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ARE OUR CHILDREN ENGAGED WITH SCHOOL IN THE ERA OF COVID-19?

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Abstract
During 2020 the health situation linked to the COVID-19 has led to the suspension of face-to-face classes in almost all of the Argentine territory. Different distance-learning resources were developed to replace traditional classes. The aim of this study was to assess the school engagement (SE) of Argentinian children and adolescents aged 3 to 18 in the distance schooling context due to the COVID-19 pandemic, and to analyze its variability based on socioeconomic status, gender, educational level and movement restriction measures. Caregivers of 1205 children and adolescents (47,5% females, 51,8% males, 0,7% trans/non-binary) answered an online survey between June 5 and June 28, 2020. The survey included an SE questionnaire which was adapted to the virtual schooling context and showed adequate psychometric properties. The results showed higher values of behavioral SE in comparison to emotional SE, and differences according to the variables measured. Less general SE in students attending second cycle of primary school (9 to 12 years), higher behavioral SE in secondary school students, and higher emotional SE in preschool children was found. Girls and students of the upper-middle and upper classes who attend private schools reported higher levels of SE in both dimensions. Also, lower SE was found in students under isolation measures, comparing to those under distancing measures. The contribution of the results for the analysis of the current situation is discussed, and the importance of school engagement as a central variable to assess the effectiveness of the educational practices in a pandemic context is highlighted.

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Introduction

Due to the global health situation linked to the COVID-19 pandemic, on March 16, 2020, the Argentinian government decided to suspend face-to-face classes in the whole country (Resolution of the Ministry of Education 108/2020). Subsequently, on March 20, Social, Preventive and Mandatory Isolation (SPMI) was decreed throughout the national territory (Decree 297/2020), which minimized physical mobility and social contact. As the year went by, the government installed a phase system: the areas with higher circulation of the virus were in SPMI, while those with less circulation were promoted to Social, Preventive and Mandatory Distancing (SPMD), which allowed commercial activities and recreational outings. Educational institutions in the whole country remained closed for the entire school year (with the exception of the city of San Juan). Schools reopened throughout the territory with special sanitary protocols in March 2021, with new closings in April in various regions due to the second wave of the pandemic.

In 2020, more than 90% of the global school population was affected by the closure of educational institutions (Ministerio de Educación de la Nación, 2020a). Without any foresight or planning, mitigating measures had to be implemented in order to guarantee the continuity of the learning process. The National Ministry of Education created the Program *Sigamos Educando* [Let's Keep Educating] (Resolution 106/20, Ministerio de Educación de la Nación) which aims to support remote schooling (Ministerio de Educación de la Nación, 2020b), by producing and distributing teaching materials, training teachers in the use of online tools, and sustaining the pedagogical bond between schools and families. Based on these resources, each school implemented different educational strategies, according to their needs and possibilities. It should be noted that the national context in which this program takes place is characterized by an inequality between different educational communities, regarding the resources available to face the situation - such as connectivity, access to digital devices and digital abilities - and the adequacy of household conditions for learning at home (Gago, 2020). According to data from the National Ministry of Education (Secretary of Evaluation and Educational Information, 2020), the most used mediums for teacher-student communication during 2020 were instant messaging (82%), e-mail

(54%), phone calls (42%) and educational virtual platforms such as Google Classroom and Moodle (37%). Only a third of teachers managed to arrange synchronic virtual meetings. These numbers vary widely depending on the educational level (preschool, primary or secondary) and the type of school management (public or private).

Pre-pandemic studies on the continuity of learning in health emergency contexts are limited (*e.g.*, Clark et al., 2020). However, there is previous evidence concerning two interrelated aspects: the effectiveness of distance learning, and the effects of education interruptions on students. Regarding the former, there are few studies on the effectiveness of online learning for primary and secondary school students (Means et al., 2009), and the results are diverse and even contradictory. Accordingly, while some studies have reported that there is no clear decrease in educational effectiveness when distance learning is compared with traditional classes (Allen et al., 2004), others have suggested that students who take online classes perform "modestly better" than those who receive face-to-face education (Means et al., 2004). Generally, the literature tends to indicate that digital technology is associated with moderate learning gains (Azevedo et al., 2020; Means et al., 2009). However, these data are not entirely comparable to the current situation, because the ordinary circumstances of distance learning differ from an emergency context. On the other hand, concerning the effects of the interruptions on education, it has been reported that prolonged and unexpected school closures can lead to lower test scores, lower educational level and lower potential for future learning (Psacharopoulos et al., 2020). It has also been shown that even scheduled holidays can cause significant learning loss for many children (Alexander et al., 2016; Cooper et al., 1996), particularly affecting those with low family income (Kim & Quinn, 2013), and having worse effects during critical schooling stages.

