/s12872-021-02349-z
27. Glinianaia S, McLean A, Moffat M, Shenfine R, Armaroli A, Rankin J. Academic achievement and needs of school-aged children born with selected congenital anomalies: A systematic review and meta-analysis *Birth Defects Res.* (2021) 113:1431–62. doi: 10.1002/bdr2.1961
28. Lah S, Castles A, Smith M. Reading in children with temporal lobe epilepsy: a systematic review. *Epilepsy Behav.* (2017) 68:84–94. doi: 10.1016/j.yebeh.2016.12.021
29. Langeveld NE, Stam H, Grootenhuys MA, Last BF. Quality of life in young adult survivors of childhood cancer. *Support Care Cancer.* (2002) 10:579–600. doi: 10.1007/s00520-002-0388-6
30. Milton B, Holland P, Whitehead M. The social and economic consequences of childhood-onset Type 1 diabetes mellitus across the lifecycle: a systematic review. *Diabetic Medicine.* (2006) 23:821–9. doi: 10.1111/j.1464-5491.2006.01796.x
31. Martin A, Booth JN, McGeown S, Niven A, Sproule J, Saunders DH, et al. Longitudinal associations between childhood obesity and academic achievement: systematic review with focus group data. *Curr Obes Rep.* (2017) 6:297–313. doi: 10.1007/s13679-017-0272-9
32. Molcho M, D'Eath M, Alforque Thomas A, Sharp L. Educational attainment of childhood cancer survivors: a systematic review. *Cancer Med.* (2019) 8:3182–95. doi: 10.1002/cam4.2154
33. Moser JJ, Veale PM, McAllister DL, Archer DP, A. systematic review and quantitative analysis of neurocognitive outcomes in children with four chronic illnesses. *Paediatr Anaesth.* (2013) 23:1084–96. doi: 10.1111/pan.12255
34. Oakley NJ, Gregory JW, Kneale D, Mann M, Hilliar M, Dayan C, et al. Type 1 diabetes mellitus and educational attainment in childhood: A systematic review. *BMJ Open.* (2020) 10:e033215. doi: 10.1136/bmjopen-2019-033215
35. Ragnarsson S, Myleus A, Hurtig A-K, Sjöberg G, Rosvall P-A, Petersen S. Recurrent pain and academic achievement in school-aged children: a systematic review. *J Sch Nurs.* (2020) 36:61–78. doi: 10.1177/1059840519828057
36. Saatci D, Thomas A, Botting B, Sutcliffe A. Educational attainment in childhood cancer survivors: a meta-analysis. *Arch Dis Child.* (2020) 105:339–46. doi: 10.1136/archdischild-2019-317594
37. Polderman TJC, Boomsma DI, Bartels M, Verhulst FC, Huizink AC, A. systematic review of prospective studies on attention problems and academic achievement. *Acta Psychiatr Scand.* (2010) 122:271–84. doi: 10.1111/j.1600-0447.2010.01568.x
38. Schneider T. Asthma and academic performance among children and youth in north america: a systematic review. *J Sch Health.* (2020) 90:319–42. doi: 10.1111/josh.12877
39. Santana CCA, Hill JO, Azevedo LB, Gunnarsdottir T, Prado WL. The association between obesity and academic performance in youth: a systematic review. *Obes Rev.* (2017) 18:1191–9. doi: 10.1111/obr.12582
40. Schulte F, Kunin-Batson AS, Olson-Bullis BA, Banerjee P, Hocking MC, Janzen L, et al. Social attainment in survivors of pediatric central nervous system tumors: a systematic review and meta-analysis from the Children's Oncology Group. *J Cancer Surviv.* (2019) 13:921–31. doi: 10.1007/s11764-019-00808-3
41. Segal AB, Huerta MC, Aurino E, Sassi F. The impact of childhood obesity on human capital in high-income countries: a systematic review. *Obesity Reviews.* (2021) 22:e13104. doi: 10.1111/obr.13104
42. Wickersham A, Sugg HVR, Epstein S, Stewart R, Ford T, Downs J. Systematic review and meta-analysis: the association between child and adolescent depression and later educational attainment. *J Am Acad Child Adolesc Psychiatry.* (2021) 60:105–18. doi: 10.1016/j.jaac.2020.10.008
43. Puka K, Tavares TP, Speechley KN. Social outcomes for adults with a history of childhood-onset epilepsy: A systematic review and meta-analysis. *Epilepsy and Behavior.* (2019) 92:297–305. doi: 10.1016/j.yebeh.2019.01.012
44. Fitzsimons KJ, Deacon SA, Copley LP, Park MH, Medina J, van der Meulen JH. School absence and achievement in children with isolated orofacial clefts. *Arch Dis Child.* (2021) 106:154–9. doi: 10.1136/archdischild-2020-319123
45. Veldwijk J, Fries MCE, Bemelmans WJE, Haveman-Nies A, Smit HA, Koppelman GH, et al. Overweight and school performance among primary school children: the PIAMA Birth cohort study. *Obesity.* (2012) 20:590–6. doi: 10.1038/oby.2011.327
46. Sabia J. The effect of body weight on adolescent academic performance. *South Econ J.* (2007) 73:871–900. doi: 10.1002/j.2325-8012.2007.tb00809.x
47. Black N, Johnston DW, Peeters A. Childhood obesity and cognitive achievement. *Health Econ.* (2015) 24:1082–100. doi: 10.1002/hec.3211
48. Crump C, Rivera D, London R, Landau M, Erlendson B, Rodriguez E. Chronic health conditions and school performance among children and youth. *Ann Epidemiol.* (2013) 23:179–84. doi: 10.1016/j.annepidem.2013.01.001
49. Kohen DE. Asthma and school functioning. *Health Rep.* (2010) 21:35–45. Available online at: <https://www150.statcan.gc.ca/n1/pub/82-003-x/2010004/article/11363-eng.pdf>
50. Champaloux SW, Young DR. Childhood chronic health conditions and educational attainment: a social ecological approach. *J Adol Health.* (2015) 56:98–105. doi: 10.1016/j.jadohealth.2014.07.016
51. Department for Education. *Pupil absence in schools in England: autumn 2018 and spring 2019*. (2019). Available online at: <https://www.gov.uk/government/statistics/pupil-absence-in-schools-in-england-autumn-2018-and-spring-2019> (accessed October 27, 2022).
52. UCL. *Chronic health conditions, school absence and attainment*. (2022). Available online at: <https://www.ucl.ac.uk/children-policy-research/projects/chronic-health-conditions-school-absence-and-attainment> (accessed November 7, 2022).



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Embracing change: from recalibration to radical overhaul for the field of school attendance

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In a world characterized by dynamic demographic shifts, rapid technological transformations, and evolving pedagogical practices, the need for reimagining school attendance and a relationship with education has become paramount. This Research Topic, boldly titled “The Unlearning of School Attendance: Ideas for Change,” compels us to challenge conventional thinking and working in this domain. The collection of 12 articles offers compelling opportunities for change, ranging from subtle recalibrations to radical overhauls, depending on the extent to which our current ideas and methods have grown outdated. This opening article serves as a thematic guide, curating the diverse prospects for transformation found within the collection. Four themes encourage us to reconceptualize school attendance and a relationship with education, while another four themes inspire new ways of working in this realm. Furthermore, we explore the pivotal role of the International Network for School Attendance (INSA) in facilitating change, as it strives to foster relationships with education, forge alliances among interested parties, and promote interdisciplinary research. As you engage with this article and the other 12 contributions in this collection, we invite you to reflect on your current ideas and methods, embracing the call for transformative change with compassion and a strong sense of purpose. Together, we can shape a future where school attendance and engagement with learning thrive in harmony with our evolving world.

KEYWORDS

relationship with education, engagement with learning, school attendance, school absenteeism, education, intervention, alliances

1 Introduction

The title for this Research Topic is provocative. “The unlearning of school attendance: Ideas for change” emphasizes that change is needed in the field of school attendance to better support learners’ readiness for adulthood. (We employ the term “learners,” rather than “youths” or “young people,” to underscore individuals’ ongoing connection with education regardless of age.) The world is changing, schooling is different, and our approach to school attendance and each learner’s relationship with education must be different too. The expression “unlearning school attendance” conveys the central notion that current ideas and methods need to be recalibrated or even overhauled, because they have not resulted in the progress

needed in the field to adequately support readiness for adulthood among all learners. Whether our ideas and methods require a small recalibration, or a radical overhaul depends on how antiquated our current ways of thinking and working are. Current ideas and methods represent our best intentions for learners, but they may be out of touch with our changing world. They may be based on outdated assumptions or practices; insufficiently driven by data; not fully aligned with the current needs of learners, families, and communities because they are insufficiently flexible; overly focused on cure relative to prevention; or not supported by available research. “The unlearning of school attendance” is not intended to suggest that everything we currently think and do needs to be recalibrated or overhauled. To be sure, we do not encourage interested parties to “throw the baby out with the bathwater.” Rather, we encourage all parties involved in school attendance to consider the need to shift their mindset or way of working, so that, collectively, we engage in the most fruitful work possible. (Regarding the term “interested parties”, we have chosen to use this term instead of “stakeholders” because the latter is contested due to its colonial connotations.)

At the heart of our collective endeavor to reshape school attendance and enhance learners’ relationship with education stands the integral role of the International Network for School Attendance (INSA). INSA recognizes the profound impact of a relationship with education on overall development and preparedness for adulthood, advocating for school attendance while addressing the challenges of absenteeism. INSA’s journey began in 2018 during a pivotal gathering, a Lorentz Centre Workshop, when researchers and practitioners in the field of school attendance came together to nurture collaboration and consensus. Since that inception, INSA’s Executive Committee has been diligently collaborating with its members to curate, create, evaluate, and disseminate information, tools, and strategies for understanding absenteeism, promoting consistent attendance, and intervening effectively in school attendance problems (SAPs).

INSA forged a partnership with the open access journals *Frontiers in Education* and *Frontiers in Psychology* to host this Research Topic. Under the leadership of INSA’s Vice President, Carolyn Gentle-Genitty, and with the support of esteemed research scholars Arya Ansari, Ineke Marshall, and Michael Gottfried, our call for articles received an enthusiastic response from the scholarly community. In this context, INSA’s Executive Committee takes great pride in presenting this introductory article, underscoring the profound significance of the Research Topic and reaffirming our collective commitment to empower all learners to embrace the world of learning.

The 12 other articles in this collection shine a light on a multitude of ways to unlearn attendance and effect change. For some readers, the articles will stimulate them to replace punitive responses to absence with a focus on learners’ relationship with education (e.g., [Kearney and González, 2022](#)), to think more broadly about influences on attendance (e.g., [Purtell and Ansari, 2022](#)), to re-think the key elements in a multi-tiered system of supports for geographical areas with high rates of chronic absenteeism (e.g., [Kearney and Graczyk, 2022](#)), or to unlearn the notion that home education is counterproductive (e.g., [Paulauskaite et al., 2022](#)). The richness in the current collection of articles is enhanced via the diversity in article types (original research, review, systematic review, perspective, hypothesis and theory), the locations in which the authors work (Australia, Belgium, Chile, England, Finland, France, Netherlands, Norway, Spain, United Kingdom, and United States), and the different

perspectives they bring to our work in the field (anthropology, business studies, computer science, computer engineering, criminal justice, education, epidemiology, law, psychiatry, psychology, public health, research data science, social work, and sociology).

