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Associations between contextual factors and school engagement: a longitudinal study of profiles

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School engagement, encompassing affective, behavioral, and cognitive dimensions, is key to promoting school retention and preventing absenteeism. Previous research has shown that maintaining high engagement is crucial for a positive educational trajectory. This study investigates the individual contributions of contextual factors, including family, teacher, and peer support, on students who initially had a lower level of school engagement in one dimension and then advanced to a higher level in the same dimension over time. The study involved students enrolled in their first year of secondary education in public schools in Chile during 2021, with the same students being evaluated again the following year. We used means cluster analysis to identify a group of students who initially had low school engagement but showed high engagement by the second evaluation. This allowed us to identify profiles of school engagement longitudinally. Our results indicated that contextual factors had a stronger association with affective engagement, followed by cognitive and behavioral engagement, respectively. Among the contextual factors, family and teachers had a stronger impact compared to peers. These findings highlight the importance of adults, particularly family and teachers, in enhancing school engagement during secondary education.

KEYWORDS

school engagement, cluster analysis, family, teachers, peers, secondary school, longitudinal study, affective engagement

Introduction

School engagement (SE) is recognized as a key factor in promoting school retention and preventing absenteeism and dropout (Miranda-Zapata et al., 2018; Fredricks et al., 2019; Miranda-Zapata et al., 2021). Because dropout is typically not a sudden act but rather the final stage in a cumulative process of losing engagement with school and learning, maintaining high SE is crucial. In broad terms, SE has been defined as the student's participation in the educational process (Saracostti et al., 2019a; Saracostti and de Toro, 2023). When students are engaged, they consider learning to be meaningful and feel motivated and committed to both learning and their future.

During the COVID-19 pandemic, SE gained increasing attention. It was a more effective way to assess which students were on or off track with their studies relative to simply assessing attendance in online learning classes (Dorn et al., 2020; Ministerio de Educación and Centro de Estudios, 2020; Canet Juric et al., 2021; Zhao and Watterston, 2021). SE goes beyond attendance, task completion, or compliance with adult directives. In this context, Darling-Hammond et al. (2021) emphasize the priority for politicians and practitioners to shift "from measuring class attendance time to measuring engagement" (p. 24) because online attendance was not the most effective indicator of students' study progress (de Toro et al., 2023).

According to a study by the Organization for Economic Cooperation and Development (2021), Chile, where the current study took place, was the member country that kept schools closed for the longest period, with total closures across 259 school days (excluding vacations and weekends). Of these, 147 days were during 2020, the first year of the health emergency, and 112 during the first semester of 2021. According to Nápoles Nápoles (2023), the pandemic confinement led to fatigue, stress, and a lack of recreational spaces for peers to interact, negatively impacting the educational processes of young people. As a result, students frequently displayed disinterest in their studies.

The current study builds on our team's longstanding research on SE and examines SE in the context of the pandemic. In this study, SE is conceptualized as a multidimensional concept comprising three dimensions: affective, behavioral, and cognitive (Fredricks et al., 2019). Affective engagement refers to the student's emotional response toward their learning process and school, characterized by feelings of involvement and seeing school as valuable and worthwhile. Behavioral engagement involves academic participation, such as attending classes and student interactions. Cognitive engagement is understood as the awareness and willingness to exert the necessary effort to understand complex ideas and develop difficult skills (Fredricks et al., 2016).

SE is highly influenced by contextual factors (CFs). The literature suggests that family, peer, and teacher support are the three main relational contexts associated with SE (Fernández-Zabala et al., 2016; Ansong et al., 2017). In the current study, the family factor refers to how students perceive being supported by their families in the learning process. This includes the family's help with homework, discussing school matters, and encouraging and motivating the students to do their best. The teacher factor refers to students feeling that teachers support them and motivate them to learn and students trusting that their teachers will help them navigate challenges and foster an environment conducive to learning. The peer support factor involves students' perceptions of their interpersonal relationships with peers, which include concern, trust, and support. All three factors are crucial for school integration, addressing school-related issues, and overcoming academic challenges (Saracostti et al., 2019a).