During 2020, some studies evaluated the impact of this situation on learning. For example, in the Netherlands, Engzell et al. (2021) revealed a learning loss of about 3 percentile points or 0.08 standard deviations when comparing the 2020 national examinations with the ones of the previous three years. In the same line, in Belgium, Maldonado and De Witte (2020) examined tests scores of students in the last year of primary school over the past five years, and found that the 2020 cohort had significant learning losses in all tested subjects. In both of these studies, the learning losses were larger in disadvantaged student populations. Based on this evidence, the current closure of schools, which has been very prolonged in time, can represent an aggravating factor in an already complex

scenario. Since long before the COVID-19 outbreak, the world has been facing a learning crisis: 53% of children in low- and middle-income countries are in a state of "learning poverty" (Azevedo et al., 2020). Some of these countries (including Argentina) have obtained low scores in the PISA tests; these scores show, for example, that 10-year-old students have difficulties to read and understand simple texts (Azevedo et al., 2020). Thus, it is estimated that this situation can get worse due to the current circumstances.

According to Dorn et al. (2020), the estimated effectiveness of the learning process in the health emergency context due to COVID-19 can vary significantly, depending on different factors. These variables include access to remote learning, quality of remote instruction, family support and student's *school engagement* (SE).

SE is a multidimensional psychological process, which includes the attention, interest, investment, and effort that students expend in the work of learning (Marks, 2000). This process enhances learning and academic performance (*e.g*., Miranda-Zapata et al., 2018). According to the model proposed by Skinner et al. (2008), SE is made up of two dimensions: behavioral and emotional engagement. Emotional engagement refers to those affective states related to students' involvement during learning activities (*e.g*., enthusiasm, interest, enjoyment, pride, vitality, encouragement). The behavioral dimension is defined by students' effort, attention and persistence when starting and carrying out learning activities.

SE is determined by the child's varied interactions with his diverse academic activities, within a fluctuating context (Skinner et al., 2009); thus, it is considered a malleable and changeable state (Lara et al., 2018). To be able to engage, students have to perceive three basic psychological needs as satisfied: competence, autonomy and relatedness (Connell & Wellborn, 1991; Skinner et al., 2008, 2009). These self-perceptions are built from the quality of social interactions (Wang & Hofkens, 2019); therefore, it is essential that the environment provides opportunities for students to feel that such needs are being met (Dupont et al., 2014).

The key role of contextual and interactional factors for the development of SE allows to hypothesize that, in the light of the changes that the pandemic has brought in everyday life and in education, SE levels have been affected. These effects on engagement are likely to vary across different population groups. On one hand, SE is affected by (and affects) psychological wellbeing (Datu & King,

2018; Stiles & Gudiño, 2018; Zhu et al., 2019), and the COVID-19 pandemic has had a differential impact on children's mental health according to gender, age and socioeconomic status - among other factors - (*e.g.*, Chen et al., 2020; Zhou et al., 2020). On the other hand, the school's resources to implement remote-schooling strategies, as well as the student's possibilities to access the learning materials and to be connected to their teachers and classmates, are deeply unequal - specially between public and private schools (Secretaría de Evaluación e Información Educativa, 2020).

Assessing SE levels during the pandemic is critical for various reasons. First, there is a lack of empirical evidence about children's and adolescents' degree of participation during prolonged school closures. In this pandemic context, participation has generally been evaluated through students' attendance at the proposed virtual spaces; however, this is more an inquiry into school records and teachers' observations than an objective measure through valid tests. Measuring students' SE can be a reliable indicator of the degree in which students participate in daily educational activities in this emergency context (Chambers et al., 2020). Secondly, it is very important to maintain SE levels as high as possible, given its association with multiple academic outcomes. The literature suggests that SE is associated with good academic performance (González et al., 2015; Wang et al., 2019), interest in learning, social skills, students' well-being and academic resilience (Miranda-Zapata et al., 2018; Tomás et al., 2016). It is also considered a protective factor against social and educational problems such as low performance, boredom and dropout (Fredricks et al., 2004), especially in vulnerable population groups (Finn & Zimmer, 2012). Therefore, SE becomes a crucial variable for minimizing potential learning losses; being disengaged during a whole school year could be very harmful in this regard, especially because the SE levels tend to last over time - during the academic year, as well as throughout the academic trajectory (Skinner et al., 2008). Finally, given SE's associations with mental health and psychological well-being, maintaining SE levels as high as possible can be a protective factor for children's and adolescents' mental health during this stressful time (Montano et al., 2021).

