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Does school climate affect students' social and emotional skills? The importance of relationships

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Abstract
Social and emotional learning (SEL) is key to an individual's success throughout life and can be fostered in children's daily settings. School climate has the potential to promote or hinder the development of SEL in students. However, it is not clear from previous research which specific aspects of school climate relate to which SEL skills. This study conducts a secondary data analysis of the Portuguese data from the OECD's 2019 Study on Social and Emotional Skills, exploring the relationships between school climate, namely, interpersonal relationships and teaching and learning practices, and 10-year-old students' social and emotional skills, through a structural equation modeling approach. Results show that peer relationships most strongly affect all social and emotional skills, followed by relationships with teachers, whereas bullying experiences negatively affect students' SEL. Contrary to what was hypothesized, teaching practices, such as teacher pedagogies, cooperative strategies, and active learning strategies, showed some negative effects on students' SEL, with no effects on most skills. Lastly, some school climate dimensions (i.e., school-level relationships, student evaluation practices) showed no effects on social and emotional skills, suggesting a more distal role. These results show interactions taking place inside the classroom and focused on relationships, instead of instruction, seem to play a more significant role in students' social and emotional development. This study aims to guide the daily practice of teachers in supporting their students' SEL development and to inform school administrations, local, and national public policy on how to best leverage school processes to support students' SEL.

Keywords Relationships · School climate · Social and emotional skills · Teaching practices

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Introduction

Decades of research and practice have already corroborated the relevance of social and emotional skills for the successful development of individuals across different life contexts and stages (Brush et al., 2022; Chernyshenko et al., 2018; Jones et al., 2019). Higher social and emotional skills are related to better academic performance (Sackett & Walmsley, 2014) and higher sense of school belonging (OECD, 2021), and predict relationships with others (Osher et al., 2020), citizenship behavior (Sackett & Walmsley, 2014), better mental and physical health (Strickhouser et al., 2017), and greater overall job and life satisfaction in adulthood (Judge et al., 2002).

Social and emotional skills are a multidimensional construct, which includes intrapersonal and interpersonal competencies (Domitrovich et al., 2017). They are personal characteristics and abilities, translated into patterns of behavior, thoughts, and feelings, which allow for our successful social functioning and wellbeing, including the way we approach tasks, manage our behavior, or establish and maintain positive social relations (OECD, 2021; Steponavičius et al., 2023). In other words, it encompasses skills such as emotional control, resilience, sociability, or curiosity.

There are a multitude of social and emotional frameworks which define, operationalize, and organize these skills with slight differences. Berg and colleagues (2019) found 136 frameworks attempting to define and operationalize social and emotional competencies in different domains and developmental stages. However, there is a general conceptual consensus on what we are talking about when addressing these different competencies. Research has also shown that these skills are shaped by different settings (Cantor et al., 2019) and can be learned (Steponavičius et al., 2023). Social-emotional learning (SEL) is the process by which the knowledge, attitudes, and abilities necessary to managing emotions, achieving a set of goals, feeling and showing empathy for others, establishing and maintaining interpersonal relationships, and making responsible decisions are acquired (Weissberg et al., 2015).

Schools stand as a preferred setting for the examination of SEL development, benefiting from being children and youth's main daily context, where they spend most of their time, and carry their most significant interactions with peers and other adults. Schools are a complex ecosystem, varying greatly in their characteristics (Jones & Bouffard, 2012). These school characteristics are defined as school climate–aspects such as the quality of relationships, teaching and learning practices, safety, belonging, resources, or organizational processes (e.g., Zullig et al., 2010). Both overall school climate (e.g., McGiboney, 2021) and some specific dimensions (e.g., peer relationships, Pollak et al., 2023; teacher-student relationships, Poling et al., 2022; sense of school belonging, OECD, 2021) have been found to relate to students' overall social and emotional skills.

In sum, there is some evidence of school climate relating to overall social and emotional learning, but little evidence on the specificities of this relationship. This paper looks into the specific role of certain school climate dimensions on students' social and emotional skills. We do so by conducting a secondary analysis of OECD data from the 2019 *Study on Social and Emotional Skills*. To our knowledge, this is the first paper to explore the effects of specific school climate dimensions on different social and emotional skills.

Social and emotional skills—the OECD approach

One of the frameworks for the development of social and emotional skills for children and youth that has been gaining attention in research and practice globally is the one proposed by the OECD, largely due to its *Study on Social and Emotional Skills* (SSES; Kankaraš &

Suarez-Alvarez, 2019). This framework conceptualizes social and emotional skills as organized in a five-dimension structure (inspired by the Big Five model of personality), for a total of 15 skills. The five domains are *open-mindedness* (skills *Curiosity*, *Tolerance*, *Creativity*), i.e., liking to learn, generate, and explore new ideas,, being inquisitive, open to different points of view, and appreciative of diversity; *task performance* (skills *responsibility*, *self-control*, *persistence*), i.e., being able to honor commitments and be reliable, to avoid distractions and impulses, and to persevere on tasks in order to achieve goals; *engaging with others* (skills *sociability*, *assertiveness*, *energy*), i.e., being able to initiate and maintain positive social connections, express opinions confidently, exert influence over peers, and approach daily life enthusiastically; *collaboration* (skills *empathy*, *trust*, *cooperation*), i.e., understanding the needs of others and caring for their well-being, believing others have good intentions, and living in harmony with others, valuing interconnectedness; and *emotional regulation* (skills *resilience*, *optimism*, and *emotional control*), i.e., being able to effectively regulate stress, to have a positive outlook on life, and to manage negative emotions in the face of frustration (OECD, 2021).

The framework for social and emotional skills presented by the OECD is fairly recent. As such, limited empirical evidence has been produced, by independent authors, to critically support its suitability. Despite overall evidence of good performance (e.g., Barata et al., 2024), criticism to this framework includes questioning its cross-cultural comparability and western-centric perspective (You, 2025), or the excessive length of its materials, leading to participant fatigue (Wang & King, 2024).

The OECD's Study on Social and Emotional Skills, which took place in 10 countries in 2019 and in 23 countries in 2023, stands as the first global effort to measure these skills in children and youth (10 and 15 years old), and aiming to understand the contextual factors—school, family, and community—which may promote or hinder social and emotional development (OECD, 2021, 2024).

School climate

Characteristics of the school environment, which influence students' overall development and academic achievement, are commonly referred to as school climate (McGiboney, 2021). School climate can be described as *how a school is*, encompassing the norms, values, relationships, and the organizational and physical structure of a school, which guide its members' patterns of experience (e.g., Thapa et al., 2013).

Despite the lack of a unique definition, there is some consensus regarding the main dimensions that characterize school climate, such as the quality of relationships within the school (between peers, teacher-student, or staff), teaching and learning practices, perceptions of safety and belonging, organizational structure and leadership, and physical resources (Thapa et al., 2013; Zullig et al., 2010). Despite being often used interchangeably in the literature (van Houtte & van Maele, 2011), school climate differs from other related terms such as "school culture" or "school environment." For instance, research on school culture often addresses aspects of the school life, which overlap with typical school climate dimensions (e.g., discipline, leadership, involvement), but traditional conceptualizations of school culture focus on shared norms, beliefs, and values (Higgins-D'Alessandro & Sadh, 1997), whereas school climate encompasses ecology, milieu, and the social system (Barr, 2011). In this paper, we refer to the consensually accepted definition of school climate (e.g., Lewno-Dumdie et al., 2020).

Different aspects of school climate have been extensively researched, mostly in relation to students' academic success (e.g., Erdem & Kaya, 2023), and shown to influence child

and youth development, with interpersonal relationships at school being one of the most relevant aspects of school climate. Positive peer relationships have been shown to relate to students' life satisfaction and academic achievement (Tepordei et al., 2023), wellbeing, emotional regulation, and decreased depression and anxiety (Pollak et al., 2023). Positive student–teacher relationships relate to higher academic achievement and school engagement, and higher emotional and behavioral regulation (Poling et al., 2022).

