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A longitudinal study of school climate: Reciprocal effects with student engagement and burnout

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Abstract

The literature on school climate, albeit vast, is limited by a scarcity of longitudinal research. This two-wave longitudinal study aims to bridge this gap by (a) assessing, over two school years, the changes in students' perceptions of several dimensions of school climate and (b) exploring the reciprocal longitudinal effects of student perceptions of school climate and multiple dimensions of engagement and burnout. The study was conducted with a sample of 243 Italian middle school students (Wave 1: sixth grade, M_{age} = 11.68; Wave 2: seventh grade, M_{age} = 12.64; 51.7% girls). Analyses of variance showed, in the second school year, a decrease in students' satisfaction with various school climate dimensions. With a latent cross-lagged model, better school climate perceptions were found to predict higher emotional engagement and lower symptoms of burned-out exhaustion a year later. The practical implications of these findings are considered in the discussion and conclusion.

KEYWORDS

cross-lagged model, longitudinal, middle school, school burnout, school climate, student engagement

1 | INTRODUCTION

There is vast consensus in the literature on educational psychology that the social and educational environment in which learning takes place is very relevant for its outcomes (Cohen et al., 2009). In this direction, educational research identified in school climate a central feature of students' experiences at school. Indeed, a school climate perceived as characterized by good relational and educational quality has been associated with positive outcomes, such as higher academic achievement and mental health (Aldridge & McChesney, 2018; Kutsyuruba et al., 2015). Intervention on school climate is also considered a viable way to support schools in addressing their weaknesses and building on their strengths (Thapa et al., 2013). However, despite scholars' interest through the years, the prevalent reliance on cross-sectional studies (Wang & Degol, 2016) and the limited attention to the effects of school climate on student outcomes related to attitudes toward learning make the potential of this construct still untapped. This study aims to fill in the main literature gaps with longitudinal research into the reciprocal effects between school climate and two variables related to students' attitudes and quality of involvement in their learning, namely engagement and burnout.

1.1 | School climate

Cohen et al. (2009, p. 182) defined school climate as "the quality and character of school life" which is "based on patterns of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures." This definition emphasizes the complex nature of the construct and its multidimensional nature, as it encompasses several components of individuals' experiences at school, (see Wang & Degol, 2016, for a review). While operationalizations of school climate have varied greatly in the recent literature, some of its core components are the quality of relations among students and between students and teachers, the educational values conveyed in the school community, the sense of being part of and connected with the community, and the perception of fair treatment and discipline (Grazia & Molinari, 2021a).

Results from a vast literature show that school climate is negatively associated with violence and problem behaviors at school (Reaves et al., 2018; Steffgen et al., 2013) and positively associated with students' mental health (Aldridge & McChesney, 2018) and academic achievement (Kutsyuruba et al., 2015). Moreover, there is a consensus on considering school climate as potentially changeable via interventions (Voight & Nation, 2016), and more precisely as a viable data-driven tool to support both good and failing schools in a process of improvement (Thapa et al., 2013). All these contributions indicate school climate as a promising direction of study to better understand the school environment, promote students' and teachers' self-reflections, and eventually foster school change and improvement.

However, besides these important findings, there are still relevant shortcomings in the research literature. Two are the main gaps to be filled. The first concerns the scarcity of longitudinal studies in the field. Indeed, most of the literature on school climate is based on cross-sectional data, with very few studies covering the span of more than one school year (see Grazia & Molinari, 2021a for a review). Longitudinal studies are needed to assess changes in students' perceptions over time and to clarify the direction of associations between school climate and outcome variables. Among the few existing studies that have analyzed changes in student perceptions of school climate over time, Wang et al. (2010) found that, throughout the 3 years of middle school, student perceptions of academic focus, discipline and order, peer relations, and student–teacher relations steadily deteriorated, while Wang and Dishion (2012) found a similar trend for student perceptions of academic support, school behavior management, teacher social support, and peer social support. Consistently, Schneider and Duran (2010) reported that students' perceptions of their schools' prosocial attitudes and social climate (in terms of a sense of safety) decreased over two school years for a sample of middle schoolers. These findings suggest that, with the passing of time, students' satisfaction with their school climate tends to decrease. However, more research is needed to understand whether this decreasing trend is a widespread phenomenon, along with its possible antecedents and correlates, to inform intervention aimed at buffering this negative trend.