Objectives

The aim of this study was to assess SE in the context of school closures in Argentina due to the COVID-19 pandemic, and to analyze its variability based on socio-demographic factors such as gender, school level, social status and

containment measure in force in the place of residence. It is expected that, based on the results obtained, strategies can be designed and implemented to maintain SE at the highest possible level, in order to maintain long-term motivation and guarantee the continuity of learning processes.

Method

Participants

The sample was composed of 1205 children and adolescents from 3 to 18 years old, out of which 574 (47.5%) were girls, 624 (51.8%) were boys and 9 children were identified with a different gender (trans or non-binary). The information was provided by their caregivers, mainly mothers (82.9%), then fathers (10.9%) and other family members (grandparents 2.2%, siblings 1.7%, uncles/aunts 1.5%, parents' partners 0.8%). Information about the socioeconomic status (SS) of 832 of them was gathered; 12.25% belonged to families with medium SS, 42.42% to a medium-high SS and 45.31% to a high SS. Families with a low or medium-low SS were not identified, probably due to sampling bias. Table 1 shows the distribution of participants according to school level, containment measure in force in the place of residence, type of educational management and gender.

Table 1. Distribution of participants based on demographic variables

					Academic Year					
					ECE	1st PE	2nd PE	LSE SE	USE SE	Total
Place	SPMI	Educational Management	Private	Female	23	25	23	17	16	104
				Male	20	16	32	19	11	78
			Public	Female	13	6	15	15	8	55
				Male	9	16	19	14	12	70
	SPMD	Educational Management	Private	Female	51	71	68	42	28	260
				Male	59	66	66	36	38	265
			Public	Female	26	36	35	26	28	151
				Male	30	47	40	44	30	191

Note: ECE=Early childhood education, PE=Primary Education, LSE=Lower Secondary Education, USE=Upper Secondary Education SE=Secondary Education

Instruments

Sociodemographic variables: A questionnaire with closed-ended questions was used to gather data on gender, age, children's and parents' educational level, type of school management and parental occupations. The

parents' educational level was classified according to a scale based on the Argentinian educational system (Pascual et al., 1993) and their occupational level was classified according to the Occupational Prestige Scale OPS70 (Sautú, 1989). Social status (SS) was calculated using the Hollingshead Index (2011), which is appropriate for the Argentinian context (Pascual et al., 1993).

School engagement: The level of emotional and behavioral SE was assessed using the Questionnaire on Dimensions and Facilitators of School Engagement [*Cuestionario de Dimensiones y Facilitadores del Compromiso Escolar*] (Gelpi Trudo et al., 2021). In its original version, it is a self-report instrument for primary school students that evaluates emotional and behavioral manifestations of SE, as well as its predictive factors. It was built based on the translation to Spanish and local adaptation of two questionnaires: The Engagement vs. Disaffection with Learning: Student-report (Skinner et al., 2008), and the Research Assessment Package for Schools - Elementary version (Institute for Research and Reform in Education, 1998). The questionnaire is answered using a 4-point Likert scale according to the level of agreement. It shows evidence of criterion validity (positive associations with grades and performance tasks in mathematics and reading comprehension), and a high level of internal consistency (α=.89).

This instrument was adapted to the context and the administration conditions of the present study. Due to the length of the complete survey, a brief version was made. 12 items were selected based on their relevance for the distance-learning situation. The chosen items evaluate behavioral and emotional indicators of SE and of its opposite, disaffection (boredom, anger, unease about school activities). Statements related to face-to-face classroom dynamics were excluded. Also, the redaction of the items was switched to the third person, in order to be answered by the caregivers (*e.g.*, "the student makes an effort to do well at school"). The psychometric properties of this adapted version of the instrument were contrasted (*see* Results below).

Procedure, design and ethical considerations

A cross-sectional, correlational study was carried out (Montero & León, 2007). The participants were recruited using an online snowball (non-probabilistic) sampling method. An open-access survey was launched on Google Forms and shared via social media. Caregivers responded regarding their children (reporting on one at a time, if they had multiple kids in care) between June 5 and June 28,

2020 - after 77-100 days of isolation. 660 of the respondents had previously filled three surveys regarding their own mental health status, the first of which (answered between March 22 and April 11) included questions about their SS.