Our previous research involved cluster analysis of dimensions of school engagement (de Toro et al., 2023) and validation of a predictive model of school engagement, contextual factors, academic performance, and attendance (Miranda-Zapata et al., 2021). While those studies were cross-sectional, the current study aims to provide a longitudinal perspective to understand how school engagement and contextual factors evolve over time, specifically focusing on the trajectories of students who exhibit low school engagement in at least one of the dimensions (affective, behavioral and cognitive) at Time 1 and then show high-level school engagement at Time 2.

Materials and methods

The current study is part of a larger research funded by the National Agency for Research and Development of Chile, 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, 2002; Sampieri, 2018).

In our study, we explore the influence of CFs on improvement in a specific SE dimension (affective, behavioral, or cognitive), whereby improvement entails a low level of the SE dimension at Time 1 and a high level at Time 2. Data collection occurred in August 2021 and then again a year later, which coincides with the return to face-to-face classes in Chile after the COVID-19 pandemic, offering a unique opportunity to investigate SE longitudinally during school reopening.

Participants

This study involved the analysis of data from three datasets. Each dataset comprised students who exhibited a low level of engagement in a specific dimension of SE at the first measurement point (Time 1) and a high level of engagement in the same dimension at the second measurement point (Time 2). A non-probability purposive sampling technique was employed to select participants, as outlined by Kerlinger and Lee (2002). We employed *k*-means cluster analysis to classify students into three groups based on their SE levels at Time 1 (low, medium, or high), with separate analyses conducted for each SE dimension (affective, behavioral, and cognitive).

The affective SE dataset included 95 students ($M = 15.16$ years, SD = 0.40 years); 46.3% girls and 53.7% boys. The behavioral SE dataset included 41 students ($M = 15.54$ years, SD = 0.75 years); 58.3% girls and 41.7% boys. The cognitive SE dataset included 104 students ($M = 15.45$ years, SD = 0.74 years); 47.1% girls and 52.9% bots.

All participating 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 (JUNAEB, 2005; Saracostti et al., 2022). All students in these schools had been invited to participate voluntarily. The students participating in the current study represent 94.5% of the students invited to participate.

Instruments

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

School Engagement Questionnaire (SEQ): This 29-item instrument measures three dimensions of SE: affective (10 items, e.g., "I feel that the school cares about me"), cognitive (12 items, e.g., "for me it is important to understand the assignments and subjects well"), and behavioral (7 items, e.g., "I leave the classroom without asking permission [or I leave the 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). 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 ($\chi^2 = 964.314$; df = 374; RMSEA = 0.052/CI = 0.048–0.056; CFI = 0.925; TLI = 0.919) (de Toro et al., 2023).

Contextual Factors Questionnaire (CFQ): This 18-item instrument measures three CFs influencing SE: family support (3 items, e.g., "I talk to my family about what I do at school [or in online classes]"), teacher support (8 items, e.g., "I get along with my teachers"), and peer support (7 items, e.g., "My classmates support me and care about me"). The response scale is identical to the SEQ. Similar to the SEQ, 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 a good fit of the data to the three-factor correlated model of family, teacher, and peer support ($\chi^2 = 414.047$; df = 132; RMSEA = 0.061/CI = 0.054–0.067; CFI = 0.963; TLI = 0.957) (de Toro et al., 2023).

Cronbach's alpha (α) was used to assess the internal consistency of the instruments when used in the current study. Both the SEQ and CFQ demonstrated adequate reliability for all dimensions at both Time 1 and Time 2 (i.e., $\alpha > 0.70$). Alpha values at Times 1 and 2 were 0.89 and 0.89 (affective engagement), 0.77 and 0.78 (behavioral engagement), 0.88 and 0.78 (cognitive engagement), 0.77 and 0.74 (family support), 0.90 and 0.91 (teacher support), and 0.90 and 0.91 (peer support), respectively.

Procedures

This study employed a prospective, longitudinal, non-experimental design. First-year secondary school students participated in an online survey at Time 1 (August–November 2021) and were followed up with the same survey 1 year later at Time 2 (August–November 2022). The educational format differed between the two time points, with schools offering a hybrid format at Time 1 and transitioning to in-person classes by Time 2.

Data collection occurred during school hours, with groups of students, using an online platform developed for the study (Saracostti et al., 2022). Trained research teacher members explained the study procedures and questionnaires, addressing any student questions. The questionnaires took approximately 30–40 min to complete. The online platform required participants to complete all questions before submitting the survey, ensuring there was no missing data.

