Perception of school climate, academic performance and risk behaviors in adolescence

Carolina Lunetti*, Laura Di Giunta*, Irene Fiasconaro*, Reout Arbel°, Emanuele Basili*, Eriona Thartori*, Ainzara Favini*, Giulia Gliozzo*, Concetta Pastorelli*, Jennifer E. Lansford^

* Sapienza University of Rome, Department of Psychology
Via dei Marsi, 78, 00175 Rome - Italy.
e-mail: Carolina.lunetti@uniroma1.it
e-mail: carolina.lunetti@uniroma1.it
° University of Haifa, Department of Counseling and Human Development
indirizzo: 199 Aba Khoushy Ave. Mount Carmel, Haifa, Israel
e-mail: reout.arbel@gmail.com
^ Duke University, Center for Child and Family Policy
inidirizzo: 2024 West Main Street, Bay C
e-mail: lansford@duke.edu

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Abstract

Previous studies support the relevance of students' perception of positive and negative school climate to learning processes and adolescents' adjustment. School climate is affected by both the interactions that are established within the classroom, and by the teachers' behaviors. This study has the overall objective of investigating the relationship between the perception of positive and negative school climate and students' (mal)adjustment during adolescence.

Participants were 105 Italian adolescents (52.5% boys, mean age = 15.56, SD = .77) who responded for 15 consecutive days (ecological momentary assessment) to questions related to their perception of positive and negative school climate (Time 1). After one year (Time 2), students' academic performance reported by mothers and fathers and adolescents' self-reported propensity to engage in risk behaviors were examined.

Four hierarchical regression models were implemented considering the mean and the instability levels (RMSSD) of the perception of positive and negative school climate as independent variables and, respectively, academic performance and risk behaviors as dependent variables.

Results suggest that a higher perception of positive school climate and its instability predict higher academic performance one year later, while a higher perception of negative school climate and its instability predict higher risk behaviors.

This study provides an innovative perspective to reflect on the relationship between students' perceptions of school climate and adolescents' (mal)adjustment.

Keywords: school climate, academic performance, risk behaviors, adolescence.

Introduction

Empirical research emphasizes the importance of students' academic success in predicting job performance and long-term adaptive developmental trajectories (Andersson & Strander, 2004). School climate (or school environment) has an important role in promoting positive long-term outcomes.

School climate is a multidimensional construct that includes physical, social and academic dimensions (Loukas, 2007). The physical dimension is composed of the appearance of the school building and classrooms, the size of the school, the proportion of students and teachers in the classrooms and the school's availability of resources. The social dimension includes the quality of interpersonal relationships between students and

teachers, the degree of social comparison among students, and the degree to which students, teachers and the school staff contribute to the school's decisions. Finally, the academic dimension includes the quality of teaching, the students' and teachers' expectations about academic success, and the teachers' monitoring of students' progress. How students perceive the school climate affects individual attitudes, behaviors and group norms (Loukas, 2007). In this framework, the present study attempts to provide important directions about the promotion of positive youth development by acting on the school climate.

Perception of school climate and academic performance

School climate is a relevant factor in affecting students' academic performance (e.g. Stewart, 2008). Moos and Moos (1978) showed that students' positive relationships within the school were significantly associated with students' higher grades. The same results were confirmed by other relatively recent studies conducted on North American samples (Crosnoe et al., 2004; O'Malley, Voight, Renshaw, & Eklund, 2015), which showed that stronger relationships between students and teachers positively affect academic achievement. Kwong and colleagues (2015) and Reynolds and colleagues (2017) demonstrated the relevance of feeling psychologically linked to the school in determining students' academic success.

Empirical studies are consistent in showing that the relationship between school climate and academic achievement could be explained by the association between school climate and other factors such as the students' sense of belonging to the school (Blum, 2005), the teachers' commitment (Collie, Shapka, & Perry, 2011), and the students' motivation to learn (Battistich, Solomon, Kim, Watson, & Schaps, 1995).

Furthermore, empirical studies conducted in the Italian context suggest that the perception of a positive school climate, characterized by good or excellent quality of the relationship between students and school and by teachers' definition of academic objectives and their willingness to support students in achieving their academic objectives, predict students' adaptive behavior, low levels of school absenteeism, and high academic success (Boncori, 2018; Catalano, Perrucchini, & Vecchio, 2014; Di Vita, 2017).