For the implementation of this research, all procedures recommended by the Declaration of Helsinki (World Medical Association, 2013) and the American Psychological Association (2010) were fulfilled. Participation was voluntary and the informed consent of the participants was mandatory. They were informed that they could interrupt their participation and abandon the study if wanted without causing negative consequences of any kind. Contact information of the research group was also provided in order to clarify doubts that may arise in relation to the care of rights in research contexts. The study was approved by the Bioethics Committee of the National University of Mar del Plata.

Results

Preliminary analyses of the instrument

The SE questionnaire showed high internal consistency (α=.92). To verify the theoretical structure of the instrument, the sample was randomly split into two halves. The first half (n=616) was used to conduct an exploratory factor analysis (EFA). The extraction method used was the unweighted least squares, and Promax rotation was applied. The EFA suggested keeping two factors, which explained 55.98% of the total variance: one related to the behavioral and attitudinal dimension of SE (effort, attention, involvement, interest; α=.91), and the other one, to the emotional dimension of SE (boredom, anger, unease about school activities; α=.78). The second half of the sample (n=589) was used to conduct a confirmatory factor analysis (CFA). The estimation method was unweighted least squares as well. The model showed excellent fit to the data (CFI=.98; GFI=.99; AGFI=.99) and the error was acceptable (RMR=.05).

Descriptive analysis

The asymmetry (Statistical=-.131, Error=.070) and kurtosis (Statistical= -.611, Error=.141) values were mostly located within ±1, and only some within ±2, which is considered acceptable (George & Mallery, 2016). Table 2 shows the descriptive and inferential statistics of the SE dimensions, in general and for each sociodemographic factor. The general SE presents a mean of 32.36 and a SD of 7.68.

Table 2. Descriptive and inferential statistics for the sociodemographic variables

		School Engagement		SE Behavioral dimension		SE Emotional dimension	
	N	M (SD)	*t*/F	M(SD)	*t*/F	M (SD)	*t*/F
General	1205	32,36(7,68)		17,55(4,69)		12,04(2,98)	
Gender							
Female	572	33.63(7.44)	$t_{(1194)}$=5.349	18.37(4.60)	$t_{(1194)}$=.5.677	12.44(2.87)	$t_{(1194)}$=4.418
Male	624	31.28(7.73)	*p*=.001 *d*=.310	16.85(4.65)	*p*=.000 *d*=.329	11.68(3.04)	*p*=.000 *d*=.257
School level							
Kindergarten	233	33.23(8.02)		17.25(5.34)		12.86(2.77)	
1st cycle PE	287	31.95(7.68)	$F_{(4.1200)}$=5.892	17.34(4.61)	$F_{(4.1200)}$=4.196	11.77(3.00)	$F_{(4.1200)}$=12.254
2nd cycle PE	298	30.85(7.22)	*p*<.001	16.68(4.14)	*p*<.001	11.27(3.05)	*p*<.001
Lower SE	214	32.84(7.67)	η^2_p=.019	18.10(4.62)	η^2_p=.009	12.07(2.94)	η^2_p=.036
Upper SE	173	33.91(7.58)		18.55(4.71)		12.66(2.77)	
Social status							
Middle class	102	30.85(8.64)	$F_{(2.829)}$=3.599	16.85(5.20)	$F_{(2.829)}$=2.578	11.43(3.42)	$F_{(2.829)}$=3.483
Upper-middle class	353	33.09(7.67)	*p*<.05	17.94(4.80)	*p*<.05	12.30(2.87)	*p*<.05
Upper class	377	32.31(7.14)	η^2_p=.009	17.41(4.34)	η^2_p=.007	12.10(2.87)	η^2_p=.009
Regime							
SPMI	331	31.42(7.77)	$t_{(1203)}$=.72	16.96(4.74)	$t_{(1203)}$=2.675	11.83(3.04)	$t_{(1203)}$=1.52
SPMD	874	32.72(7.62)	*p*<.05 *d*=.170	17.77(4.66)	*p*<.05 *d*=.173	12.12(2.96)	*p*=.129 *d*=.097
Type of management							
Private	731	32.60(7.75)	$t_{(1203)}$=1.133	17.74(4.72)	$t_{(1203)}$=1.820	12.07(2.99)	$t_{(1203)}$=483
Public	474	32.00(7.57)	*p*=.189 *d*=.078	17.24(4.64)	*p*=.501 *d*=.107	11.99(2.97)	*p*=.629 *d*=.027

Sociodemographic factors and School Engagement

First, a comparison was made between the behavioral and emotional dimensions of SE within the sample. The differences were significant (t(1, 1204)=55.40; p<.001; d=1.40), with behavioral SE means being higher.

