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Exploring School Engagement and Academic Outcomes Over Time: The Role of Contextual Factors in Chile

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ABSTRACT

School engagement is a multidimensional construct encompassing affective, cognitive, and behavioral dimensions, influenced by contextual factors like family, peer, and teacher support. This longitudinal study examines how these dimensions of school engagement mediate the relationship between contextual factors and academic outcomes—specifically, class attendance and performance in language and mathematics—over 3 years among 284 Chilean students (46.5% boys and 53.5% girls) enrolled in their first year of secondary education in public schools in Chile. Our findings reveal that teacher support plays a significant role in enhancing school engagement, which in turn impacts academic outcomes, with behavioral and cognitive engagement having distinct effects on attendance and subject performance. The study also identifies gender differences in engagement dynamics, with teacher support influencing affective engagement in girls and behavioral engagement in boys. This study addresses a gap in longitudinal studies within Latin America, providing insights into the complex interplay between contextual factors, gender, and school engagement, with implications for targeted educational interventions.

1 | Introduction

School engagement is a fundamental concept in education, recognized for its direct impact on academic success, student retention in the educational system and the quality of the school climate (Estévez et al. 2021; Fredricks et al. 2004; Sattar et al. 2022). This construct encompasses multiple dimensions that transcend simple class attendance, including students' overall satisfaction, sense of belonging, and willingness to actively interact with their educational environment (Chen et al. 2021; Snijders et al. 2020; Strauss and Volkwein 2004). In addition to affecting individual student outcomes, school engagement also influences the dynamics and atmosphere of the educational institution (Hirschfield and Gasper 2011; Mazerolle

et al. 2019; Mendoza and King 2020). On the other hand, high levels of engagement not only improve academic performance, but are also associated with lower rates of negative behaviors such as disobedience, school delinquency, and absenteeism, thus reinforcing a positive school environment (Estévez et al. 2021; Hirschfield and Gasper 2011; Li et al. 2020; Mazerolle et al. 2019; Reyes-de-Cózar et al. 2023).

Several factors influence school engagement, from intrinsic elements related to students' motivation and self-efficacy, to extrinsic factors such as the school environment, the quality of relationships with teachers and peers, and the support received in educational and family settings (Ansong et al. 2017; Wei et al. 2023).

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Summary

- Teacher support emerged as a crucial factor in fostering school engagement, with significant effects on behavioral and cognitive engagement, highlighting the need for professional development programs that equip educators with strategies to strengthen Student–teacher relationships.
- The distinct impact of engagement dimensions on academic outcomes underscores the importance of targeted interventions, with behavioral engagement playing a key role in mathematics and language performance. In contrast, cognitive engagement specifically enhances language achievement.
- Gender differences in school engagement reveal the need for tailored educational strategies, as teacher support influences affective engagement in girls and behavioral engagement in boys, emphasizing the importance of gender-responsive approaches in fostering student success.

Understanding the complexity of these factors and how they interact to influence school engagement is essential for educators and educational policymakers to develop effective strategies that promote active student engagement and improve educational outcomes (Li et al. 2023; Olana and Tefera 2022; Wang and Eccles 2013).

1.1 | Definition and Dimensions of School Engagement

School engagement is defined as a multidimensional construct that includes students' overall satisfaction with their educational experience, their sense of belonging within the institution, and their willingness to continue to engage in the learning process (Estévez et al. 2021; Fomina et al. 2021; Grazia and Molinari 2023; Wong and Liem 2022).

Several authors identify three key dimensions of school engagement: cognitive, emotional, and behavioral (Fredricks et al. 2004; Hong et al. 2020; Jimenez-Liso et al. 2021; Tam et al. 2023).

Cognitive engagement refers to the mental effort and dedication a student invests in understanding and mastering academic content (Khan et al. 2023). This includes the interest in learning, the willingness to face and overcome intellectual challenges, and the ability to self-manage the learning process. Emotional engagement is related to the emotions that students associate with their school experience. This includes the sense of belonging to the school, the quality of relationships with peers and teachers, and the positive or negative emotions that arise in relation to academic tasks and the school environment in general (King and Frondozo 2021; Roorda et al. 2011). Finally, behavioral engagement encompasses observable actions and behaviors that reflect the student's involvement in school, such as regular attendance, active participation in class, homework completion, and participation in extracurricular activities (Mendoza and King 2020).

Each of these dimensions is crucial to understanding the impact of school engagement on academic outcomes and overall student well-being (Fatou and Kubiszewski 2018; Strauss and Volkwein 2004). Cognitive engagement ensures that students are truly engaged in the learning process and not simply attending class (Fredricks et al. 2016). Emotional engagement reflects how students feel within the school environment, which is essential to their long-term well-being and motivation. Finally, behavioral engagement is manifested in the concrete actions that students perform within the school, being a direct indicator of their participation and dedication (Joshi et al. 2022).

1.2 | Factors Influencing School Engagement

School engagement is influenced by a variety of contextual factors, including relationships with family, peers, and teachers. Recent studies have shown that these three relational contexts are key determinants of school engagement (Ansong et al. 2017; De Toro et al. 2023; Fernández-Zabala et al. 2016; Hu and Tali 2023; Olana and Tefera 2022; Ramos-Díaz et al. 2016; Saracostti et al. 2024).

Peer relationships are a critical factor in school engagement. Peer influence can have a significant effect on a student's motivation and engagement. Mendoza and King (2020) highlight how engagement can be “contagious” in the classroom context, suggesting that a positive and stimulating social environment can enhance student engagement. This social contagion effect highlights the importance of fostering a collaborative and supportive classroom environment where students feel motivated to actively participate. Similarly, de De Toro et al. (2023) found that higher engagement profiles were associated with better academic performance, emphasizing the role of peers and classroom dynamics in promoting engagement (De Toro et al. 2023).

The affective and supportive relationship between students and teachers is another determinant of school engagement. Roorda et al. (2011) emphasize that positive Student–teacher relationships can significantly increase the level of engagement, while negative relationships can have the opposite effect, decreasing motivation and participation (Havik and Westergård 2020; Roorda et al. 2011). More recent research in Malaysia found a strong positive correlation between teacher–student relationships and student engagement ($r = 0.740$, $p < 0.01$), highlighting the importance of building positive teacher–student interactions (Yi and Kutty 2023). The quality of these interactions is crucial, as students who feel supported and understood by their teachers tend to be more engaged in their learning and persist in their education.

Regarding positive teacher–student relationships (TSR) and school engagement, the studies show a medium to significant association between positive TSR relationships and school engagement. The overall effect sizes for the positive relationship were $r = 0.39$ for a fixed effects model and $r = 0.34$ for a random effects model. This suggests students with positive affective relationships with their teachers show higher school engagement (Roorda et al. 2011).

Regarding negative teacher-student relationships (TSR) and school engagement, Roorda et al. (2011) reported that negative relationships with teachers had a significant impact on school engagement, with effect sizes of $r = -0.32$ in a fixed effects model and $r = -0.31$ in a random effects model. These findings indicate that conflictive or strained teacher-student relationships are associated with lower levels of school engagement.

Recent studies during the COVID-19 pandemic have also emphasized the role of teacher-student relationships in remote learning contexts. Domina et al. (2021) found that household material and technological resources, including access to high-speed internet, were predictors of student engagement in remote learning (Domina et al. 2021). Furthermore, Khlaif et al. (2021) identified that digital inequality and cultural factors significantly influenced engagement in online learning (Khlaif et al. 2021).

Regarding positive relationships and academic achievement, the studies reported that the relationship between positive TSR and academic achievement was significant, although smaller than the impact on school engagement ($r = 0.16$ for fixed effects). This suggests that, although positive affective relationships with teachers contribute to academic achievement, their impact is more substantial on engagement than academic achievement. Similarly, negative TSRs affected academic achievement, with a lower negative correlation ($r = -0.15$).

Regarding the moderating impact of student characteristics. Studies showed that students at academic risk (such as those with low socioeconomic status or learning difficulties) are more affected by negative TSRs, suggesting that these students are more vulnerable to conflictual relationships with teachers. This review highlights the crucial importance of affective teacher-student relationships in terms of school engagement and academic achievement, especially for academically at-risk students (Yi and Kutty 2023).

1.3 | Relevance of Gender in School Engagement

Gender has been shown to be an influential factor in school engagement, with studies identifying significant differences between boys and girls (Korlat et al. 2021; Lam et al. 2012). Research indicates that girls tend to report higher levels of school engagement compared to boys, a trend that is consistently observed across diverse cultural and educational contexts (Korlat et al. 2021; Lam et al. 2012). Recent studies also show that during the COVID-19 pandemic, girls demonstrated higher perceived teacher support, intrinsic value, and engagement in digital learning environments (Korlat et al. 2021).

Generally, girls tend to report higher levels of engagement, which is reflected in their superior academic performance compared to boys (Wilcox et al. 2018; Xia et al. 2023). In their study, Wilcox et al. (2018) examined the relationship between gender, social support, anxiety, and school engagement in elementary and middle school students. Results showed that girls are more responsive to social support and tend to report higher levels of anxiety compared to boys. While academic engagement was a significant predictor in boys, anxiety played a larger role

in predicting school engagement in girls, highlighting key differences in how gender influences these factors.

On the other hand, a study by Kang et al. (2023) found that negative teacher-student relationships had a stronger impact on girls' emotional engagement than on boys', suggesting that gender differences also exist in the association between teacher-student relationships and school engagement (Kang et al. 2023). Similarly, greater emotional engagement has also been shown to be associated with a lower likelihood of inaccurate educational expectations, especially for adolescent boys and ethnic minorities (Gutman and Schoon 2018). Understanding these gender differences in engagement is essential for developing effective strategies to support both boys and girls in educational settings.

These gender differences in engagement are also reflected in longitudinal studies, which suggest that girls' perceived support from their social and family environment may moderate their level of engagement (Gutman and Schoon 2018; Salmela-Aro et al. 2021). Recent research further indicates that girls tend to conform to traditional feminine norms and engage more in verbal subjects, whereas boys are more motivated in mathematics and science (Wirthwein et al. 2020).

It is crucial to address these differences from a longitudinal perspective to understand how they develop over time and in different educational contexts (Lietaert et al. 2015).

Longitudinal studies of student engagement reveal significant gender differences, highlighting how boys and girls engage differently in educational settings over time. Several factors influence these differences, including individual characteristics, teacher-student relationships, and educational contexts. Insights from these studies can inform the development of strategies to improve gender participation and ultimately improve educational outcomes.