Data analysis

Intraclass correlation coefficients (ICCs) were first calculated to determine the potential need for hierarchical data analysis, with schools and students as random factors and time nested within students. These were calculated for each dimension of SE (affective, behavioral and cognitive) using Stata Software version 16 (StataCorp, 2019). The criterion value "cutoff" to justify a multilevel analysis corresponds to an ICC value for the school factor at or above 0.05 (Heck et al., 2012). The statistical significance of the ICCs was determined by estimating 95% confidence intervals that did not contain the value 0.

Multilevel analysis was then conducted using the mixed procedure in Stata (version 16; StataCorp, 2019). This approach accounted for the nested structure of the data, with schools and students as random factors and time nested within students. CFs were treated as fixed effects. The comparison of trends between groups over time was based on the probability value ($p < 0.05$) of the parallelism test of the interaction between CFs over time in the multilevel longitudinal repeated-measures model.

K-means cluster analysis was performed using IBM SPSS Statistics for Windows (version 23.0; IBM Corp, 2015) to identify student groups with low, medium, and high levels in each SE dimension at Time 1 and Time 2. The analysis focused on students who transitioned from a low level in one SE dimension (affective, behavioral, or cognitive) at Time 1 to a high level in the same dimension at Time 2. General linear modeling was employed to estimate statistically significant changes between the beginning and end of the study.

Layered scatter plots were generated using JMP Student version 14 (JMP, 1989–2023) to visualize the data. The quality and significance of associations were evaluated using a general linear model that included all CF trajectories. The model's goodness-of-fit was assessed by the percentage of explained variance (R-squared), with values closer to 100% indicating a better fit. Additionally, a coefficient of variation of less than 30% was considered acceptable, supporting the accuracy of the estimated model parameters.

Results

Descriptive statistics

Table 1 presents the means and standard deviations for each SE dimension (affective, cognitive, and behavioral) and the CFs (family support, teacher support, and peer support) for Time 1 and Time 2.

Table 2 displays the bivariate Pearson correlation coefficients for each SE dimension and the CFs for Time 1 and Time 2.

TABLE 1 Descriptive statistics at Time 1 and Time 2.

Variable	Time 1		Time 2	
	Mean	SD	Mean	SD
Affective engagement	2.73	0.512	3.81	1,031
Cognitive engagement	2.70	0.365	3.66	0.931
Behavioral engagement	3.49	0.628	4.25	0.823
Family support	2.71	0.732	3.92	1,066
Teacher support	2.73	0.777	3.92	0.989
Peer support	2.54	0.782	3.66	1,276

TABLE 2 Correlation matrix.

Pearson correlation		Time 1		Time 2	
Variable by	Variable	Correlation	*p*-value	Correlation	*p*-value
Cognitive SE	Affective SE	**0.513**	**0.0001**	**0.6503**	**<0.0001**
Behavioral SE	Affective SE	0.0101	0.9432	**−0.3975**	**0.0035**
Behavioral SE	Cognitive SE	−0.0959	0.4986	−0.0121	0.9323
Family support	Affective	**0.6526**	**<0.0001**	**0.6991**	**<0.0001**
Family support	Cognitive	0.2322	0.0976	**0.6491**	**<0.0001**
Family support	Behavioral	0.2238	0.1107	−0.1148	0.4176
Teacher support	Affective	**0.6463**	**<0.0001**	**0.7641**	**<0.0001**
Teacher support	Cognitive	**0.5309**	**<0.0001**	**0.6082**	**<0.0001**
Teacher support	Behavioral	**0.4296**	**0.0015**	−0.268	0.0548
Teacher support	Family	**0.6859**	**<0.0001**	**0.6576**	**<0.0001**
Peer support	Affective	**0.6312**	**<0.0001**	**0.7546**	**<0.0001**
Peer support	Cognitive	0.2354	0.0929	**0.4325**	**0.0014**
Peer support	Behavioral	−0.0796	0.5748	**−0.3703**	**0.0069**
Peer support	Family	**0.6774**	**<0.0001**	**0.5212**	**<0.0001**
Peer support	Teacher	**0.5322**	**<0.0001**	**0.6288**	**<0.0001**

Statistically significant correlations and their *p*-values are in bold.