Perception of school climate and adolescents' risky behaviors

The literature that has examined the perception of school climate has also investigated its association with maladaptive outcomes, such as internalizing and externalizing problems (Astor, Benbenishty, Zeira, & Vinokur, 2002). Previous studies highlighted the predictive role of several variables in determining the perception of negative school climate, such as observing violent behaviors within the school, students' fear of attending school, and authoritarian and low supportive teaching. Astor and colleagues (2002) examined the association between the perception of school climate and adolescents' antisocial behavior. Students' antisocial behaviors were associated with the negative perception of school climate, which was operationalized as low quality of student-teacher relationships and high perception of fear by students toward the school context. A further relevant study was conducted by Hendron and Kearney (2016) on a large sample of adolescents. Several constructs included in the perception of positive school climate, such as sharing resources, parental school involvement, positive relationships among students, and positive relationships between students and teachers, correlate significantly and negatively with adolescents' externalizing problems. Moreover, those students who harbor negative feelings in their relationship with the school and with their teachers show high absenteeism and high antisocial behavior (Corville-Smith, Ryan, Adams, & Dalicandro, 1998). Overall, these studies empirically support the negative association between students' perception of positive school climate and youth externalizing behaviors.

The present study

The overall aim of the present study was to longitudinally examine the contribution of students' perception of school climate to academic performance and risk behaviors a year later, controlling for students' gender. In particular, this study includes two specific goals: a) first, to examine the impact of the perception of positive and negative school climate on adolescents' later academic performance and risk behaviors; b) second, to examine the impact of the instability (variability) in the perception of positive and negative school climate, over a period of 15 days, on adolescents' later academic performance and risk behaviors. In accordance with previous studies supporting that the perception of positive school climate is positively associated with students' academic achievement through a heightened sense of belonging to the school, high levels of support and cooperation between students and teachers, and through teachers' heightened commitment (e.g. Boncori, 2018), we expect that

the perception of positive school climate will be positively associated with adolescents' later academic performance. Furthermore, in accordance with previous studies suggesting that that the perception of negative school climate is positively related to students' externalizing problems, through perceived lack of supportive student-teacher relationships and lack of safety in the school environment (e.g. Corville-Smith, Ryan, Adams, & Dalicandro, 1998), we expected that students' perception of negative school climate positively predicts adolescents' later risky behaviors. Finally, we are not aware of previous studies that have examined the association between instability (variability) in the perception of positive and negative school climate and youth (mal)adjustment; thus, our goal in this direction is exploratory.

Methods

Participants and procedures

Participants were part of a larger longitudinal study, titled Parenting Across Cultures (PI: J. Lansford; PI for the Italian site: C. Pastorelli) that started in 2008 when children were 8 years old. The present study focuses on the eighth and ninth years of the data collection in Rome, specifically targeting 105 Italian family triads (T1: youth M_{age} = 15.66, *SD* = .77; 52.5% boys; T2: N = 95, youth M_{age} = 16.45, *SD* = .67). Adolescents' mothers had 13.88 years of education on average (*SD* = 4.25) and fathers had 13.46 years on average (*SD* = 4.24). In addition, 72% of the parents were married or cohabitating, whereas 28% were divorced, separated, or widowed. Participants were recruited from diverse schools with high-, middle-, and low-income families in Rome, with the attempt to overlap as much as possible the national socio-economic distribution (ISTAT, 2007).

After obtaining parental informed consent and child assent, interviews with adolescents were conducted at Time 1 by using the mobile ecological momentary assessment (mEMA; Wen et al., 2017). For 15 consecutive days, adolescents received a personalized email on their mobile phones, containing the URL link to complete a questionnaire via Qualtrics. Each online questionnaire lasted approximately five minutes. One year later (Time 2), interviews with parents and adolescents were conducted in families' homes or another preferred location. Each interview lasted approximately one hour.

All procedures were approved by Sapienza University of Rome's Institutional Review Board.

Measures

Adolescents' gender. Adolescents' gender (1 = boys, 2 = girls) at Time 1 was included as a covariate.

Time 1 Adolescents' perception of positive and negative school climate. Through mEMA, students evaluated whether they experienced (yes = 1; no = 0) 4 positive ("Since this morning, did any of these things happen at school?..."; e.g., "Teacher helped me" ; α = .86) and negative school events (e.g., "Teacher was mean to me"; α = .85). School climate items were adapted from a previously validated protocol used in similar EMA research designs (Jensen, George, Russell, & Odgers, 2019). Then, the answers to those items were summed to create a total score for positive and negative school climate, respectively. In addition, the root mean square of successive differences (RMSSD; Ebner-Priemer & Trull, 2012) was calculated for each of those total scores in order to calculate the instability/variability score around each adolescent's perception of positive and negative school climate over the 15 days.