Other proximal processes taking place inside the classroom may be noteworthy for students' social and emotional development, since interactions at school mostly take place within the context of academic teaching and learning. The work developed by Pianta, Hamre, and colleagues (Hamre et al., 2013; Pianta et al., 2012) defines "classrooms as a relational setting for development" (Pianta et al., 2012, pp. 367), in which teachers set the tone for all interactions taking place in the classroom, as well as for student engagement, motivation, and ability to learn. As such, teaching practices and methods, as well as classroom management, motivation, and engagement with students, are also central aspects of school climate.

Linking school climate and social and emotional skills

Overall school climate has been consistently found to be positively related to different student outcomes, including social and emotional learning (see McGiboney, 2021 for a detailed summary). The first OECD Study on Social and Emotional Skills (OECD, 2021), which reports school climate as measured by sense of school belonging, bullying experiences, and perceived quality of relationships with teachers, shows that sense of school belonging particularly relates to the skills of sociability, cooperation, and optimism; bullying experiences negatively correlate with nearly all skills; and student–teacher relations positively correlate with nearly all skills, particularly optimism, curiosity, and cooperation.

The relationship between school climate and SEL is seen in different socioeconomic contexts and cultures, including in low-income countries (Larson et al., 2020). For instance, a study comparing the influence of students' perceptions of teacher support, student–student support, and opportunities for autonomy in the classroom on socioemotional adjustment between Chinese and American adolescents found students' perceptions of all three dimensions to be positively associated with adolescents' self-esteem, and negatively related to depressive symptoms for both samples (Jia et al., 2009). Research on school and classroom quality in South America finds ties between the teaching environment, diversity climate, and violence prevalence, and students' overall wellbeing, sense of belonging and engagement, and school adjustment (Preiss et al., 2015). Luque González and colleagues (2022) found that positive perceptions of teacher–student relations, student–student relations, liking of school, and fairness of school rules positively relate with emotional intelligence (emotional attention, clarity of feelings, and mood repair) across different European countries (Spain, Norway, and Poland; Luque González et al., 2022).

A positive school climate may even attenuate the adverse effects of low family socioeconomic status on students' social and emotional development. For instance, using SSES 2019 data from China, Shi and colleagues (2023) found that socioemotional aspects of the school climate (namely, school SEL evaluation, school SEL promotion, and school SEL training) mitigate the negative impact of low socioeconomic status on students' collaboration-, task performance-, and emotional regulation-domain skills (Shi et al., 2023). Furthermore, interventions aimed at improving classroom quality and interpersonal relationships at school show positive impacts on students' SEL. A meta-analysis by Korpershoek

and colleagues (Korpershoek et al., 2016) shows that interventions targeting teachers' behavior, students' behavior, students' social-emotional development, and teacher–student relationships showed effects on students' socioemotional outcomes.

Research has been offering evidence that certain school characteristics—particularly those related to interpersonal relationships, school belonging, and processes taking place inside the classroom—may more directly support students' social and emotional development (i.e., play a more proximal role); whereas other school climate dimensions may be more distal. However, previous research is unclear as to what specific school climate dimensions may matter more for specific social and emotional skills.

Proximal dimensions of school climate and students' SEL

Positive relationships with friends and classmates at school are primordial to student wellbeing and adjusted development (Long et al., 2021). Students' perceptions of a cooperative school climate relate to more positive overall social and emotional skills, particularly for underprivileged students (Wang et al., 2022), whereas peer support, and feeling connected and safe at school stand as strong protective predictors of student wellbeing (Lester & Cross, 2015).

Studies have shown this association between peer relationships and student outcomes, such as improved life satisfaction (Tepordei et al., 2023) and overall mental health (Long et al., 2021), decreased depressive symptoms (Adedeji et al., 2022), better academic achievement (Yaoyao, 2021), and higher school connectedness and belonging (Gowing, 2019). Inversely, negative relations with peers, such as bullying victimization experiences, are related to lower core SEL competencies (namely, social awareness, relationship skills, and self-management; Yang et al., 2020) and overall poorer mental health (Konishi et al., 2018).

Positive relationships between students and their teachers are also essential to students' sense of wellbeing and adjustment, and a key facilitator of student learning (Al Nassari et al., 2014), as well as of teacher job satisfaction, sense of effectiveness (Zee et al., 2016), and wellbeing (Bottiani et al., 2019; McLean & Connor, 2015). For instance, higher perceived relationship quality with teachers predicted lower child-reported depressive symptoms (Rucinski et al., 2018), and increased students' prosocial behavior (Longobardi et al., 2021). Also, when students perceive greater social and emotional support by their teachers, they are more likely to report higher levels of their own social and emotional competence (Collie, 2022).

Distal dimensions of school climate and students' SEL

Conversely, it may also be true that other school climate dimensions, such as organizational characteristics, structural indicators, or individual teacher-related processes, indirectly relate to students' SEL. For instance, when teachers perceive a more positive overall school climate (Fang & Qi, 2023), they also report a higher sense of job satisfaction and self-efficacy, which in turn increases classroom management quality and relationships with students, improving student SEL. Also, headteachers' leadership style largely influences school climate, which in turn relates to students' socioemotional development (Oyetunji, 2009), and better school infrastructure and resources impact student learning and

achievement (Hanushek & Woessmann, 2017; Yang & Lee, 2022), which are an outcome of social and emotional skills.

For instance, students' perceptions of teacher leadership, helpful, and understanding behaviors are positively related to their SEL skills (Şïmşek & Mutlu, 2021). Additionally, classrooms composed of a majority of high-risk children in terms of social and behavioral skills are more likely to have lower levels of emotional support, classroom organization, and instructional support (Sutton et al., 2021), showing how students' socioemotional characteristics also influence teacher practices inside the classroom.

As for instructional practices, a review by Huang and Lajoie (2023) makes the case for social-emotional interactions positively relating to collaborative learning, but the authors also highlight that these findings are often mixed. Additionally, "teachers who increase test performance are not necessarily the same as those who help students improve their social-emotional skills" (Loeb et al., 2018, p. 2). In fact, Jackson (2018) found larger teacher effects on non-cognitive skills than on test scores, which largely predicted high-school completion and later university attendance (Jackson, 2018). This suggests that different teaching practices (i.e., more focused on relationships versus on instruction) may relate differently to student outcomes.

The way teachers perceive leadership, interpersonal relations, and organization at their school dictates how they experience and navigate daily school life, ultimately transpiring it to their students. For instance, teachers' work engagement and sense of community relates positively with children's social, emotional and behavioral functioning in early childhood (Bostic et al., 2023). Implementation research also shows that the impact of SEL interventions on student outcomes is larger in schools with lower levels of leadership, accountability, and safety (as perceived by teachers) at pre-test, i.e., where there was greater room for improvement (McCormick et al., 2015), and that teachers' perceptions of good socioemotional leadership from their school administrations lead to higher implementation quality, increasing impacts on students' SEL (Li et al., 2023).

SEL practices

The investment on research and implementation of school-based SEL interventions has shown evidence of impacts on an array of student outcomes, such as academic achievement (Corcoran et al., 2018), overall mental health and wellbeing, and decreased risk behaviors (Sklad et al., 2012), and the effective development of social and emotional skills (Cipriano et al., 2023; Durlak et al., 2022), but also for teachers, such as an increase in teachers' social and emotional competence and wellbeing, and decreased psychological distress (Oliveira et al., 2021), as well as in classroom quality and teacher-student relationships (Korpershoek et al., 2016), and the wider school community, positively impacting school climate, and the quality of school–family relationships (Cipriano et al., 2023). SEL interventions have also been found to be more effective when implemented by teachers (as opposed to staff external to the school; Al-Jbouri et al., 2023), as well as when taking a systemic and whole-school approach (Goldberg et al., 2019). Research has been recommending the ultimate aim of embedding social and emotional learning in schools' curriculum (Cefai et al., 2018), since SEL practices at the classroom level have proven their efficacy (Jomaa et al., 2023; Korpershoek et al., 2016).

However, despite the reported evidence on how different aspects of school climate relate to students' social and emotional development, the current gap in the literature is twofold. First, there is little research on what specific characteristics of school climate relate to

which social and emotional skills (Bosacki et al., 2023). Second, there is a lack of clarity in the literature on how these two constructs relate conceptually, with SEL being sometimes included as a dimension of school climate, or with school climate being framed as either a dimension or an outcome of social and emotional learning. In this study, we argue that school climate dimensions related to interpersonal relationships and to teaching practices directly affect students' social and emotional skills.