A second limitation is that school climate literature, both longitudinal and cross-sectional, predominantly focused on its negative associations with mental health issues, risk behaviors (Aldridge & McChesney, 2018), and externalizing problem behaviors (Reaves et al., 2018), with the aim to understand its possible role in preventing detrimental individual and relational psychopathological outcomes. On the contrary, existing studies mostly overlooked the opportunity to study how school climate can be associated with students' attitudes toward learning, thus promoting a high quality, well-adjusted involvement in learning for students. This study aims to bridge this gap by considering two aspects of students' feelings and attitudes towards learning, that is, their levels of engagement and burnout. Together, these constructs capture a picture of the quality and adjustment of students' involvement in their own learning process, with relevant implications for adolescents' positive development (Li & Lerner, 2011).

1.2 | School climate and student engagement

Student engagement is a multidimensional construct describing students' active and positive involvement in their school activities (Fredricks et al., 2004). It comprises three dimensions: behavioral (e.g., paying attention in class), emotional (e.g., feeling interested and stimulated while studying), and cognitive (e.g., adopting strategies to learn new material). More recently, a fourth component has been added (Mameli & Passini, 2017; Reeve & Tseng, 2011), called agentic engagement, which refers to the students' active and transformative contributions to the ongoing flow of class activities (e.g., expressing preferences and doubts).

Student engagement has a central role in sustaining the completion of secondary and postsecondary school (Appleton et al., 2008; Lawson & Lawson, 2013) and has been associated with educational success and mental health (Wang & Peck, 2013), and the feeling that learning in school is important as a means for achieving personal goals (Voelkl, 2012). For these reasons, it is important to study the associations of engagement with school climate, to find new ways to promote highly involved attitudes toward learning for students. The few existing studies on the associations between students' engagement and school climate perceptions have provided some interesting results. Two studies (Fatou & Kubiszewski, 2018; Yang et al., 2020) found positive associations between several dimensions of school climate and student engagement. Interestingly, a cross-cultural study comparing American and Chinese students (Bear et al., 2018) showed that the relation between school climate (considered as a composite score including dimensions related to relational quality, fairness of rules, clarity of expectations, and safety) and engagement was significant only for the American sample, suggesting possible cultural differences. These results indicate that the association between school climate and student engagement is a promising direction of study, but more research is needed to strengthen these findings with diverse samples and longitudinal designs.

1.3 | School climate and school burnout

School burnout refers to a maladjustment experienced by students toward their school activities (Salmela-Aro et al., 2009), composed of a sense of emotional exhaustion (e.g., feeling overwhelmed by schoolwork), cynical and detached feelings towards school (e.g., experiencing a loss of meaning in studying), and a sense of inadequacy (e.g., believing one's own capacities to be lacking). While clearly related to opposite sides of students' experiences of involvement with learning, this construct and student engagement are not mutually exclusive, and can combine in complex patterns. In fact, previous person-oriented studies have found profiles of students reporting simultaneously high levels of engagement but also exhaustion and cynicism (Salmela-Aro et al., 2016; Salmela-Aro & Read, 2017; Tuominen-Soini & Salmela-Aro, 2014).

As student engagement, school burnout can have relevant implications for students' well-being and educational success. Indeed, studies showed that it can lead to depressive symptoms (Salmela-Aro et al., 2009) and drop-out (Bask & Salmela-Aro, 2012). Thus, while the association between school climate and student burnout is a scarcely researched topic, this seems an important direction of study to inform actions to promote well-adjusted and

successful learning. A recent person-oriented research studied this variable alongside student engagement and school climate and found that different profiles of middle school students (characterized either by low engagement combined with high burnout, high engagement combined with low burnout or high engagement combined with high burnout) reported relevant differences in school climate perceptions (Molinari & Grazia, 2021). Altogether, the findings presented here and above suggest that school climate, student engagement, and burnout are related and call for longitudinal studies that can more deeply understand the associations among these variables.

1.4 | The present study

Notably, no previous study investigated the discussed associations between school climate, student engagement, and burnout with a longitudinal design, leaving a major limitation in the existing literature. In fact, while the above-mentioned studies with cross-sectional design, albeit limited in number, showed an association among these variables, none provided information on the direction of influences. This is an important research question as it is theoretically possible to hypothesize influences in both directions. On the one hand, positive school climate perceptions might have long-term effects on students' positive involvement with learning. On the other, it is possible to predict that students' levels of engagement and burnout will affect their school climate perceptions, consistently with previous longitudinal studies showing that higher levels of engagement had a positive effect on students' perceptions of their learning environment (Jang et al., 2012, 2016). A longitudinal study is thus needed to assess not only the existence but also the direction of associations between school climate and student engagement and burnout.