Regarding gender differences, a study by Cinar et al. (2023) found that girls generally show higher levels of classroom engagement than boys during elementary school. Girls with higher attention skills and fewer externalizing behaviors during elementary school showed slower improvement in engagement, whereas boys did not improve significantly over time. On the other hand, in secondary education, Van de Gaer et al. (2008) observed that both boys and girls experienced a decline in school participation. However, the decline was more pronounced for boys. Girls showed more positive and consistent language learning associated with their participation levels.

Despite advances in understanding school engagement, there are several gaps in the literature regarding the role of gender, especially in the context of longitudinal studies. These gaps limit a complete understanding of how gender influences engagement over time and across different educational contexts.

Although some recent research has started to unpack variations within gender, there is still a lack of longitudinal studies that explore how boys' and girls' engagement evolves over time. A study by Yu et al. (2020) moved beyond the traditional binary perspective, identifying distinct groups of adolescents based on

their conformity to different gender norms. The study revealed that within-gender variations, such as academically at-risk girls and well-performing boys, remain underexplored in the current research landscape (Yu et al. 2020). However, most current studies remain cross-sectional, as noted by Van Houtte (2020), which captures only a moment in time, not allowing for a detailed analysis of how factors such as gender influence school engagement during different educational stages (Van Houtte 2020).

Additionally, there is a gap in research on how teacher support differentially influences boys' and girls' school engagement over time. Some studies suggest that autonomy support might have a greater protective effect for boys than for girls, but more research is needed to confirm whether these differences persist over time and in different educational contexts (Lietaert et al. 2015). Salmela-Aro et al. (2021) highlight that most research on student engagement focuses on antecedents rather than the long-term outcomes, pointing to a critical gap in understanding the longitudinal impact of different support mechanisms on gendered school engagement (Salmela-Aro et al. 2021). This aspect is crucial for designing educational strategies that are effective for both genders and that consider their specific needs.

Another critical gap lies in research across diverse cultural contexts. Most existing longitudinal studies on gender and school engagement have been conducted in Western countries. This narrow focus overlooks the complex dynamics in other cultural and educational systems. Steinmann and Rutkowski (2023) emphasize the need for more culturally diverse research, as gender gaps in educational outcomes can differ significantly across regions, indicating that global patterns and solutions may not be universally applicable (Steinmann and Rutkowski 2023). Similarly, Psaki et al. (2022) identify substantial knowledge gaps in interventions to address gender-related educational barriers, particularly in low- and middle-income countries (Psaki et al. 2022).

Finally, most longitudinal studies on gender and school engagement have focused on specific cultural contexts, mainly in Western countries. This leaves a gap in understanding how these dynamics work in different cultures and educational systems. For instance, Rehman et al. (2023) examines gender gaps in school enrollment and completion in Pakistan, but similar studies in Latin American countries are notably limited (Rehman et al. 2023). Patall et al. (2018) highlight the need to expand longitudinal research to include more cultural diversity and different educational contexts to get a more complete picture of how gender affects school engagement in a global setting. More studies are needed in Latin America, where cultural and educational dynamics may differ significantly from those observed in other contexts.

1.4 | The Importance of Longitudinal Studies of School Engagement

Longitudinal studies are critical for understanding the evolution of school engagement and how contextual factors influence its development over time (Niittylahti et al. 2021; Salmela-Aro

et al. 2021; Wylie and Hodgen 2012; Xing et al. 2019). Longitudinal studies allow us to observe changes in engagement during key transitions in students' educational lives, such as the move from primary to secondary school and the transition to higher education (Wigfield et al. 2015). These studies also highlight the importance of affective relationships between students and teachers in maintaining long-term engagement (Thornberg et al. 2023). Fomina et al. (2021) conducted a longitudinal study on the relationship between self-regulation, school engagement, and academic achievement, finding that conscious self-regulation significantly predicts successful learning and high student engagement during transitions in schooling. This study underscores the need for longitudinal research to understand how self-regulation and engagement interact over time (Fomina et al. 2021).

On the other hand, the quality of the teacher-student relationship is a crucial predictor of long-term school engagement. Thornberg et al. (2023) highlight that positive affective relationships can increase engagement, while negative relationships can reduce it. This effect is consistent in longitudinal studies and underscores the importance of emotional bonds in the school environment. This aligns with findings by Niittylahti et al. (2021), who explored student engagement in vocational education and found that strong connectedness with teachers and peers supported engagement, indicating the importance of social relationships for maintaining engagement throughout educational trajectories (Niittylahti et al. 2021). In addition, school environment and academic motivation are factors that, if properly managed, can have a lasting impact on engagement. Students who perceive their school environment as supportive, relevant, and offering them choices tend to show higher levels of academic motivation, which in turn positively influences their engagement (Wang and Eccles 2013).

Not all students experience engagement in the same way. Individual trajectories of engagement can vary considerably, and these variations are often related to levels of academic competence and participation in extracurricular activities. Niittylahti et al. (2021) highlight that students who feel more connected to their peers and who show intrinsic interest in the curriculum tend to maintain a higher level of engagement over time. Additionally, Research by Fomina et al. (2021) emphasizes that students with higher self-regulation tend to maintain better engagement levels over time. This study also indicated that academic success plays a more significant role in predicting future engagement as students' progress to higher grade levels (Fomina et al. 2021).

These individual differences may also be mediated by contextual factors, such as family support and the quality of the educational environment.

The Wylie and Hodgen (2012) study conducted in New Zealand shows how quantitative longitudinal studies of patterns of school engagement in students aged 10–16 years yield useful information on the factors contributing to different levels of school engagement and its role in academic and social achievement. The authors identify different trajectories of school engagement behind declining levels of this variable over time. At the same time, they observe the relationship between

subtypes of engagement over time, through structural equation modeling, showing that cognitive/academic competence scores contribute significantly to explaining attitudinal competence in the next age group, but not in the opposite direction. For example: in reading, higher achievement at age 10 increases perseverance, curiosity and communication, later when those children are 12 years old.

The quantitative longitudinal study conducted in the UK by Gutman and Schoon (2018), which examines associations between emotional engagement (school engagement subtype) and educational expectations, covering ages 14 to 16, concludes that, on average, emotional engagement increases over time having effects on educational expectations.

Another study by González and Paoloni (2015), analyzes the structural relationships between school motivation facilitator variables and academic achievement, as well as the role of school engagement and disaffection as mediators of the effects of control and value on achievement in Spanish students aged 12 to 16 years. Their results confirmed the hypotheses that control, and value significantly predict engagement, disaffection and achievement. In turn, commitment and disaffection predicted performance and partially mediated the effects of control and value on performance.

Despite the wealth of longitudinal research, there remains a lack of studies in certain cultural contexts, particularly in Latin America. For example, Salmela-Aro et al. (2021) conducted a review of 104 longitudinal studies on adolescent school engagement from 2010 to 2020. Their findings indicate that most studies have focused on the behavioral dimension (70.19%), followed by emotional (60.58%) and cognitive (34.62%). While some studies have examined all three dimensions together, only 3.85% explicitly used a scale designed to assess them simultaneously, such as the Behavioral-Emotional-Cognitive School Engagement Scale (BEC-SES; Li and Lerner 2013). This highlights a gap in the literature regarding the comprehensive measurement of school engagement across its three core dimensions.

At the same time, most studies were conducted in North America (43%) and Europe (34%), followed by Asia (13%) and Oceania (9%). Most of them came from the United States (41%), followed by Belgium (9%) and China (8%), showing the lack of studies in Latin American contexts and Spanish-speaking students. On the other hand, it was evident that 93% of the studies focused on the factors that precede student engagement, such as peer support, psychological well-being, and relationships with teachers, while only 38% of the studies analyzed the outcomes of engagement, such as academic performance or achievement.

Regarding the objects of engagement, the studies focused mainly on engagement within the classroom (53.8%), followed by school (45.2%) and schoolwork (42.3%). Only 10.6% of the studies analyzed engagement in specific subjects (such as mathematics or science). There was no evidence of any study focusing on language. This evidence calls for more longitudinal studies in diverse contexts to provide a holistic view of how school engagement evolves globally.

In the Latin American context, longitudinal studies on school engagement are practically nonexistent. Previous research in Chile and Latin America has demonstrated the mediating role of school engagement between contextual factors and academic achievement, but it has been based on cross-sectional designs (Miranda-Zapata et al. 2018, 2021). For example, the study by Miranda-Zapata et al. (2018) found the mediating role played by school engagement, in relation to the influence of contextual factors, on the dependent variable dropout risk factors (academic achievement and attendance) in students in transit from primary to secondary education in public schools, while the study by Miranda-Zapata et al. (2021) sought to establish the fit of a cross-sectional model of mediation of school engagement between the relationship between contextual factors and school performance in elementary and secondary school students in Chile, Colombia, Spain, Peru and Uruguay. This model causally links school engagement (affective, cognitive and behavioral) with school attendance and school performance, also including the indirect effect of contextual factors (family, teachers and peers).

The cross-sectional studies, while providing empirical evidence in favor of a theoretical predictive model through a single measurement of contextual factors and school engagement, have identified the need for longitudinal studies that allow a deeper understanding of the behavior of the variables over time.

Despite advances in research on school engagement globally, a notable gap persists in the literature regarding longitudinal studies in Latin America. While cross-sectional models have been developed and validated in countries such as Chile and other nations in the region (Miranda-Zapata et al. 2018; Miranda-Zapata et al. 2021), these approaches fail to capture the complex and evolving dynamics of school engagement over time. Cross-sectional models provide a “snapshot” of phenomena at a given point in time, but lack the ability to observe how contextual factors, such as family environment, peers, and teachers, interact with different dimensions of school engagement at various stages of students’ educational development.

This gap in the literature highlights the importance of conducting longitudinal studies that can develop sustainable predictive models to improve educational outcomes in the region. Research such as that of Miranda-Zapata et al. (2021) suggests that to fully understand the influence of family, school and social context on academic achievement and school attendance, it is crucial to observe how these variables relate and change over time. A longitudinal approach would also allow us to capture the interactions between different dimensions of school engagement and contextual factors over years of educational development, providing a solid basis for more precise and effective educational interventions.

In this sense, it is essential that future research in Latin America employ longitudinal methodologies that allow for a detailed observation of school engagement. Such a design would facilitate the identification of patterns and trends over time, allowing researchers and educators to gain a deeper understanding of how school engagement develops and is affected by different factors at different points in academic life.

1.5 | The Present Study

This study seeks to address this gap through a longitudinal design that annually measures dimensions of school engagement (SE) and contextual factors (CFs) to develop sustainable predictive models that improve educational outcomes. The central hypothesis of this study posits that at least one of the contextual factors -whether family, teachers, or peers-will exert an indirect influence on socio educational achievement, defined as academic performance in language, mathematics, and school attendance. The causal model links school engagement with class attendance and school performance while also considering the indirect effect of contextual factors.