The current study

Taking advantage of the rich contextual description of educational settings by both students and teachers, as well as of the comprehensive evaluation of children's social and emotional skills provided by data from the OECD's Study on Social and Emotional Skills (2021), the present study aims to understand the relationship between the school climate dimensions of both interpersonal relationships and teaching practices, and students' social and emotional skills, through a structural equation modeling approach, by conducting a secondary analysis of data from the 10-year-old Sintra sample of the SSES 2019.

Specifically, we aim to address the question "Which school climate dimensions relate to which social and emotional skills?" We hypothesize that both school climate dimensions of *interpersonal relations* and *teaching practices* relate positively with overall social and emotional skills, and we particularly expect the following findings:

(a) a positive effect of peer relationships, teacher-student relationships, and overall school relationships on all social and emotional skills, expecting larger effects on skills from the *emotional regulation*, *engaging with others*, and *collaboration* domains;
(b) a negative effect of bullying experiences on all social and emotional skills, expecting larger effects on skills from the *engaging with others* and *emotional regulation* domains;
(c) a positive effect of teacher pedagogies, and collaborative and active teaching practices on skills from the *collaboration*, *open-mindedness*, and *task performance* domains;
(d) effects of the *Interpersonal relationships* domain to be larger than those of the *teaching practices* domain.

Figure 1 illustrates how the structural model hypothesized in this study was developed and how the diagram with SEM results should be interpreted. School climate latent variables are the exogenous variables, and social and emotional skills latent variables are the endogenous variables in our model. When interpreting the diagram with results of the structural model, bold arrows indicate significant positive effects, and thinner arrows indicate significant negative effects.

Methods

Sample

We used data from the OECD Study on Social and Emotional Skills in 2019 (SSES; OECD, 2021). The SSES was administered to over 60 000 participants of 10 and 15 years of age in 10 cities around the world, collecting data on 15 different social and emotional skills, as well as on sociodemographic, family, school, and community contextual characteristics,

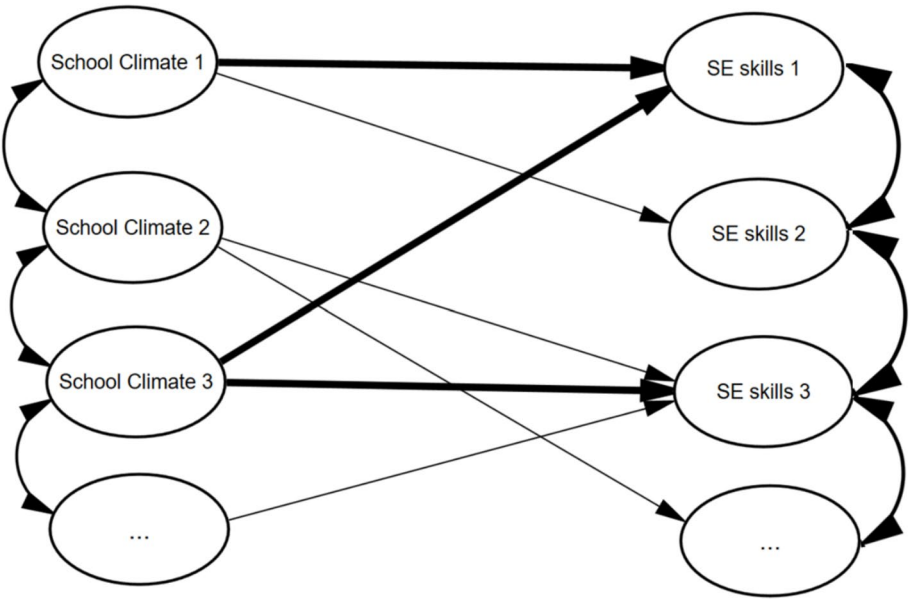


Fig. 1 Proposed structural associations between school climate dimensions and SE skills, respecting correlations within domains

with data on students' skills being reported by students, families, and teachers. Portugal was represented in this study by the Municipality of Sintra, contributing with nearly 4000 participants. In this paper, we included data from the SSES 2019 younger cohort only (i.e., 10-year-old students). Data was collected by the OECD, and made publicly available on their website. We used these clean databases, downloaded from the OECD's SSES directory, for the purpose of our study.

Student sample

The study sample of students consists of 2242 ten-year-old students attending school in the municipality of Sintra between September and December of 2019.

Students' mean age was 10.85 years old (SD = 0.29), with 51.6% being female. Students attended between the second and the sixth grades of the Portuguese educational system ($M = 5.30$, SD = 0.58), with the majority attending fifth grade (59.55%). Over 4% of students in this cohort were considered of special educational needs. The majority (88.1%) was born in Portugal, but only two-thirds of parents were so (66.5% of mothers and 67% of fathers). Most students spoke Portuguese at home (91.6%; Table 1).

The Portuguese educational system comprises 12 years of compulsory schooling, typically attended by students between the ages of six and 18. The first 4 years (first to fourth grades) correspond to the first cycle of basic education (primary education), followed by the second cycle (fifth and sixth grades) and the third cycle (seventh to ninth grades). The final stage (tenth to twelfth grades) constitutes secondary education (or high school). Accordingly, students aged 10 years old are most commonly enrolled in the fourth or fifth grade. However, some students may have repeated one or more school years, which

Table 1 Students' sociodemographic characteristics

	N	*M*	SD	Min	Max
Age	2242	10.85	0.29	10.25	11.42
Grade	2242	5.30	0.58	2	6
ISEI[a] of Mother	1929	38.98	17.67	10	89
ISEI of Father	1861	41.70	15.94	10	89
	N	%			
Second grade	1	0.05			
Third grade	12	0.54			
Fourth grade	99	4.42			
Fifth grade	1335	59.55			
Sixth grade	795	35.5			
Female	1156	51.6			
Male	1040	46.4			
Other	11	0.5			
Special educational needs	95	4.2			
Student born in Portugal	1874	88.1			
Mother born in Portugal	1410	66.5			
Father born in Portugal	1405	67.0			
Speaks Portuguese at home	1974	91.6			

[a]International Socio-Economic Index of occupational status; Ganzeboom et al., 1992

accounts for the presence of second and third graders in our sample. Additionally, students who have not yet turned 11 years at the beginning of the academic year may still be 10 years old during early sixth grade, which explains the inclusion of some sixth grader students in our sample. This also means some students have already transitioned from the first to the second cycle, while others have not. The vast majority of our sample (95.05%), however, attended the second cycle of schooling (i.e., fifth or sixth grade).

Teacher sample

The study sample of teachers consists of 364 teachers working at a school in the municipality of Sintra between September and December of 2019.

Most (82.5%) were female, with a mean age of 49.01 years (SD = 8.833). They had an average of 23.44 years of teaching experience (SD = 9.779), having spent around 9.30 years (SD = 8.832) at their current school. Only 5.8% of teachers taught at more than one school, and the majority (95.6%) taught full-time. Most teachers were highly qualified, with 86.9% holding a master's degree (Table 2).

School sample

Data for the 10-year-old student sample was collected in 52 schools, in which three were private (with the remainder being public). Schools had an average of 825 students (SD = 652.63), and 74 teachers (SD = 64.35), with an average student–teacher ratio

Table 2 Teachers' sociodemographic characteristics

		N	*M*	SD	Min	Max
Age		361	49.01	8.833	28	68
Years teaching at this school		353	9.30	8.832	0	38
Years as a teacher in total		353	23.44	9.779	0	44
Years in other education roles (apart from teaching)		333	6.47	10.331	0	44
		N	%			
Gender	Female	297	82.5			
	Male	60	16.7			
Teaching at another school		21	5.8			
Teaching full time		344	95.6			
Level of formal education	Below upper secondary education	2	0.6			
	Upper secondary education	1	0.3			
	Bachelor's degree (or equivalent)	42	11.7			
	Master's degree (or equivalent)	312	86.9			
	Doctorate	2	0.6			
Initial teaching qualifications	Standard programme at a post-secondary institution	212	69.3			
	In-service programme	83	27.1			
	Work-based programme	7	2.3			
	Training in a field other than teaching	3	1.0			
Subjects taught	Reading, writing and literature	79	24.5			
	Mathematics	66	20.6			
	Science	53	16.7			
	Social studies	40	12.6			
	Modern foreign languages	39	12.3			
	Ancient Greek and/or Latin	1	0.3			
	Technology	29	9.2			
	Arts	63	19.4			
	Physical education	33	10.5			
	Religion and/or ethics	7	2.3			
	Practical and vocational skills	9	2.9			
	Other	96	69.0			

of 13.38 (SD = 5.16). Most schools (54.2%) are located in a town (i.e., with 15, 000 to 100,000 inhabitants); 37.5% of schools reported having 26–50% of students from socioeconomically disadvantaged homes, and 25% of schools reported having 11–25% of students from an immigrant background (Table 3).