The present longitudinal study has been designed to address two specific aims, bridging the discussed gaps in the literature. The first aim was to assess changes in students' school climate perceptions over two school years. For this purpose, school climate was distinguished in several dimensions, to assess change in the perception of specific aspects. Based on the limited previous literature (Wang et al., 2010; Wang & Dishion, 2012), perceptions of all school climate dimensions were expected to worsen from one school year to the next. The second and central aim of this study was to explore the reciprocal longitudinal effects of students' general perceptions of school climate and their levels of engagement and burnout. Based on previous studies (Fatou & Kubiszewski, 2018; Yang et al., 2020), it was possible to hypothesize that the association of school climate with student engagement dimensions would be positive, while it would be negative with burnout dimensions. For the reasons discussed above, no hypotheses were advanced on the direction of influence, and a data analysis strategy capable of clarifying the issue was chosen.

2 | METHOD

2.1 | Participants

Two hundred and forty-three students from four middle schools in Northern Italy participated in this study. The focus on middle schools was motivated by the far-reaching interest in the practical implications of school climate research. As early adolescence is a critical period for social and emotional development and a vulnerable stage for academic performance and engagement (Kim et al., 2014), a deeper understanding of school climate perceptions and their effects on learning processes at this educational level would be an important tool for supporting schools and educators. In the Italian school system, the 3 years of middle school (sixth, seventh and eighth grade) constitute a self-contained stage of transition from primary to secondary school, with a stable environment (classmates and teachers are mostly unchanged over the 3 years). Participants completed the questionnaire on two occasions, in 2019 when participants were enrolled in sixth grade (T1) and in 2020, when participants were enrolled in seventh grade (T2). In both waves, data were collected at the same time of the school year (between February and March), so that possible confounding variables, such as students and teachers' fatigue in proximity to the end of the school year or increased anxiety during testing

periods, were controlled for. At Wave 1, students were aged from 11 to 14 years, with a mean age of 11.68 (SD = 0.65); at Wave 2, students age ranged from 12 to 15 years (M_{age} = 12.64, SD_{age} = 0.65). The sample was equally distributed by gender (girls were 51.7% of the total sample) and participants were mostly born in Italy (with only 6.6% of students reporting a different country of birth). The participating schools were all mixed-gender and situated in urban areas of small and medium cities. Participants' socioeconomic status was not assessed directly for the research but taken from the Italian Ministry of University and Research official website, which reports that these schools are attended by students from a medium socioeconomic context, with a relevant percentage (between about 10% and 20%) of immigrant students, mainly coming from Northern Africa and East-Europe, and mostly second-generation.

2.2 | Procedures

Both data collections were conducted in agreement with the ethical norms defined by the Italian National Psychological Association. Before completing the questionnaire all participants were informed about the study's aims, the confidentiality of their answers and voluntary nature of participation, and they provided their consent. Informed consent of legal guardians was also collected (with about 1% of parents refusing). All the questionnaires were completed during school hours on an online software allowing for the randomization of the item order for each participant. The researcher was always in attendance to give the same instructions to everyone and answer any questions.

2.3 | Measures

For each of the following scales, participants answered on a 6-point Likert scale ranging from “completely disagree” to “completely agree,” so that higher scores indicate higher engagement, higher burnout and better school climate perceptions. Cronbach's α for each measure and dimension, descriptive statistics and intercorrelations are reported in Table 1.

2.3.1 | School climate

Participants completed selected dimensions from the student-version of the Multidimensional School Climate Questionnaire (MSCQ, Grazia & Molinari, 2021b), an Italian validated questionnaire on many dimensions of school climate divided into Classroom Practices and School Atmosphere, developed from the work of Janosz et al. (1998). For the current study, the five dimensions from the School Atmosphere scale were used, describing the relational and educational climate of the whole school. The dimensions were: Student Relations, referring to the quality of relations among students (item sample: “Students treat each other with respect”); Student–Teacher relations, referring to the quality of relationships between students and their teachers (item sample: “In general, students and teachers get along with each other”); Educational Climate, referring to the capacity of the school community to convey the value of a good education (item sample: “You can feel that studying is important”); Sense of Belonging, referring to the sense of being connected to the community (item sample: “I am proud to be a student of this school”); Interpersonal dJustice, referring to the perception of fair treatment and discipline (item sample: “Students are treated fairly”).