At Time 1 (year 2021), there was only a positive and significant correlation between affective and cognitive SE. Regarding CFs, family support had a direct and significant correlation with affective SE, while teacher support showed a direct and significant correlation with all SE dimensions and with family support and peer support. Additionally, peer support had a direct and significant correlation with family support.

At Time 2, affective SE showed direct and significant correlations with all SE and CF variables except for behavioral SE, which had a negative correlation. Cognitive SE had a direct and significant correlation with behavioral SE and with all CFs. Behavioral SE showed an inverse and significant correlation with peer support. Finally, teacher support had direct and significant correlations with both family support and peer support.

Intraclass correlation coefficients and multilevel analysis

The results of school engagement within-school ICCs and 95% confidence intervals justify the use of multilevel analysis: affective ICC = 0.274 (0.043–0.763), cognitive ICC = 0.202 (0.171–0.359), and behavioral ICC = 0.687 (0.285–0.924).

The repeated measures multilevel within-schools panel model showed highly significant differences only in the Time factor ($p < 0.001$) for the SE dimensions, as follows: affective Time 1 ($M = 2.4$, SD = 0.32) and Time 2 ($M = 4.42$, SD = 0.51), cognitive Time 1 ($M = 2.63$, SD = 0.16) and Time 2 ($M = 4.37$, SD = 0.32), and behavioral Time 1 ($M = 3.15$, SD = 0.42) and Time 2 ($M = 4.66$, SD = 0.23). The mean scores for each SE dimension were higher in Time 2. The differences between Time 1 and Time 2 for the CFs were not statistically significant ($p > 0.05$): family support ($M = 3.32$, SD = 0.71), teacher support ($M = 3.34$, SD = 0.66), and peer support ($M = 3.46$, SD = 0.74). Finally, differences in the test of parallelism of the trend over time in the interaction between CFs and time were not statistically significant ($p > 0.05$).

According to the results of the multilevel analysis, the increase in the level of SE from Time 1 to Time 2 is attributed to the criterion for selecting the sample (i.e., students who had a low level of SE at Time 1 and a high level of SE at Time 2). This does not reflect significant differences between schools regarding the effect of CFs on SE. This could be explained by the fact that the schools in the sample are similar to each other: urban public schools are characterized by high levels of school vulnerability.

Analysis of affective school engagement in relation to contextual factors

Figure 1 shows the trends of the affective SE profiles in relation to the CFs. The family support and teacher support profiles were positively and significantly associated at both time points. Furthermore, the mean scores of affective SE were higher at Time 2, with differences of up to two and a half points compared to Time 1. There were no statistically significant differences between family support at Time 1 and Time 2 and no significant difference between teacher support at Time 1 and Time 2; in fact, both family support and teacher support had lower mean score ranges at Time 1 than at Time 2.

Table 3, Section A provides the parameter estimates of the relationship between CFs and affective SE. It is observed that the influence of family support on affective SE presented a similar association but with greater precision than the influence of teacher support on affective SE. The latter showed the closest approximation of the model to the data, with a high coefficient of determination or explained variance of affective SE at 0.98 (Figure 2).