Measures

The *Survey on Social and Emotional Skills (SSES) – Student form* (OECD, 2021) is a self-report instrument composed of 120 items, answered on a scale of 1 (*totally disagree*) to 5 (*totally agree*), which allows the assessment of a set of 15 social and emotional skills

Table 3 School characteristics

		N	*M*	SD	Min	Max
Total number of students		40	825.35	652.63	175	2800
Total number of teachers		40	74.3	64.35	8	285
Student–teacher ratio		38	13.38	5.16	2.17	29.38
Funding by government (%)		45	83.88	25.32	0	100
Funding by parents (%)		44	11.23	25.74	0	100
School enrolment—boys		40	410.35	309.22	77	1144
School enrolment—girls		40	415	357.03	87	1800
		N	%			
Public school		49	94.2			
Private school		3	5.8			
School location	Village or rural area	2	4.2			
	Small town	15	31.3			
	Town	26	54.2			
	City	2	4.2			
% of students from socioeconomically disadvantaged homes	Less than 5%	3	6.3			
	5–10%	4	8.3			
	11–25%	6	12.5			
	26–50%	18	37.5			
	More than 50%	3	6.3			
% of students from immigrant background	Less than 5%	8	16.7			
	5–10%	7	14.6			
	11–25%	12	25.0			
	26–50%	5	10.4			
	More than 50%	1	2.1			

by child or youth participants. It theoretically frames the targeted skills in a five-dimension structure similar to that of the Big Five model of personality. However, also following recent trends in the literature, the OECD approaches these skills as being malleable, learnable, and context dependent, as opposed to fixed traits of personality (Kankaraš & Suarez-Alvarez, 2019). This Big Five structure aims to provide a "general outline of how these skills are organized" (Chernyshenko et al., 2018, p. 9), but each individual skill should still be interpreted and measured separately.

Each of the 15 subscales is composed of eight items; the subscales are *assertiveness* ("I enjoy leading others"), *cooperation* ("I get along well with others"), *creativity* ("I have a good imagination"), *curiosity* ("I like learning new things"), *emotional control* ("I stay calm even in tense situations"), *empathy* ("I know how to comfort others"), *energy* ("I am full of energy"), *optimism* ("I look at the bright side of life"), *persistence/perseverance* ("I make sure that I finish tasks"), *resilience/stress resistance* ("I am relaxed and handle stress well"), *responsibility* ("I am a responsible person"), *self-control* ("I stop to think before acting"), *sociability* ("I make friends easily"), *tolerance* ("I like hearing about other cultures and religions"), and *trust* ("I believe most people are kind").

Data from the global sample of SSES main study by OECD (2021) indicates Cronbach's alpha's internal consistency levels between 0.71 (*empathy*) and 0.85 (*assertiveness*).

With the dissemination of the study's results by OECD, and the subsequent availability of the instrument, several educational and community interventions promoting children and youth's social and emotional skills across Portugal had the opportunity to administer the SSES to evaluate the impact of their interventions.[1] A study by Castro et al. (2023) tested the validity of the SSES – Child/Youth form with this nationally representative community sample, corroborating the instruments good psychometric properties and overall usefulness for educational and community practitioners and researchers: internal consistency levels ranged from 0.697 (*empathy*) to 0.903 (*persistence/perseverance*), with the total scale showing an excellent level of internal consistency ($a = 0.951$; Castro et al., 2023).

For the purpose of this study, a preliminary exploratory factor analysis (EFA) was conducted to explore the factor structure of social and emotional skills items for 10-year-old students. Table 4 summarily presents the final structure of 12 components [KMO = 0.947; Bartlett, χ^2 (7140) = 76,733.113, $p < .001$, accounting for 49.22% of total variance], and the corresponding load of the final 83 items to its main component, which were named as follows: *emotional control*, *cooperation*, *leadership*, *task persistence*, *responsibility*, *tolerance and curiosity*, *trust in others*, *resilience*, *optimism*, *creativity*, *energy*, and *sociability*.

The *Contextual Questionnaire – Student form* includes a total of 170 items, organized as follows: 15 items with anchoring vignettes (e.g., "How much do you agree that each of the following students is a kind person?"); 43 items addressing sociodemographic information; 11 items addressing physical and psychological wellbeing, overall Life satisfaction, and perceptions of safety; two items regarding future educational level and job expectations; five items asking how informed the student is on several current societal issues; 45 items addressing quality of relationships with others (parents, teachers, friends, classmates); 12 items regarding how the student spends their free time; six items regarding sense of school belonging; four items about perceptions of school cooperative and competitive climate between students; six items addressing bullying experiences at school; three items on student–teacher relationships; three items about experiencing anxiety when taking a test; five items about engagement in extracurricular activities; three items on growth mindset; and seven items of cognitive assessment. For the purpose of this study, we used a total of 18 items, addressing aspects such as relationships with peers and teachers, sense of school belonging, perceptions of school climate, and bullying experiences.

The *Contextual Questionnaire – Teacher form* includes a total of 120 items, organized as follows: 24 items regarding sociodemographic characteristics and formal teacher training specificities; 14 items on active learning pedagogies and collaborative practices adopted in the classroom (e.g., "How often do you assign the following activities to your students?: Preparing and giving a talk/presentation together"); seven items on teacher pedagogies (e.g., "In your teaching, to what extent can you do the following?: Help my students to value learning"); nine items on student assessment and grade assignment; 15 items on the promotion and evaluation practices of social and emotional skills at the school; 14 items regarding the extent to which the teacher considers student learning hindered by different school characteristics; 10 items addressing perceptions of overall school organizational and relational climate; eight items regarding perceptions of bullying in the school community; one item on job satisfaction; three items on growth mindset; and lastly, 15 items with anchoring vignettes (e.g., "How much do you agree that each of the following students is a hard-working person?"). For the purpose of this study, we used a total of 43

[1] This took place within the scope of the Gulbenkian Academies for Knowledge, an initiative funded by the Calouste Gulbenkian Foundation (https://gulbenkian.pt/academias).

Table 4 Summary of factorial structure for the Social and Emotional Skills scale

Component	Items								
1 Emotional control $\alpha = 0.799$	I know how to control my anger	I can control my actions	I get mad easily*	I am not easily upset	I keep my emotions under control	I am relaxed and handle stress well	I often feel angry*		
2 Cooperation $\alpha = 0.833$	I am reliable and can always be counted on	I like to help others	I am helpful and unselfish with others	I am always willing to help my classmates	It is important to me that my friends are okay	I treat others with respect	I like to be with my friends	I work well with other people	I like to spend my free time with others
3 Leadership $\alpha = 0.860$	I like to be the leader of a group	I like to be a leader in my class	I am dominant, and act as a leader	I enjoy leading others	I want to be in charge	I am a leader	I dislike leading a team*		
4 Task persistence $\alpha = 0.800$	I finish what I start	I make sure that I finish tasks	I keep working on a task until it is finished	I hate leaving tasks unfinished	I like to make sure there are no mistakes	I am a responsible person	I avoid mistakes by working carefully	I finish things despite difficulties in the way	I sometimes find a solution other people don't see
5 Responsibility $\alpha = 0.718$	I forget to do work I was asked to do*	I often forget to do things I promised*	I rarely ask others how they are feeling*	I stop when work becomes too difficult*	I avoid responsibilities*	I often rush into action without thinking*	I say the first thing that comes to my mind*	I don't like learning*	
6 Tolerance and curiosity $\alpha = 0.793$	I like hearing about other cultures and religions	I love to learn about other countries and cultures	I ask questions about other cultures	I feel comfortable in new cultural environments	I learn a lot from people with differing beliefs	I want to travel to other countries	I am eager to learn	I like to ask questions	I like learning new things
7 Trust in others $\alpha = 0.797$	I think most of my classmates keep their promises	I believe that most people are honest	I believe that my friends can keep my secrets	I trust others	I believe that my friends will never betray me	I believe most people are kind	I distrust people*	I believe that other people will help me	
8 Resilience $\alpha = 0.738$	I am afraid of many things*	I get scared easily*	I panic easily*	I often feel nervous*	I stay calm even in tense situations	I am often worried about something*	I often feel sad*		