The solutions that seem pertinent in some geographical areas (countries or localities) may be less needed or less transferable to other areas due to differences in education systems ([Heyne et al., 2022](#)) and socio-cultural influences on attendance and absenteeism ([Kearney et al., 2023](#)). However, there are key themes that emerge from the collection, and we believe these themes are of global relevance. In this overview article, we summarize the key themes emerging from the 12 articles in the collection (Section 2). We then describe ways in which INSA is working to help the field of school attendance move forward (Section 3).

2 Themes from the work presented in this Research Topic

In this section, we present eight themes that encapsulate the concept of “unlearning attendance.” These themes derive from a thorough curation of articles in the Research Topic, incorporating insights from the collection along with our own contributions. We have organized the themes into two principal areas: four themes focusing on thinking about school and attendance, and four focusing on ways of working to promote attendance and reduce absenteeism. This dual categorization establishes a framework for navigating the diverse array of topics, findings, and insights presented across the 12 articles. Importantly, an inherent interplay between thinking and working exists: our *thinking* shapes our *working*, and reciprocally, our *working* on attendance and absenteeism further shapes our *thinking*. This relationship reflects the broader distinction and interplay between theory and practice.

2.1 Thinking broadly about the meaning of attendance

When we think about attendance, it is natural for our minds to conjure images of children or adolescents at school and to have ideas about them attending school until graduation. These images and ideas, while neither inherently correct nor incorrect, represent a narrow rather than broad understanding of how we can think about attendance.

2.1.1 Attendance is about more than seat time

Familiarity with the literature on attendance and absence reveals a predominant focus, until now, on learners being at school. In effect, the focus has been on “seat time”; whether or not learners are in class. [Kearney et al. \(2022\)](#) refer to in-seat class time as a traditional metric which is “becoming obsolete for many students” (p. 8) because of changes in the contexts and strategies for teaching and learning, including online learning, hybrid learning which combines online with in-person learning at school, and self-learning.

“Unlearning attendance” is an invitation to think more broadly about the concept of attendance. Drawing on newer definitions of school attendance, [Kearney et al. \(2022\)](#) shift the emphasis away from the physical location for learning toward engagement with learning.

Engagement includes learners' "cognitive, behavioral, and emotional investment in academic work and progression" (p. 8), and new metrics might include log-ins to online learning, time on task, and interactions with teachers. Kearney et al. also draw attention to the role of education in community settings such as internships, again countering the notion that education only occurs during in-seat time at school.

According to [Kearney and Graczyk \(2022\)](#), we need to prioritize "more flexible, valid methods to define attendance for diverse, contemporary learning formats" (p. 4). Learning formats are determined not only by contemporary changes in education, but also by the unique learning needs of specific populations of learners. [Paulauskaite et al.'s \(2022\)](#) work, for example, points to the potential value of elective home education for learners with neurodevelopmental conditions. For these learners, and others, traditional metrics of attendance will fail to capture their engagement with learning. (For more on engagement with learning, see Section 2.2.1.)

2.1.2 Attendance is about more than completing compulsory education at a specific time

Another traditional notion is that school completion is a singular event ([Kearney et al., 2022](#)). While a graduation ceremony is certainly a singular and special event, symbolizing and celebrating the learner's completion of requirements for compulsory education, focusing solely on school completion detracts attention from the need to provide ongoing education opportunities for those not following a traditional time-frame for school completion. As noted by [Kearney et al. \(2022\)](#), many learners are not in a position to complete compulsory education at a legally predefined age (e.g., 18 years), especially those with disabilities. These learners need more time to complete schooling, and graduation policies need to be revised to "blur the line between completing high school and beginning the adult readiness process" (p. 7). Alongside revised policies, there needs to be an expansion of existing options to provide "alternative, creative, and viable pathways to school completion" ([Kearney and Graczyk, 2022](#), p. 4). Suggestions for flexible pathways to school completion include personalized methods of completion based on learners' circumstances and interests ([Kearney and González, 2022](#)), partnerships with community-based learning centers and credit recovery initiatives ([Kearney and Graczyk, 2022](#)), and options to participate in vocational training programs or community college ([Kearney et al., 2022](#)).

In essence, a broader and more flexible conceptualization of attendance involves viewing readiness for adulthood as a process, which necessitates a reconceptualization of school completion ([Kearney et al., 2022](#)). This broader conceptualization also focuses attention on the value of post-secondary education, a topic addressed in another Research Topic in *Frontiers in Psychology* ([Education Not Cancelled: Pathways from absence to post-secondary education](#)). Post-secondary education is also addressed in the current Research Topic via [Korotchenko and Dobbs' \(2023\)](#) article about college enrolments (see Section 2.6).

2.2 Thinking broadly about the function of attendance

The broader conceptualization of attendance described in the previous section compels us to relinquish seat-time and the completion of compulsory education as the sole objectives. Interested

parties are encouraged to focus on the functions of attendance. Two primary and related functions are engagement with learning and readiness for adulthood.

2.2.1 Attendance in the service of engagement with learning

Student engagement emerged as a construct in the 1980s, with roots in the literature on the prevention of school dropout. Recent work places engagement at the center of high school reform efforts and school-based interventions to enhance outcomes across academic, social, behavioral, and emotional domains ([Reschly and Christenson, 2012](#); [Fredricks et al., 2019](#)). Student engagement is a nebulous construct. At present, there is no consensus on a definition, nor on how it can be differentiated from motivation. For instance, [Fredricks et al. \(2004\)](#) view engagement as a meta-construct which subsumes motivation. Others view engagement as the outward manifestation of motivation ([Skinner et al., 2009](#)) and as closely aligned with effort ([Nagy et al., 2022](#)).

Despite the conceptual haziness, there is broad agreement that engagement is a multi-dimensional construct comprising behavioral, cognitive, and affective domains. [Fredricks et al. \(2004\)](#) describe the domains as follows. Behavioral engagement "draws on the idea of participation," including involvement in academic and extracurricular activities (p. 60). Cognitive engagement "draws on the idea of investment," incorporating thoughtfulness as well as willingness to exert effort to comprehend ideas and to master skills (p. 60). Emotional engagement "encompasses positive and negative reactions" to school and different aspects of school such as teachers, classmates, and academics. There is also agreement that engagement is amenable to the effects of intervention and highly affected by contexts, including peer, school/classroom, family, and community contexts. Aspects of the classroom and school contexts that are known to increase student engagement include teacher warmth and supportiveness, instructional strategies that encourage student interaction, organizational aspects of the school (especially smaller school size), and feeling physically and psychologically safe at school ([Finn and Zimmer, 2012](#); [Fredricks et al., 2019](#)).

Articles in this Research Topic take up the important theme of engagement. [Niemi et al. \(2022\)](#) explored absenteeism among learners with ADHD. In their Discussion, they call for more support for school engagement among those with ADHD as a way to prevent attendance problems among this group, and thus to support their learning. In [Kearney et al.'s \(2022\)](#) review article, there is the suggestion that engagement with school is augmented by restorative practices, including school-family-community partnerships and strategies to enhance safety and social relationships.

[Bowen et al. \(2022\)](#) describe a program that leverages technology and a gamification system to engage learners from underserved communities in an intervention that fosters social and emotional qualities for success. The program does not directly address engagement with learning, but it does so indirectly by supporting the development of learner's social and emotional skills and competencies, which the authors associate with in-class participation. In their empirical study, they explored factors in the behaviors of elementary school children (kindergarten to 6th grade) that are connected with absenteeism. Some of the factors they analyzed pertain to "core values associated with in-class participation" (p. 1), including "enthusiastic in class", "focused

within class”, “meet or exceed expectations on assignments”, and “demonstrates initiative”. Children at low risk for absenteeism were found to have a strong work ethic, to contribute to class discussion, and to complete course work as per the instructions, suggesting that engagement in the form of in-class participation is connected with school attendance.

LeBoeuf et al. (2023) investigated absenteeism among learners in Montessori schools, an alternative system of education renowned for high student engagement. In their introduction they note that Montessori classrooms aim to maximize learners’ interest, concentration, and intrinsic motivation, offering individualized instruction and free-choice about what is worked on and whether work is done individually or with peers, and providing a consistent teacher across several years. They note prior research in which Montessori students report a stronger sense of community at school, and more enjoyment of schoolwork, relative to those at conventional schools. Their study was based on the assumption that Montessori schools are adept at increasing the engagement of students and families, which is reflected in higher levels of school attendance relative to those at conventional schools. In other words, attendance in the service of engagement with learning can further facilitate attendance when learners are well-engaged, constituting a virtuous cycle.

2.2.2 Attendance in the service of readiness for adulthood

Attendance is in the service of engagement with learning, which is in the service of learners’ readiness for adulthood. According to Kearney et al. (2022), readiness for adulthood for all learners is the primary long-term outcome related to school attendance. Readiness includes the skills needed to be successful in one’s further education (i.e., beyond compulsory education) and employment, including career and life skills. This will require changes in education with respect to pedagogical goals, such as greater focus on “a whole child/citizen approach where learning is ... competency-based ... and in part focused on student well-being” (p. 5). Kearney et al. argue that this kind of learning emphasizes the skills needed for adult readiness, including critical thinking, problem-solving, creativity, communication, interpersonal skills, and self-management. For a discussion about school-based promotion of well-being, see McNeven et al. (2023).

At the other end of the developmental spectrum, Purtell and Ansari (2022) write about school readiness. They note that young children from low-income families are more likely to be absent from preschool relative to those from higher-income families, and that numerous efforts are needed to increase school readiness among disadvantaged children. Thus, efforts to prepare learners for adulthood need to commence as early as preschool, to improve school attendance, in the service of learning, in the service of readiness for adulthood.

2.3 Thinking creatively about the provision of education

Articles in the Research Topic draw attention to the need for broad, creative thinking about the provision of education, with respect to the setting in which education occurs and the curriculum.

2.3.1 The setting in which education occurs

Two articles in the collection focus on home-based education, in one case because parents de-registered their child from school (i.e., elective home education; Paulauskaite et al., 2022), and in the other case because schools were closed due to the COVID-19 pandemic (i.e., emergency remote education; Havik and Ingul, 2022). We address these articles in turn.

Paulauskaite et al. (2022) provide a wide-ranging account of the functioning and needs of UK learners with neurodevelopmental conditions (autism and/or intellectual disability) who participated in elective home education before and/or after the start of the COVID-19 pandemic. The researchers elicited parent perspectives on home education and found that the most common reason given for de-registering their child from school, whether de-registering occurred before or after the start of the pandemic, was that their child’s additional needs were not met sufficiently at school (e.g., learning and mental health needs). It is not surprising then that the main advantage of elective home education according to parents was the opportunity to provide “personalized education and one-to-one support” (p. 8). This included the freedom to tailor education to the needs and interests of their child. This study thus challenges the notion that learning among those with neurodevelopmental conditions needs to happen in a school setting. In support of this, the researchers found that there was no difference in levels of internalizing or externalizing problems between those in home education and those still registered at a school.