2.3.2 | Student engagement

Participants completed an Italian validated instrument on student engagement (Mameli & Passini, 2017) comprising four dimensions: Emotional (item sample: “I have fun learning something new”), Behavioral (item sample: “In class I

TABLE 1 Descriptive statistics and intercorrelations for observed dimensions of school climate, engagement and burnout at T1 and T2

Variable		1	2	3	4	5	6	7	8	9	10	11	12	13	14
School climate															
1	School climate T1	-	0.50**	0.78**	0.48**	0.46**	0.36**	0.43**	0.31**	0.35**	0.11	−0.41**	−0.26**	−0.17**	−0.22**
2	School climate T2		-	0.45**	0.78**	0.32**	0.46**	0.24**	0.46**	0.12	0.31**	−0.31**	−0.44**	−0.22**	−0.40**
Student engagement															
3	Emotional engagement T1			-	0.56**	0.56**	0.48**	0.58**	0.34**	0.40**	0.14*	−0.52**	−0.33**	−0.19**	−0.21**
4	Emotional engagement T2				-	0.40**	0.59**	0.30**	0.56**	0.20**	0.34**	−0.29**	−0.47**	−0.14*	−0.31**
5	Behavioral engagement T1					-	0.63**	0.52**	0.42**	0.32**	0.21**	−0.47**	−0.34**	−0.13	−0.18**
6	Behavioral engagement T2						-	0.39**	0.57**	0.15*	0.25**	−0.43**	−0.52**	−0.10	−0.23**
7	Cognitive engagement T1							-	0.50**	0.46**	0.25**	−0.27**	−0.21**	0.01	−0.03
8	Cognitive engagement T2								-	0.29**	0.43**	−0.28**	−0.31**	0.05	0.04
9	Agentic engagement T1									-	0.47**	−0.18**	−0.11	0.05	−0.02
10	Agentic engagement T2										-	−0.10	−0.11	−0.01	−0.01
Student burnout															
11	Cynicism T1											-	−51**	0.47**	0.31**
12	Cynicism T2												-	0.31**	0.55**
13	Exhaustion T1													-	0.49**
14	Exhaustion T2														-
M (mean)		4.63	4.45	4.65	4.49	4.75	4.61	4.62	4.50	4.00	3.97	2.94	3.03	3.24	3.29
SD (standard deviation)		0.83	0.87	1.09	1.12	0.90	1.03	1.05	1.23	1.07	1.14	1.37	1.40	1.29	1.37
Skewness		−0.96	−0.87	−1.15	−0.96	−0.63	−0.54	−1.12	−1.14	−0.39	−0.30	0.15	0.20	0.20	0.07

TABLE 1 (Continued)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Kurtosis	0.79	0.87	1.22	0.74	0.39	−0.34	1.06	1.10	−0.30	−0.51	−1.03	−0.95	−0.90	−1.03
Cronbach's α	.93	.93	.85	.85	.67	.74	.82	.90	.70	.75	.68	.75	.73	.77

Note: The five dimensions of school climate were averaged to obtain a single integrative second-order variable.

*$p < .05$; **$p < .01$; ***$p < .001$.

work as hard as I can"), Cognitive (item sample: "When I study, I try to find connections between topics"), and Agentic (item sample: "In class I express my preferences and opinions"). In agreement with the authors, an abbreviated 16-item version was used, comprising items with the highest factor loadings in the validation of the instrument for each dimension. The factorial structure of the instrument was tested in a preliminary measurement model (described in the Section 3).

2.3.3 | School burnout

Participants completed the nine-item Italian adaptation (Fiorilli et al., 2014) of the school burnout inventory (Salmela-Aro et al., 2009). The measure originally comprised three dimensions: Exhaustion (item sample: "I feel overwhelmed by schoolwork"), Cynicism (item sample: "I often wonder whether school has any meaning"), and Inadequacy (item sample: "In the past, I had better expectations toward school than I have now"). However, the Italian validation was conducted with high school students and a previous study (Molinari & Grazia, 2021) found unacceptable psychometric properties for the inadequacy dimension in a middle school sample. As also in this study's data the dimension reported inadequate Cronbach's α at T1 (.57), only the Exhaustion and Cynicism dimensions were used, and the two-dimension factorial structure was tested in a measurement model.

2.4 | Data analysis

To achieve the first aim, the SPSS software version 24 was used to conduct a univariate analysis of variance (ANOVA) between mean scores reported at T1 and T2 for each of the five school climate dimensions. To assess the effect size of differences between T1 and T2 η^2 scores were computed. Interactions between gender and time were tested to control the role of gender in changes of school climate perceptions.