Table 4 (continued)

Component	Items					
9 Optimism $\alpha = 0.740$	I enjoy life	I am a happy person	I look at the bright side of life	I am always positive about the future	I wake up happy almost every day	
10 Creativity $\alpha = 0.700$	I have a good imagination	I have difficulty imagining things*	I have little creativity*	I am original, come up with new ideas	I like to create things	
11 Energy $\alpha = 0.663$	I have less energy than my class-mates*	I am full of energy	I maintain high energy throughout the day	I like sports where I can run	I am less active than other people*	I tire out quickly*
12 Sociability $\alpha = 0.692$	I have difficul-ties making friends*	I make friends easily	I have many friends			
13 $\alpha = 0.554$	I predict the needs of others	I understand what others want				
14 $\alpha = 0.500$	I have unpredict-able emotions and moods*	I change my mood a lot*	I am slow to start in the morning*			

Components 13 and 14 were excluded from the final structure due to low internal consistency

*Negatively worded items have been reversely scored

items, addressing aspects such as teaching practices in the classroom, pedagogical practices, relationships with students, student evaluation practices, social and emotional skills policies at the school, and overall school-level relationships (teacher-student, and between teachers and/or staff).

For the purpose of this study, a preliminary exploratory factor analysis (EFA) was conducted to explore the factor structure of items addressing school climate (particularly regarding relational aspects, and teaching practices) for 10-year-old students. Table 5 summarily presents the final structure of nine components [KMO = 0.750; Bartlett, χ^2 (1830) = 26,299.431, $p < .001$, accounting for 56.61% of total variance], and the corresponding load of the final 47 items to its main component, which were named as follows: *teacher pedagogies*, *overall school-level relationships*, *relationships with peers*, *student evaluation practices*, *bullying experiences*, *collaborative classroom practices*, *active learning pedagogies*, *social and emotional skills promotion in the classroom*, and *relationships with teachers.*

Ethics

This paper employed only secondary analysis of data directly collected by the OECD with students from Sintra, Portugal, as part of the first edition of the Study on Social and Emotional Skills (OECD, 2021). The OECD employed rigorous data collection, management, and ethical procedures, which can be found in detail in the final report and technical report of the study. All materials pertaining to the study, as well as the databases used in this research, are publicly available online.

Data analysis

The factors drawn from the exploratory factor analyses for both School Climate and Social and Emotional Skills dimensions were used as constructs in a structural equation model (SEM), and its items were used as observed variables. For all tested models, the used estimator was the weighted least square mean and variance adjusted (WLSMV). The chi-square test was used for model fit, and other indices used for the goodness-of-fit test included the comparative fit index (CFI), the Tucker–Lewis Index (TLI), the root-mean-square error of approximation (RMSEA), and the weighted root-mean square residual (WRMR). For the CFI and TLI indices, values over 0.90 represent an acceptable fit, with a good fit being over 0.95 (Hu & Bentler, 1999), whereas for RMSEA values are considered acceptable if below 0.06 (Hu & Bentler, 1999). All SEM analyses were conducted using Mplus 7.

We tested the measurement models for both School Climate and Social and Emotional Skills. For both, we analyzed the standardized estimates for all observed variables and excluded those with low estimates (i.e., < 0.5), as long as model fit improved. This resulted in the exclusion of three items from the School Climate measurement model, and nine items from the social and emotional (SE) skills measurement model (including all items in the *energy* construct, which was fully excluded). Model fit for both measurement models was still low for CFI and TLI indices (school climate (χ^2 (1484) = 11,345.190, CFI = 0.755, TLI = 0.737; social and emotional skills (χ^2 (3254) = 15,816.382, CFI = 0.787, TLI = 0.778), but acceptable for RMSEA (school climate RMSEA = 0.061; social and emotional skills RMSEA = 0.042). Despite the low fit for CFI and TLI indices, but acceptable for RMSEA, results were coherent with what was obtained in each EFA, and thus, both

models were kept. For the structural model, we used all school climate and social and emotional skills at the same level, and ignored the two-level measurement structure. Online resource 1, Supplementary Table 3 presents the detailed item loadings for both measurement models.

The structural model was defined with all nine school climate constructs as latent independent variables, and all 11 social and emotional skills construct as latent dependent variables. Students' gender (i.e., being female), school grade, mother education, and socioeconomic status were added as control variables, and data was clustered by school. We correlated exogenous variables between each other, and endogenous variables between each other. Results on correlation estimates can be found in Online resource 1, Supplementary Table 4.

Figure 1 exemplifies the tested structural model, whereas Fig. 2 presents model results. Due to the complexity of the model, and for improved clarity in reading and interpreting results, Fig. 2 illustrates all significant paths found in the structural model, with bold arrows showing significant positive paths, and thinner arrows showing significant negative paths. Table 6 presents all individual structural paths estimates and their corresponding level of significance.

Results

The estimated structural model presented good fit (χ^2 (6987) = 8662.383, RMSEA = 0.010, CFI = 0.896, TLI = 0.890, WRMR = 1.750), with all indices of goodness of fit ranging from acceptable to good.

Direct effects among latent variables demonstrated that *relationships with peers* have a positive association to all social and emotional skills. The effects are larger for *sociability* ($\beta = 0.724$, $p < 0.001$), *trust in others* ($\beta = 0.645$, $p < 0.001$), *optimism* ($\beta = 0.529$, $p < 0.001$), and *cooperation* ($\beta = 0.521$, $p < 0.001$), and small for *resilience* ($\beta = 0.276$, $p < 0.001$), *leadership* ($\beta = 0.176$, $p < 0.001$), and *responsibility* ($\beta = 0.077$, $p = 0.046$), although all statistically significant.

Relationships with teachers have positive associations, although small, to most social and emotional skills: *responsibility* ($\beta = 0.223$, $p < 0.001$), *tolerance and curiosity* ($\beta = 0.165$, $p < 0.001$), *task persistence* ($\beta = 0.149$, $p < 0.001$), *emotional control* ($\beta = 0.097$, $p < 0.001$), *cooperation* ($\beta = 0.090$, $p = 0.002$), and *optimism* ($\beta = 0.068$, $p = 0.016$), and a small negative relation to *sociability* ($\beta = -0.095$, $p < 0.001$).

Bullying experiences have a negative effect on most skills, with this effect being moderate for *responsibility* ($\beta = -0.343$, $p < 0.001$), and small for the remaining skills, ranging between −0.288 for *resilience* ($p < 0.001$) and −0.077 for *cooperation* ($p = 0.007$). A small but significant positive association of bullying experiences was found to *leadership* ($\beta = 0.174$, $p < 0.001$).

As for *teacher pedagogies*, all significant paths to social and emotional skills are negative but small, specifically on *emotional control* ($\beta = -0.093$, $p = 0.018$), *sociability* ($\beta = -0.087$, $p = 0.021$), and *resilience* ($\beta = -0.072$, $p = 0.006$). Partially significant, small negative associations were also found for *optimism* ($\beta = -0.065$, $p = 0.055$) and *cooperation* ($\beta = -0.064$, $p = 0.055$).