In addition, we expect to test the validity of the predictive model differentiating by gender, analyzing how engagement varies between boys and girls in middle school students in Chile.

This study not only aims to close the existing gap in longitudinal studies in Latin America, but also to provide a more detailed understanding of how contextual dynamics influence school engagement over time. At the same time, it seeks to generate empirical evidence that will allow educational policymakers to design more effective interventions tailored to the specific needs of students according to their gender and educational stage. This could contribute significantly to the development of strategies that promote greater equity and quality in education in the region.

1.6 | Methodology

The current study is part of a larger research titled “Modeling school commitment, contextual factors, and socio-educational achievement of children and adolescents: From the international scientific literature to a mixed longitudinal study in Chile.” The overarching project employs a mixed methods design (quantitative and qualitative) to explore the relationships over time between SE, CFs, and educational trajectories of students in Chilean public schools (Creswell 2015; Sampieri 2018).

This study has a correlational-causal longitudinal design and seeks to model the structure that relates school engagement (affective, cognitive, and behavioral) with a direct effect on the dependent variables: attendance to classes and school performance in math and readings in Chilean students over time. The indirect effect of contextual variables (Family, Teachers and Classmates) on the dependent variables through school engagement. The causal model links school engagement (at time 2) with class attendance and school performance (at time 3), while also considering the indirect effect of contextual factors (at time 1).

In addition, this study also analyzes whether there are variations in this relationship depending on whether they are in primary or secondary education or if they are boys or girls.

1.7 | Participants

The study involved 284 students from secondary education, comprising 132 boys (46.5%) and 152 girls (53.5%). All

participants were assessed in three consecutive grades of school, in the years 2021, 2022 and 2023. In the year 2021, students in 1st secondary grade between the ages of 13 and 17 years ($M = 15.11$, $SD = 0.621$) were evaluated.

The students belonged to educational establishments in the central regions of Chile. All students were enrolled in public schools classified as vulnerable based on the School Vulnerability Index calculated annually by the National School Aid and Scholarship Board. This index considers factors such as family socioeconomic context, access to healthcare, housing quality, and parental educational level (Saracostti et al. 2022).

1.8 | Instruments

Two self-report questionnaires were employed to assess study variables.

Contextual Factors Questionnaire (CFQ): This 18-item instrument measures three CFs influencing SE: family support (3 items, e.g., ‘When I have a problem, I get help from my family’), teacher support (8 items, e.g., ‘Teachers care about me not only as a student but also as a person’), and peer support (7 items, e.g., ‘At my school, at least one classmate supports me with difficult assignments’). Students respond on a 5-point scale from 1 (never or almost never) to 5 (always or almost always) (Lara et al. 2018).

The versions adapted for classroom and nonclassroom educational contexts were used (Lara et al. 2022). There were two versions of the questionnaires depending on the school grade of the participants: the version developed for primary school students in Chile and the version developed for secondary school students in Chile (originally developed by Navarro et al. 2021 in a non-pandemic context). Both versions present the same factorial structure, with similar items but adapted to the developmental stage of the targeted students. Lara et al. (2022) reports the same factorial structure of three correlated factors (family, teachers, and peers) and adequate levels of internal consistency.

The CFQ was adapted and validated for the remote, face-to-face, or hybrid educational contexts in Chile during the pandemic (Lara et al. 2022). This adaptation maintained the original instrument's structure and content, demonstrating an acceptable fit of the three-factor correlated model of family, teacher, and peer support to data ($RMSEA = 0.077$, $CFI = 0.955$, $TLI = 0.948$). Which constitutes evidence in favor to construct validity. Also, the scale presents good reliability: Family ($\Omega = 0.81$), teachers ($\Omega = 0.93$) and peers ($\Omega = 0.93$).

School Engagement Questionnaire (SEQ): This 29-item instrument measures three dimensions of SE: affective (10 items, e.g., ‘I feel like I am part of this school’; ‘I am proud to be at this school’), cognitive (12 items, e.g., ‘Before an exam, I plan how to study the subject’; ‘I know what study strategies and habits I must change to improve and get better grades’), and behavioral (7 items, e.g., ‘I behave well in classes [face to face or online]; I am usually late for classes [or I late for online classes]’). Students respond on a 5-point scale from 1 (never or almost

never) to 5 (always or almost always) (Lara et al. 2018). There are two versions of the questionnaires depending on the school grade of the participant: the version developed for primary school students in Chile and the version developed for secondary school students in Chile (originally developed by Lara et al. 2018 in a non-pandemic context). Both versions present the same factorial structure, with similar items but adapted to the developmental stage of the students targeted. Lara et al. (2022) reports the same factorial structure of three correlated factors (affective, behavioral, and cognitive school engagement) and adequate levels of internal consistency.

Similarly, to the contextual factor questionnaire, the version used in this study was adapted and validated for the context of virtual, face-to-face, or hybrid classes in the Chilean educational system caused by the COVID-19 pandemic (Lara et al. 2022). This adaptation maintained the original instrument's structure and content, and confirmatory factor analysis indicated a good fit of the data to the three-factor correlated model of affective, behavioral, and cognitive SE (RMSEA = 0.061, CFI = 0.943, TLI = 0.938), which constitutes evidence in favor to construct validity. Also, the scale presents good reliability: Affective (Omega = 0.90), cognitive (Omega = 0.93) and behavioral (Omega = 0.88).

1.8.1 | Secondary Databases

Data available from administrative records of schools or their administrators will be utilized to describe variables related to socio-educational outcomes, such as average mathematics grades, average language grades, and school attendance.

1.9 | Procedures

This study was approved by the Ethics Committee of the Universidad de Valparaíso, in Chile. Before data collection, permissions were obtained from the educational centers where the data was collected, as well as the informed consent signed by the legal representatives of the participants, and the consent of the students themselves.

Data collection occurred at three points in time: in 2021, 2022 and 2023. In 2021, participants completed questionnaires assessing Contextual Factors, while in 2022, they completed questionnaires assessing School Engagement. Both sets of questionnaires were administered during school hours, with groups of students, through a computer platform developed for data collection (Saracostti et al. 2022). Trained research teacher members explained the study procedures and questionnaires, addressing any student questions. The completion of each questionnaire took approximately 20–30 min. The online platform required participants to complete all questions before submitting the survey, ensuring there was no missing data.

At the end of the 2023 academic year, data were collected from administrative records of schools, including average mathematics grades, average language grades, and school attendance of the students who participated in the study.

1.10 | Data Analysis

The study used a Structural Equation Model (SEM) with mediation to test hypotheses about the predictive capacity of contextual factors (CF) in year 1 on outcomes (attendance, math, and language) in year 3 through the school engagement (SE) in year 2, which was referred to as Model 1. A SEM model studies relationships between observed variables (e.g., items on a scale) and latent variables (e.g., the constructs those items measure) specified in theoretical models that allow testing hypotheses of how the set of variables define constructs and how they relate to each other (Schumacker and Lomax 2016).

Before test the structural models, several Confirmatory Factor Analyses (CFA) were performed to test the fit of the measurement model of each scale and identify evidence in favor to construct validity if the fit is at least acceptable. Loadings are used to calculate coefficient Omega to obtain evidence of reliability of every factor of each scale. Values of Omega above 0.70 indicates good reliability (Campos-Arias and Oviedo 2008).

Then CFA's are performed for each group of student conformed by sex. Measurement invariance for boys and girls is test for each scale to allow the multigroup structural equation modeling by gender (boys and girls) to evaluate the moderation of gender in the parameters of the model. To stablish the satisfaction of configural model, the CFA criteria were used. For metric and scalar models, a difference of CFI (Δ CFI) between the most constraint model and the less constraint model should be smaller than -0.01 (Rensvold and Cheung 2001).

The moderation hypotheses were tested by comparing parameters using the multi-group SEM strategy, according to which all the relationships in the model are compared between groups (Wang and Wang 2012). After fitting the model in the total sample, the gender moderation between boys and girls (Model 2) was performed.

The Mplus 8.8 software was chosen to perform the statistical analyses using the WLSMV estimator for categorical variables. Traditional criteria were used to interpret model fit: RMSEA < 0.05 for a good fit, RMSEA < 0.08 for reasonable (Browne and Cudeck 1993); CFI and TLI > 0.95 for a good fit, and CFI and TLI ≥ 0.90 for reasonable (Hu and Bentler 1999). The SRMR is considered adequate if it is less than 0.08 (Hu and Bentler 1999).

2 | Results

2.1 | Measurement Invariance by Gender

As it is shown in Table 1, scalar measurement invariance is achieved for Contextual Factor scale by gender. This allows to perform a multigroup analysis by gender with this scale.

As it is shown in Table 2, scalar measurement invariance is achieved for School Engagement scale by gender. This allows to perform a multigroup analysis by gender with this scale.

TABLE 1 | Measurement invariance of contextual factors scale by gender.

Model	χ^2	df	p	D_SB χ^2	D_df	RMSEA	CFI	D_CFI	TLI
0 Configural (correlated factors)	448.776	291	0.000	—	—	0.068	0.958	—	0.956
1 Metric (loadings fixed)	434.921	309	0.000	21.776	18	0.054	0.973	0.015	0.973
2 Scalar (loadings and thresholds fixed)	490.617	339	0.000	62.846	30	0.056	0.967	−0.006	0.970

Abbreviations: CFI, Comparative Fit Index; D_CFI, Delta of Comparative Fit Index; D_df, Delta of degrees of freedom; df, degrees of freedom; D_SB χ^2 , Delta of Satorra-Bentler adjustment of Chi-Square; p, statistical significance; RMSEA, Root Mean Square Error of Approximation; TLI, Tucker-Lewis Index; χ^2 , Chi-square.