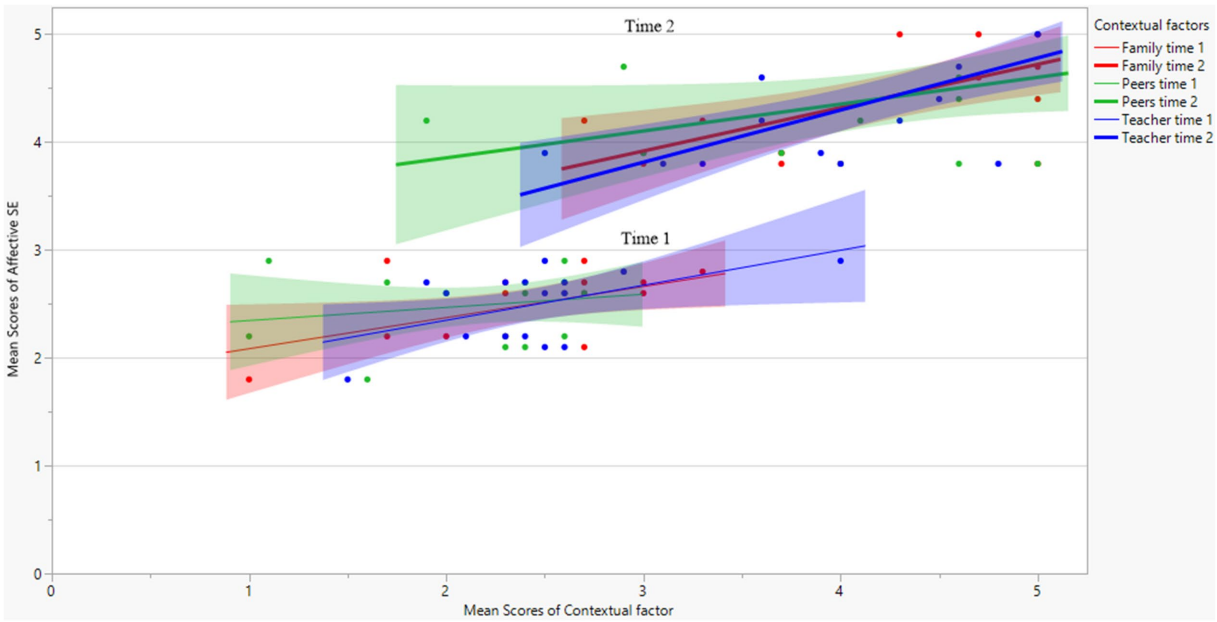

FIGURE 1
Association of the affective school engagement with contextual factors.

TABLE 3 Quality and precision of the model for estimating the association between school engagement and contextual factors.

Section A. Model for estimating the association between affective SE and CF								
SE affective model	R^2 bootstrap	F	p-value (F)	β_0	p-value (β_0)	β_1	p-value (β_1)	*CV%
Family support Time 1	0.43	5.17	0.038	1.80	<0.001	0.29	0.038	11.6
Family support Time 2	0.69	11.28	0.004	2.71	<0.001	0.40	0.004	9.2
Teacher support Time 1	0.53	5.44	0.034	1.70	<0.001	0.32	0.034	14.7
Teacher support Time 2	0.98	18.60	0.001	2.36	<0.001	0.48	<0.001	26.0
Peers support Time 1	0.70	1.89	0.209	2.23	<0.001	0.12	0.427	13.5
Peers support Time 2	0.63	1.78	0.210	3.36	<0.001	0.25	0.074	10.9
Section B. Estimation model of the association between cognitive SE and CF								
SE cognitive model	R^2 bootstrap	F	p-value (F)	β_0	p-value (β_0)	β_1	p-value (β_1)	CV%
Family support Time 1	0.50	8.44	0.012	2.31	<0.001	0.11	0.012	4.9
Family support Time 2	0.48	5.46	0.035	3.43	<0.001	0.22	0.035	6.6
Teacher support Time 1	0.70	9.05	0.009	2.31	<0.001	0.10	0.009	16.4
Teacher support Time 2	0.93	5.59	0.033	2.06	<0.001	0.11	0.033	5.2
Peers support Time 1	0.83	1.53	0.237	2.49	<0.001	0.05	0.237	5.9
Peers support Time 2	0.69	1.45	0.249	4.05	<0.001	0.08	0.249	7.4
Section C. Estimation model of the association between behavioral SE and CF								
SE conductual model	R^2 bootstrap	F	p-value (F)	β_0	p-value (β_0)	β_1	p-value (β_1)	CV%
Family support Time 1	0.77	0.17	0.683	3.34	<0.001	−0.07	0.683	13.7
Family support Time 2	0.80	7.88	0.012	4.30	<0.001	0.11	0.012	4.2
Teacher support Time 1	0.97	7.62	0.013	4.11	<0.001	−0.36	0.013	11.5
Teacher support Time 2	0.99	15.21	0.001	4.11	<0.001	0.17	0.001	3.7
Peers support Time 1	0.96	20.31	0.003	4.38	<0.001	−0.46	<0.001	9.3
Peers support Time 2	0.82	2.66	0.121	4.47	<0.001	0.06	0.121	4.7

*CV, Coefficient of variation.