Havik and Ingul (2022) report on Norwegian teachers’ perspectives on remote education during the COVID-19 pandemic, including their perspectives on whether it was likely to make school return following school closure easier or harder for learners with attendance problems. Motivation for the study included the notion that learners with attendance problems might benefit from remote education (e.g., reducing gaps in learning) and acknowledgement that there are disparate perspectives on whether remote education is indeed helpful. The authors found that forced school closures led to teachers feeling more confident about using digital tools to facilitate engagement with schoolwork, and the teachers wished to make more use of hybrid solutions (i.e., education at school and digitally) for learners who find it difficult to attend school regularly. In addition, two-thirds of teachers believed a return to school following closure would be more difficult for those with attendance problems whereas one-third believed it would be easier. The authors suggest that digital contact with learners absent from school may reduce the sense of alienation from school, that contact with these learners *at* school can increase opportunities for teachers to provide close monitoring and greater structure, and that teachers and parents need to cooperate in considering the advantages and disadvantages of home-based education for learners with attendance problems. They conclude that there is scope for variability in interventions for SAPs by incorporating digital tools for remote education.

The aforementioned articles illustrate flexibility regarding the setting for education, whether due to parent choice or the imposition of remote teaching during school closures. The articles present arguments in favour of home-based education for learners with developmental conditions (Paulauskaite et al., 2022) and to some extent for those with school attendance problems (Havik and Ingul, 2022). Kearney and Graczyk (2022) also suggest that home-based education and online programs are a flexible way to facilitate school

completion by accounting for individual circumstances and interests. At the same time, it is important to note that inclusive education does not allow for segregation (United Nations Committee on the Rights of Persons with Disabilities (CRPD), 2016), the argument being that school systems need to adapt in order to support and engage all learners – including those with difficulty attending school. With this in mind, “unlearning attendance” also calls upon interested parties to re-imagine academic, behavioral, and social–emotional learning provided within school systems so that there is less need for learners to participate in home education.

2.3.2 The curricula for education

Kearney et al. (2022) argue that readiness for adulthood (described in Section 2.2.2) will require creative educational efforts, such as reconfigured curricula in secondary education. They describe the fundamental shift that is occurring worldwide in instructional formats, and the prospects for learning via formats which are “accessible, collaborative, inclusive, personalized, [and] self-paced ...” (p. 5). As noted in Section 2.1, this includes education that occurs outside the school setting and via ongoing education opportunities for those who do not follow a traditional path toward school completion (e.g., blended and self-learning, non-profit agency-based instruction, and vocational and fieldwork).

In the article by Purtell and Ansari (2022), there is indirect reference to curricula for education. They argue that positive experiences at preschool are likely to increase children’s motivation to attend and parents’ willingness to send their child to school, thereby reducing absenteeism. Indeed, they found that children who enjoyed school attended more often, as did children who were in classrooms rated as higher quality. It is highly conceivable that the children’s enjoyment of school, and the quality of the teacher–child interactions, were influenced by the curriculum.

2.4 Thinking broadly about influences on attendance

The articles in this collection encourage and inspire us to think broadly about influences on attendance and absence. We firstly curate ideas from the articles according to the need to think broadly, and then present examples of broad thinking based on the empirical studies in the collection.

2.4.1 The need for broad thinking about influences

When we think broadly about influences on attendance and absence, we are better placed to develop grand theories, offer more effective intervention, and reduce stigma for learners and families.

In Kearney and González’s (2022) overview of risk factors for attendance problems and factors protecting against these problems, they describe the forked approach to understanding attendance and absence. Some parties adopt a broad “systemic” focus (e.g., examining structural economic inequalities) while others adopt a narrow “analytic” focus (e.g., examining parental involvement in education). Kearney and González acknowledge that it is understandable that professionals from the many disciplines focusing on absenteeism bring specific foci to their efforts to understand absenteeism, but they lament the forked approach because it impedes the development and

testing of grander theories of attendance and absenteeism, and it restricts avenues for intervention. They thus call for a more inclusive approach to understanding attendance and responding to attendance problems in order to derive grander theories and more effective intervention.

Indeed, a primary aim of broad thinking is to improve our work to promote attendance and reduce attendance problems. Kearney and González (2022) explain, for example, that increased attention to racial equity in educational institutions has shed light on the role that biased processes in schools and communities play in attendance problems (e.g., exclusionary discipline in the form of suspensions; arrests). These processes warrant attention in intervention for attendance problems. According to Kearney and Graczyk (2022), “unlearning school attendance” calls for attention in intervention to broad political and economic issues. They explain that many school districts with high rates of chronic absenteeism are in areas where there are deep structural inequalities and few support services which are often fragmented. They note the need for enhanced equity in intervention, calling for trauma-informed practices because of high rates of adverse child experiences; culturally relevant interventions (e.g., program content; interested parties who reflect learners’ values and culture); and support for learners so that they can “navigate hostile racial school climates” (p. 3).

Broad thinking also reduces learners’ and families’ sense of being blamed for absenteeism. According to Kearney et al. (2022), a broader perspective helps us move away from a deficit narrative around absenteeism. In other words, absenteeism will no longer be understood as arising from problems with the learner. Absence from school may be an adaptive option for some learners, such as avoiding victimization, pursuing employment, or rejecting an education system that is biased against some learners with respect to disciplinary policies (Kearney et al., 2022). By expanding the focus from specific risk factors (e.g., a learner’s mental health challenges; family dynamics) to broader contextual influences outside a family’s control (e.g., the physical environment at school; housing insecurity; neighborhood violence), less blame is placed on learners and families and they will experience less undue burden for resolving attendance problems (Kearney et al., 2022). These are important conditions for successful intervention.

Comprehensive models that reflect and foster broad thinking about influences on attendance and absence include the Kids and Teens at School (KiTeS) bioecological framework (Melvin et al., 2019). Melvin and colleagues draw attention to multiple simultaneous influences and their interactions over time, including influences in the microsystems (e.g., a child’s or adolescent’s sleep problems; a family’s economic hardship), the mesosystem which represents interconnections among microsystems (e.g., student–teacher relationship; parent–school contact), the exosystem (e.g., school climate; educational policies), the macrosystem (e.g., neighborhood violence; government policies), and the chronosystem (e.g., time of the school year; changes in the other systems as the learner moves from primary school to high school). Examples of research on these influences are presented next.

2.4.2 Examples of broad thinking about influences

The eight empirical studies in the collection address a range of influences on attendance, including combinations of micro-, meso-,

exo-, macro-, and/or chronosystem influences. Furthermore, the studies involve examination of new variables and/or the examination of previously studied variables but among different populations.

Arbour et al. (2023) examined the effects of universal strategies to promote attendance among preschool children in Chile as well as targeted strategies to reduce absenteeism among those at risk for chronic absence. Their theory of change for improving attendance has six primary determinants that span child-level factors (e.g., motivation to attend), family-level factors (e.g., focus on attendance at parent-teacher meetings; incentives for families), school-level factors (e.g., a health corner in the classroom to reduce child illness; formation of a School Attendance Committee to analyze attendance data, identify children at risk of chronic absence and the causes of absences in each case, and develop an individualized approach to help each child and family overcome barriers to attendance), and a macrosystem factor (i.e., free school van to provide transportation to school). The researchers found that attendance rates were better when schools participated in the intervention *and* prioritized school attendance, compared to when schools participated in the intervention but did *not* prioritize attendance, or simply did not participate in the intervention. While Arbour et al.'s study was not designed to investigate factors contributing to absenteeism, their evaluation of a professional development intervention points to the probable impact of micro-, meso-, and macrosystem influences on attendance and absenteeism.

Purtell and Ansari's (2022) study directly addresses the influence of multiple systems on the attendance of US preschoolers in non-compulsory education (Head Start) who come from low-income families, the majority of whom come from ethnic minority families. Absenteeism was found to be influenced, for example, by family necessity (e.g., whether or not parents were in full-time employment and thus needing their child to be in preschool), family routines (e.g., children's sleep patterns), stressors for the family (e.g., adequacy of medical care; perception of living in a violent neighborhood), classroom characteristics (e.g., quality of teacher-child interactions), and social support for parents (e.g., from other parents in the Head Start program). The authors note that there was no single mechanism driving absence; rather, multiple factors across contexts influenced absenteeism. They align their findings with the bioecological theory that multiple systems shape absenteeism, arguing that attention to one factor alone will have little impact on absenteeism. They call for attention to complex family circumstances in order to reduce absenteeism, and recommend the fostering of relationships among parents of preschoolers.

Paulauskaite et al. (2022) address influences on elective home education. As noted previously (Section 2.3.1), parents' reasons for de-registering their child from school were broadly similar across parents who de-registered prior to the pandemic and those who de-registered during the pandemic. The main reason given by both groups of parents was low satisfaction with school for not meeting their children's additional needs. Health concerns due to the COVID-19 pandemic were influential in decision-making for fewer than one-quarter of parents who de-registered their child after the onset of the pandemic. Because the study addresses the impact of the pandemic, it includes the chronosystem in efforts to understand learners' participation in education at school or at home.

Two other studies in the collection addressed the impact of the COVID-19 pandemic. Havik and Ingul (2022) explored Norwegian

teachers' perspectives on how teachers could apply their experience of remote education during the pandemic to help learners with attendance problems return to school after school reopening. Study findings thus contribute to an understanding of the maintenance and remediation of attendance problems, rather than the development of these problems. The findings (summarized in Section 2.3.1) have implications for micro-, meso-, and exosystem influences on attendance and absence, including learners' sense of alienation from school, teachers' confidence in using digital tools to facilitate engagement with schoolwork, schools' policies concerning educational formats to engage learners and support those who have difficulty attending school, and family-school contact to determine optimal learning pathways for learners. Korotchenko and Dobbs (2023) explored the impact of the pandemic on university enrollment in Texas, the USA, and argued that future research should consider the additional impact of the political environment in areas where universities are located (i.e., the macrosystem) and the extent to which universities have adapted to the new circumstances ushered in by the pandemic, such as the percentage of courses offered online (i.e., the exosystem).

Niemi et al. (2022) examined absenteeism and the symptoms and functions associated with absenteeism among Finnish adolescents with ADHD, relative to those without ADHD, accounting for other factors such as the family's socioeconomic status. Learners with ADHD were more often absent from school, and their absences were more often due to separation anxiety, agoraphobia/panic, school aversion/other attractive alternatives, aggression, problems with parents, and family-related problems. The authors suggest that ADHD may serve as a risk factor for these other difficulties, increasing risk for absence from school. For example, those with difficulty concentrating might not receive the extra support they need at school, leading to school aversion and thus absence.

Bowen et al. (2022) studied US elementary school children's behaviors related to core values, such as enthusiasm in class, being focused within class, respecting others' space, and respectful communication. Peer relationships emerged as a major factor influencing absenteeism. Behaviors commonly observed among learners at high risk for absenteeism included being argumentative and insulting peers. Kearney et al.'s (2022) review article underscores the need to also address broader influences on peer relations, such as the impact that increasing migration has on the need to help different groups of learners integrate in a school's culture.

LeBoeuf et al. (2023) explored the relationship between school type – Montessori or non-Montessori – and chronic absenteeism, as well as racial disparities in chronic absenteeism across the two school types, while attempting to account for the characteristics of families who self-select into Montessori schools. In this way, the researchers addressed micro-, meso-, and exosystem influences on attendance and absence.