Time 2 Adolescents' academic performance. Mothers and fathers completed seven items from the Child Behavior Checklist (CBCL; Achenbach, 1991), in which they indicated (from 1 = "failing" to 4 = "above average") the academic performance of their child compared to the students from his/her classroom, in seven subject matters (reading, writing, math, spelling, social studies, science, other). We created a composite score for academic performance by averaging the mean levels of adolescents' academic performance reported by mothers and fathers (inter-parent $r = .34$, $p < .001$).

Time 2 Adolescents' risky behaviors. Adolescents completed 11 items from the Youth Self-Report (YSR; Achenbach, 1991) referring to behaviors such as stealing from home and disobeying school rules (from 0 "not true" to 2 "very true/often true") during the last six months. Items were averaged to create a total score (α = .77).

Analytical approach

After examining Pearson correlations among the variables of interest, we implemented four hierarchical regression models (see Figure 1) using SPSS.20.

In the first regression model (Model 1), academic performance was the dependent variable; adolescents' gender was included in the first step and positive and negative school climate were included in the second step. Model 2 was similar to Model 1, with the difference of including the instability of positive and negative school climate in the second step, rather than the average level of these constructs. Models 3 and 4 overlap-

ped the former models in terms of the two steps of independent variables, with the difference of focusing instead on adolescents' risky behaviors as the dependent variable.

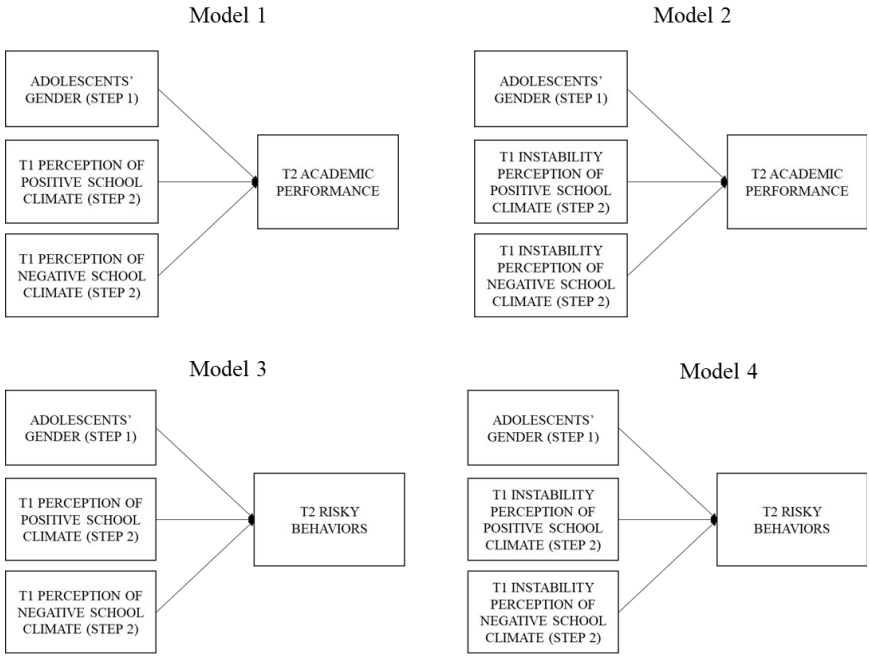

Fig. 1 - *Tested hierarchical regression models*

Results

Descriptive statistics and correlations

Table 1 reports means, standard deviations, skewness, and kurtosis of the study variables for the overall sample (skewness and kurtosis were in acceptable range; Curran, West, & Finch, 1996). Correlations among variables within the overall sample are reported in Table 2. Adolescents' gender correlated significantly only with Time 2 academic performance; academic performance was higher in girls than in boys. Adolescents' perception of negative school climate and its instability at Time 1 correlated positively and significantly with adolescents' later risky behaviors, whereas adolescents' Time 1 perception of positive school climate and its instability did not. Finally, adolescents' Time 1 perception of positive school climate and its instability correlated positively and significantly with adolescents' later academic performance, whereas adolescents' Time 1 perception of negative school climate and its instability did not.