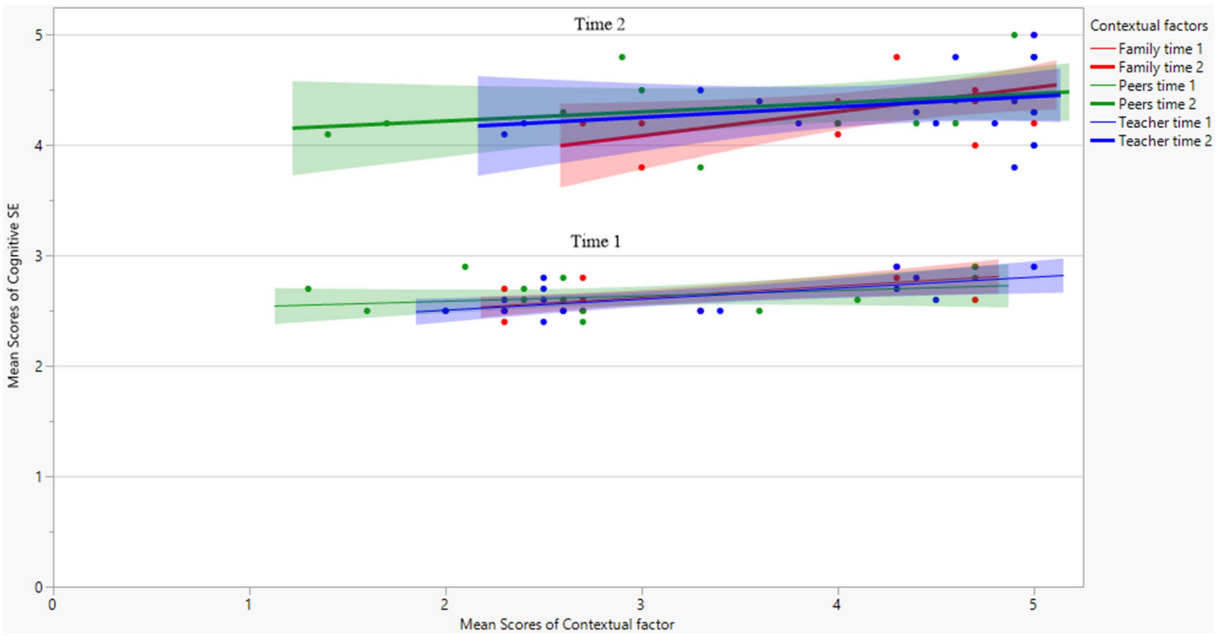

FIGURE 2
Association of the cognitive school engagement with contextual factors.

Analysis of cognitive school engagement in relation to contextual factors

The associations between CFs with cognitive SE showed trends, but they were less pronounced than those observed for affective SE, as indicated by less steep slopes. Notably, the influence of family support on cognitive SE at Time 2 stands out. Initially, the level of association for family support was similar to that for teacher support. The response ranges of the CF scores were identical at both Time 1 and Time 2.

As shown in Table 3, Section B, the strongest association was between family support and cognitive SE at Time 2 ($\beta_1 = 0.22$, $p = 0.035$) with a good fit of the model to the data ($R^2 = 0.93$) and a very low variation (CV of 6.6%).

Cognitive engagement, such as affective engagement, increased markedly at Time 2. However, the trajectory was parallel and stable, with a lower association with the CFs, showing constancy and lower amplitude of the reliability bands of the trajectories at Time 1.

Analysis of behavioral school engagement in relation to contextual factors

As shown in Figure 3, at Time 1, both teacher support and peer support had a negative relationship with behavioral SE. At Time 2, family support and teacher support showed a small positive relationship with behavioral SE, with a confidence interval with a smaller amplitude and a better fit than at Time 1.

Table 3, Section C presents the model's parameter estimates, highlighting the negative relationships at Time 1 between teacher support and behavioral SE ($\beta_1 = -0.36$, $p = 0.013$) and between peer support and behavioral SE ($\beta_1 = -0.46$, $p < 0.001$). At Time 2, positive associations were observed between family support and behavioral SE ($\beta_1 = 0.11$, $p = 0.012$) and between teacher support and behavioral SE ($\beta_1 = 0.17$, $p = 0.001$). There were high levels of fit for behavioral SE, with R^2 values ranging from 0.77 to 0.99.