To achieve the second aim, the Mplus software version 8 (Muthen & Muthen, 1998–2017) was used to test a cross-lagged longitudinal model with latent variables. As the sample was relatively small and the measurement models very complex, rather than testing a complete measurement model together with the structural model, a two-step procedure was adopted, to reduce the number of parameters to be estimated simultaneously and to obtain fit indices for all models. First, confirmatory factor analyses (CFA) separately for T1 and T2, were conducted to obtain latent variables for each dimension of school climate, student engagement, and burnout. The resulting latent variables for school climate, engagement, and burnout were saved using the SAVEDATA option provided by the Mplus software. Then, the latent scores for each of the five dimensions of school climate were averaged using the DEFINE command provided by the Mplus software to obtain a single integrative score of school climate to include in the model. The rationale for this choice was based on the need to test a relatively parsimonious model, with a manageable number of parameters and good interpretability, while keeping distinct the different dimensions of engagement and burnout to clearly understand which aspects are specifically related to school climate perceptions. This approach is consistent with recent literature on school climate with similar analytic strategies (Bear et al., 2018; Yang et al., 2020). The use of a composite score was also corroborated by the validation study of the measure (MSCQ), which displayed that these five dimensions of school climate load on a single second order latent factor (Grazia & Molinari, 2021b). Finally, the cross-lagged model presented in Figure 1 was tested with the obtained latent variables. The model included seven autoregressive effects, the six effects of school climate perceptions at T1 on engagement and burnout dimensions at T2 and the six reciprocal effects of engagement and burnout dimensions at T1 on school climate perceptions at T2. For clarity of presentation synchronous correlations among variables at the same time were not drawn in the figure but were included in the model. Gender was included in the model as a control variable.

For all SEM models the robust maximum likelihood estimator (MLR) was used to estimate parameters and the full information likelihood method (FIML) was used to deal with missing data. For the overall model evaluation, the following indices of fit were considered: the comparative fit index (CFI), the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA). In line with the recommendation of Hu and Bentler (1999), goodness-of-fit criteria were used to quantify acceptable (CFI > 0.90, SRMR < 0.10, RMSEA < 0.08) and excellent fit (CFI > 0.95, SRMR < 0.08, RMSEA < 0.06).

3 | RESULTS

3.1 | Preliminary analyses

Descriptive statistics for school climate, engagement and burnout dimensions, and the intercorrelations among all observed variables are presented in Table 1. As expected, school perceptions positively correlated with engagement dimensions and negatively correlated with burnout dimensions. Engagement dimensions were positively intercorrelated among them, as were burnout dimensions. Interestingly, not all engagement dimensions significantly correlated with all burnout dimensions: as anticipated, engagement and burnout are not opposites of a same continuum but rather describe different aspects of students' involvement in learning.

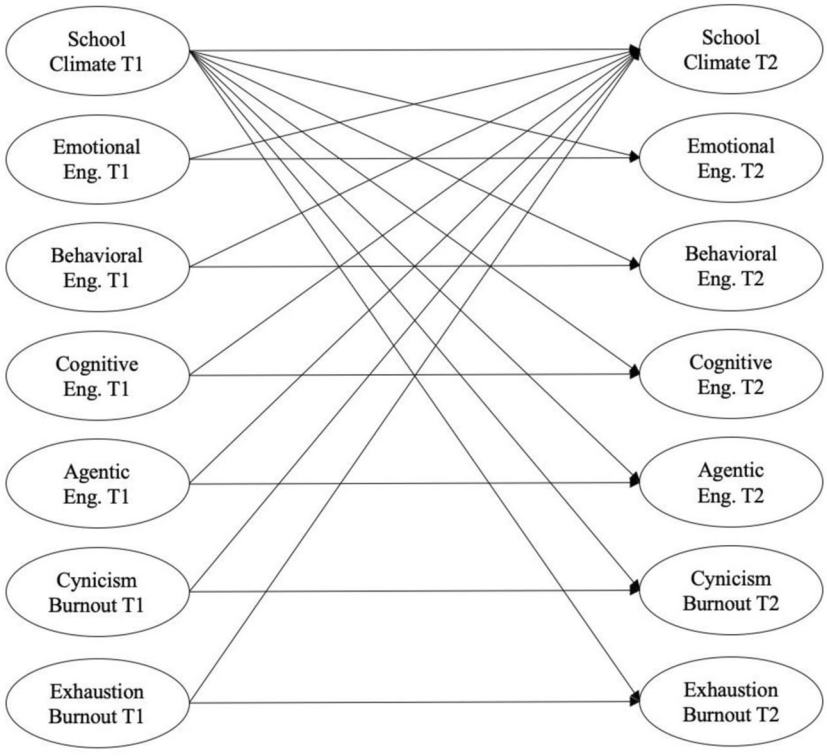

FIGURE 1 Cross-lagged model with latent variables tested to study the effects between school climate perceptions and student engagement and burnout

TABLE 2 Results of the analysis of variance for perceptions of each school climate dimension at T1 and T2

Variable	T1		T2		Analysis of variance		
	M	SD	*M*	SD	*F* (1484)	*p*	η^2
Student relations	4.56	1.00	4.40	1.02	2.92	.088	0.01
Student–teacher relations	4.23	1.11	4.09	1.20	3.35	.068	0.01
Educational climate	4.87	0.90	4.70	0.99	4.56	.033	0.01
Sense of belonging	4.83	1.14	4.67	1.22	2.20	.139	0.01
Interpersonal justice	4.63	1.08	4.42	1.13	4.88	.028	0.01

Abbreviations: *M*, mean; SD, standard deviations.