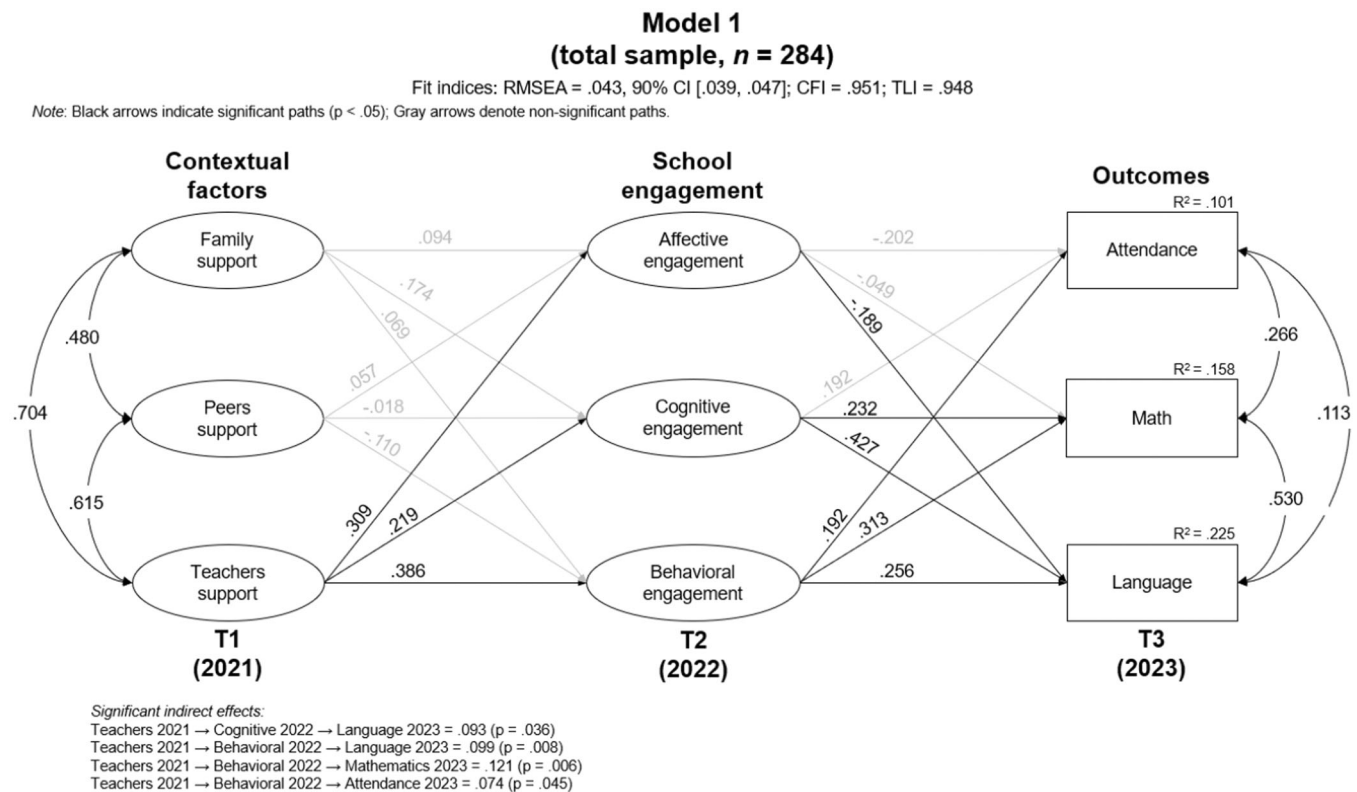
TABLE 2 | Measurement invariance of school engagement scale by gender.

Model	χ^2	df	p	D_SB χ^2	D_df	RMSEA	CFI	D_CFI	TLI
0 Configural (correlated factors)	984.386	724	0.000	—	—	0.050	0.927	—	0.924
1 Metric (loadings fixed)	997.346	749	0.000	42.431	25	0.048	0.930	0.003	0.930
2 Scalar (loadings and thresholds fixed)	1059.956	806	0.000	82.712	57	0.047	0.929	−0.001	0.933

Abbreviations: CFI, Comparative Fit Index; D_CFI, Delta of Comparative Fit Index; D_df, Delta of degrees of freedom; df, degrees of freedom; D_SB χ^2 , Delta of Satorra-Bentler adjustment of Chi-Square; p, statistical significance; RMSEA, Root Mean Square Error of Approximation; TLI, Tucker-Lewis Index; χ^2 , Chi-square.

The model that examined the effects of contextual factors in T1 and school engagement in T2 on attendance and grades in math and language in T3 showed a good fit to the data (RMSEA = 0.043, CFI = 0.951, TLI = 0.948).

cognitive engagement ($\gamma = 0.219$, $p = 0.030$). Behavioral engagement has a statistically significant on the three outcome variables. Behavioral engagement has a positive and medium effect on mathematics ($\beta = 0.313$, $p < 0.001$), a positive and



Teacher's support has a statistically significant effect on each dimension of school engagement. Teacher support has a positive and medium effect on behavioral engagement ($\gamma = 0.386$, $p = 0.001$), a positive and medium effect on affective engagement ($\gamma = 0.309$, $p = 0.001$), and a positive and small effect on

small effect on language ($\beta = 0.256$, $p < 0.001$), and a positive and small effect on attendance to class ($\beta = 0.192$, $p < 0.014$). Cognitive engagement has a statistically significant, positive, and medium effect on language ($\beta = 0.427$, $p < 0.001$), and a positive and small effect on attendance to class

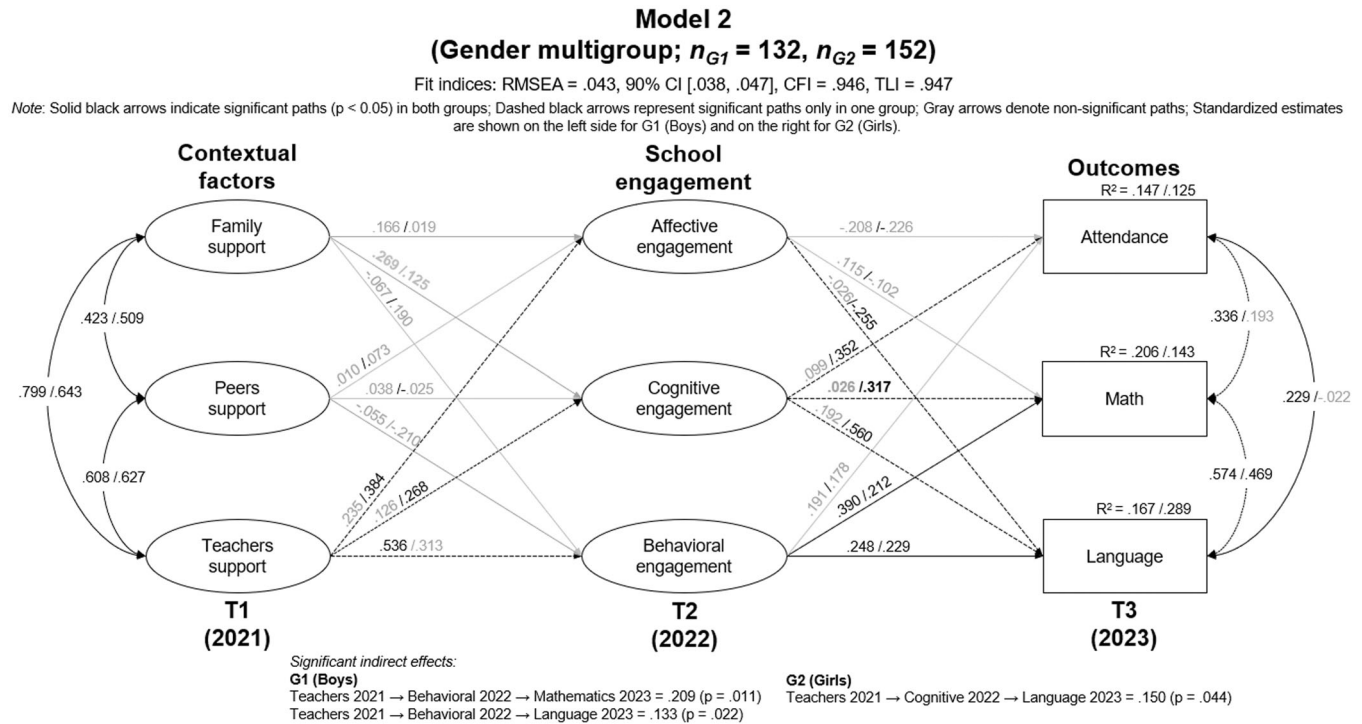
($\beta = 0.232$, $p = 0.007$). Affective engagement has a statistically significant, negative, and small effect on language ($\beta = -0.189$, $p < 0.022$).

2.2 | The Moderating Role of the Gender

The gender was examined using multi-group analyses as a categorical variable (boys vs girls).

3 | Discussion

The findings of this study reveal nuanced insights into the dynamics of school engagement in Chilean students, emphasizing the role of contextual factors and gender in shaping engagement and academic outcomes. The study's longitudinal design, focusing on secondary education over 3 years, provides a comprehensive view of how school engagement evolves and the differential impact of family,



The multi-group analysis had fit indices that fit acceptably with the data (RMSEA = 0.043, CFI = 0.946, TLI = 0.947). Although comparisons were non statistically significant, which indicates there is no moderating effect of gender, it results remarkable that the effect of Teachers on affective engagement ($\gamma = 0.384$, $p < 0.001$) is statistically significant in girls and it cannot be differentiated from zero in boys ($\gamma = 0.235$, $p > 0.05$). In the same way the effect of teachers on behavioral engagement, which is statistically significant in boys ($\gamma = 0.536$, $p < 0.001$), but it cannot be differentiated from zero in girls ($\gamma = 0.313$, $p > 0.05$).

2.3 | Mediation of School Engagement

Indirect effects were found statistically significant in boys and girls subsamples. In boys, behavioral engagement mediates the effect of teachers support on mathematics (indirect effect = 0.209, $p = 0.011$) and behavioral engagement also mediates the effects of teacher support on language (indirect effect = 0.133, $p = 0.022$). In girls, only a mediation effect was found on the relation between teachers support and language, which is mediated by cognitive engagement (indirect effect = 0.150, $p = 0.044$).

teacher, and peer support on cognitive, affective, and behavioral engagement.

3.1 | The Role of Contextual Factors in School Engagement

Our study underscores the critical influence of teacher support on school engagement, aligning with existing literature highlighting these relationships' importance (Ansorg et al. 2017; Roorda et al. 2011; Salmela-Aro et al. 2021; Saracostti et al. 2024). Interestingly, teacher support positively affects each dimension of school engagement, which resonates with the literature indicating that teacher-student relationships significantly shape students' observable school behaviors (Mendoza and King 2020), and also coincides with recent research on the predictive power of self-regulation on academic success and engagement (Fomina et al. 2021).

However, contrary to expectations, peer support did not significantly impact any dimension of school engagement in this study. This finding diverges from previous research emphasizing peer group engagement's "contagious" nature (Mendoza and King 2020). One possible explanation could be cultural or

context-specific factors within the Chilean education system that differentiate peer influence from other contexts. Further research is needed to explore this discrepancy, possibly investigating peer dynamics in different educational environments.