Summary

Overall, the results show a higher degree of association of CFs with affective SE, followed by cognitive SE and behavioral SE. Among the CFs, family support and teacher support stand out over the associations for peer support. These associations are generally significant, with a high level of goodness of fit for the parameter estimates model. CF scores tend to be lower at Time 1 than at Time 2.

Discussion

The overall results of the present study demonstrate that the contextual factors (CFs) showing the strongest association with positive changes in dimensions of school engagement (SE), especially affective engagement, over time are family support and teacher support. There is a broad consensus in the scientific community about the benefits associated with family support in the educational field (Fernández-Zabala et al., 2016; Saracostti et al., 2019b; Yang et al., 2023), proving to be a primary CF for a successful educational path (Benner et al., 2016; Lara and Saracostti, 2019; Otani, 2020). Although family influence is often considered to decrease as students progress through their schooling journey, the key seems to be understanding how family support can adapt to meet the needs of students at different stages of their development (Hoover-Dempsey and Sandler, 1995). The positive relationship between family support and SE, as found in previous studies (e.g., Yang et al., 2023), aligns with the findings of this study.

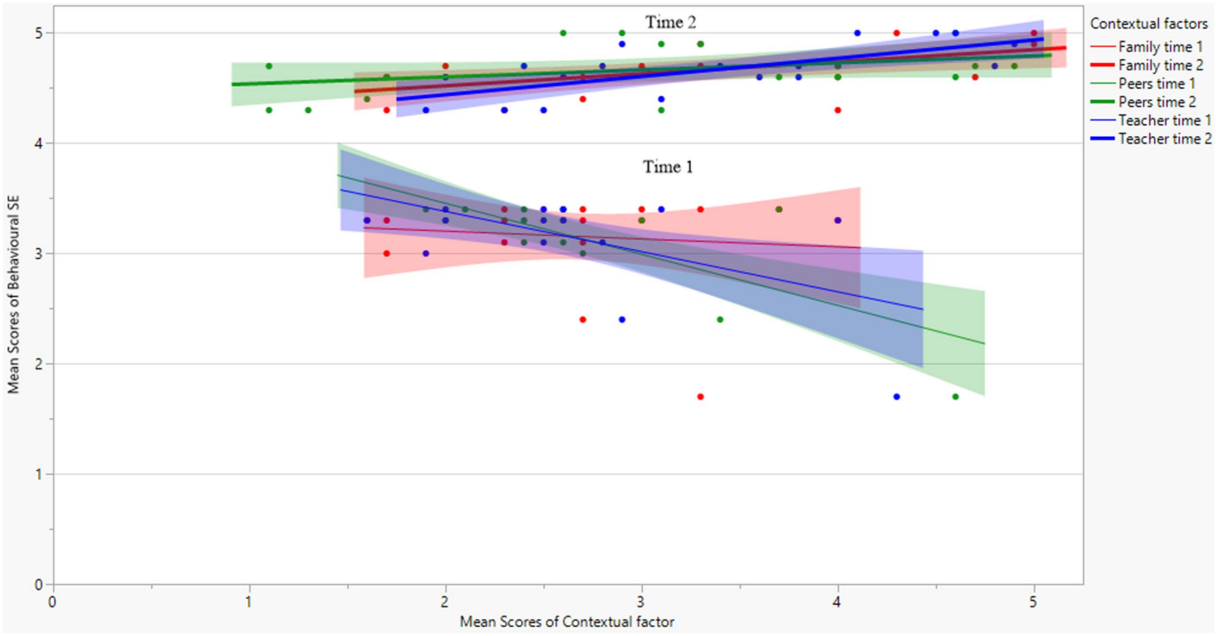

FIGURE 3
Association of the behavioral school engagement with contextual factors.

In relation to teacher support, various studies highlight this as the CF component with the strongest connection to SE (Martin and Collie, 2019; Havik and Westergård, 2020; de Carvalho and Veiga, 2023). In the cross-sectional study by Miranda-Zapata et al. (2021), which analyzed the influence of CFs on SE in five Ibero-American countries, teacher support consistently showed a significant relationship with all three dimensions of SE (affective, behavioral and cognitive). Similarly, the present longitudinal study indicates a higher degree of association between teacher support and affective SE.