Statistically significant differences and small effect sizes were observed among age groups. For total SE, preschool and upper secondary school (10th to 12th grade) students display the highest mean scores; while second cycle of primary school (4th to 6th grade) students show the lowest average values. *Post-hoc* analyses showed that second cycle of primary school students have significatively lower SE than preschool and secondary school students. Regarding the behavioral dimension of SE, second cycle of primary education children have the lowest levels, and this difference is significant in relation to secondary students. Preschoolers also show significant differences with upper secondary students. Regarding the emotional dimension of SE, the means of preschoolers are the highest and they have significant differences with the first and second cycles of primary education, and with lower secondary education. Both first and second

cycle of primary students have the lowest values in these variables and differ significantly from lower and upper secondary education.

Concerning sociodemographic variables, results showed significant differences on SE based on gender. Girls have higher levels of general, behavioral and emotional SE as compared to boys. Regarding SS, upper-middle-class participants exhibited the highest average values of SE in all its dimensions, and there is a significant difference between participants from average and high SS. The type of school management (public vs. private) did not show significant differences in any of the variables. Finally, statistically significant differences and small effect sizes were observed in all SE dimensions based on the containment measure in force at the time of data collection, with SE levels being higher in the SPMD regime.

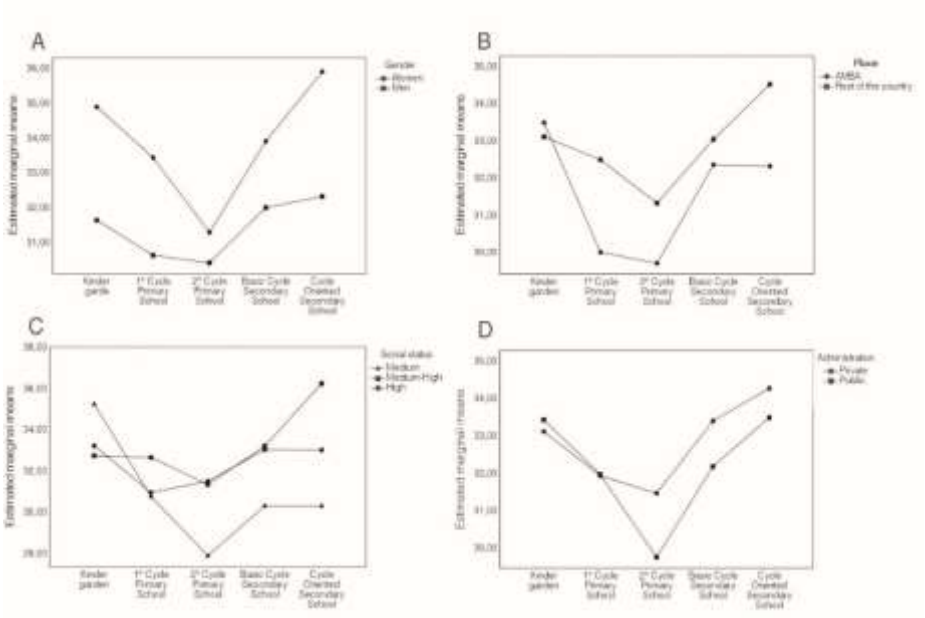

Figure 1. Demographic factors grouped according to school level

Table 3. Analysis of differences between SE, based on interaction between factors

General SE	Gender	School stage	School management	Containment measure	Social status
Gender	-	No (Model: $F(9)=6,60$; $p<.001$; $n^2_p=.048$; R^2adjusted=.041)	No (Model: $F(3)=9.83$; $p<.001$; $n^2_p=.024$; R^2adjusted=.022)	No (Model: $F(3)=12,23$; $p<.001$; $n^2_p=.030$; R^2adjusted=.027).	No (Model: $F(5)=5.205$; $p<.001$; $n^2_p=.031$; R^2adjusted=.025)
School stage	-	-	No Model: $F(9)=3.215$; $p<.001$; $n^2_p=.024$; R^2adjusted=.016	No (Model: $F(9)=3.906$; $p<.001$; $n^2_p=.029$; R^2adjusted=.021	No (Model: $F(14)=2,730$; $p<.001$; $n^2_p=.045$; R^2adjusted=.028
Management	-	-	-	No (Model: $F(3)=3.722$; $p<.001$; $n^2_p=.009$; R^2adjusted=.007	Yes (Modelo: $F(5)=3.774$; $p<.001$; $n^2_p=.009$; R^2adjusted=.016.
Containment measure	-	-	-	-	No Model: $F(5)=2.179$; $p<.001$; $n^2_p=.013$; R^2adjusted=.007
Social status	-	-	-	-	-