3.2 | Changes in school climate perceptions over time

Results from the ANOVA are reported in Table 2, along with descriptive statistics for each school climate dimension. Perceptions of Educational Climate and Interpersonal Justice significantly decreased from T1 to T2 even though the percentage of variance explained (η^2) was small. The other dimensions' means were again lower at T2 than at T1, but the difference was nonsignificant. There was no significant interaction with gender.

3.3 | Measurement models

CFAs conducted separately for T1 and T2 to obtain latent variables of school climate dimensions reported good fit to the data (respectively MLR $\chi^2(179) = 279.61$, $p = .000$, RMSEA = 0.048, CFI = 0.94, SRMR = 0.06 and MLR $\chi^2(197) = 348.72$, $p = .000$, RMSEA = 0.056, CFI = 0.94, SRMR = 0.05) with all indicators significantly loading ($p < .001$) on the expected factors. CFAs conducted separately for T1 and T2 to obtain latent variables for engagement and burnout dimensions reported acceptable fit to the data, with all indicators significantly loading ($p < .005$) on the expected factors. More specifically, the indices of fit for the expected four-dimensions model for student engagement were MLR $\chi^2(112) = 181.34$, $p = .000$, RMSEA = 0.050, CFI = 0.94, SRMR = 0.06 at T1 and MLR $\chi^2(111) = 194.04$, $p = .000$, RMSEA = 0.056, CFI = 0.95, SRMR = 0.08 at T2. The indices of fit for the expected two-dimensions model for school burnout were MLR $\chi^2(12) = 20.78$, $p = .054$, RMSEA = 0.055, CFI = 0.97, SRMR = 0.04 at T1 and MLR $\chi^2(12) = 18.39$, $p = .104$, RMSEA =0.047, CFI = 0.98, SRMR = 0.04 at T2.

3.4 | Cross-lagged model between school climate and student engagement and burnout

The cross-lagged model estimated with the resulting latent variables for engagement and burnout and the integrative score of school climate obtained acceptable model fit: MLR $\chi^2(35) = 69.45$, $p = .001$, RMSEA = 0.064, CFI = 0.97, SRMR = 0.03. Standardized path coefficients are presented in Figure 2. Synchronous correlations among variables, not represented in the figure for clarity of presentation, are reported in Table 3. As expected, school climate perceptions at T1 had a positive effect on the emotional dimension of student engagement at T2 and a negative effect on the exhaustion dimensions of burnout at T2. The other paths were not significant. Paths from student engagement and burnout at T1 to school climate at T2 were not significant. Gender, included in the model as a control variable, had no significant effect on any of the model variables.

TABLE 3 Synchronous correlations among latent variables in the cross-lagged model

Measures	Time 1						Time 2					
	1	2	3	4	5	6	1	2	3	4	5	6
1. School climate	-						-					
2. Emotional eng.	0.73***	-					0.64***	-				
3. Behavioral engagement	0.62***	0.86***	-				0.42***	0.65***	-			
4. Cognitive engagement	0.51***	0.74***	0.81***	-			0.44***	0.64***	0.72***	-		
5. Agentic engagement	0.51***	0.67***	0.76***	0.84***	-		0.43***	0.50***	0.58***	0.65***	-	
6. Cynicism	−0.38***	−0.47***	−0.41***	−0.27***	−0.27***	-	−0.36***	−0.35***	−0.31**	−0.18**	−0.16*	-
7. Exhaustion	−0.26***	−0.29***	−0.21***	−0.09	−0.11	0.83***	−0.36***	−0.24***	−0.18*	−0.01	−0.11	0.82***

*$p < .05$.
**$p < .01$.
***$p < .001$.

4 | DISCUSSION

The use of a longitudinal design in the current study provided an advancement that has been long called for in the school climate literature (Wang & Degol, 2016), with important educational implications, as it can inform interventions for improving schools' effectiveness. In particular, the results shed light on the change of school climate perceptions over time and the reciprocal effects between students' school climate perceptions and their levels of engagement and burnout. Key findings and practical implications for researchers and educators are discussed below.