Educational and cultural dynamics in Latin America differ significantly from those in North America and Europe, shaping student engagement in distinct ways. In many Latin American countries, educational systems face structural challenges such as socioeconomic inequality, limited educational resources, and variations in teacher training quality, which can influence students' engagement and academic performance (Psaki et al. 2022; Steinmann and Rutkowski 2023). Additionally, cultural values emphasizing familial interdependence and collectivism may shape the role of family and peer support in school engagement differently from individualistic Western contexts (Olana and Tefera 2022). In Chile, public education has historically experienced disparities in funding and access, which can impact students' perceptions of support from teachers and peers. Understanding these contextual differences is crucial to interpreting the findings of this study and highlighting the need for more research in Latin American settings.

Some studies in Latin American contexts or with Latino populations have shown that peer support does not always significantly influence school engagement. For example, a study by our research team (Miranda-Zapata 2021) analyzed the influence of peer support on school engagement in five Ibero-American countries—Colombia, Chile, Uruguay, Peru, and Spain—without finding a significant influence. Only in the cases of Colombia and Spain did the peer support factor show a medium-sized effect on affective school engagement. The study by Bosacker (2016) examined Latino secondary school students in an urban environment in the USA, specifically young people of Latino origin (probably of Mexican or Central American descent) in low-income neighborhoods. Self-report questionnaires and school grades were used to assess the relationship between peer support and academic and psychological functioning. The results showed no significant relationship, probably due to the small sample size, which limited the study's statistical power (Bosacker 2016). In another study with 2,028 Angolan students (Portuguese-speaking and of Latin-African cultural background) aged between 14 and 22 (mean age = 17.4), Gutiérrez et al. (2017) found that perceived peer support did not predict school engagement, unlike teacher and family support, which did have a significant impact (Gutiérrez et al. 2017). Finally, Izaguirre and Di Capua (2020) analyzed data from more than 100,000 sixth graders in Latin America and the Caribbean from the TERCE (Third Regional Comparative and Explanatory Study) coordinated by UNESCO. Although they identified certain peer effects on academic performance in math, language, and science, these effects were variable and not always significant, depending on the type of school (public, private, or rural), which suggests that the impact of peer support is neither uniform nor decisive in all school contexts (Izaguirre and Di Capua 2020).

Another possible explanation is the impact of the COVID-19 pandemic. In Chile, schools were closed for in-person learning for approximately 18 months, with most students switching to online classes from March 2020 until mid-2021. This prolonged period of virtual learning significantly disrupted students' typical social

interactions, including those with peers. Research indicates that the lack of in person contacts during the pandemic limited opportunities for peer support and interaction, which are crucial for developing social bonds and fostering group engagement (Morales Retamal 2020; Zamudio Elizalde 2021).

The extended use of online classes may have led to difficulties in building and maintaining meaningful peer relationships, thus diminishing the usual "contagious" effect of peer engagement. Additionally, the abrupt shift to virtual learning created a social environment that likely impacted the quality and frequency of peer interactions. The lack of a physical classroom, where students naturally interact, collaborate, and provide mutual support, could explain why peer support did not emerge as a significant factor in this study.

Further research is needed to explore this discrepancy, possibly investigating how the pandemic-induced changes in educational environments affected peer dynamics and their role in school engagement. Additionally, a recent study in Peru during the pandemic found that perceived school motivation and effort dropped sharply over time, highlighting the importance of social and contextual factors in influencing engagement (Tsai et al. 2023). Similar effects could have been at play in the Chilean context, given the extended period of remote learning and its impact on students' social support systems.

Family support did not significantly affect any of the dimensions of school engagement, suggesting that it is not a determining factor in the involvement of high school students in their studies. This finding contrasts with previous studies that indicate that family support may influence certain aspects of academic engagement, especially with gender differences, where girls tend to perceive greater support from their peers and have greater emotional and behavioral engagement than boys (Fernández-Zabala et al. 2016). Other studies suggest that, although relevant, family support is less direct during adolescence, when students seek autonomy and find support in other contexts, such as peer support and internal motivation (Olana and Tefera 2022).

Moreover, additional research indicates that peer and teacher support tend to be more influential on academic engagement than family support in high school students, especially those at risk for demotivation and school failure (Gutiérrez et al. 2017). This aligns with studies that find peer support helps reduce cynicism towards school, improving adolescents' academic performance and behavioral engagement (Virtanen et al. 2020). Also, emotional and organizational support in the classroom environment has been shown to contribute significantly to students' behavioral engagement (Virtanen et al. 2015).

These findings suggest that family support may be complementary, while peer and teacher support emerge as crucial to adolescent school engagement.

3.2 | Impact of School Engagement on Socio-Educational Outcomes

Our study uncovered intricate relationships between various dimensions of school engagement and socio-educational

outcomes, notably impacting language and mathematics performance. Specifically, behavioral engagement exhibited a significant positive effect across both subjects, with a moderate impact on mathematics and a more minor yet meaningful effect on language. These findings align with previous findings suggesting that students with higher behavioral engagement tend to exhibit better academic perseverance, enhancing subject-specific performance (Fernández-Zabala et al. 2016).

Similarly, cognitive engagement had a moderately positive effect on language performance and a slight yet noticeable impact on class attendance. This indicates that students more engaged cognitively tend to remain more focused, improving subject-specific outcomes and their overall commitment to attending school (Virtanen et al. 2020). These findings emphasize that cognitive and behavioral engagement play distinct yet complementary roles in promoting academic success, particularly in structured subjects like mathematics, where sustained effort and engagement can be directly linked to performance improvements (Olana and Tefera 2022).

Overall, our results suggest that fostering cognitive and behavioral engagement is essential for enhancing academic performance, with each type of engagement uniquely contributing to students' learning outcomes and their broader educational trajectories.

On the other hand, affective engagement showed a negative effect on language performance. This negative effect of affective engagement on language grades is somewhat surprising, as it contrasts with the widely held view that emotional attachment to school generally fosters academic success (Roorda et al. 2011). One plausible interpretation is that high levels of affective engagement might be associated with emotional distress or anxiety, which can impede academic performance, as suggested in studies exploring the link between engagement and mental health (Wilcox et al. 2018).

The lack of a significant effect of affective and cognitive engagement on physical class attendance may reflect changes in the relevance of school attendance due to the distance learning modalities implemented during the pandemic. In this context, factors such as access to technology and family support may have influenced virtual class attendance more than school engagement. The absence of a significant effect of affective and cognitive engagement on physical class attendance contradicts those demonstrated by previous research, which has reported a strong link between school engagement and the prevention of absenteeism and dropout (Fredricks et al. 2019; Miranda-Zapata et al. 2018, 2021). These findings may highlight shifts in the importance and dynamics of school attendance due to the widespread adoption of distance learning during the pandemic. In this altered learning environment, external factors such as access to reliable technology, stable internet connectivity, and family support likely played a more prominent role in determining virtual class attendance than traditional forms of school engagement. This reliance on technology overshadowed the influence of affective engagement, as students' ability to attend and participate remotely depended more on logistical support than emotional or cognitive commitment to school. Additionally, the shift to online modalities likely altered how

students interact with and feel connected to the school environment, potentially diminishing the relevance of affective and cognitive engagement for attendance (Virtanen et al. 2020).

This context suggests that while cognitive and affective engagement is typically linked to consistent attendance in physical settings, distance learning may require a unique set of engagement predictors more closely tied to external supports and resources rather than to students' internal commitment. Consequently, these findings underscore the critical need for comprehensive digital and family-based support to facilitate virtual attendance and new models of engagement tailored to distance learning contexts (Olana and Tefera 2022).

Finally, the indirect effects analysis sheds light on the nuanced mediating role of different dimensions of school engagement in academic outcomes. Specifically, affective, cognitive, and behavioral engagement were found to mediate the relationship between teacher support and language performance, suggesting that positive teacher-student relationships can significantly shape students' engagement in ways that directly enhance language skills. This pathway implies that teachers' emotional support and encouragement foster a positive learning environment and promote engagement behaviors that translate into better language outcomes.

In contrast, only cognitive and behavioral engagement mediated the link between teacher support and mathematics performance, underscoring that academic subjects like math may rely more on structured cognitive and task-focused behaviors rather than affective connections alone. This differential mediation effect highlights how teacher support might cultivate specific engagement types according to the cognitive demands of each subject, enhancing academic performance in distinct ways (Peng et al. 2022).

These findings underscore the critical role of tailored teacher support strategies to bolster student engagement across subjects, indicating that fostering affective and behavioral engagement is essential for language learning. In contrast, focusing on cognitive and behavioral engagement may be more impactful for subjects like mathematics (Ansong et al. 2017).

3.3 | Gender Differences in School Engagement

The study's findings also highlight significant gender differences in the impact of contextual factors on school engagement. The results of the multi-group analysis by gender show significant differences in the effect of teacher support on affective and behavioral engagement. For girls, teacher support had a significant effect on affective engagement, whereas for boys, this effect was not significant. In contrast, teacher support had a significant impact on behavioral engagement for boys but was not significant for girls.

The gender differences observed in the relationship between teacher support and school engagement align with previous research. Studies suggest that girls tend to perceive teacher support as emotionally relevant, benefiting more in terms of affective engagement (Furrer and Skinner 2003; Wentzel 2009).

This aligns with our finding that teacher support significantly influenced affective engagement for girls but not for boys. In contrast, boys have been found to respond more strongly by structural aspects of the school environment, such as clear and consistent teacher support, which explains why teacher support was significantly related to behavioral engagement for boys but not for girls (Lietaert et al. 2015; Wang and Eccles 2013). Additionally, Cinar et al. (2023) emphasize the need for gender-differentiated approaches by demonstrating that boys do not naturally improve their classroom participation over time, unlike girls, and that boys with behavioral difficulties require additional support to sustain their school participation. They may need different strategies to leverage their behavioral participation for academic improvement. (Lei et al. 2018).

These differences may be attributed to gendered socialization patterns, where girls are encouraged to seek emotional connections, while boys are more influenced by external reinforcement and structure (Patrick et al. 2007; Skinner et al. 2008). The lack of a significant effect of teacher support on boys' affective engagement suggests that they may not rely as much on emotional bonds with teachers for motivation, instead responding more to autonomy-supportive and competence-driven reinforcement (Ryan et al. 1994). Similarly, the non-significant effect on girls' behavioral engagement could indicate that their engagement behaviors are more internally regulated rather than contingent on external teacher reinforcement.

These findings highlight the importance of gender-responsive teaching strategies. For girls, teachers should prioritize emotionally supportive and autonomy-focused approaches to sustain affective engagement. For boys, more structured and directive forms of support may be needed to encourage active classroom participation (Lietaert et al. 2015). Future research should explore additional moderating factors, such as classroom climate, academic anxiety, class participation, subject area, and teacher expectations, to provide a more nuanced understanding of these gendered engagement patterns.