In sum, the empirical studies largely represent what Kearney and colleagues (Kearney, 2021; Kearney et al., 2022) refer to as the analytic perspective, whereby the focus is on specific contexts and individual concerns, rather than the systemic perspective whereby the focus is on overarching contexts and structural concerns. However, some of the studies directly or indirectly address broader influences in the exosystem, macrosystem, and chronosystem. For other recent examples of studies addressing the influence of multiple systems on attendance and absence, see Singer et al. (2021), Leduc et al. (2022), and Lee et al. (2023).

2.5 Working on attendance, not only on absence

For some, working to promote attendance might simply sound like the inverse of working to reduce absence. However, from a practice perspective, there are important differences between the two, whereby interventions to ensure regular school attendance are largely different from the interventions used when learners display emerging or chronic attendance problems (Heyne et al., 2022). Theoretical and empirical articles in the current collection underscore the great need to promote attendance, alongside our work to reduce absence.

The three theoretical articles include important insights about the need to promote attendance. Kearney and González (2022) argue that a focus on attendance and not only absence places value on the efforts of learners and families who have overcome barriers to attendance. Kearney and Graczyk (2022) present the multidimensional, multi-tiered system of supports (MD-MTSS) framework for attendance and absence, which places attendance at the forefront of efforts by interested parties to support learning and development. This three-tiered framework, which the authors introduced a few years earlier (Kearney et al., 2019a,b; Kearney and Graczyk, 2020), underscores the importance of universal interventions to augment learners' current attendance and prevent absence (Tier 1), alongside early intervention strategies to assist when absenteeism is emerging, mild, and moderate (Tier 2), and intensive intervention when substantial assistance is needed because absenteeism has become severe or chronic (Tier 3). Kearney et al. (2022) note that the multi-tiered approach "allows for a broader reframing of school absenteeism toward efforts to enhance school attendance," so much so that there will be more focus on attendance than on absenteeism (p. 12). It should also be noted that prioritizing the promotion of attendance among all learners, in effect preventing absenteeism, can reduce the time and effort that would otherwise be needed to provide Tier 2 and Tier 3 interventions.

Kearney and Graczyk (2022) remind us that MD-MTSS frameworks for addressing attendance and absence are a work in progress, but they have potential, especially because the strategies that can be applied in each Tier have empirical support. Indeed, it is pleasing to see increased awareness and use of such frameworks to address attendance and absence (e.g., Barnes, 2020; Mitchell, 2021; Karel et al., 2022), suggesting that interested parties increasingly appreciate the importance of working on attendance, not only absence.

Empirical articles in the collection directly or indirectly address the topics of promoting attendance and/or addressing absence before it becomes chronic. In this way, the work represented in these articles corresponds with Tiers 1 and 2 of the MTSS framework for promoting attendance and reducing absence.

Arbour et al. (2023) describe and evaluate an intervention with preschool children, including the efforts in five schools prioritizing the promotion of attendance among all preschool children, paying "special attention to the regular and rigorous application of ... attendance-promoting strategies" (p. 9). Because school readiness is regarded as one of the universal interventions at Tier 1 in the MTSS framework (Kearney and Graczyk, 2022), Arbour et al.'s (2023) focus on preschool children represents work to promote school attendance. The intervention they evaluated also emphasizes the use of targeted or "individualized" strategies to prevent chronic absenteeism among

preschoolers already displaying some absence, representative of Tier 2 in the MTSS framework.

Purtell and Ansari (2022), who also focused on preschool children, argued that their study of reasons for absences could help identify factors to be targeted to increase preschoolers' attendance and thus their readiness for school. Thus, while the immediate aim was to identify ways to reduce absenteeism, the ultimate aim was to promote attendance beyond preschool.

Bowen et al.'s (2022) investigation of factors underlying absenteeism aimed to increase knowledge about thresholds for prevention and intervention (in terms of learners' low, medium, and high risk for absenteeism), in order to effectively influence school attendance. Peer relationships were found to be a critical factor affecting absenteeism, and they thus warrant attention in efforts to promote attendance and prevent absenteeism. Because the authors referred to the prevention of absenteeism and targeted support, their work relates to both Tiers 1 and 2 of the MTSS framework to promote attendance and reduce absenteeism.

Niemi et al. (2022) do not focus *per se* on the promotion of attendance and prevention of absence, but in the discussion of their results, they draw attention to the importance of prevention. Specifically, they call for research examining interventions to prevent SAPs among adolescents with ADHD (e.g., by supporting engagement with school).

2.6 Working with attendance-related data

Researchers often use school attendance data to investigate influences on absence (e.g., associations between absenteeism and socio-economic factors), the impact of absence (e.g., associations with subsequent academic achievement), and the outcome of interventions to reduce absence (e.g., change in attendance between pre-intervention and post-intervention). Five empirical studies in the current collection are exemplary.

Purtell and Ansari (2022) tested associations between child, family, and center factors, and preschoolers' levels of absenteeism across the school year. Absence was based on parents' approximations of the number of days their child had been absent from preschool since the start of the school year.

Niemi et al. (2022) compared absenteeism among adolescents with and without ADHD. Absence was measured via an item in the Inventory for School Attendance Problems (Knollmann et al., 2019) which asks learners to estimate the frequency of absence in the previous 12 school weeks.

Bowen et al. (2022) used a data-driven approach to understand underlying factors affecting absenteeism, through the lens of pattern recognition. They employed machine learning methodologies to identify learners at low, medium, and high risk for absenteeism, drawing on more than 26,000 student-level datapoints, representing the behaviors of 332 students in one school. The behaviors, reported by educators, relate to core values associated with in-class participation. While the analyses did not make use of attendance data *per se*, they led to the identification of behaviors the authors associate with attendance (e.g., whether or not learners attend class on time and report to class prepared to learn). In effect, the researchers measured participation at school and engagement with learning.

Arbour et al. (2023) used publicly available databases from the national Ministry of Education in Chile to determine rates of absence over time (2011 to 2017), in order to evaluate the effectiveness of an intervention to promote attendance and prevent chronic absenteeism. These databases include individual-level daily attendance of learners enrolled in public schools.

LeBoeuf et al. (2023) used school-level data on the number of chronically absent learners (missing 15 or more school days), derived from the Civil Rights Data Collection survey of public schools in the United States, to study racial disparities in absenteeism across 116 Montessori schools and 116 non-Montessori schools (representing over 94,000 students). They critiqued the publicly available data on absenteeism, noting that it does not allow researchers to answer questions about why learners are chronically absent, making it difficult to develop intervention that meets the needs of learners. They called for improved record-keeping of the reasons for absences (e.g., health, transportation).

A sixth study, conducted by Korotchenko and Dobbs (2023), made use of official enrollment data as opposed to attendance data. The enrollment data pertained to post-secondary education, specifically universities in Texas, USA. Time-related changes in fall semester enrollment counts were examined between 2009 and 2021, to investigate the impact of the pandemic on enrollments generally, and on different study programs (e.g., criminal justice, social sciences, natural sciences). The researchers reported a small negative effect of the pandemic on overall enrollments at universities, but a small positive effect for enrollments in the natural sciences.

The articles in the Research Topic also underscore the value of working with school attendance data to identify and respond to the needs of individual learners, schools, and communities. Arbour et al.'s (2023) article is particularly illustrative. Their intervention makes use of a real-time data platform, based on the notion that strategies informed by data are more effective. A software engineer developed the platform which reads schools' attendance data, creates a database of each child's percent of attendance, and signals which children attended less than 90 percent of school days. Data was used in the context of two intervention strategies that rely on regular monitoring of the real-time data. The "Success Plan" involved showing families their child's absences to date and the number of absences remaining before the threshold for chronic absenteeism was reached, and asking families to develop a concrete plan with goals and strategies for preventing chronic absence. The "School Attendance Committee" reviewed data on a monthly basis, identified learners at risk of chronic absenteeism, and designed personalized strategies for working with each child and their family. Those using data were provided with coaching, to support the development of data literacy skills and processes. The use of data to manage absenteeism by implementing tailor-made interventions, as reported by Arbour et al., contrasts with the reporting that the historical use of data was primarily for administrative purposes (Heyne et al., 2022).

The theoretical articles in the current collection also draw attention to the need to use attendance-related data and other data to advance our work in the field. Writing about the promotion of attendance and prevention of absenteeism, Kearney and Graczyk (2022) note that schools are encouraged to use data to shape their policy decisions. Kearney and González (2022) write about the collection of data at multiple points (e.g., during the school day; during the school year) and in relation to constructs other than

attendance (e.g., log-ins to online learning; completed assignments; mastery of skills). Kearney et al. (2022) write about the need for large data sets and sophisticated analysis of data to: define problematic absenteeism; identify causes of absenteeism for a given learner, school, or community; design attendance tracking and early warning systems that combine data from multiple agencies and provide feedback to caregivers; and inform best practices for education and school attendance. While acknowledging privacy concerns, they argue for the use of disaggregated data to facilitate the use of "growth or on-track metrics" (p. 9) and to better identify groups at higher risk for absence, helping ensure *all* learners are supported in their readiness for adulthood via school attendance.

Going forward in practice and research, our use of attendance and absence data will require attention to the quality of the data and how it is used. Kearney and Childs (2022) addressed these topics in detail. Regarding quality, for example, they raise issues about the accuracy of recorded data, the importance of immediate recording as opposed to later recall, and variation in data according to who reports on attendance and absence. Issues related to the use of data include whether a 10% cut-off to define problematic absenteeism is equally applicable and helpful for all student groups and regions, the fact that important information is missed when interested parties simply rely on aggregated attendance data, and the need for guardrails that ensure data are used to improve outcomes for *all* learners rather than data leading to negative consequences for sub-groups such as those prone to exclusionary attendance policies (e.g., suspension). The quality and utility of data related to engagement should also be considered.

2.7 Working on the needs of specific groups of learners

There are many influences on attendance and absence (Section 2.4). While it is conceivable that all learners are exposed to one or more risk factors for absenteeism, not all will experience problems with attendance. As Kearney et al. (2022) explain, absenteeism disproportionately affects vulnerable groups of learners. For example, in developed countries, higher rates of absenteeism occur among vulnerable groups such as migrants, those of color, and those with disabilities. For learners in low-income countries, barriers to education include food and housing insecurity and long distances to school. Learners with intersecting risk factors are especially vulnerable, such as those with disabilities who lack transportation to school, and those of various racial and ethnic groups who have health problems. Intersecting risk factors are also addressed by Kearney and Graczyk (2022). They call for a fundamental reconfiguration of the MTSS framework to better address the needs of learners in geographical areas where there are high rates of chronic absenteeism, such as in large urban school districts with deep structural inequalities, fragmented support services, and residential mobility.

Five of the empirical articles in the current collection underscore the need to address specific risk factors and broader contextual influences that render particular groups of learners vulnerable to absenteeism. We address each in turn.

Niemi et al. (2022) summarized prior work documenting the difficulties learners with ADHD experience during schooling (e.g., failure to complete schoolwork) and beyond (e.g., greater difficulty finding a job). In their own empirical study, they found that

adolescents with ADHD had a higher level of absence relative to those who were neurotypical, and among those with ADHD the most common reason for absence was “school aversion” (e.g., I’d rather do something at home that is more fun than school; I think it’s OK if I skip school every now and then). Niemi et al. suggest that school aversion might arise among those with ADHD as a result of their difficulty concentrating and not getting sufficient support in school. They argued that preventing absence among learners with ADHD could thus focus on increasing school engagement.