4.1 | Changes of school climate perceptions over time

The first aim of this study, bridging an important gap in the literature, was to measure changes in students' perceptions of several school climate dimensions over two school years. As expected on the basis of the few existing studies, students' perceptions of school climate showed a general negative trend over time. However, contrary to expectations, not all decreases were statistically significant. Students reported significantly lower satisfaction with the Educational Climate of their school, that is, the capacity of the school to cultivate value and enthusiasm for learning, and with the perceived fairness in student treatment (Interpersonal Justice). Instead, unlike previous studies (Wang et al., 2010), perceptions of the relational-oriented dimensions that is, Student Relations, Student–Teacher relations, and Sense of Belonging—did not register a significant decrease. A possible explanation for this discrepancy with previous results is that the multidimensional approach adopted in this study (Grazia &

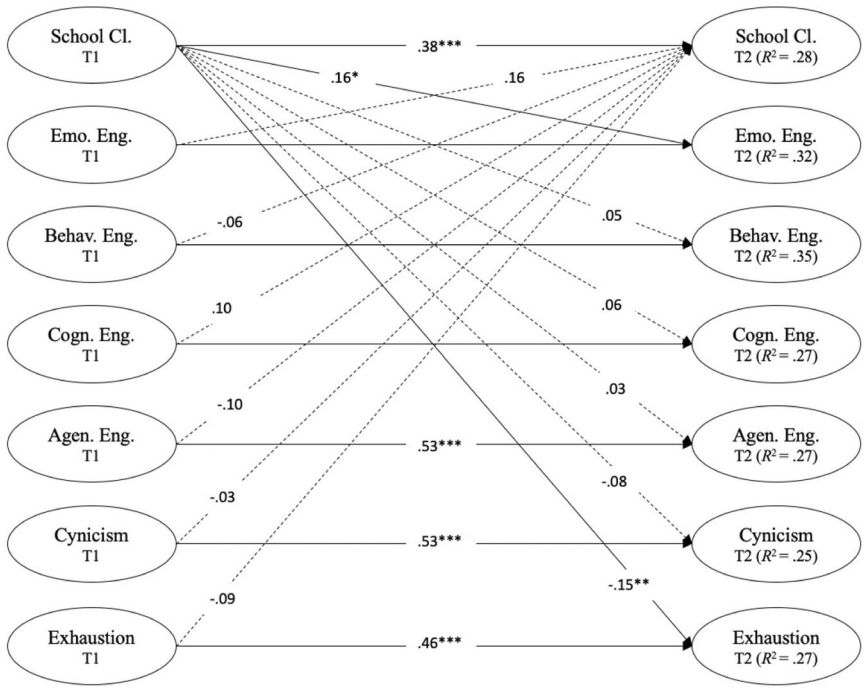

FIGURE 2 Standardized parameter estimates for the cross-lagged model. Dashed lines represent nonsignificant paths. Autoregressive effects for affective, behavioral, and cognitive engagement, not reported in the figure for clarity of representation, were 0.44, 0.55, and 0.54, respectively, all significant at $p < .001$. *$p < .05$; **$p < .01$; ***$p < .001$

Molinari, 2021b) may have allowed to more clearly distinguish between various aspects of school climate. It is possible that previous studies considered "relations" as a general feature of school climate, especially with regard to student–teacher relations. In this study, the general relational quality (i.e., the levels of friendliness and capacity to get along) was distinguished from other interpersonal elements, such as teachers' fairness in establishing and enforcing rules and penalties. This may have allowed the emergence of more specific critical issues related to the perception of justice and educational values. Of course, this interpretation needs to be strengthened by collecting more evidence with longitudinal data that would allow to improve our understanding of school climate perception trends over time.

It should be noted that the discussed decreases were small in size, accounting for limited changes in school climate perceptions. This may be due to the small interval of time (1 year) or indicate that the decrease is generally limited. Nonetheless, consistently with previous literature (Schneider et al., 2010; Wang & Dishion, 2012), after a year, students were overall less satisfied with their environment. Notably, even those dimensions not showing a significant decrease still registered lower means at the second year of data collection, while no dimension reported even the slightest increase. Of course, these findings do not allow us to clarify the factors behind these worsening perceptions. They may be due to the actual deterioration of the school climate, but also to the cognitive and emotional changes early adolescent students undergo during middle school (Kim et al., 2014) or to an inability of the school environment to adapt to students' changing needs (Wang, 2009; Wang & Dishion, 2012). Further studies will be needed to shed light on this very important distinction, especially through the inclusion of teachers' perspectives, as their inputs would help to compose a more complex picture of changes in learning environment perceptions (Wang & Degol, 2016). Nonetheless, the study findings provided evidence that, while progressing with their schooling, students experienced disillusionment toward their environment more than a growing sense of satisfaction and communion with their school. This is consistent with other concerning findings describing negative trends on aspects of students' positive involvement and enthusiasm toward school, such as their levels of motivation (Eccles & Roeser, 2011) and positive emotions (Ahmed et al., 2013). These results should sound an alarm bell for promoting interventions able to trigger a reversal of this detrimental trend, especially in light of the findings on the association between school climate and student engagement and burnout that will be discussed below.