On another hand, significant indirect effects were found in the boys' and girls' groups. In boys, behavioral engagement mediates the effect of teacher support in mathematics and language. In contrast, cognitive engagement was found to mediate the relationship between teacher support and language grades in girls. These findings support previous research indicating variations in how students respond to teacher support by gender (Gutman and Schoon 2018; Yu et al. 2020) and highlight the importance of promoting gender-differentiated engagement, as different forms of school support influence academic performance differentially.

4 | Conclusion

This study illustrates the multifaceted nature of school engagement, emphasizing the influence of contextual factors and gender. By adopting a longitudinal perspective, this study fills a significant gap in the Latin American context and provides a basis for developing more effective educational strategies.

This study contributes to reducing the gap in longitudinal research on school engagement in Latin American contexts,

particularly in Chile. The findings underscore the importance of understanding school engagement as a dynamic process influenced by contextual factors that vary by gender. However, the study raises questions for future research, particularly on the interaction between peer support and the Chilean educational context. In addition, the unexpected negative relationship between affective engagement and academic performance suggests the need to explore the emotional complexity of school experiences, including the potential impact of anxiety and stress.

Future research should focus on multicultural and context-sensitive longitudinal studies that allow a deeper understanding of engagement dynamics in different educational contexts (Salmela-Aro et al. 2021). While it addresses the gap in Latin American studies, expanding this study to other Latin American countries and diverse educational settings would provide a more holistic understanding of school engagement dynamics.

4.1 | Practical Implications

The findings of this study can guide the implementation of more effective and personalized educational interventions focused on enhancing school engagement and improving the academic performance of students:

4.2 | Focused Interventions on Family Support and Student-Teacher Relationships

Given the role of family support in cognitive and affective engagement, it is recommended that schools develop comprehensive strategies that actively involve families.

The influence of teacher support on behavioral engagement suggests implementing training programs for teachers in positive interaction strategies.

4.2.1 | Socioemotional Support Programs

The negative relationship between affective engagement and academic performance in language highlights the need to address emotional factors within the school environment. Developing social-emotional support programs, stress management, and counseling services can help students manage school-related anxiety and stress, facilitating healthier and more effective engagement.

The pandemic may have disrupted peer support dynamics and school engagement. Therefore, schools should prioritize rebuilding social relationships among students. Integration activities, peer mentoring programs, and collaborative spaces can effectively reestablish a sense of community and foster mutual support.

The lack of significant impact of peer support suggests the need to examine further the particularities of the Chilean context and how cultural and social factors influence student relationships. Educational policies should be flexible and adaptive,

considering not only students' individual needs but also the characteristics of the local context to ensure their effectiveness.

4.2.2 | Gender-Differentiated Interventions

Gender differences in the impact of teacher support underscore the importance of designing educational strategies that respond to the specific needs of boys and girls.

Addressing the various dimensions of engagement, as well as differences related to gender, will allow for the development of more inclusive and equitable educational strategies, thus promoting quality and equity in education in the region.

4.3 | Limitations of the Study

Despite the valuable findings, this study presents some limitations to consider when interpreting the results.

4.3.1 | General Methodological Considerations

Within-person variability was not controlled, limiting the ability to fully isolate changes in school engagement from external factors. In addition, the model did not include variables such as classroom participation or academic anxiety, and subgroup analyses (e.g., by socioeconomic status) were not possible due to the institutional similarity across schools. Future research could address these aspects to enrich the understanding of engagement and achievement.

4.3.1.1 | Measurement Design. Using only three measurement time points limits the ability to capture more continuous and detailed variations in school engagement over time.

4.3.1.2 | Self-Report. Reliance on self-report questionnaires may introduce response biases, such as social desirability or inaccurate student perceptions of their engagement. In consideration of ethical principles of anonymity and confidentiality, the results of the individual reports for each student were not shared with their teachers or parents. At the school, general results were provided without identifying information for each student. For these reasons, it is likely that biases were at least partially controlled.

4.3.1.3 | Pandemic Impact. The COVID-19 pandemic altered educational dynamics during the study period, potentially affecting levels of school engagement and interactions among students, teachers, and families.

4.3.1.4 | Binary Gender Classification. This study relies on a binary gender classification (boy/girl), which does not account for the complexities of gender identity and adaptation to gender norms. This choice was determined by the structure of our data set, which does not include additional gender categories or subgroup classifications. Future research could explore a more nuanced approach that considers gender beyond a

binary framework, providing a deeper understanding of its influence within the studied context.

4.3.1.5 | Lack of Explicit Latent Variables for Ability and Motivation. This study does not explicitly model latent variables such as ability or motivation, which have been identified as key predictors of school engagement and academic outcomes (Dadandi and Yazıcı 2024). However, aspects of motivation are indirectly reflected in the cognitive engagement dimension, which includes students' effort, persistence, and investment in learning. Despite this, future research should consider incorporating explicit measures of motivation and ability to provide a more comprehensive understanding of their role in shaping school engagement and academic performance.

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Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

References

- Ansorg, D., M. Okumu, G. L. Bowen, A. M. Walker, and S. R. Eisensmith. 2017. "The Role of Parent, Classmate, and Teacher Support In Student Engagement: Evidence From Ghana." *International Journal of Educational Development* 54: 51–58. <https://doi.org/10.1016/j.ijedudev.2017.03.010>.
- Bosacker, M. A. 2016. The Examination of Peer Support on Psychological and Academic Functioning in a Sample of Inner-City Latino Students. PCOM Psychology Dissertations. 368.
- Browne, M. W., and R. Cudeck. 1993. "Alternative Ways of Assessing Model Fit." In *Testing Structural Equation Models*, edited by K. A. Bollen and J. S. Long, 132–166. Sage.
- Campos-Arias, A., and H. C. Oviedo. 2008. "Propiedades Psicométricas De Una Escala: La Consistencia Interna [Psychometric Properties of a Scale: Internal Consistency]." *Revista de Salud Pública* 10, no. 5: 831–839.
- Chen, Y., Y. Zhang, L. Zhang, et al. 2021. "Childhood Emotional Neglect and Problematic Mobile Phone Use Among Chinese Adolescents: A Longitudinal Moderated Mediation Model Involving School Engagement and Sensation Seeking." *Child Abuse & Neglect* 115: 104991. <https://doi.org/10.1016/j.chiabu.2021.104991>.
- Cinar, S., T. Cinsdikici, and S. E. Sulak. 2023. "Gender Differences in Classroom Engagement Trajectories In Primary School." *Educational Psychology* 43, no. 1: 1–19. <https://doi.org/10.1080/01443410.2021.1998305>.
- Creswell, J. W. 2015. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*. Pearson.
- Dadandi, i., and H. Yazıcı. 2024. "Cognitive Ability or Motivation, or Both: An Integrative Path Analysis of the Interplay Between Two Key Factors in Academic Achievement." *British Educational Research Journal* 50, no. 5: 2342–2362. <https://doi.org/10.1002/berj.4027>.
- Domina, T., E. Ruzek, D. Hamlin, and A. Gaston. 2021. "Modeling Achievement Growth: Evaluating the Impact of Educational