To analyze the interaction effects, an exploration by pairs of sociodemographic variables was made through univariate analysis (*see* Table 3). Only one interaction effect was observed (*see* Figure 2). The type of school management (F(1.829)=3,628; p=.057; η^2_p=.004) and the SS of the respondent (F(1.829)=2,614; p=.074; η^2_p=.006) produce an interaction effect for the general SE: children and adolescents who attend private schools and belong to the upper-middle class obtained the highest values in SE (M=33.97; SD=7.63; CI=32.96-34.98) (*see* Figure 2).

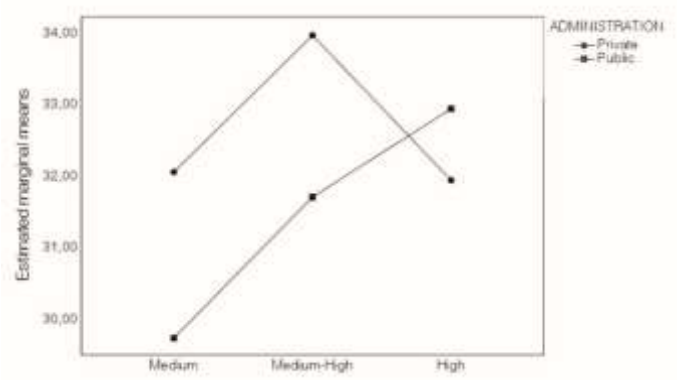

Figure 2. Interaction effect between socioeconomic status and type of school management

Discussion

Due to the pandemic, most countries decided to close their schools. In Argentina, face-to-face classes have been replaced for remote education during the entire 2020 school year. The complexity of this scenario, which combines inequalities in the access to virtual education and the uncertainty about its effectiveness with preexisting structural problems in the national education system, highlights the need for studies on the reality of education in the pandemic context. During this time of school closures, it is important to find out if students are participating effectively in activities, which can be done by assessing their engagement with academic activities, a key variable for sustaining learning processes.

The aim of this study was to assess SE in the distance-schooling context due to the COVID-19 pandemic in children and adolescents aged 3 to 18, and to examine the effects of school level, gender, socioeconomic status and containment measures in SE. The main results and possible explanations for them are presented below.

Differences between behavioral and emotional SE

Higher values of behavioral SE were found in comparison to emotional SE. As previously mentioned, the former refers to behaviors linked to effort, attention and persistence, while the latter points to enjoyment, interest, enthusiasm (as opposed to boredom, anxiety and unease) about school activities. One possible explanation for this difference is based on the impact of school closures on the social aspect of schooling. Because of the closures, students have stopped sharing physical space and learning activities with classmates and teachers, replacing them (in the best-case scenario) with virtual interactions. But school is not only about class time and academic learning: it is organized around characteristics that are social in nature and embedded within social interactions between peers (Estell & Perdue, 2013). Main opportunities for developing bonds, such as group projects, recesses or extra-curricular activities, are mostly missing in the virtual environment. For children and adolescents, these moments of informal social interaction are probably one of the most enjoyable parts of going to school. In this sense, positive emotions towards school, *i.e.*, emotional engagement, are predicted in great part by the satisfaction of the need of relatedness and belonging within the school context (Furrer & Skinner, 2003).

In this line, a study conducted by Estell & Perdue (2013) showed that emotional engagement is more strongly predicted by peer support, while behavioral engagement is more affected by parental support. In the social isolation context, kids are not having face-to-face interaction with their classmates, but only with their family members. Therefore, it is expected (in the best cases) for perceived support by family members to be higher, thus incrementing behavioral - but not so much emotional - SE.

These results are concerning, since emotional engagement is the active element in sustaining academic motivation (Skinner et al., 2008).

Differences in general SE according to school level

Differences in SE were observed based on the school level students are in. In the first place, SE is significantly lower in the second cycle of primary education (4^{th} to 6^{th} grade) comparing to the other school levels.