Paulauskaite et al. (2022) summarized prior work on the experiences and needs of learners with autism and/or intellectual disability. Absenteeism occurs at higher rates relative to typically developing learners, many feel isolated and/or bullied at school, and they require individualized support for their learning and development. According to Paulauskaite et al., these challenges are often a precursor to parents de-registering their child from school and providing elective home education, commonly because parents are dissatisfied with the school’s capacity to meet their child’s learning needs and mental health needs. Paulauskaite et al. found similar results in their own study. The most common reason parents de-registered their child from school was that the school did not sufficiently meet their child’s learning needs and mental health needs. Furthermore, one of the main difficulties for parents who provide elective home education is supporting their child’s complex needs. Clearly, school-based adaptations are needed (e.g., improved one-to-one support) so the needs of all learners with autism and/or intellectual disability can be met within the school environment. Fortunately, there has been increased attention to school attendance and participation among those with neurodevelopmental conditions (Totsika et al., 2020, 2023; Heyne, 2022; Melvin et al., 2023; Li et al., 2024).

Purtell and Ansari (2022) addressed the question of which preschool children are more likely to be absent from school, focusing on children from low-income families, a group known to be at greater risk for absenteeism. They found that absenteeism was shaped by multiple factors related to family circumstances (including social and economic disadvantages) and school processes. They thus call for a comprehensive approach to reduce preschool absenteeism, including consideration of the complex circumstances experienced by families across the school year, a focus on family outreach, easily accessible information on transport and medical referrals, the promotion of relationships between the parents of children in the preschool program, and the promotion of positive classroom experiences for children.

LeBoeuf et al. (2023) explored chronic absenteeism in learners from Montessori and non-Montessori schools, focusing on low-income schools and racial disparities in absence. These two foci were motivated by prior research showing higher absence rates in low-income schools, higher absence among Black and Hispanic learners relative to White learners, higher rates of suspension among colored learners relative to White learners, and higher proportions of Black and Hispanic learners in low-income schools. LeBoeuf et al. also note that chronic absence may perpetuate the racial disparities identified in learners’ academic achievement, arguing that effective intervention to lower absence needs to focus on racial disparities in absenteeism, and that evaluation of an intervention “must consider whether it is appropriately lowering rates for all student demographic groups” (p. 2). In their conclusion they suggest that Montessori

schools may benefit from the provision of extra support for Black and Hispanic students.

Arbour et al. (2023) evaluated an intervention to promote attendance and reduce absenteeism among preschool children. Unlike the forementioned studies in this section, Arbour et al. did not focus on a circumscribed group of children identified in prior studies as being at higher risk for absenteeism. Rather, the intervention involved school personnel working with individual families to develop and evaluate a strategy to help each family overcome a specific barrier to attendance (e.g., intrafamilial violence contributing to a child’s absences). The study reminds us – as educators, practitioners, researchers, and policymakers – to simultaneously consider the unique needs of every learner and family, alongside the identified needs of specific groups of learners, such as those described in the empirical studies in this collection, including those with ADHD, those with autism and/or intellectual disability, or those from lower-income families.

The systematic review by Jay et al. (2023) centers around learners with chronic health conditions (CHCs) such as asthma, cancer, chronic pain, epilepsy, obesity, and type 1 diabetes. Citing previous research, they note that CHCs affect over one quarter of learners in early adolescence, learners with CHCs are more often absent from school, and in many cases they have lower academic achievement relative to those without CHCs. Further, they note that it is widely hypothesized that absence from school explains the lower achievement among those with CHCs. They conducted an umbrella review (i.e., systematic review of systematic reviews) to examine the role of absences in the lower academic achievement of these learners, reviewing 27 systematic reviews that quantified the association between CHCs and academic achievement. The 27 reviews covered 441 studies. Surprisingly, only 7 of the 441 studies (2%) tested the mediational role of school absence in the relationship between CHCs and academic attainment. None of these yielded evidence that absence is a mediator. To improve educational outcomes among learners with CHCs, Jay et al. call for better understanding of the causes of absence, which can include acute illness, management of the condition, and healthcare appointments. They argue against rigid attendance policies focused solely on the reduction of absence because they may fail to improve academic attainment for learners with CHCs, and they could even be harmful. Instead, school attendance policies should allow flexibility, including the provision of resources for learners to stay engaged with education even when not physically present at school.

2.8 Working on alliances, dissemination, and implementation

Alliances within and across interested parties (e.g., learners, caregivers, educators, health professionals, community partners, researchers, policymakers, national and international organizations) and across disciplines (e.g., computer science, education, psychiatry, psychology, public health, social work, sociology) are essential to recalibrating and overhauling the way we think and work to promote engagement with learning and readiness for adulthood. Alliances foster greater understanding among interested parties, promote much-needed consensus in the field of school attendance, and are key to promoting attendance and reducing absenteeism (Heyne et al., 2020).

The theoretical articles in the collection stress the importance of alliances. [Kearney and González \(2022\)](#) plead for the abandonment of compartmentalized discipline-specific approaches in favour of multidisciplinary alliances “to better conceptualize and manage the full ecology of school attendance and its problems” (p. 1). They call for alliances involving professionals, lay persons, educational and government entities, and systems of care. [Kearney and Graczyk \(2022\)](#) draw attention to the need for alliances among community services (e.g., housing, public health, welfare) and with schools, to improve tracking of learners separated from the educational process and to develop early intervention appropriate to particular localities. They also note the need for collaboration across school districts to track learners who transfer from one school to another. [Kearney et al.’s \(2022\)](#) article aims to support multi-party partnerships that involve the sharing of resources and expertise, a mutual vision for well-coordinated ongoing interactions among partners studying the complexities inherent to attendance and absence, cohesive narratives that can influence policy and practice, and the formation of family-school-community partnerships. Their theory of change for school attendance and absence is presented as a starting point for discussion among interested parties, especially those who come from different perspectives. They also note that technological advances have increased scope for coordinating data systems across key agencies that have ordinarily not collaborated (e.g., educational, governmental, and public health entities).

Examples of alliances are found in the empirical articles in this collection. Researchers [Paulauskaite et al. \(2022\)](#) consulted with a parent advisory group during their study, working together on the development of the survey for parents, analysis of the data, and interpretation of the results. Researchers [Bowen et al. \(2022\)](#) collaborated with the Fight for Life Foundation to access school-based data derived from a platform created by the Foundation, in order to learn more about factors underlying absenteeism. [Arbour et al. \(2023\)](#) describe an intervention that cultivated various alliances in the context of a model of professional development, including: collaboration between school leadership, teachers, aides, and parents, to develop and test strategies to promote school attendance and reduce absenteeism; a networked peer learning community occurring across traditional hierarchies, in which teams from different schools observed each other’s work and shared learnings, data, successes, and failures in the service of the common goal of promoting attendance and reducing absenteeism, using a common theory of change and measures; and collaboration between school personnel and families to prevent occasional absenteeism from becoming chronic absenteeism. The development of the intervention was itself the result of a partnership between leaders in an early childhood education foundation, schools, and local and national government.

The outcomes of alliances need broad dissemination and implementation, which are essential to change in the field of school attendance ([Heyne et al., 2020](#)). Dissemination involves actively distributing ideas and materials to specific audiences (e.g., information, instruments, interventions) and implementation involves actively promoting the adoption and integration of these ideas and materials (e.g., policies, skills, practices) ([Greenhalgh et al., 2004](#)). In the current collection of articles there are examples and suggestions related to dissemination and implementation. [Niemi et al. \(2022\)](#) employed a translated version of a new instrument, the

Inventory of School Attendance Problems ([Knollmann et al., 2019](#)), to understand SAPs among Finnish learners. [Arbour et al. \(2023\)](#) suggest that improvements in attendance will only be maintained via rigorous application, monitoring, and problem-solving of attendance strategies, and that improvements will disappear without “intentional support for implementation” (p. 17). [Kearney and Graczyk \(2022\)](#) call for investment in training so that multi-professional assessment and intervention can be provided when there is need for Tier 2 and Tier 3 supports, and [Kearney and González \(2022\)](#) suggest that MTSS approaches be implemented within existing frameworks that are culturally responsive. According to [Kearney et al. \(2022\)](#), there is currently insufficient dissemination and implementation of positive interventions for attendance and absenteeism across schools and community agencies. Positive interventions are intentional, foster well-being, and are empirically supported, and the authors contrasted them with punitive interventions such as exclusionary discipline. High fidelity delivery, another important issue for implementation in the field of school attendance ([Heyne et al., 2020](#)), also warrants attention.

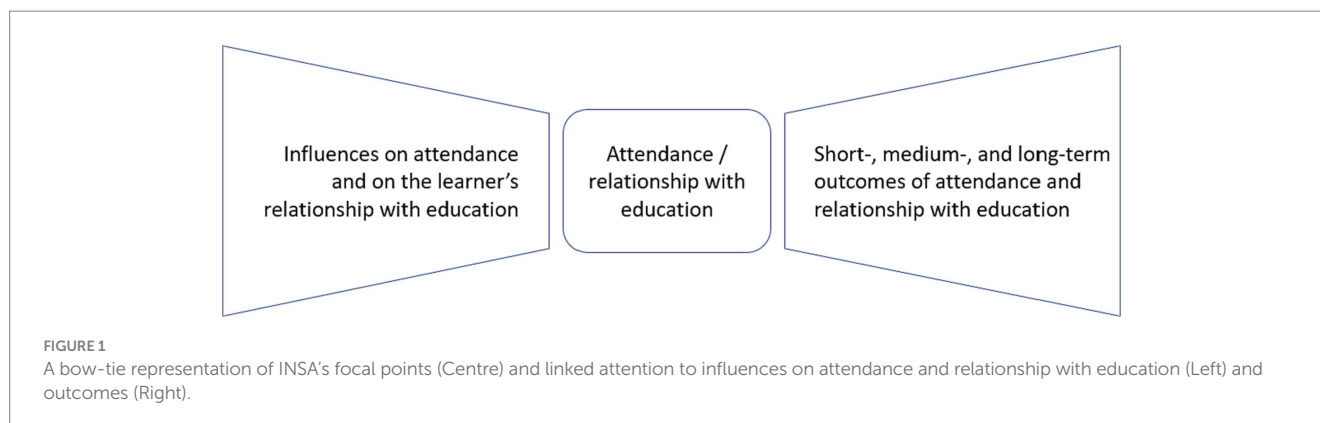
3 INSA’s work to move the field forward

INSA and her members are attuned to the need for change. There is a growing number of learners absent from school ([Heyne et al., 2020](#); [Gren Landell, 2021](#)); socioeconomic inequalities impact participation in education (e.g., [Ripamonti, 2018, 2023](#); [Sosu et al., 2021](#)); absence is negatively associated with short-term academic performance, final educational attainment, and economic outcomes through the life cycle (e.g., [Cattan et al., 2023](#)); there is imprecision in national policies and practices for recording, reporting, and using attendance data to promote attendance and reduce absenteeism ([Heyne et al., 2022](#)); cross-national research is hampered by inconsistencies in the definitions of SAPs (e.g., [Kreitz-Sandberg et al., 2022](#)); and current interventions for SAPs are ineffective for some learners (e.g., [Heyne, 2022](#)).