- Interventions." *Educational Researcher* 50, no. 3: 173–184. <https://doi.org/10.3102/0013189X21993978>.
- Estévez, I., C. Rodríguez-Llorente, I. Piñeiro, R. González-Suárez, and A. Valle. 2021. "School Engagement, Academic Achievement, and Self-Regulated Learning." *Sustainability* 13, no. 6: 3011. <https://doi.org/10.3390/su13063011>.
- Fatou, N., and V. Kubiszewski. 2018. "Are Perceived School Climate Dimensions Predictive of Students' Engagement?" *Social Psychology of Education* 21, no. 3: 427–446. <https://doi.org/10.1007/s11218-017-9422-x>.
- Fernández-Zabala, A., E. Goñi, I. Camino, and L. M. Zulaika. 2016. "Family and School Context In School Engagement." *European Journal of Education and Psychology* 9, no. 2: 47–55. <https://doi.org/10.1016/j.ejeps.2015.09.001>.
- Fomina, T., E. Filippova, and V. Morosanova. 2021. "Longitudinal Study of the Relationship Between Conscious Self-Regulation, School Engagement, and Student Academic Achievement." *Психологическая наука и образование* 26, no. 5: 87–99. <https://doi.org/10.17759/pse.2021260503>.
- Fredricks, J. A., P. C. Blumenfeld, and A. H. Paris. 2004. "School Engagement: Potential of the Concept, State of the Evidence." *Review of Educational Research* 74, no. 1: 59–109. <https://doi.org/10.3102/00346543074001059>.
- Fredricks, J. A., M. Filsecker, and M. A. Lawson. 2016. "Student Engagement, Context, and Adjustment: Addressing Definitional, Measurement, and Methodological Issues." *Learning and Instruction* 43: 1–4. <https://doi.org/10.1016/j.learninstruc.2016.02.002>.
- Fredricks, J. A., Reschly, A. L., and Christenson, S. L., ed. 2019. *Handbook of Student Engagement Interventions: Working With Disengaged Students*. Academic Press.
- Furrer, C., and E. Skinner. 2003. "Sense of Relatedness as a Factor in Children's Academic Engagement and Performance." *Journal of Educational Psychology* 95, no. 1: 148–162. <https://doi.org/10.1037/0022-0663.95.1.148>.
- Van de Gaer, E., H. Pustjens, J. Van Damme, and A. De Munter. 2008. "Tracking and the Effects of School Engagement on Academic Achievement." *Educational Psychology* 28, no. 1: 1–16. <https://doi.org/10.1080/01443410701465288>.
- González, A., and P. V. Paoloni. 2015. "Compromiso Conductual Y Desafección Con Las Actividades Escolares: Explorando Un Modelo De Facilitadores Motivacionales Y Resultados De Rendimiento [Behavioral Engagement and Disaffection With School Activities: Exploring a Model of Motivational Facilitators and Performance Outcomes]." *Anales de Psicología/Annals of Psychology* 31, no. 3: 869–878. <https://doi.org/10.6018/analesps.31.3.176981>.
- Grazia, V., and L. Molinari. 2023. "A Multidimensional Approach to the Study of School Climate and Student Engagement." *Journal of Educational Research* 116: 386–395. <https://doi.org/10.1080/00220671.2023.2278771>.
- Gutiérrez, M., J. M. Tomás, I. Romero, and J. M. Barrica. 2017. "Perceived Social Support, School Engagement and Satisfaction With School." *Revista de Psicodidáctica (English ed.)* 22, no. 2: 111–117. <https://doi.org/10.1016/j.psicoe.2017.05.001>.
- Gutman, L. M., and I. Schoon. 2018. "Emotional Engagement and Educational Aspirations of Young People in England." *British Journal of Educational Psychology* 88, no. 4: 506–526. <https://doi.org/10.1111/bjep.12213>.
- Havik, T., and E. Westergård. 2020. "Teacher–Student Relationships and Student Engagement in Primary and Secondary School." *Scandinavian Journal of Educational Research* 64, no. 5: 647–668. <https://doi.org/10.1080/00313831.2019.1595713>.
- Hirschfield, P. J., and J. Gasper. 2011. "The Relationship Between School Engagement and Delinquency in Late Childhood and Early Adolescence." *Journal of Youth and Adolescence* 40, no. 1: 3–22. <https://doi.org/10.1007/s10964-010-9579-5>.
- Hong, W., R. Zhen, R. D. Liu, M. T. Wang, Y. Ding, and J. Wang. 2020. "The Longitudinal Linkages Among Chinese Children's Behavioural, Cognitive, and Emotional Engagement Within a Mathematics Context." *Educational Psychology* 40: 666–680. <https://doi.org/10.1080/01443410.2020.1719981>.
- Van Houtte, M. 2020. "Understanding the Gender Gap in School (Dis) Engagement From Three Gender Dimensions: The Individual, the Interactional and the Institutional." *Educational Studies* 49, no. 2: 260–278. <https://doi.org/10.1080/03055698.2020.1842722>.
- Hu, L., and P. M. Bentler. 1999. "Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria Versus New Alternatives." *Structural Equation Modeling: A Multidisciplinary Journal* 6, no. 1: 1–55. <https://doi.org/10.1080/10705519909540118>.
- Hu, Y., and M. Tali. 2023. "Student Engagement and Its Association With Peer Relation and Teacher-Student Relation: A Systematic Review." *Educational Administration: Theory and Practice* 29, no. 4. <https://doi.org/10.52152/kuey.v29i4.763>.
- Izaguirre, A., and L. Di Capua. 2020. "Exploring Peer Effects in Education in Latin America and the Caribbean." *Research in Economics* 74, no. 1: 73–86.
- Jimenez-Liso, M. R., A. Bellocchi, M. Martinez-Chico, and R. Lopez-Gay. 2021. "A Model-Based Inquiry Sequence as a Heuristic to Evaluate Students' Emotional, Behavioural, and Cognitive Engagement." *Research in Science Education* 52: 1313–1334. <https://doi.org/10.1007/s11165-021-10010-0>.
- Joshi, D. R., K. P. Adhikari, B. Khanal, J. Khadka, and S. Belbase. 2022. "Behavioral, Cognitive, Emotional and Social Engagement in Mathematics Learning During COVID-19 Pandemic." *PLoS One* 17, no. 11: e0278052. <https://doi.org/10.1371/journal.pone.0278052>.
- Kang, R., X. Zhou, H. Liu, and S. Gong. 2023. "Gender Differences In the Relationship Between Teacher-Student Relationships and Student Engagement." *Psychology in the Schools* 60, no. 2: 284–298. <https://doi.org/10.1002/pits.22684>.
- Khan, H., R. Gul, and M. Zeb. 2023. "The Effect of Students' Cognitive and Emotional Engagement on Students' Academic Success and Academic Productivity." *Journal of Social Sciences Review* 3, no. 1: 322–334. <https://doi.org/10.54183/jssr.v3i1.141>.
- Khlaif, Z. N., S. Salha, and B. Kouraichi. 2021. "Emergency Remote Learning During COVID-19 Crisis: Students' Engagement." *Education and Information Technologies* 26: 7033–7055. <https://doi.org/10.1007/s10639-021-10566-4>.
- King, R., and C. Frondozo. 2021. "Variety Is the Spice of Life: How Emotional Diversity Is Associated With Better Student Engagement and Achievement." *British Journal of Educational Psychology* 91, no. 1: 143–162. <https://doi.org/10.1111/bjep.12436>.
- Korlat, S., M. Kollmayer, J. Holzer, et al. 2021. "Gender Differences in Digital Learning During COVID-19: Competence Beliefs, Intrinsic Value, Learning Engagement, and Perceived Teacher Support." *Frontiers in Psychology* 12: 637776. <https://doi.org/10.3389/fpsyg.2021.637776>.
- Lam, S., S. Jimerson, E. Kikas, et al. 2012. "Do Girls and Boys Perceive Themselves as Equally Engaged in School?" *Journal of School Psychology* 50, no. 1: 77–94. <https://doi.org/10.1016/j.jsp.2011.07.004>.
- Lara, L., M. Saracostti, J. Navarro, et al. 2018. "Compromiso Escolar: Desarrollo Y Validación De Un Instrumento." *Revista Mexicana de Psicología* 35, no. 1: 56–62. <http://comeppsi.com/images/rmp/RMP%20351%20052-062.pdf>.
- Lara, L., M. Saracostti, and X. de Toro. 2022. "Adaptation and Psychometric Properties of the School Engagement and Contextual Factors Questionnaires for COVID-19 and post-COVID-19 Context." *PLoS One* 17, no. 8: e0272871. <https://doi.org/10.1371/journal.pone.0272871>.

- Lei, H., Y. Cui, and W. Zhou. 2018. "Relationships Between Student Engagement and Academic Achievement: A Meta-Analysis." *Social Behavior and Personality: An International Journal* 46, no. 3: 517–528. <https://doi.org/10.2224/sbp.7054>.
- Li, L., R. Zhang, and A. M. Piper. 2023. "Predictors of Student Engagement and Perceived Learning in Emergency Online Education Amidst COVID-19: A Community of Inquiry Perspective." *Computers in Human Behavior Reports* 12: 100326. <https://doi.org/10.1016/j.chbr.2023.100326>.
- Li, W., W. Gao, and J. Sha. 2020. "Perceived Teacher Autonomy Support and School Engagement of Tibetan Students in Elementary and Middle Schools: Mediating Effect of Self-Efficacy and Academic Emotions." *Frontiers in Psychology* 11: 50. <https://doi.org/10.3389/fpsyg.2020.00050>.
- Li, Y., and R. M. Lerner. 2013. "Interrelations of Behavioral, Emotional, and Cognitive School Engagement in High School Students." *Journal of Youth and Adolescence* 42, no. 1: 20–32. <https://doi.org/10.1007/s10964-012-9857-5>.
- Lietart, S., D. Roorda, F. Laevers, K. Verschueren, and B. De Fraine. 2015. "The Gender Gap in Student Engagement: The Role of Teachers' Autonomy Support, Structure, and Involvement." *British Journal of Educational Psychology* 85, no. 4: 498–518. <https://doi.org/10.1111/bjep.12095>.
- Mazerolle, L., S. Bennett, E. Antrobus, S. M. Cardwell, E. Eggins, and A. R. Piquero. 2019. "Disrupting the Pathway From Truancy to Delinquency: A Randomized Field Trial Test of the Longitudinal Impact of a School Engagement Program." *Journal of Quantitative Criminology* 35: 663–689. <https://doi.org/10.1007/s10940-018-9395-8>.
- Mendoza, N. B., and R. B. King. 2020. "The Social Contagion of Student Engagement in School." *School Psychology International* 41, no. 5: 454–474. <https://doi.org/10.1177/0143034320946803>.
- Miranda-Zapata, E., L. Lara, J. Navarro, M. Saracostti, and X. de Toro. 2018. "Modelización Del Efecto Del Compromiso Escolar Sobre La Asistencia a Clases Y El Rendimiento Escolar." *Revista de Psicodidáctica* 23, no. 2: 102–109. <https://doi.org/10.1016/j.psicod.2018.02.003>.
- Miranda-Zapata, E., L. Lara, and M. Saracostti. 2021. "Modelización Del Efecto Del Compromiso Escolar Sobre El Rendimiento Escolar En Cinco Países De Iberoamérica [Modeling the School Engagement Effect on School Performance in Five Iberoamerican Countries]." *Revista Iberoamericana de Diagnóstico y Evaluación – e Avaliação Psicológica* 59, no. 2: 151–161. <https://doi.org/10.21865/RIDEP59.2.12>.
- Morales Retamal, C. 2020. "Salud Mental De Los Niños, Niñas Y Adolescentes En Situación De Confinamiento." *Anales de la Universidad de Chile* 17: 303–318. <https://doi.org/10.5354/0717-8883.2020.58931>.
- Navarro, J. J., X. De-Toro, and L. Lara, and M. Saracostti. 2021. "Validación de un instrumento de Medición de Factores Contextuales Relacionados con el Compromiso Escolar / Validation of an Instrument that Measures Contextual Factors Related to School Engagement, Revista Iberoamericana de Diagnóstico y Evaluación-e Avaliação Psicológica." *RIDEP* 59, no. 2: 109–124. <https://doi.org/10.21865/RIDEP59.2.09>.
- Niittylahti, S., J. Annala, and M. Mäkinen. 2021. "Student Engagement Profiles In Vocational Education and Training: A Longitudinal Study." *Journal of Vocational Education & Training* 75: 372–390. <https://doi.org/10.1080/13636820.2021.1879902>.
- Olana, E., and B. Tefera. 2022. "Family, Teachers and Peer Support as Predictors of School Engagement Among Secondary School Ethiopian Adolescent Students." *Cogent Psychology* 9: 1–21. <https://doi.org/10.1080/23311908.2022.2123586>.
- Patall, E. A., R. R. Steingut, A. C. Vasquez, S. S. Trimble, K. A. Pituch, and J. L. Freeman. 2018. "Daily Autonomy Supporting or Thwarting and Students' Motivation and Engagement in the High School Science Classroom." *Journal of Educational Psychology* 110, no. 2: 269–288. <https://doi.org/10.1037/edu0000214>.
- Patrick, H., A. M. Ryan, and A. Kaplan. 2007. "Early Adolescents' Perceptions of the Classroom Social Environment, Motivational Beliefs, and Engagement." *Journal of Educational Psychology* 99, no. 1: 83–98. <https://doi.org/10.1037/0022-0663.99.1.83>.
- Peng, Y., Y. Li, Y. Su, K. Chen, and S. Jiang. 2022. "Effects of Group Awareness Tools on Students' Engagement, Performance, and Perceptions in Online Collaborative Writing: Intergroup Information Matters." *Internet and Higher Education* 53: 100845. <https://doi.org/10.1016/j.iheduc.2022.100845>.
- Psaki, S., N. Haberland, B. Mensch, L. Woyczynski, and E. Chuang. 2022. "Policies and Interventions to Remove Gender-Related Barriers to Girls' School Participation and Learning in Low- and Middle-Income Countries: A Systematic Review of the Evidence." *Campbell Systematic Reviews* 18, no. 1: e1207. <https://doi.org/10.1002/cl2.1207>.
- Ramos-Díaz, E., A. Rodríguez-Fernández, A. Fernández-Zabala, L. Revuelta, and A. Zuazagoitia. 2016. "Adolescent Students' Perceived Social Support, Self-Concept and School Engagement//Apoyo Social Percibido, Autoconcepto E Implicación Escolar De Estudiantes Adolescentes." *Revista de Psicodidáctica* 21, no. 2: 339–356.
- Rehman, N., I. Andleeb, and M. Iqbal. 2023. "Unraveling the Gender Gap: A Comparative Analysis of School Enrollment and Secondary Education Completion in Pakistan's Provinces." *Journal of Research in Educational Sciences* 14, no. 16: 26. <https://doi.org/10.14505/jres.v14.16.03>.
- Rensvold, R. B., and G. W. Cheung. 2001. "Pruebas de invarianza métrica mediante modelos de ecuaciones estructurales: Solución del problema de estandarización [Testing Metric Invariance Using Structural Equation Models: Solving the Standardization Problem]." In *Equivalencia en la medición: Investigación en gestión [Equivalence in Measurement: Research in Management]*, edited by C. A. Schriesheim, and L. L. Neider, 25–50.
- Reyes-de-Cózar, S., A. Merino-Cajaville, and M. R. Salguero-Pazos. 2023. "Avoiding Academic Burnout: Academic Factors That Enhance University Student Engagement." *Behavioral Sciences* 13, no. 12: 989. <https://doi.org/10.3390/bs13120989>.
- Roorda, D. L., H. M. Y. Koomen, J. L. Spilt, and F. J. Oort. 2011. "The Influence of Affective Teacher-Student Relationships on Students' School Engagement and Achievement: A Meta-Analytic Approach." *Review of Educational Research* 81, no. 4: 493–529. <https://doi.org/10.3102/0034654311421793>.
- Ryan, R. M., J. D. Stiller, and J. H. Lynch. 1994. "Representations of Relationships to Teachers, Parents, and Friends as Predictors of Academic Motivation and Self-Esteem." *Journal of Early Adolescence* 14, no. 2: 226–249. <https://doi.org/10.1177/027243169401400207>.
- Salmela-Aro, K., X. Tang, J. Symonds, and K. Upadaya. 2021. "Student Engagement in Adolescence: A Scoping Review of Longitudinal Studies 2010–2020." *Journal of Research on Adolescence* 31, no. 2: 256–272. <https://doi.org/10.1111/jora.12619>.
- Sampieri, R. H. 2018. *Metodología de la investigación: Las rutas cuantitativa, cualitativa y mixta [Research methodology: Quantitative, qualitative, and mixed routes]*. McGraw Hill.
- Saracostti, M., X. de Toro, H. Miranda, E. Miranda-Zapara, L. Lara, and M. T. Hernández. 2024. "Associations Between Contextual Factors and School Engagement: A Longitudinal Study of Profiles." *Frontiers in Education* 9: 1365789. <https://doi.org/10.3389/educ.2024.1365789>.
- Saracostti, M., X. de Toro, A. Rossi, L. Lara, and M. B. Sotomayor. 2022. "Implementation of a Web-Based System to Measure, Monitor, and Promote School Engagement Strategies. A Chilean Experience." *Frontiers in Psychology* 13: 980902. <https://doi.org/10.3389/fpsyg.2022.980902>.
- Sattar, T., M. I. Ullah, and B. Ahmad. 2022. "The Role of Stakeholders' Participation, Goal Directness and Learning Context In Determining Student Academic Performance: Student Engagement As a Mediator."