This could be due, on one hand, to the lack of opportunities for joint learning, which is fundamental to sustain effort, feel reciprocity, learn by observation and receive feedback from others, especially at this age (9 to 12 years). According to a national survey (Secretaría de Evaluación e Información Educativa, 2020), most of the schoolwork given during the school closure was for individual resolution; and children at this age may not yet have a sufficient degree of autonomy so as to organize shared online activities by themselves. Middle childhood is a key period for SE cultivation: at this stage, extra-familial relationships increase, children start doing extracurricular activities and schooling becomes more formal, and through these new experiences, children get opportunities to develop their engagement (Mahatmya et al., 2012). Currently, these opportunities have been interrupted: children are at home, coming into physical contact only with their family.

On the other hand, this result may be related to the pandemic's effects on children's mental health. As mentioned earlier, there is evidence of a bidirectional association between psychological wellbeing and SE (Datu & King, 2018). Second cycle of primary school is characterized by increases in academic demands, which tend to result in higher levels of anxiety and unease (*e.g.*, Punaro & Reeve, 2012). Also, it has been found that the increases in anxiety and depression symptoms during the COVID-19 pandemic have been higher for children in this age group (9 to 11 years) (Loades et al., 2020). This would translate into a lower general psychological wellbeing, which in turn could be negatively affecting SE.

Secondly, the results show that behavioral SE is higher in secondary school students. To learn effectively in the online setting, the student needs to have good self- regulation, good time and task management (Vigil et al., 2020). In this sense, adolescents have a higher degree of autonomy than children, depending less on their teachers and parents' physical presence to organize, start and complete their school activities. This occurs especially in upper secondary education (the last three years of compulsory schooling), in which students are 15 or older; at this age, they have already developed a greater capacity for reflection and self-regulation, and their actions are more deliberate and goal-oriented, so their ability to put an effort in schoolwork is greater than that of younger children (Mahatmya et al., 2012). Actually, some studies have suggested that the online setting can be beneficial for adolescents' engagement: for example, Lawrence and Fakuade (2021) have found that Nigerian adolescent learners showed high levels of commitment towards online learning during the COVID-19 lockdown. Digital education, especially at this age, can offer opportunities for rapid learning, innovation and creativity; technology makes learning available from different locations, encourages collaborative learning and increases learning competence (Lawrence & Fakuade, 2021). These characteristics of online learning can enhance the teenage students' self-perceptions of autonomy, which are predictive of better SE levels (Connell & Wellborn, 1991; Skinner et al., 2008, 2009).

A higher level of emotional SE was found in preschool children (3-5). This could be due to the fact that kindergarten activities tend to be playful and fun, so they naturally generate more enthusiasm and interest than purely academic tasks. On the other hand, low levels of behavioral SE were reported in this level. This is to be expected, since children at that age are still developing their capacity for self-regulation, so they hardly possess the ability to stay focused on the task and follow the rules by themselves, without the physical presence of a teacher to guide them (Mahatmya et al., 2012). It has been proposed that children's abilities to self-regulate their behavior develop in the context of social interactions with peers and adults: before they are able to exert control for themselves, they gain this control through the regulation of others. Therefore, children find it difficult to engage in classroom tasks in an isolation context (Williford et al., 2013).

Differences based on gender

The results indicate that SE is higher in girls than in boys, for both dimensions. This goes in line with previous literature (*e.g.*, Estell & Perdue, 2013;

Goñi et al., 2018; Wang & Eccles, 2012): girls tend to show higher levels of engagement, subjective assessment of learning and extracurricular participation, as well as fewer behavioral problems; while boys tend to have more negative feelings about school and to report less attachment to it. One possible explanation for this differences is given by the "gender stratification" hypothesis, according to which girls have to work harder in societies characterized by gender inequality, in order to compensate having lesser social, economic and politic opportunities (King, 2016). Another explanation is that students tend to calibrate the direction and amount of their SE in accordance with their gender identity; for boys, displaying a "masculine image" enters in conflict with engagement, as putting effort into schoolwork and following rules is typically associated with the feminine stereotype (Kessels et al., 2014).

Also, according to Furrer & Skinner (2003), the sense of relatedness to teachers has a stronger effect on SE for boys than for girls: given that boys generally show less involvement and enjoyment of academic activities than girls, interpersonal ties to the teacher could provide them with a bigger motivational boost. Thus, changes brought by the school closures in the student-teacher interactions may have affected the two genders in a different way.