The same is true for *cooperative classroom practices*, which negatively relate to *Emotional control*, with a small but significant effect size ($\beta = -0.091$, $p = 0.003$), and *tolerance and curiosity*, with a small and partially significant effect ($\beta = -0.074$,

Table 5 Summary of final factorial structure for school climate indicators

Component	Items						
1. Teacher pedagogies $\alpha = 0.878$	Motivate students with low interest school work	Get students to believe they can do well	Help students think critically	Help students to value learning	Get students to follow classroom rules	Make clear expectations about student behavior	Control disruptive classroom behavior
2. Overall school-level relationships $\alpha = 0.846$	School leadership—teachers get along well	School culture—mutual support	School issue—culture of shared responsibility	Teachers and students get on well	Teachers believe student wellbeing is important	Teachers are interested in what students have to say	School provide extra assistance to students
3. Relationships with peers $\alpha = 0.757$	At school—students like me	At school—make friends easily	School climate: Students cooperating with each other	School climate: Students value cooperation	At school—belong	Classmates—friendly to you	How close to—Your classmates
4. Student evaluation practices $\alpha = 0.801$	Consider student achievement level	Consider student improvement in performance since beginning of term	Consider student participation	Recognize student effort	Observe students and provide feedback		
5. Bullying experiences $\alpha = 0.800$	I was threatened	I got hit or pushed around	Students took away or destroyed my things	Students made fun of me			
6. Collaborative classroom practices $\alpha = 0.685$	Students work in groups based upon their abilities	Students work on projects at least one week to complete	Let students judge their own progress	Students hold a debate and argue point of view			
7. Active learning pedagogies $\alpha = 0.681$	How often: Students discuss textbook materials	How often: Discuss student questions	How often: Class discussion in which I participate	How often: Students present to class	Have student answer questions in class		
8. SES promotion at school $\alpha = 0.675$	Special classes aimed specifically at developing skills	Separate classes specific to skill development	Request to promote the development of students' social and emotional skills	Include the development of social and emotional skills as the objective			

Table 5 (continued)

Component	Items		
9. Relationship with teachers $\alpha = 0.784$	Teachers—got along well	Teachers—treated me fairly	Teachers—interested in my wellbeing

$p = 0.051$); as well as for the *promotion of social and emotional skills in class*, which partially negatively relates to students' *emotional control* ($\beta = -0.063$, $p = 0.089$) and *sociability* ($\beta = -0.059$, $p = 0.073$).

Active learning pedagogies show small positive associations with *Resilience* ($\beta = 0.110$, $p = 0.001$) and *emotional control* ($\beta = 0.063$, $p = 0.075$).

Overall, *school-level relationships* and *student evaluation practices* do not seem to directly relate to social and emotional skills.

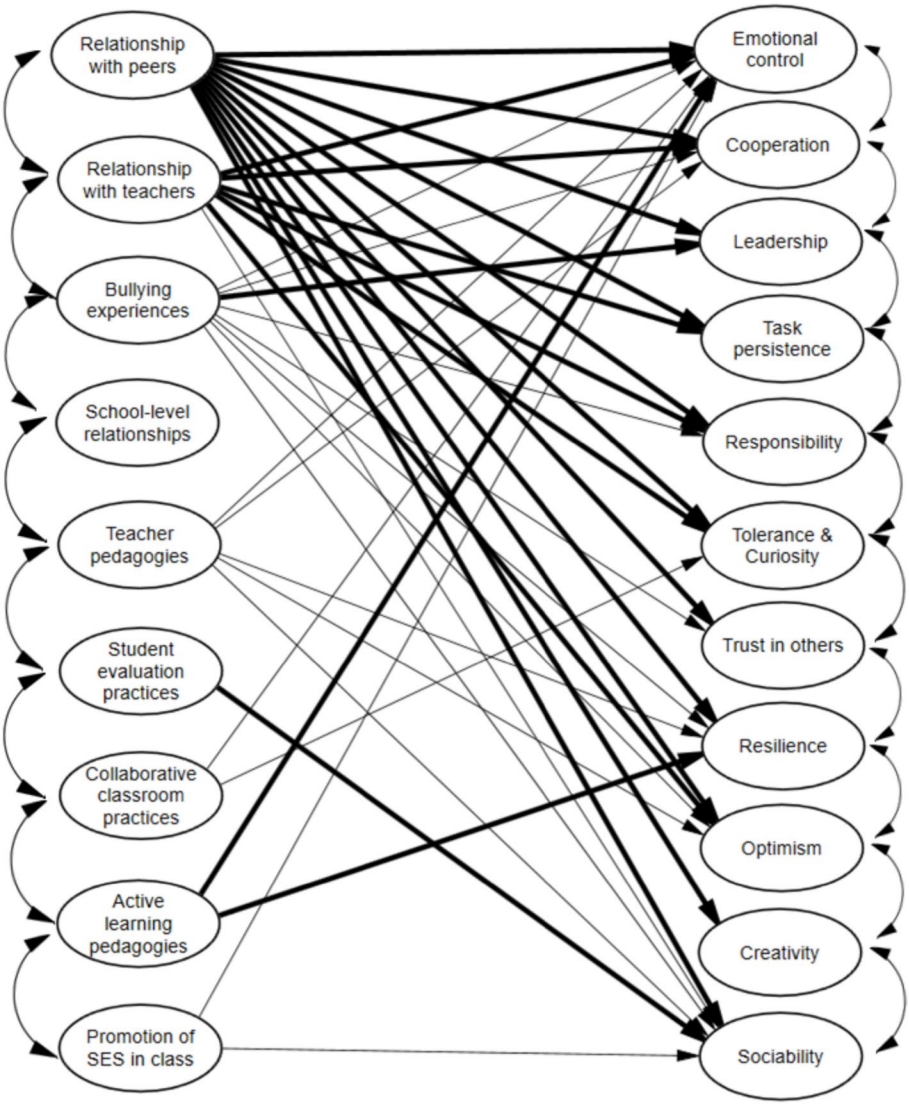
To control for the role of sociodemographic variables, social and emotions skills constructs were regressed onto the variables *gender* (i.e., being female), *school grade*, *maternal education*, and *socioeconomic status*. Results show that being female relates negatively with *cooperation* ($\beta = -0.206$, $p < 0.001$), *task persistence* ($\beta = -0.116$, $p < 0.001$), *creativity* ($\beta = -0.112$, $p < 0.001$), *tolerance and curiosity* ($\beta = -0.112$, $p < 0.001$), and *trust in others* ($\beta = -0.042$, $p = 0.054$), and positively with *resilience* ($\beta = 0.219$, $p < 0.001$). Students' grade relates negatively with *leadership* ($\beta = -0.121$, $p < 0.001$), *task persistence* ($\beta = -0.085$, $p = 0.001$), *tolerance and curiosity* ($\beta = -0.080$, $p = 0.001$), *creativity* ($\beta = -0.073$, $p = 0.001$), and *emotional control* ($\beta = -0.065$, $p = 0.015$). Maternal educational level partially negatively relates only with *creativity* ($\beta = -0.058$, $p = 0.055$). Lastly, students' socioeconomic status relates positively with *creativity* ($\beta = 0.164$, $p < 0.001$), *task persistence* ($\beta = 0.126$, $p < 0.001$), *responsibility* ($\beta = 0.125$, $p < 0.001$), and *leadership* ($\beta = 0.080$, $p = 0.018$). All effect sizes for the control variables are small.

Correlations between school climate latent variables showed half were significant, with *relationships with peers* and *teacher pedagogies* correlating positively with most other school climate dimensions; correlations were small to moderate in size (between $r = 0.462$ and $r = -0.191$). As for social and emotional skills, the vast majority correlated positively and significantly with each other; most correlations were small to moderate in size, but some are considered large (ranging between $r = 0.664$ and $r = -0.157$). See Online resource 1, Supplementary Table 4 for the full correlation matrix.

Discussion

This study aimed to understand how specific school climate dimensions—particularly in the domains of interpersonal relationships and teaching practices—related to different social and emotional skills in students. It did so through a structural equation modeling approach, which allowed us to parse out the contribution of each dimension, while also allowing for the natural overlap among dimensions and skills.