- Frontiers in Psychology 13: 875174. <https://doi.org/10.3389/fpsyg.2022.875174>.
- Schumacker, R. E., and R. G. Lomax. 2016. *A Beginner's Guide to Structural Equation Modeling*. Routledge.
- Skinner, E., C. Furrer, G. Marchand, and T. Kindermann. 2008. "Engagement and Disaffection in the Classroom: Part of a Larger Motivational Dynamic?" *Journal of Educational Psychology* 100, no. 4: 765–781. <https://doi.org/10.1037/a0012840>.
- Snijders, I., L. Wijnia, R. M. J. P. Rikers, and S. M. M. Loyens. 2020. "Building Bridges in Higher Education: Student-Faculty Relationship Quality, Student Engagement, and Student Loyalty." *International Journal of Educational Research* 100: 101538. <https://doi.org/10.1016/j.ijer.2020.101538>.
- Steinmann, I., and L. Rutkowski. 2023. "The Link Between Gender Gaps in School Enrollment and School Achievement." *Comparative Education Review* 67, no. 4: 584–612. <https://doi.org/10.1086/725395>.
- Strauss, L. C., and J. F. Volkwein. 2004. "Predictors of Student Commitment at Two-Year and Four-Year Institutions." *Journal of Higher Education* 75, no. 2: 203–227. <https://doi.org/10.1080/00221546.2004.11778903>.
- Tam, K. I., K. Philpott-Robinson, T. Johnson, and A. E. Lane. 2023. "Measurement of School Engagement in Elementary School Students: A Scoping Review." *American Journal of Occupational Therapy* 77, no. 3: 7703205150. <https://doi.org/10.5014/ajot.2023.050036>.
- Thornberg, R., E. Hammar Chiriac, C. Forsberg, and L. Wänström. 2023. "The Association Between Student-Teacher Relationship Quality and School Liking: A Small-Scale 1-Year Longitudinal Study." *Cogent Education* 10, no. 1: 2211466. <https://doi.org/10.1080/2331186X.2023.2211466>.
- De Toro, X., M. Saracostti, L. Lara, H. Miranda, and E. Miranda-Zapata. 2023. "School Engagement Profiles in Chilean Secondary Students." *Frontiers in Psychology* 13: 1088089. <https://doi.org/10.3389/fpsyg.2022.1088089>.
- Tsai, Y. H., T. W. P. Janssen, T. V. Vu, et al. 2023. "Trajectories of Early Adolescents' Perceptions of School Motivation and Effort During the Pandemic in Perú: A Four Time Point Longitudinal Observational Study." *Acta Psychologica* 239: 103984. <https://doi.org/10.1016/j.actpsy.2023.103984>.
- Virtanen, T. E., M. K. Lerkkanen, A. M. Poikkeus, and M. Kuorelahti. 2015. "The Relationship Between Classroom Quality and Students' Engagement in Secondary School." *Educational Psychology* 35, no. 8: 963–983. <https://doi.org/10.1080/01443410.2013.822961>.
- Virtanen, T. E., K. Vasalampi, N. Kiuru, M. K. Lerkkanen, and A. M. Poikkeus. 2020. "The Role of Perceived Social Support as a Contributor to the Successful Transition From Primary to Lower Secondary School." *Scandinavian Journal of Educational Research* 64, no. 7: 967–983. <https://doi.org/10.1080/00313831.2019.1639816>.
- Wang, J., and X. Wang. 2012. "Structural Equation Modeling." In *Applications Using Mplus*. Higher Education Press. <https://doi.org/10.1080/10705511.2014.935842>.
- Wang, M.-T., and J. S. Eccles. 2013. "School Context, Achievement Motivation, and Academic Engagement: A Longitudinal Study of School Engagement Using a Multidimensional Perspective." *Learning and Instruction* 28: 12–23. <https://doi.org/10.1016/j.learninstruc.2013.04.002>.
- Wei, W., J. Liu, X. Xu, K. Kolletar-Zhu, and Y. Zhang. 2023. "Effective Interactive Engagement Strategies for Mooc Forum Discussion: A Self-Efficacy Perspective." *PLoS One* 18, no. 11: e0293668. <https://doi.org/10.1371/journal.pone.0293668>.
- Wentzel, K. R. 2009. "Student's Relationship With Teachers as Motivational Contexts." In *Handbook of Motivation at School*, edited by K. R. Wentzel, and A. Wigfield, 301–322. Routledge/Taylor & Francis Group. <https://doi.org/10.4324/9780203879498>.
- Wigfield, A., J. S. Eccles, J. A. Fredricks, S. Simpkins, R. W. Roeser, and P. C. Blumenfeld. 2015. "Development of Achievement Motivation and Engagement." In *Handbook of Child Psychology and Developmental Science*, 657–706. Wiley.
- Wilcox, G., J. McQuay, A. Blackstaffe, R. Perry, and P. Hawe. 2018. "Supporting Academic Engagement in Boys and Girls." *Canadian Journal of School Psychology* 33, no. 3: 179–192. <https://doi.org/10.1177/0829573517703239>.
- Wirthwein, L., J. R. Sparfeldt, A. Heyder, S. R. Buch, D. H. Rost, and R. Steinmayr. 2020. "Sex Differences in Achievement Goals: Do School Subjects Matter?" *European Journal of Psychology of Education* 35: 403–427. <https://doi.org/10.1007/s10212-019-00427-7>.
- Wong, Z. Y., and G. A. D. Liem. 2022. "Student Engagement: Current State of the Construct, Conceptual Refinement, and Future Research Directions." *Educational Psychology Review* 34, no. 1: 107–138. <https://doi.org/10.1007/s10648-021-09628-3>.
- Wylie, C., and E. Hodgen. 2012. *Trajectories and Patterns of Student Engagement: Evidence From a Longitudinal Study*. New Zealand Ministry of Education.
- Xia, Q., T. K. F. Chiu, and C. S. Chai. 2023. "The Moderating Effects of Gender and Need Satisfaction on Self-Regulated Learning Through Artificial Intelligence (AI)." *Education and Information Technologies* 28, no. 7: 8691–8713. <https://doi.org/10.1007/s10639-022-11547-x>.
- Xing, X., M. Huerta, and T. Garza. 2019. "College and Career Preparation Activities and Their Influence on Post-High School Education and Work Attainment." *Journal of Career and Technical Education* 34, no. 1: 8–28.
- Yi, F., and F. Kutty. 2023. "The Role of Temperament and Teacher-Student Relationships in Student Engagement: A Study of Primary School Students in Johor." *International Journal of Academic Research in Progressive Education and Development* 12, no. 2: 16519. <https://doi.org/10.6007/ijarped/v12-i2/16519>.
- Yu, J., R. McLellan, and L. Winter. 2020. "Which Boys and Which Girls Are Falling Behind? Linking Adolescents' Gender Role Profiles to Motivation, Engagement, and Achievement." *Journal of Youth and Adolescence* 50, no. 2: 336–352. <https://doi.org/10.1007/s10964-020-01293-z>.
- Zamudio Elizalde, P. D. 2021. "El Compromiso Escolar De Estudiantes De Bachillerato En El Contexto De Aprendizaje En Línea." *Revista Latinoamericana De Estudios Educativos* 51: 65–90. <https://doi.org/10.48102/rlee.2021.51.ESPECIAL.447>.