Differences based on the containment measure in force (SPMI/SPMD)

The results indicate higher levels of engagement among those who live in areas subjected to a distancing regime, in comparison to those students in areas in which strict isolation was still in force. It should be taken into account that the severity of the sanitary situation and the harshness of social restrictions (along with its secondary consequences on family dynamics and economy, among others) enhance the negative impact of the pandemic on stress and general mental health. (*e.g.*, Canet Juric et al., 2020; Zhou et al., 2020). Also, as stated by Domina et al. (2021), pandemic-induced family stressors (such as worries associated with job security, home schooling and health) are likely to disrupt SE levels. During the SPMD phase, some of these problematics may have had some level of relief, decreasing its detrimental effects on SE.

Differences based on socioeconomic status and type of school management

Differences in SE based on SS were reported. Even though there are no differences between state and private schools, an interaction effect between SS and school management was found: the most engaged children are those who attend private schools and who belong to the upper-middle class. It is important to

consider that both variables are linked to availability, on the part of the school and of the students, of the technological resources needed to access teaching materials and virtual spaces. As found by Domina et al. (2021), both device availability and Internet access are significantly related to SE in the context of remote instruction due to the COVID-19 lockdown.

A similar result was found by Cullinane & Montacute (2020), whose study indicates that middle class and upper-middle class students are much more likely to access a virtual connection (30%), compared to working-class students (16%). Moreover, SS is associated with parental educational level. According to the mentioned study, the nature of parental supervision varies among these groups, so as the parent's confidence on themselves when trying to give learning support to their children: parents with more educational background were much more likely to feel confident as educators (Cullinane & Montacute, 2020). In the same line, the study by Domina et al. (2021) showed that students with relatively high educated parents do better on completing and submitting assignments online, and log on to remote classes more frequently. Therefore, having highly educated parents not only seems to enhance parental support for students, which is known to be predictive of behavioral SE levels (Furrer & Skinner, 2003); but also, having a helping adult nearby can improve children's learning and achievement, therefore increasing their feelings of competence, which are associated with higher SE (Skinner et al., 2008, 2009).

Conclusions

To sum up, the findings reported in this study provide information about the variables that affect SE, particularly in a context of emergency and remote schooling. It was observed that SE in this context is differentially affected according to school level, gender, containment measures in force and socioeconomic factors. Students in the second cycle of primary school, from the middle class attending state-run schools, and boys, present lower levels of SE. On the contrary, adolescents, upper-middle class students who attend private schools, and girls, show greater SE in this pandemic context. These findings support the central role that interactional and contextual factors play in creating and sustaining SE.

One of the limitations of this study is that it lacks representation from lower-middle and lower-class students. This is probably due to the type of sampling implemented. According to the literature, a greater loss of engagement and learning is expected among low-income students (Bacher-Hicks et al., 2020), who are less likely to have access to high-quality remote learning or to an enabling learning environment (such as a quiet space with minimal distractions). Another limitation is that the questionnaires were answered by the caregivers instead of children themselves; they may have more easily perceived the children's behaviors when faced with school tasks than their emotions, which possibly explains part of the differences found between the two dimensions of SE. In addition, adults are not usually very attentive to adolescents' academic activities, in comparison to young children, so the results for the older age group should be considered with caution. It is always advisable to use the multi-informant approach (Duckworth & Yeager, 2015), which was difficult due to the context.

Acknowledging the factors that are affecting SE in the emergency context may help to generate more effective political responses to these kind of situations in the future, whether they are health-related or not. Governments, educational institutions and families can play a part in promoting SE, especially in exceptional situations like this. For example, students' engagement with remote education increases when they are given with opportunities for socioemotional learning - such as moments of interaction with friends, encouragement from educators to do something kind, extracurricular activities, encouragement to interact with family members, and counseling (Domina et al., 2021).

Children and adolescents' SE should be one of the focal points for the planning, design and implementation of public policies and strategies to face the side effects of the pandemic on education systems. On one hand, as stated by Montano (2021), engagement is a predictor of optimal psychological outcomes, such as general subjective well-being; even in a challenging environment like a pandemic, SE still can help the learners fulfill their basic psychological needs. On the other hand, promoting SE, especially in vulnerable populations, can help mitigate potential learning losses due to the lockdown. Our results could collaborate on the rapid diagnosis of the school situation in this context, for the early implementation of specific interventions to reduce the effects of the pandemic.

Declaration of conflicting interests

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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