Model results showed good fit to the data, indicating this seems to be an adequate depiction of how these dimensions interact for 10-year-old students. Our findings partially support our hypothesis. Specifically, hypothesis (a) was fully confirmed for effects of *peer relationships*, partly confirmed for effects of *teacher–student relationships*, and not confirmed for effects of *overall school-level relationships*; hypothesis (b) on the effect of *bullying experiences* was also mostly confirmed, except for unexpected findings of a positive effect on *leadership*, and a larger negative effect on *responsibility*; hypothesis (c) was overall not confirmed, since mixed effects were found of *teacher pedagogies*, and *collaborative* and *active teaching practices*; and hypothesis (d) was confirmed and even surpassed, since we found not only larger but also more frequent effects of interpersonal relationships than teaching practices on students' social and emotional skills.



Model fit: $\chi 2(6987)=8662.383$, RMSEA=0.010, CFI=0.896, TLI=0.890, WRMR=1.750.

Bold arrows indicate significant positive effects, thin arrows indicate significant negative effects.

Fig. 2 Significant effects of the association between school climate dimensions and social and emotional skills. Model fit: $\chi^2(6987)=8662.383$, RMSEA = 0.010, CFI = 0.896, TLI = 0.890, WRMR = 1.750. Bold arrows indicate significant positive effects; thin arrows indicate significant negative effects

Structural model results confirm our hypothesis that relational aspects of the school climate are of the utmost relevance to students' social and emotional development, more so than other processes taking place inside the classroom, which are more related to teaching and learning practices. This was found to be especially true for relationships with peers which, as hypothesized, were proven to be predictive of every single SEL skill measured,

Table 6 Structural equation model results: individual structural paths estimates for each Social and Emotional Skill regressed onto each School Climate dimension

		Social and Emotional (SE) Skills										
		1	2	3	4	5	6	7	8	9	10	11
School climate	Relationships with peers	.309***	.521***	.176***	.394***	.077**	.425***	.645***	.276***	.529***	.359***	.724***
	Relationship with teachers	.097***	.090**	−.046	.149***	.223***	.165***	−.027	−.051	.068**	.027	−.095***
	Bullying experiences	−.231***	−.077**	.174***	−.037	−.343***	.028	−.103***	−.288***	−.112***	.021	−.108**
	Overall school-level relationships	.032	.054	.017	.036	−.016	.057	.042	−.023	.018	.051	.007
	Teacher Pedagogies	−.093**	−.064*	−.028	−.044	−.011	−.044	.006	−.072**	−.065*	−.008	−.087**
	Student evaluation practices	.019	−.028	−.020	.004	−.014	.000	−.050	−.021	−.008	.012	.063*
	Collaborative classroom practices	−.091**	−.021	.018	−.060	−.041	−.074*	−.017	−.059	.027	−.026	.043
	Active learning pedagogies	.063*	.017	−.019	.047	.036	−.042	.005	.110**	.033	−.040	.044
	Promotion of SE skills in class	−.063*	−.051	.035	−.004	.019	−.012	−.038	−.020	−.027	−.027	−.059*
Control variables	Female	.022	−.206***	.043	−.116***	−.012	−.112***	−.042*	.219***	−.016	−.112***	.006
	Grade	−.065**	−.003	−.121***	−.085**	.015	−.080**	−.034	−.031	−.026	−.073**	.017
	Mother education	.012	.011	−.023	−.041	.032	−.001	−.019	.037	.002	−.058*	.031
	Socioeconomic status	−.018	.028	.080**	.126***	.125***	.038	−.041	.010	.009	.164***	−.001

SE Skills: 1 – Emotional Control, 2 – Cooperation, 3 – Leadership, 4 – Task persistence, 5 – Responsibility, 6 – Tolerance & Curiosity, 7 – Trust in others, 8 – Resilience, 9 – Optimism, 10 – Creativity, 11 – Sociability. Model fit: $\chi 2(6987) = 8662.383$, RMSEA = 0.010, CFI = 0.896, TLI = 0.890, WRMR = 1.750

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Values are standardized β estimates

and more so of those in the domains of *engaging with others* (*sociability*), *collaboration* (*trust in others*, *cooperation*), and *emotional regulation* (*optimism*). This is not surprising since peers take on a more significant role as children grow older (Evans et al., 2018). In the Portuguese schooling system, this relationship may be intensified by the transition from primary school (fourth grade) to middle school (fifth grade), when friends and classmates play a more key role than teachers or other adults (Waters et al., 2014). Indeed, there is a vast body of literature on the importance of positive peer relationships, and how these interact with a variety of individual (skills, well-being, behavior) and environmental (school, family, community, technology) factors, particularly in early adolescence. A systematic review and meta-analysis by Mitic and colleagues (2021) pinpoints social–emotional skills as one of the most relevant factors for positive peer relationships, as well as aspects of the school environment, for early adolescents. Similarly, a qualitative study with early adolescents at the time of school transition shows these students identify socioemotional behaviors (such as kindness, empathic actions, conflict management, communication) as determinants for the development of positive friendships (Krammer et al., 2023). Lastly, evidence from intervention studies (e.g., Orson et al., 2020; Renick & Schaefer, 2025) and systematic reviews of interventions (Pollak et al., 2023) shows how promoting social and emotional skills and positive peer relationships positively affect each other, particularly in early adolescence. In the midst of the transforming period that is adolescence (neurologically, socially and emotionally), the intertwine between socioemotional development and relationships with peers seems to be particularly relevant (Oberle et al., 2010).

Relationships with teachers were also relevant, but their impact was specific, rather than undifferentiated. We found that a positive relationship with teachers more directly and positively affected 10-year-old students' skills in the domains of *task performance* (*responsibility, task persistence*), *emotional regulation* (*emotional control*), and *open-mindedness* (*tolerance and curiosity*). This partly corroborates our hypothesis, as we did not foresee effects on task performance-related skills. However, these findings may be explained by the fact that relationships with teachers are established mostly based on formal interactions, taking place inside the classroom in a teaching and learning exchange (Pianta et al., 2003, 2012). We also found a surprising negative effect of *relationships with teachers* on *sociability*—i.e., students' ability to initiate and maintain social connections with others. This may suggest that students who are best at negotiating relationships with teachers may have more difficulty making (and maintaining) new peer friendships. Despite the majority of prior research pointing to a positive association between student–teacher and student–student relationships (i.e., students who get along well with teachers also tend to have better peer relationships; e.g. Longobardi et al., 2022), some studies report mixed findings. For example, Li and colleagues (2024) found both positive and negative student–teacher relationships related to disliking between peers, consequently affecting students' classroom engagement. More specifically, the effect of negative teacher–student relationships on classroom engagement was larger for students who were less disliked by their peers (Li et al., 2024).

The negative effect of *bullying experiences* on most social and emotional skills is expected, and its adverse effects on a set of student outcomes is well documented (Armitage, 2021; Moore et al., 2017). Previous research has even found significant associations between bullying victimization and three core SEL competencies (social awareness, relationship skills, and self-management; Yang et al., 2020). As hypothesized, *bullying experiences* have a larger negative effect on skills from the domains of *emotional regulation* (*resilience*, *emotional control*, *optimism*), *engaging with others* (*sociability*), and *collaboration* (*trust in others*, *cooperation*). Its largest effect was, however, on *responsibility*,

which we did not predict. This is further evidence of the negative impact of bullying victimization on school engagement and related academic success (Totura et al., 2013). The positive association between bullying experiences and students' leadership is found elsewhere in the literature: Dong and colleagues found that negative leaders tend to more frequently be victims of bullying than positive leaders in early middle school children, suggesting different leadership profiles may explain this interaction (Dong et al., 2023). Our results add evidence to the importance of investing in preventing bullying behaviors and improving peer relationships in school settings (Smith & Low, 2013).

As for *teacher pedagogies*, i.e., how teachers motivate their students and lead them to believe they can do well, its negative effects on students' social and emotional skills seem more relevant in skills related to *Emotional regulation* (*emotional control*, *resilience*, *optimism*), and to interpersonal skills (*cooperation*, *sociability*). There may be several reasons for this finding. First, it may be a result of the mutual support between students' social and emotional skills and school climate variables, in the sense that teachers may invest more in caring for, and motivating their students who lack emotional regulation skills. For instance, previous research has found that higher levels of teachers' care and emotional support relate to students' lower academic persistence and higher feelings of anger (Ferguson et al., 2015). A meta-analysis by Lei and colleagues (2018) also found that higher teacher support relates more strongly to students' negative academic emotions (e.g., anxiety, boredom, anger, hopelessness); on the contrary, the relationship between teacher support and positive academic emotions (e.g., relief, hope, enjoyment, pride) is weak; these findings are more significant for middle school students, when compared to all other age groups (Lei et al., 2018).