In this section we highlight some of the ways INSA is working to help the field of school attendance move forward so that all learners are supported in their readiness for adulthood. We concentrate on three topics: (1) increasing the focus on a relationship with education; (2) strengthening alliances among interested parties; and (3) fostering leading interdisciplinary research to inform practice.

3.1 Increasing the focus on a relationship with education

INSA’s mission has school attendance as a focal point. Simultaneously, there is keen awareness of the myriad factors influencing both attendance and the outcomes of attendance. Moreover, there is growing attention to learners’ relationship with education, and its interconnectedness with their circumstances, their educational journey, and the outcomes of their journey ([Figure 1](#)). We use “relationship with education” to refer broadly to the interactions and experiences individuals have with learning environments, curriculum, teachers, and peers. It is thus broader than constructs that are primarily focused on the school setting, like



“school engagement”, “school attachment”, “school connectedness”, and other related terms (see [Jimerson et al., 2003](#)).

Bioecological models have provided a valuable framework to enrich our understanding of the individual, family, school, and community factors that influence whether a learner attends school (e.g., [Melvin et al., 2019](#)). These models apply regardless of the specific context in which learners attend school, such as mainstream schools, special educational settings, or alternative educational programs. However, the models require updating due to increasing diversity in what it means to attend school. The post-Covid-19 era has given rise to a higher demand for online and hybrid learning models which offer education outside of a traditional physical classroom setting, which some learners and families prefer ([Paulauskaite et al., 2022](#)).

The changing educational landscape urges us to explore the factors that influence learners’ relationship with education, regardless of the context within which they learn. The work of [Maynard et al. \(2014\)](#) will be instructive. These researchers found that school disengagement was influenced by nonshared environmental factors (i.e., contexts and experiences unique to each sibling), when controlling for genetic influences. Thus, individual and contextual factors influencing a learner’s relationship with education need to be considered, including genetics, family, and school influences. For example, there is a need to better understand the specific parenting practices that promote their child’s school engagement ([Yang et al., 2023](#)). The interplay between attendance and engagement also warrants attention. Some studies point to the positive influence of engagement on attendance ([Miranda-Zapata et al., 2018](#)) and on school completion ([Fall and Roberts, 2012](#); [Wang and Fredricks, 2014](#); [Niehaus et al., 2016](#)), encompassing affective, behavioral, and/or academic aspects of engagement. Other studies point to the negative influence of absence from school on engagement ([Kızıldağ et al., 2017](#)) and on the related construct of belonging ([Mooney et al., 2022](#)), indicating that school attendance is important in maintaining positive engagement trajectories that benefit outcomes for learners.

Understanding how the learning environment, whether it is at school or elsewhere, interacts with learners’ relationship with education is crucial. This knowledge will enrich existing bioecological models of attendance so they better account for the diversity of settings in which learning can occur. It will also enable the development and implementation of effective interventions to foster an optimal relationship with education for all learners, wherever their educational journey takes place.

In the process, it will be important to pursue the challenging task of defining and measuring each learner’s relationship with education, alongside our ongoing work to define and measure attendance. For example, will log-ins to online learning be equated to attendance, relationship with education, or both? In a review of 35 years of research on school engagement, [Martins et al. \(2022\)](#) noted that the behavioral dimension of engagement is often investigated via measures of school attendance, participation in class, and compliance with school rules. Alternative conceptualizations and measures of behavioral engagement will be needed when education occurs outside of the school setting.

In conclusion, practitioners, researchers, and policymakers must go beyond an emphasis on improving school attendance, by prioritizing positive educational experiences for young individuals. This entails supporting their active engagement in education, not only for academic learning, but also for emotional and social development (e.g., self-reflection, effective collaboration). Education, as emphasized by [Biesta \(2015\)](#), is about learning for a reason. As he emphasizes, “education always needs to engage with questions of content, purpose, and relationships” (p. 76). Education involves qualifying individuals to do things (by acquiring knowledge, skills, and dispositions), socializing them (e.g., cultural and professional traditions), and empowering them to become subjects of initiative and responsibility, rather than objects of others’ actions—a process Biesta refers to as subjectification. Ultimately, fostering a positive relationship with education, at school and elsewhere, is vital for preparing young individuals for adulthood ([Kearney et al., 2022](#)).

3.2 Strengthening alliances among interested parties

School attendance problems are complex, necessitating action at multiple levels, including the microsystem, mesosystem, and macrosystem (see Section 2.4). Advancing effective multi-level responses requires collaboration with a wide range of interested parties, including but not limited to learners, parents/caregivers, families, educators, health professionals, community partners, researchers, advocates, and policymakers. Therefore, building alliances that bring these individuals and groups together is a key goal of INSA.

Alliances create both opportunities and challenges. They allow us to harness and synergize the knowledge and skills of each party to create changes that would be impossible to achieve on an individual

level. Alliances work best when there is trust, open communication, and a commitment by all to share ideas and listen to the perspectives and experiences of others (Senge, 2006). Working in this way can challenge us; it requires humility (e.g., recognizing that our own knowledge is partial and incomplete) as well as attentiveness to power relations (e.g., recognizing that some groups, such as professionals, typically have more influence over agenda-setting and decision-making than do learners and their families).

Enhancing learners' participation in these alliances deserves special attention, because traditionally the voices of children and adolescents were not sought, or they were subjected to the interpretation of others. School attendance is fundamentally an issue that affects school-age learners, and it is therefore crucial to shift toward bottom-up, democratic, and participatory processes that enable the integration of their perspectives and experiences. This approach was initially stimulated by an increased recognition of the children's right emanating from the United Nations Convention on the Rights of the Child (United Nations, 1989). Since then, it has been acknowledged that engaging with learners is an essential component of effective interventions and policy initiatives as it increases the likelihood of positive outcomes for them, and for organizations and systems (Roth and Brooks-Gunn, 2016).

INSA is actively fostering robust alliances and enhancing collaborative capacity across all aspects related to school attendance. Illustrations of these endeavors were highlighted at our recent INSA 2022 Conference in The Netherlands. The conference incorporated a series of dynamic roundtable discussions attended by a diverse range of participants, including researchers, educators, health professionals, family advocates, and learners. These sessions facilitated the exchange of knowledge on specific topics of mutual interest. The notable presence of adolescents at the conference injected valuable insights, energy, and enthusiasm into the discussions. A pivotal keynote session featured young representatives from three Dutch organizations, allowing them to share their personal journeys and articulate their vision for school attendance (further details can be accessed [via this link](#)).

Another example of INSA's commitment to advancing the field is exemplified by the recent establishment of its Education, Training, and Policy Sub-Committee in March 2023. Comprising academics and practitioners from Ireland, Australia, and the United States (Catriona O'Toole, Lisa McKay-Brown, Matthew White, and Patricia Graczyk), the committee is actively seeking youth representation as it prepares to shape its mission and terms of reference. An essential aspect of the committee's envisaged role is to cultivate alliances in alignment with the suggestions outlined in Section 2.8. This includes facilitating various professional learning opportunities that bring together diverse groups to share expertise and resources. The committee aims to collaborate on identifying foundational concepts and good practice principles, offering guidance on policy related to school attendance, supporting the implementation of research-based findings in educational settings, and advocating for comprehensive responses to school attendance challenges on both national and international levels.

3.3 Championing interdisciplinary research to inform practice

The landscape of school attendance and absenteeism research is rich and diverse, as evident from the plethora of publications listed in

the research menu of INSA's website.¹ This repository offers a compelling glimpse into the global investment of time, money, creativity, and collaborative efforts dedicated to advancing our understanding of so many aspects related to attendance and absence. This is to be celebrated. It also leads to questions about the research questions posed, the methodologies employed, and the impact of research findings on the field of school attendance.

Navigating these questions is not straightforward. One significant challenge lies in the fact that the majority of practical, scientific, and scholarly work on school attendance and absenteeism tends to occur within distinct scientific disciplines rather than fostering collaboration across them. This siloed approach results in numerous independent avenues of investigation that are not always well-coordinated or integrated (Heyne et al., 2020; Kearney, 2021). Addressing this challenge calls for an interdisciplinary focus on school attendance and absenteeism research.

Against this background, INSA established its Scientific Sub-Committee in February 2022. The committee, composed of four members (Laelia Benoit, Carolina González, Christopher Kearney, and Gil Keppens), represents diverse scientific disciplines (education, psychiatry, psychology, sociology) and countries (The Netherlands, France, Spain, and the USA). Its primary vision is to promote interdisciplinary research and build connections toward a more cohesive and coordinated approach to school attendance and absenteeism. This objective will be realized by crafting a shared research agenda that encompasses common goals and actions across disciplines and research contexts (such as geographical areas of study and methodologies) and by encouraging collaboration among INSA's members and other interested parties. Six strategies are employed to facilitate a more interdisciplinary research agenda, as described next.

First, it is imperative to establish a common language. Researchers from diverse backgrounds and disciplines often employ varying terminology and concepts to describe similar phenomena (Heyne et al., 2019; Kearney et al., 2022; Kearney and González, 2022). For example, the term "school attendance problems" may be conceptualized differently among researchers, sometimes serving as a reference to absenteeism without specifying a defined level deemed "problematic". The development of a shared vocabulary and conceptual framework is crucial to enhancing communication and fostering collaboration across disciplines.

Second, there is a need to promote interdisciplinary research. Encouraging collaboration among researchers from diverse disciplines in joint research projects will introduce diverse perspectives and expertise for formulating and addressing complex research questions. This collaborative efforts aims to integrate systemic and analytical perspectives in our approach to researching school attendance and absenteeism (Kearney, 2021). This includes exploring ecological levels associated with school attendance and absenteeism, considering both proximal and distal factors. Microsystem-level or proximal factors, often the focus of researchers and school personnel, serve as valid predictors of school absenteeism. These include challenges such as mental health issues for learners, learning disorders, and low parent involvement in education. A more inclusive and destigmatizing approach to school attendance and absenteeism will entail a deeper

¹ <https://www.insa.network/research/journal-articles>

analysis and integration with broader ecological levels (Kearney et al., 2022). Examples of these broader levels include the quality of interactions between learners, parents, and schools, the type of educational system, economic development, and youth unemployment rates (Claes et al., 2009; Keppens and Spruyt, 2018; Leduc et al., 2022). In sum, considering multiple ecological levels allows us to strategically leverage the entire system in support of learners.

Third, greater use of mixed methods approaches becomes crucial. Integrating both qualitative and quantitative methods offers a more comprehensive understanding of school attendance and absenteeism. For example, qualitative tools like interviews and observations can yield insights into reasons and underlying mechanisms for attendance and absenteeism, while quantitative methods such as surveys and attendance data can provide information on the prevalence and risk factors of absenteeism. A key aspect of employing quantitative methods involves using sophisticated data analytic strategies for large data sets. This aids in pinpointing root causes of absenteeism within specific communities, schools, or student groups (Hough, 2019; Keppens, 2022, 2023). These analytic strategies include algorithm- and model-based approaches designed to unveil predictive patterns or outcomes.