Tab. 1 - *Descriptive statistics*

Constructs	*Mean*	*SD*	*Range (min-max)*	*Skewness*	*Kurtosis*
1) T1 Perception of negative school climate (self-report)	0.01	0.01	0.00-0.06	1.36	1.78
2) T1 Perception of positive school climate (self-report)	0.02	0.02	0.00-0.10	1.29	1.55
3) T1 Instability of the perception of negative school climate (self-report)	0.07	0.06	0.00-0.25	0.65	0.17
4) T1 Instability of the perception of positive school climate (self-report)	0.12	0.07	0.00-0.35	0.90	0.77
5) T2 Academic performance (parents' report)	3.10	0.31	2.40-4.00	0.71	0.70
6) T2 Risky behaviors (self-report)	0.38	0.23	0-00-1.00	0.68	0.01

Note: SD = Standard Deviation.

Tab. 2 - *Correlations among the study variables*

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
(1) Adolescents' Gender	-						
(2) T1 Perception of negative school climate (self-report)	.04	-					
(3) T1 Perception of positive school climate (self-report)	-.09	.07	-				
(4) T1 Instability of the perception of negative school climate (self-report)	.01	.95**	.07	-			
(5) T1 Instability of the perception of positive school climate (self-report)	-.12	.03	.97**	.02	-		
(6) T2 Academic performance (parents' report)	.24*	-.08	.21**	-.13	.21*	-	
(7) T2 Risky behaviors (self-report)	-.04	.29*	-.20	.24*	-.18	-.22	-

Note: Adolescents' Gender: 1 = boys, 2 = girls. ** $p < .01$; * $p < .05$.

Hierarchical regression models

Model 1 significantly explained 14.8% of the Time 2 academic performance variance [$F(3,87) = 5.05$, $p < .01$]. Specifically, at the first step, adolescents' gender significantly predicted Time 2 academic performance ($\beta = .24$, $p = .02$), and at the second step, only the perception of positive school climate significantly predicted Time 2 academic performance ($\beta = .27$, $p < .01$), whereas the perception of negative school climate did not ($\beta = -.15$, $p = .12$) (see Table 3).

Tab.3 - *Hierarchical regression model 1*

	Time 2 academic performance				
Predictors	R	ΔR^2	β	B_{SE}	F
Step 1	.24	.06*			$F(1,89)=5.65$, $p = .020$
Adolescents' Gender			.15	.24*	
Step 2	.38	.08**			$F(2,87)=5.05$, $p = .003$
Time 1 Perception of negative school climate			3.6	-.15	
Time 1 Perception of positive school climate			-.3.6	.27*	

Note: Adolescents' Gender: 1 = boys, 2 = girls. ** $p < .01$; * $p < .05$.

Model 2 significantly explained 17% of the Time 2 academic performance variance [$F(3,87) = 5.93$, $p < .01$]. Specifically, at the first step, adolescents' gender significantly predicted Time 2 academic performance ($\beta = .24$, $p = .02$), and at the second step, only the instability in the perception of positive school climate significantly predicted Time 2 academic performance ($\beta = .28$, $p < .01$), whereas the instability in the perception of negative school climate did not.

Tab. 4 - *Hierarchical regression model 2*

	Time 2 academic performance				
Predictors	R	ΔR^2	β	B_{SE}	F
Step 1	.24	.06*			$F(1,89)=5.65$, $p = .020$
Adolescents' Gender			.01	.01	
Step 2	.41	.11**			$F(2,87)=5.94$, $p = .001$

Time 1 Instability of the perception of negative school climate	-.93	-.18
Time 1 Instability of the perception of positive school climate	1.14	.28**

Note: Adolescents' Gender: 1 = boys, 2 = girls. ** $p < .01$; * $p < .05$.

Model 3 significantly explained 13.6% of the Time 2 risky behaviors variance [$F(3,70) = 3.66$, $p < .05$]. Specifically, at the first step, adolescents' gender did not significantly predict Time 2 risky behaviors ($\beta = -.04$, $p = .73$), and at the second step, both the perception of positive school climate ($\beta = -.22$, $p < .05$) and the perception of negative school climate ($\beta = .30$, $p < .01$) significantly predicted Time 2 risky behaviors (see Table 5).

Tab. 5 - *Hierarchical regression model 3*

	Time 2 risky behaviors				
Predictors	R	ΔR^2	β	B_{SE}	F
Step 1	.04	.00			$F(1,72)=0.11$, $p = .738$
Adolescents' Gender			-.01	-.04	
Step 2	.36	.13*			$F(2,70)=3.66$, $p = .016$
Time 1 Perception of negative school climate			5.7	.30**	
Time 1 Perception of positive school climate			-2.2	-.22*	

Note: Adolescents' Gender: 1 = boys, 2 = girls. ** $p < .01$; * $p < .05$.