In contrast, this study found a limited association between peer support and SE over time. This finding contradicts other results in the scientific literature (Kiefer et al., 2015; Roundfield et al., 2018). This discrepancy may be attributed to the challenges posed by the pandemic and school closures, which hindered the strengthening of emotional support among peers and the development of their social skills. These disruptions likely impacted self-esteem, security, and confidence, contributing to an increase in negative emotions such as stress, frustration, and sadness (Zamudio, 2021). Similarly, the pandemic restricted in-person interactions, hindering the formation of meaningful bonds, integration into social groups, and the development of intimacy distinct from the family environment (Morales Retamal, 2020).

A more extensive longitudinal study with more measurements over time would enhance the assessment of the stability of our findings. For example, Salmela-Aro et al. (2021) systematically mapped and analyzed longitudinal research on adolescent student engagement published from 2010 to 2020, predominantly in North America and Europe. Notably, none of these studies were conducted in Latin America.

While our longitudinal approach represents an important contribution to research on SE in Latin American countries, a limitation of our study is that SE and CF measurements were conducted at only two points in time. This limitation may have constrained the ability to achieve more definitive results. Additionally, our study is limited by the intentional sampling approach, which focuses solely on students in urban and vulnerable contexts. Therefore, future research with probabilistic and larger samples should explore whether SE profiles change over time in more diverse contexts.

Furthermore, while our study employed a prospective longitudinal design, it was non-experimental. Moving forward, a key opportunity for research in Chile and Latin America is to undertake longitudinal quasi-experimental designs with broader time scopes, allowing for a more robust examination of the associations between CFs and SE. In this context, studies could explore the implications of various SE profiles over time on variables such as school attendance and retention, student behavior, and student wellbeing. For example, studies could examine students who exhibited high school engagement initially but showed a decline over time or investigate the differential performance of profiles initially low in one, two, or all three dimensions of school engagement (affective, behavioral, and/or cognitive). Another area for exploration is to analyze strategies implemented by teachers and families that may have positively influenced student trajectories during the post-pandemic period. Understanding these strategies could better prepare teachers and families to provide support during future health, economic, social, and/or political crises.

Regarding the focus of this article, it is noteworthy to emphasize the benefits of employing person-centered techniques to comprehend SE. While studies using variable-centered analytical approaches offer important insight into various associations, they often describe findings in terms of an abstract or statistically average participant, which may not accurately represent any real study participants. Using such findings to develop school interventions can lead to inaccuracies, assuming that a one-size-fits-all approach is suitable without considering individual

differences. In contrast, person-centered techniques allow for a detailed examination of behavioral profiles, their evolution over time, and comparisons that can more accurately identify adaptive or maladaptive behaviors. This approach enables the development of more specific and targeted interventions (Fredricks et al., 2019).

Our exploration into how interpersonal factors—family support, teacher support, and peer support—influence students who improved their levels of school engagement despite adverse circumstances such as the pandemic and its aftermath contributes to understanding the factors that foster educational resilience. Education resilience is viewed as a dynamic process shaped by interactions between individuals and their environment, especially teachers and school administrators. It embodies a moral strength, reflecting a person's ability to persist in the face of adversity without succumbing to discouragement (Noriega Aguilar et al., 2016; Olmo and Segovia, 2018). Similarly, our study underscores the important role of adult support—both from families and teachers—in promoting sustained social–emotional development among secondary school students over time.

Data availability statement

The datasets generated and analysed during the current study are not publicly available due the fact that they constitute an excerpt of research in progress but are available from the corresponding author on reasonable request.

Ethics statement

The studies involving humans were approved by Comité de ética de la Universidad Autónoma de Chile. The studies were conducted in accordance with the local legislation and institutional requirements. Written informed consent for participation in this study was provided by the participants' legal guardians/next of kin.

Author contributions

MS: Conceptualization, Funding acquisition, Investigation, Project administration, Supervision, Writing – original draft, Writing – review & editing. XT: Conceptualization, Investigation, Writing – original draft, Writing – review & editing. HM: Formal analysis, Writing – original draft, Writing – review & editing. EM-Z: Formal analysis, Methodology, Writing – original draft, Writing – review & editing. LL: Investigation, Methodology, Writing – original draft, Writing – review & editing. MH: Investigation, Writing – original draft, Writing – review & editing.

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Conflict of interest

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

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