Fourth, enhancing engagement with interested parties is imperative. The inclusion of educators, policymakers, parents, and learners in the research process ensures that research questions are not only relevant and practical but also that findings are actionable. As highlighted in Section 3.2, INSA's recent conference featured round table discussions aimed at fostering dialogue among academics, policymakers, practitioners, parents, and learners facing school attendance problems. One of these discussions centered on the theme "Action on research: What needs to happen next?". The insights derived from this round table discussion played a pivotal role in shaping the strategy for INSA's Scientific Sub-Committee.

Fifth, addressing the social determinants of absenteeism is essential. These determinants encompass non-medical factors that can influence school attendance, reflecting the conditions in which individuals are born, grow, work, live, and age. They are shaped by a broader set of forces and systems that define daily life, such as poverty, housing instability, limited access to healthcare, early childhood development, and considerations of social inclusion and non-discrimination. Notably, researchers have begun incorporating global social justice variables into models of school attendance and absenteeism, particularly in aspects related to migration, racial and income inequality, economic policies and opportunities, labor markets, violence, food insecurity, and healthcare (Keppens and Spruyt, 2018; Kearney et al., 2023). Embracing an interdisciplinary approach is crucial for identifying and addressing these underlying factors, as further discussed in the next paragraph.

Sixth, there is a need to conduct interdisciplinary research and disseminate research findings widely. Such interdisciplinary research is poised to generate insights that inform more comprehensive approaches to attendance and solutions for absenteeism (Kearney and Graczyk, 2020, 2022). An illustrative example of a comprehensive approach could involve addressing the mental health needs of learners, offering support for families to navigate the challenges they face, implementing policies and practices that promote attendance, and utilizing community resources for additional support. It is essential to disseminate emerging insights to a diverse array of interested parties, including families, educators, practitioners, policymakers, and organizations, to ensure their translation into effective practices and

policies. This will necessitate employing different dissemination strategies for various groups of interested parties, including tailoring information to the audience so it can be understood and used.

Implementing these strategies will enable INSA to facilitate a more interdisciplinary research agenda, breaking down silos between different fields and disciplines. This approach fosters collaboration and communication among researchers, educators, practitioners, and policymakers. Such collaboration holds the potential for establishing greater consensus and standardization around the conceptualization and measurement of school attendance and its problems, the development of multilevel assessment and intervention protocols applicable across various contexts, more effective implementation of interventions, and ultimately, better outcomes for learners. Currently, INSA's Scientific Sub-Committee is preparing a review and critique of contemporary systemic and analytic measurement strategies related to school attendance/absenteeism and related constructs. This initiative serves as a benchmark to develop a roadmap for constructing a next-generation common measurement of school attendance/absenteeism and related constructs.

4 Conclusion

Changing how we approach school attendance has the potential to significantly improve attendance rates, foster a meaningful relationship with education among learners, and better prepare them for adulthood. Drawing upon the insights of the 42 authors contributing to this Research Topic, we have curated eight crucial themes, four focusing on transforming our thinking about attendance, and four focusing on innovative work within this space. As you consider the concept of "unlearning school attendance," we encourage a thoughtful reflection on the need for recalibration to radical overhaul across these eight themes: thinking broadly about the meaning of attendance (Theme 1), thinking broadly about the function of attendance (Theme 2), thinking creatively about the provision of education (Theme 3), thinking broadly about influences on attendance (Theme 4), working on attendance and not only on absenteeism (Theme 5), working with attendance-related data (Theme 6), working on the needs of specific groups of learners (Theme 7), and working on alliances, dissemination, and implementation (Theme 8).

Readers are invited to assess the relevance of these themes to their contributions in the field of school attendance. Additionally, three dilemmas merit consideration. First, as we contemplate the meaning of attendance (Theme 1) and the function of attendance (Theme 2), while engaging with attendance-related data (Theme 5), a tension arises between using conventional, easily measurable metrics like in-seat time at school, and the need to develop and use more flexible and valid metrics based on our evolving, nuanced understanding of attendance. New metrics should account for contemporary learning formats and factors associated with an individual's relationship with education. Second, as we delve into influences on attendance (Theme 4), creative thinking about education provision (Theme 3), and addressing the needs of specific learner groups (Theme 7), the challenge is to reconcile flexible approaches to education, which may inadvertently lead to segregation, with the principle of inclusive education. How can the field strike a balance, offering flexible, personalized education that is both inclusive and culturally responsive, without resorting to segregating practices that might detrimentally

impact learners' long-term educational outcomes? Third, when committed to working on attendance, not solely on absenteeism (Theme 6), a potential tension arises in resource allocation for delivering universal interventions to promote attendance (Tier 1), targeted interventions for individuals or groups facing emerging, mild, or moderate absence (Tier 2), and intensive interventions for those displaying chronic or severe absence (Tier 3). While universal promotion of attendance is crucial, the question remains: How can we strike a balance to prevent the dilution of universal efforts and ensure that targeted and intensive interventions effectively address individual needs without creating disparities?

As INSA, these and other questions will occupy the forefront of our minds as we actively seek to advance the field. We extend a sincere invitation for your active engagement with our ongoing efforts detailed in Section 3. To learn more, please visit our website at www.insa.network and contact us at info@insa.network. Together, we can drive meaningful change in the realm of school attendance, paving the way for a brighter future for all learners.

Author contributions

All authors contributed to the framing, work, and final version of the article. Lead author and co-founder of the International Network for School Attendance (INSA), DH, lead the curation of materials and

ideas. INSA's six Executive Committee members, the authors of this article, were instrumental in crafting the long-range goals for the future of the field of school attendance. All authors approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

The author(s) declared that they were an editorial board member of *Frontiers*, at the time of submission. This had no impact on the peer review process and the final decision.

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References

- Arbour, M., Soto, C., Alé, Y., Atwood, S., Muñoz, P., and Marzolo, M. (2023). Absenteeism prevention in preschools in Chile: impact from a quasi-experimental evaluation of 2011–2017 Ministry of Education data. *Front. Educ.* 7:975092. doi: 10.3389/feduc.2022.975092
- Barnes, K. M. (2020). The effects of a tiered intervention system on chronic absenteeism in a public school district in Tennessee (Order No. 28021922) [Doctoral dissertation, Union University]. Pro Quest Dissertations Publishing.
- Biesta, G. (2015). What is education for? On good education, teacher judgement, and educational professionalism. *Eur. J. Educ.* 50, 75–87. doi: 10.1111/ejed.12109
- Bowen, F., Gentle-Genitty, C., Siegler, J., and Jackson, M. (2022). Revealing underlying factors of absenteeism: a machine learning approach. *Front. Psychol.* 13:958748. doi: 10.3389/fpsyg.2022.958748
- Cattan, S., Kamhöfer, D. A., Karlsson, M., and Nilsson, T. (2023). The long-term effects of student absence: evidence from Sweden. *Econ. J.* 133, 888–903. doi: 10.1093/ej/ueac078
- Claes, E., Hooghe, M., and Reeskens, T. (2009). Truancy as a contextual and school-related problem: a comparative multilevel analysis of country and school characteristics on civic knowledge among 14 year olds. *Educ. Stud.* 35, 123–142. doi: 10.1080/03055690802470258
- Fall, A.-M., and Roberts, G. (2012). High school dropouts: interactions between social context, self-perceptions, school engagement, and student dropout. *J. Adolesc.* 35, 787–798. doi: 10.1016/j.adolescence.2011.11.004
- Finn, J. D., and Zimmer, K. S. (2012). "Student engagement: what is it? Why does it matter?" in *Handbook of research on student engagement*. eds. S. Christenson, A. Reschly and C. Wylie (New York, NY: Springer).
- Fredricks, J. A., Blumenfeld, P. C., and Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Rev. Educ. Res.* 74, 59–109. doi: 10.3102/00346543074001059
- Fredricks, J. A., Reschly, A. L., and Christenson, S. L. (2019). *Handbook of student engagement interventions: Working with disengaged students*. Academic Press.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., and Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Q.* 82, 581–629. doi: 10.1111/j.0887-378X.2004.00325.x
- Gren Landell, M. (2021). "Introduction" in *School attendance problems: A research update and where to go*. ed. M. Gren Landell (Jerringfonden), 19–38. Available at: <https://jerringfonden.se/wp-content/uploads/2021/04/202101-Jerringfonden-Antologi-A5-sammanslagen.pdf>
- Havik, T., and Ingul, J. M. (2022). Remote education/homeschooling during the COVID-19 pandemic, school attendance problems, and school return: teachers' experiences and reflections. *Front. Educ.* 7:895983. doi: 10.3389/feduc.2022.895983
- Heyne, D. (2022). Developmental issues associated with adolescent school refusal and cognitive-behavioral therapy manuals: a practitioner review. *Zeitschrift für Kinder-Jugendpsychiatrie und Psychotherapie [Journal of Child and Adolescent Psychiatry and Psychotherapy]* 50, 471–494. doi: 10.1024/1422-4917/a000881
- Heyne, D., Gentle-Genitty, C., Gren Landell, M., Melvin, G., Chu, B., Gallé-Tessonneau, M., et al. (2020). Improving school attendance by enhancing communication among stakeholders: establishment of the international network for school attendance (INSA). *Eur. Child Adolesc. Psychiatry* 29, 1023–1030. doi: 10.1007/s00787-019-01380-y
- Heyne, D., Gren Landell, M., Melvin, G., and Gentle-Genitty, C. (2019). Differentiation between school attendance problems: why and how? *Cogn. Behav. Pract.* 26, 8–34. doi: 10.1016/j.cbpra.2018.03.006
- Heyne, D., Kearney, C. A., and Finning, K. (2022). "Mental health and attendance at school: setting the scene" in *Mental health and attendance at school*. eds. K. Finning, T. Ford and D. Moore (Cambridge: Cambridge University Press)
- Heyne, D., Keppens, G., and Dvořák, D. (2022). From attendance data to student support: international practices for recording, reporting, and using data on school attendance and absence. *Orbis Scholae* 16:5–26.
- Hough, H. (2019). "Roll call: describing chronically absent students, the schools they attend, and implications for accountability" in *Absent from school: Understanding and addressing student absenteeism*. eds. M. A. Gottfried and E. L. Hutt (Cambridge, MA: Harvard Education Press), 15–34.
- Jay, M. A., Sanders-Ellis, D., Blackburn, R., Deighton, J., and Gilbert, R. (2023). Umbrella systematic review finds limited evidence that school absence explains the association between chronic health conditions and lower academic attainment. *Front. Public Health* 11:1122769. doi: 10.3389/fpubh.2023.1122769
- Jimerson, S. R., Campos, E., and Greif, J. L. (2003). Toward an understanding of definitions and measures of school engagement and related terms. *Contemp. Sch. Psychol.* 8, 7–27. doi: 10.1007/BF03340893
- Karel, E., Heyne, D., De Weerd, M., and Halberstadt, R. (2022). The recording, reporting, and use of school attendance data by school personnel in the Netherlands: toe the line or take a new path? *Orbis Scholae* 16, 137–156. doi: 10.14712/23363177.2022.16
- Kearney, C. A. (2021). Integrating systemic and analytic approaches to school attendance problems: synergistic frameworks for research and policy directions. *Child Youth Care Forum* 50, 701–742. doi: 10.1007/s10566-020-09591-0