Finally, Model 4 explained 9% of the Time 2 risky behaviors variance [$F(3,70) = 3.30$, $p = .08$]. Specifically, at the first step, adolescents' gender did not significantly predict Time 2 risky behaviors ($\beta = -.04$, $p = .73$), and at the second step, only the instability of the perception of negative school climate significantly predicted Time 2 risky behaviors ($\beta = -.24$, $p < .05$), whereas the instability of the perception of positive school climate did not ($\beta = -.17$, $p = .13$) (see Table 6).

Tab. 6 - *Hierarchical regression model 4*

	Time 2 risky behaviors				
Predictors	R	ΔR^2	β	B_{SE}	F
Step 1	.04	.00			$F(1,72)=0.11$, $p = .738$
Adolescents' Gender			-.01	-.04	
Step 2	.30	.01*			$F(2,70)=2.30$, $p = .039$
Time 1 Instability of the perception of negative school climate			.93	.23*	
Time 1 Instability of the perception of positive school climate			-.53	-.17	

Note: Adolescents' Gender: 1 = boys, 2 = girls. ** $p < .01$; * $p < .05$.

Discussion

Recent studies focusing on the determinants of students' positive development emphasize the importance of students' perceptions of the school climate in promoting students' adaptive outcomes, such as academic success, and counteracting students' maladaptive outcomes, such as risky behavioral problems.

The present study had the overall aim of longitudinally examining the contribution of students' perceptions of positive and negative school climate, and instability in these perceptions, as predictors of students' later academic performance and risky behaviors, in a sample of Italian adolescents. The present study is innovative being one of the few studies to consider the positive and negative dimensions of school climate as separate constructs, and the only one, to our knowledge, that uses the innovative methodology of the mobile ecological momentary assessment to examine the contribution of the instability (variability) in students' perception of the school climate over a 15 day period.

The first objective of the present study was to examine the predictive value of the average perception of positive and negative school climate with respect to later academic performance and risky behaviors in adolescence. Our results, like previous studies (e.g. Boncori, 2018), support the importance of the perception of a positive school climate, characterized by high support in the relationship between students and teachers, high motivation to learn, perception of the school as a safe environment, and high sense of belonging to the school, in promoting high academic performance one year later. With respect to risky behaviors, our findings

are consistent with previous studies (e.g. Corville-Smith, Ryan, Adams, & Dalicandro, 1998) suggesting that the perception of a negative school climate, characterized by low support and cooperation in the relationship between students and teachers and low sense of belonging to the school, predicts high levels of students' risky behaviors.

A second objective of this study was to examine how the instability in adolescents' perceptions of positive and negative school climate over a 15-day period was associated with students' later academic performance and risky behaviors. Our results suggested that instability in the perception of positive school climate significantly and positively predicted later academic performance, and instability in the perception of negative school climate positively predicted later risky behaviors.

Our findings may also be interpreted in light of studies attesting to the role of adolescents' sensitivity to rewards and punishments (i.e., feedback sensitivity) on their school success. In particular, previous studies have shown that school performance is more influenced by sensitivity to rewards than by sensitivity to punishment, which instead was associated with maladaptive behaviors (Cauffman et al., 2010). In the operationalization of our score of positive school climate, we included items that may be related to sensitivity to rewards in the school context (e.g., "Teacher was proud of me"), whereas in the operationalization of our score of negative school climate we included items that may be related to sensitivity to punishment in the school context (e.g., "Didn't do well at school). Consistent with such a perspective, we found that students' perception of a positive school climate, even when it occurs occasionally (i.e., high instability in perceived positive school climate), is related to students' academic performance. On the other hand, the perception of a negative school climate, even when it does not occur as often (i.e., high instability in perceived negative school climate) may be associated with students' disengagement from learning processes, which in turn may lead them to engage more often in risky behaviors. However, this is only a hypothesis that deserves to be explored in future studies.

Despite the significant contribution of this study to understanding the importance of students' perceptions of positive and negative school climate in relation to adolescents' adaptive and maladaptive outcomes, the present study has some limitations. In particular, we did not control for the effects of the stability of the outcomes or family socio-economic status, which might influence or moderate the association between perceptions of school climate and adolescents' (mal)adjustment. Moreover, we did not examine the effects of other variables, such as parental involvement at school and the personality characteristics of both students and teachers, on the considered outcomes. Future studies may overcome the-

se limitations and clarify the role played by instability in the perception of the school climate on positive youth development. Overall, the present study provides important implications for guiding programs aimed at preventing adolescents' risky behaviors and promoting adolescents' academic success, by acting on the characteristics of the school environment.

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