Second, because data relies on teacher self-report of their classroom practices, and emphasizes frequency over quality, there may be a gap between what teachers report doing, and the quality of their actual practices. As argued by Dietrich and colleagues (2020), there needs to be further evidence on how different aspects of teacher–student relationships (i.e., focusing more on relational versus instructional aspects) influence student outcomes, including social and emotional (Dietrich et al., 2020). For instance, research by Raave (2024) found that different profiles of teacher–student interactions relate differently to specific students' social and emotional skills: *compliant* and *confrontational* teachers show a negative effect on students' self-control, empathy, trust, cooperation and responsibility, whereas *helpful* and *dissatisfied* teachers positively impact students' responsibility, assertiveness, persistence and self-control.

Teaching practices seemed to be of lesser significance for specific social and emotional skills when compared to more relational aspects of the school climate, as we hypothesized. However, some specific relationships are noteworthy. The frequent use of *collaborative classroom practices* seems to negatively affect students' *emotional control*, *tolerance* and *curiosity*—again, this may be evidence of the bidirectionality of this relationship, in which teachers with students who lack these skills may adopt collaborative practices more often. Previous research shows clear benefits of cooperative learning for academic achievement (e.g., Slavin, 2012), and there is no prior evidence of this negative effect on students' social and emotional skills. In fact, Zagni et al. (2025) found evidence of the impact of a cooperative learning tool on students' social and emotional skills, peer relationships, and overall perception of classroom climate. Future research in the field of teaching and learning should dive deeper into the dynamics of collaborative learning and students' openness and emotional regulation—particularly by looking attentively to the effective quality of these practices in the classroom (implementation, specific instructions, feedback quality), since

there is evidence that low quality cooperative strategies may have detrimental effects on motivation and engagement (e.g., Meyer et al., 2016).

The use of *active learning pedagogies* seemed to have a positive effect on students' *emotional control* and *resilience*. The effects of active learning on academic achievement are well documented in the literature (e.g., Aji & Khan, 2019). Our research provides new evidence of it being particularly beneficial for 10-year-old students' overall emotional regulation, suggesting the need for a deeper look into implementation quality of active learning strategies, and its impact on students' social and emotional competencies.

Results regarding how the promotion of social and emotional skills in the classroom affects students' skills seemed contradictory to prior research. Extensive literature shows that both classroom interventions, and SEL practices integrated in the daily routine of the classroom, have positive effects on students' social and emotional development (Durlak et al., 2022). However, research also states that, in order to be effective, these practices must be intentionalized in a sequential, active, focused, and explicit (S.A.F.E.; Durlak et al., 2010) manner. The present data does not show if that is the case, and we can assume a discrepancy between what teachers report to be the school's standard practice, and the quantity and quality of the SEL practices that indeed take place daily inside different classrooms. Also, descriptive results show that, despite including these skills as an objective in their curricula, not many teachers report having special classes aimed specifically at developing social and emotional skills at their school.

Lastly, the absence of significant relationships between the school climate aspects of *overall school-level relationships* and *student evaluation practices*, and students' social and emotional skills suggest these may be more distal processes that can relate indirectly to students' social and emotional development. Further research is needed on the role these specific school climate characteristics may play.

Limitations and recommendations for research and practice

The present study is not without limitations. First, despite data from multiple informants being an advantage, it relied on self-report by both students and teachers. While data reliability is at question with all self-report measures, in this study, there should be particular care when interpreting teacher practices, since the survey mainly inquires teachers about the frequency with which they implement those practices, and not about how they implement them. It would be useful to look deeper into *how* teachers do it (instead of *how often*) and how that quality relates to social and emotional skills, particularly through observational measures (Leff et al., 2011). This hindrance also calls for a mixed methods approach, which combines students' and teachers' words, or observational data, with quantitative tools, in order to provide a more detailed and rigorous understanding of these relationships (Barata & Yoshikawa, 2014).

Second, the sample included 10-year-old students attending different school grades (between second and sixth grade). This means that, despite the vast majority (over 95%) of students in our sample had already transitioned from primary school (i.e., fifth and sixth graders), others had not (i.e., fourth graders and below); some may even have been retained for at least one school year (i.e., second and third graders). Despite having controlled for school grade in our analysis, this requires caution in interpreting findings. Students may be new to a class or a school, or have known it for over a year; also, characteristics of primary schools and post-primary schools vary substantially, with primary school students, for instance, having the same teacher and classroom throughout the day, and post-primary school students changing teachers with each subject. This means attending different grades

and cycles has evident implications for how students perceive school climate, and such should be taken into account when reflecting on our findings.

Third, these results do not imply causality, since data looks only at associations between these constructs. Causal evidence from intervention studies is needed, as the evidence in favor of school-based SEL interventions is resounding (e.g., Cipriano et al., 2023; Durlak et al., 2022), with proven positive impacts across the world in both individual and contextual variables (Deitz et al., 2021; Fernández-Martín et al., 2021; Agırkan & Ergene, 2022; Kim et al., 2022).

Fourth, taking into account the evidence of the bidirectionality of the relationship between school climate dimensions and students' overall social and emotional skills, this research does not unequivocally state that one predicts the other, since results rely on one data collection point only. Longitudinal studies are needed in order to more clearly address this question.

Fifth, we may pose the possibility that certain competencies (e.g., emotional control) may be either more sensitive or more exposed to the influence of context variables (e.g., quality of relationships). Additionally, research shows these skills do not develop at the same time, nor in a linear manner across the lifespan (e.g., Chernyshenko et al., 2018), meaning some school climate dimensions may be more relevant to certain skills for 10-year-old students, but not for other age groups. Further research in SEL development is needed to corroborate this hypothesis, particularly with longitudinal studies.

Lastly, the SSES survey, despite its valuable effort, does not constitute a thorough and comprehensive school climate measure. There is the need to pair the measurement of students' social and emotional skills with a more comprehensive measure of school climate for middle school, which takes into account the quality of different dimensions of school climate in a more theoretically sound manner (Baumsteiger et al., 2023).

Conclusion

There is a growing trend in education practice to focus on relational education (Hickey & Riddle, 2023), i.e., the awareness that all educational and learning experiences are relational, and there cannot be successful learning and adjusted development in students in a climate that is not set by overall positive relationships and daily interactions. Research on relational education must seek to understand how these relational practices relate to students' social and emotional development. This study adds evidence to this question.

Our results also provide important insights for policy and practice. Interventions to promote social and emotional skills ought to focus on relationships as a priority, since this can be an effective path to the promotion of social and emotional skills, but also because it contributes to improving an array of other school climate dimensions. This can be done through interventions to promote positive relationships between peers and with teachers. As an example, the municipality of Sintra took its participation in SSES 2019 as an opportunity to prompt a data-based initiative in all its schools, encouraging the development, implementation, monitoring, and evaluation of SEL interventions to promote the social and emotional skills of the municipality's children and youth.[2]

These results support schools, local, and national public policy makers in investing more effectively to promote positive school climates, and the overall healthy social and emotional development of their students, by prioritizing the quality of different relationships inside the school.

[2] "ADN Socioemocinal de Sintra 2.0" project; https://educacao.sintra.pt/adn-socioemocional-das-escolas-de-sintra-20/projeto-adn-socioemocional-20

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Data availability This research employs secondary analysis of data from OECD's Study on Social and Emotional Skills 2019 (SSES). All materials pertaining to the SSES 2019, as well as the databases used in this research, are publicly available online.

Declarations

Ethics approval and consent to participate This research was approved by the Ethics Council from Iscte – University Institute of Lisbon (process 18/2024).

Consent for publication Not applicable.

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Current Themes of Research:

Social and emotional skills, school climate, monitoring and evaluation of social and emotional learning interventions in educational and community settings.

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Note: These citations and references have been properly anonymized in the manuscript