- Kearney, C. A., Benoit, L., González, C., and Keppens, G. (2022). School attendance and school absenteeism: a primer for the past, present, and theory of change for the future. *Front. Educ.* 7:1044608. doi: 10.3389/feduc.2022.1044608
- Kearney, C. A., and Childs, J. (2022). Improving school attendance data and defining problematic and chronic school absenteeism: the next stage for educational policies and health-based practices. *Prevent. School Fail. Alternat. Educ. Child. Youth* 67, 265–275. doi: 10.1080/1045988X.2022.2124222
- Kearney, C. A., Childs, J., and Burke, S. (2023). Social forces, social justice, and school attendance problems in youth. *Contemp. Sch. Psychol.* 27, 136–151. doi: 10.1007/s40688-022-00425-5
- Kearney, C. A., and González, C. (2022). Unlearning school attendance and its problems: moving from historical categories to postmodern dimensions. *Front. Educ.* 7:977672. doi: 10.3389/feduc.2022.977672
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. J. (2019a). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 1). *Front. Psychol.* 10:2222. doi: 10.3389/fpsyg.2019.02222
- Kearney, C. A., González, C., Graczyk, P. A., and Fornander, M. J. (2019b). Reconciling contemporary approaches to school attendance and school absenteeism: toward promotion and nimble response, global policy review and implementation, and future adaptability (part 2). *Front. Psychol.* 10:2605. doi: 10.3389/fpsyg.2019.02605
- Kearney, C. A., and Graczyk, P. A. (2020). A multidimensional, multi-tiered system of supports model to promote school attendance and address school absenteeism. *Clin. Child. Fam. Psychol. Rev.* 23, 316–337. doi: 10.1007/s10567-020-00317-1
- Kearney, C. A., and Graczyk, P. A. (2022). Multi-tiered systems of support for school attendance and its problems: an unlearning perspective for areas of high chronic absenteeism. *Front. Educ.* 7:1020150. doi: 10.3389/feduc.2022.1020150
- Keppens, G. (2022). Who is absent from school when? An optimal matching analysis of within-year variation in the timing of school absences. *J. Sch. Psychol.* 95, 90–104. doi: 10.1016/j.jsp.2022.07.003
- Keppens, G. (2023). School absenteeism and academic achievement: does the timing of the absence matter? *Learn. Instr.* 86:101769. doi: 10.1016/j.learninstruc.2023.101769
- Keppens, G., and Spruyt, B. (2018). Truancy in Europe: does the type of educational system matter? *Eur. J. Educ.* 53, 414–426. doi: 10.1111/ejed.12282
- Kızıldağ, S., Demirtaş-Zorbaz, S., and Zorbaz, O. (2017). School engagement of high school students. *Educ. Sci.* 42, 107–119. doi: 10.15390/EB.2017.6740
- Knollmann, M., Reissner, V., and Hebebrand, J. (2019). Towards a comprehensive assessment of school absenteeism: development and initial validation of the inventory of school attendance problems. *Eur. Child Adolesc. Psychiatry* 28, 399–414. doi: 10.1007/s00787-018-1204-2
- Korotchenko, S., and Dobbs, R. (2023). The effect of COVID-19 pandemic on college enrollment: how has enrollment in criminal justice programs been affected by the pandemic in comparison to other college programs. *Front. Educ.* 8:1136040. doi: 10.3389/feduc.2023.1136040
- Kreitz-Sandberg, S., Backlund, A., Fredriksson, U., Israelsson, J., Rasmusson, M., and Gren Landell, M. (2022). Recording and reporting school attendance and absence: international comparative views on attendance statistics in Sweden, Germany, England, and Japan. *Orbis Scholae* 16, 187–212. doi: 10.14712/23363177.2023.9
- LeBoeuf, L., Goldstein-Greenwood, J., and Lillard, A. S. (2023). Rates of chronic absenteeism in Montessori and non-Montessori title 1 schools. *Front. Educ.* 8:1059071. doi: 10.3389/feduc.2023.1059071
- Leduc, K., Tougas, A. M., Robert, V., and Boulanger, C. (2022). School refusal in youth: a systematic review of ecological factors. *Child Psychiatry Hum. Dev.*, 1–19. Advance online publication. doi: 10.1007/s10578-022-01469-7
- Lee, K., McMorris, B. J., Chi, C.-L., Looman, W. S., Burns, M. K., and Delaney, C. W. (2023). Using data-driven analytics and ecological systems theory to identify risk and protective factors for school absenteeism among secondary students. *J. Sch. Psychol.* 98, 148–180. doi: 10.1016/j.jsp.2023.03.002
- Li, B., Heyne, D., Scheeren, A., Blijd-Hoogewys, E., and Rieffe, C. (2024). School participation of autistic youths: the influence of youth, family, and school factors. *Autism: International Journal of Research and Practice*.
- Martins, J., Cunha, J., Lopes, S., Moreira, T., and Rosário, P. (2022). School engagement in elementary school: a systematic review of 35 years of research. *Educ. Psychol. Rev.* 34, 793–849. doi: 10.1007/s10648-021-09642-5
- Maynard, B. R., Beaver, K. M., Vaughn, M. G., DeLisi, M., and Roberts, G. (2014). Toward a bioecological model of school engagement: a biometric analysis of gene and environmental factors. *Soc. Work. Res.* 38, 164–176. doi: 10.1093/swr/svu018
- McNeven, S., Main, K., and McKay, L. (2023). Wellbeing and school improvement: a scoping review. *Leadersh. Policy Sch.*, 1–19. doi: 10.1080/15700763.2023.2183512
- Melvin, G., Freeman, M., Ashford, L. J., Hastings, R. P., Heyne, D., Tonge, B. J., et al. (2023). Types and correlates of school absenteeism among students with intellectual disability. *J. Intellect. Disabil. Res.* 67, 375–386. doi: 10.1111/jir.13011
- Melvin, G. A., Heyne, D., Gray, K. M., Hastings, R. P., Totsika, V., Tonge, B. J., et al. (2019). The kids and teens at school (KiTeS) framework: an inclusive bioecological systems approach to understanding school absenteeism and school attendance problems. *Front. Educ.* 4:61. doi: 10.3389/feduc.2019.00061
- Miranda-Zapata, E., Lara, L., Navarro, J.-J., Saracostti, M., and De-Toro, X. (2018). Modelling the effect of school engagement on attendance to classes and school performance. *Revista de Psicodidáctica* 23, 102–109. doi: 10.1016/j.psicoe.2018.03.001
- Mitchell, M. C. (2021). A qualitative study of strategies and practices used to improve student attendance and chronic absence at urban elementary schools (Order No. 28721454) [Doctoral dissertation, Valdosta State University]. Pro Quest Dissertations Publishing.
- Mooney, A., Redmond, G., and Kaambwa, B. (2022). Does socioeconomic status impact the relationship between school absence and outcomes? *Aust. Educ. Res.* 50, 941–964. doi: 10.1007/s13384-022-00535-2
- Nagy, R. P., Martin, A. J., and Collie, R. J. (2022). Disentangling motivation and engagement: exploring the role of effort in promoting greater conceptual and methodological clarity. *Front. Psychol.* 13:1045717. doi: 10.3389/fpsyg.2022.1045717
- Niehaus, K., Irvin, M. J., and Rogelberg, S. (2016). School connectedness and valuing as predictors of high school completion and postsecondary attendance among Latino youth. *Contemp. Educ. Psychol.* 44–45, 54–67. doi: 10.1016/j.cedpsych.2016.02.003
- Niemi, S., Lagerström, M., and Alanko, K. (2022). School attendance problems in adolescent with attention deficit hyperactivity disorder. *Front. Psychol.* 13:1017619. doi: 10.3389/fpsyg.2022.1017619
- Paulauskaite, L., Timmerman, A., Kouroupa, A., Allard, A., Gray, K. M., Hastings, R. P., et al. (2022). Elective home education of children with neurodevelopmental conditions before and after the COVID-19 pandemic started. *Front. Psychol.* 13:995217. doi: 10.3389/fpsyg.2022.995217
- Purtell, K. M., and Ansari, A. (2022). Why are children absent from preschool? A nationally representative analysis of head start programs. *Front. Educ.* 7:1031379. doi: 10.3389/feduc.2022.1031379
- Reschly, A. L., and Christenson, S. L. (2012). “Jingle, jangle, and conceptual haziness: evolution and future directions of the engagement construct” in *Handbook of research on student engagement*. eds. S. L. Christenson, A. L. Reschly and C. Wylie (Boston, MA: Springer).
- Ripamonti, E. (2018). Risk factors for dropping out of high school: a review of contemporary, international empirical research. *Adolesc. Res. Rev.* 3, 321–338. doi: 10.1007/s40894-017-0075-y
- Ripamonti, E. (2023). Cultural capital, economic capital, and participation in early childhood education: a place-based approach. *Reg. Sci. Policy Pract.* 15, 387–402. doi: 10.1111/rsp3.12635
- Roth, J. L., and Brooks-Gunn, J. (2016). Evaluating youth development programs: Progress and promise. *Appl. Dev. Sci.* 20, 188–202. doi: 10.1080/10888691.2015.1113879
- Senge, P. (2006). *The fifth discipline: The art and practice of the learning organization (2nd)*. Random House Books.
- Singer, J., Pogodzinski, B., Lenhoff, S. W., and Cook, W. (2021). Advancing an ecological approach to chronic absenteeism: evidence from Detroit. *Teach. Coll. Rec.* 123, 1–36. doi: 10.1177/016146812112300406
- Skinner, E. A., Kindermann, T. A., Connell, J. P., and Wellborn, J. G. (2009). “Engagement and disaffection as organizational constructs in the dynamics of motivational development” in *Handbook of motivation at school*. eds. K. R. Wenzel and A. Wigfield (New York: Routledge/Taylor & Francis Group), 223–245.
- Sosu, E. M., Dare, S., Goodfellow, C., and Klein, M. (2021). Socioeconomic status and school absenteeism: a systematic review and narrative synthesis. *Rev. Educ.* 9:e 3291. doi: 10.1002/rev3.3291
- Totsika, V., Hastings, R. P., Dutton, Y., Worsley, A., Melvin, G., Gray, K., et al. (2020). Types and correlates of school non-attendance in students with autism spectrum disorders. *Autism* 24, 1639–1649. doi: 10.1177/1362361320916967
- Totsika, V., Kouroupa, A., Timmerman, A., Allard, A., Gray, K. M., Hastings, R. P., et al. (2023). School attendance problems among children with neurodevelopmental conditions one year following the start of the COVID-19 pandemic. *J. Autism Dev. Disord.* doi: 10.1007/s10803-023-06025-3
- United Nations World Nations convention on the rights of the child. (1989). Available at: <https://www.refworld.org/docid/3ae6b38f0.html>
- United Nations Committee on the Rights of Persons with Disabilities (CRPD). (2016). General comment no. 4 on article 24: the right to inclusive education. Available at: <https://www.ohchr.org/en/documents/general-comments-and-recommendations/general-comment-no-4-article-24-right-inclusive>
- Wang, M. T., and Fredricks, J. A. (2014). The reciprocal links between school engagement, youth problem behaviors, and school dropout during adolescence. *Child Dev.* 85, 722–737. doi: 10.1111/cdev.12138
- Yang, D., Chen, P., Wang, K., Li, Z., Zhang, C., and Huang, R. (2023). Parental involvement and student engagement: a review of the literature. *Sustainability* 15:5859. doi: 10.3390/su15075859

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