4.2 | Reciprocal longitudinal effects of school atmosphere, student engagement and burnout

The second aim of this study was to assess the reciprocal longitudinal associations between school climate perceptions and students' levels of engagement and burnout, to provide evidence on how school climate perceptions can influence students' attitudes toward learning, bridging in a second important gap in the literature. The use of a cross-lagged model for addressing this aim further allowed to clarify the very important issue of directionality of effects, never previously addressed by cross-sectional studies (Bear et al., 2018; Fatou & Kubiszewski, 2018; Yang et al., 2020).

On a general level, the results showed two significant effects of school climate perceptions on student involvement variables (engagement and burnout) and none in the other direction. This means that, for the participating students, perceiving a better climate led to improved involvement, while initial levels of engagement and burnout did not affect later school climate perceptions. This important finding suggests that school climate can be a lever for promoting better attitudes toward learning for all students, rather than just reinforcing a virtuous circle for "good students," already engaged and well-adjusted.

More specifically, as expected on the basis of previous literature (Fatou & Kubiszewski, 2018), school climate perceptions positively predicted students' levels of emotional engagement and negatively predicted exhaustion the following year, even when controlling for previous levels of engagement and burnout. This means that, even after accounting for each student's individual tendencies, perceiving a better relational and educational atmosphere in

school still led to more feelings of enthusiasm and interest toward learning activities and less feelings of being overwhelmed by schoolwork. The finding of positive longitudinal associations with engagement and negative associations with burnout is consistent with and expands upon existing cross-sectional literature on school climate (Fatou & Kubiszewski, 2018; Molinari & Grazia, 2021; Yang et al., 2020). With the caution required by the fact that this is a first study in this direction, these results suggest that the quality of relational, educational, and fairness climate in school can indeed positively affect students' engagement and burnout.

Moreover, while the effects found in this study were not large in size, it is notable that they describe long-term effects of a positive school climate, stretching into the following school year. This suggests that the school climate perceived at one time has a far-reaching capacity to affect students' educational paths, extending beyond the end of the current school year. This is an innovative and relevant finding that supports the importance of reflecting and intervening on school climate not only for preventing undesirable outcomes, such as bullying and aggression (Reaves et al., 2018; Steffgen et al., 2013), but also for promoting better learning. More specifically, it suggests that schools interested in improving engagement and reducing burnout for their students may obtain long-lasting results by intervening not only directly on didactic practices (Mameli et al., 2020), but also on school-wide climate aspects, such as the quality of relations among students and between students and teachers, on the transmission of educational values and on the students' sense of belonging and fairness.

4.3 | Limitations

The present study had some limitations that need to be acknowledged when interpreting its findings and that need to be addressed in future research. The first limitation concerns the specific sociocultural context where the research was conducted. However, while these findings may not be readily generalizable to schools worldwide, they provide innovative insights for the international literature on school climate, which may be expanded upon with broader samples of students. Moreover, this study was limited by its duration, focused upon two school years: future studies may move forward this line of inquiry by spanning several school years, to test whether the discussed effects persist or change over longer periods of time. Lastly, it should be clearly noted that these findings are related to the collection of individuals' self-reported perceptions of school climate, which do not necessarily correspond to the actual climate. In the future, research including observational methods may provide further information in this direction.

5 | CONCLUSION

Notwithstanding the limitations discussed above, the present study provides innovative findings to the literature on school climate, inquiring into the evolution over time of students' school climate perceptions and the long-term positive effects of a positive school climate on the quality of students' involvement with learning. While these findings suggest possible directions of advancement for future literature, they also have relevant practical implications. The results indicate that better perceptions of school climate led students to feel more emotionally engaged in and less overwhelmed by their schoolwork while, at the same time, showing that perceptions of school climate deteriorated over time. This calls for an increased awareness by educators, school psychologists and policymakers on the importance of addressing school climate as a means to promote better education, with interventions aimed at reversing the negative trend and tapping into school climate potential as a catalyst for students' enthusiasm towards learning.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

ETHICS STATEMENT

The research was conducted in accordance with the ethical norms of the Italian National Psychological. Informed consent was obtained from all individual participants included in the study and their legal guardians.

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