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The influence of effortful control and empathy on perception of school climate

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Abstract The purpose of this study was to determine the predictive power of effortful control (EC) and empathy for perception of school climate. Self-report measures of EC, dispositional empathy, and perception of school climate were obtained for 398 students (204 females) aged 12 to 13. Sociometric status was peer-evaluated, and academic achievement was based on students final grades at the end of the school year. The structural equation model that was developed confirms the influence of EC and empathy on perception of school climate. The model manages to explain 39 % of the variance in perception of school climate and confirms that for males and females alike, the predictive power of EC and empathy is greater than for other variables studied such as academic achievement and sociometric status. Further, EC and empathy are found to have a positive influence on academic achievement. The importance of developing activities to foster EC and empathy in order to facilitate interpersonal relationships and enhance perception of the school climate is discussed.

Keywords Effortful control · Empathy · Academic performance · Peer relationships · School climate

Knowledge of the factors that foster a good social climate in schools is a subject of great interest in most western countries (Díaz-Aguado Jalón et al. 2010; Thapa et al. 2012). The perception of a positive school climate is related to lower levels of aggression and violence in schools

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(Goldstein et al. 2008; Meyer-Adams and Conner 2008), reduces behavioral problems (Wang 2009; Loukas and Murphy 2007; Loukas and Robinson 2004), enhances academic achievement (Jia et al. 2009; Wang and Holcombe 2010), and facilitates a student's learning and healthy development (Thapa et al. 2012). It is not surprising, therefore, that education professionals are implementing classroom and school activities that ensure a positive school climate.

The definitions of school climate have been heterogeneous. School climate is defined by the perceptions of the school interpersonal relationships and the organizational framework, norms, and values that regulate such relationships (Cohen et al. 2009). Reviews by Thapa et al. (2012) and Zullig et al. (2010) relate climate to order, safety, and discipline; positive social relationships; efficient teaching and learning strategies; and personal identification with the school. This multidimensional nature of the concept is also found when identifying the factors that influence school climate. From an organizational point of view, specific sociodemographic characteristics related to a positive or hostile school climate have been analyzed. On a more psychological level, individual student or teacher characteristics, which covary with improvement or deterioration of the climate, have been studied (Fan et al. 2011). Research has shown that both sociostructural and individual factors affect the perception of school climate, although the latter are more relevant (Vieno et al. 2005). In this paper, we investigate the predictive power of effortful control and empathy over the perception of school climate.

Social adjustment, academic achievement, and perception of school climate

Individual factors that are negatively related to perceptions of school climate include the frequency of aggressive behavior and poor academic achievement (Suldo et al. 2008). The aggressive behavior displayed by students (either as perpetrators or victims) predicts a negative perception of the psychosocial climate at their school (Meyer-Adams and Conner 2008). They see their school as less safe and feel less satisfied with its social climate than students who do not undergo such aggressive experiences (Goldstein et al. 2008). As regards academic performance, Fan et al. (2011) reported that students repeating a grade or students with behavioral problems perceived teacher-student relationships less positively. Further, students with behavioral problems also perceived school rules of coexistence and discipline as less fair and clear.

These individual characteristics, which affect the perception of school climate negatively, coincide with those that predict difficulties in school adjustment. Aggressiveness, behavioral problems, and poor academic achievement are major obstacles to students adjusting well to school demands (Eisenberg et al. 2010c) and lead to conflicts with peers and teachers (Nurmi 2012). The question is whether the variables that are positively related to academic achievement and social behavior also positively predict perceptions of a good social climate. Several studies have found positive relationships between effortful control (EC) and empathy and academic achievement and social adjustment (see reviews of Rueda et al. 2010; Eisenberg et al. 2010c; Liew 2011; Fernández-Vilar and Carranza 2012). It is possible that these individual factors are also positively related to the perception of a good school climate.

EC, empathy, and perception of school climate

EC is a basic dimension of the temperament that mediates voluntary control over behavior and the regulation of emotional reactivity (Derryberry and Rothbart 1997). EC is related to the efficiency of executive attention to shift and focus attention (attentional control), inhibit inappropriate

behaviors (inhibitory control), and activate or implement an action when there is a strong tendency to avoid such action (activation control). It is also associated with information integration and action planning (Eisenberg et al. 2010c; Diamond 2013). Longitudinal studies have shown that the EC measure of first-grade students predicts literacy achievement 2 years later (Liew et al. 2008). Further, low EC levels are linked to high levels of impulsiveness, aggressiveness, and disruptive behavior 4 years after the initial evaluation (Eisenberg et al. 2009). In adolescents, Checa et al. (2008) reported that students who have better control resources also attain higher levels of academic achievement, particularly in mathematics, and are preferred by peers in sociometric tests.

Although there is abundant information on the positive relationship between EC and academic achievement (Eisenberg et al. 2010c), very few studies have focused directly on its influence on the perception of school climate. Silva et al. (2011) observed that EC is associated with positive attitudes to school in preschoolers. These authors suggest that children with a high level of EC have better relationships with their teachers, which duly fosters a positive attitude to school. Loukas and Robinson (2004) and Loukas and Murphy (2007) found that low EC levels increase the risk of behavioral problems in preadolescents, but positive perceptions of school climate (cohesion and satisfaction) protect them from this risk. However, these studies do not specifically analyze whether EC predicts the perception of school climate, or whether there is some mediating factor in this relationship.

Empathy is another variable that has been positively related to school adjustment although it has been scarcely explored in studies on climate perception. Empathy is defined as a cognitive-emotional process that enables understanding of another s affective experiences (Decety and Svetlova 2012; Eisenberg et al. 1994). It encompasses affective, cognitive, and emotion-regulating elements. Literature reports that empathy facilitates prosocial behavior and good interpersonal adjustment (Rimé 2009; De Waal 2008). The ability to empathize has been linked to lower levels of relational aggression (Loudin et al. 2003) and to greater peer acceptance (Wentzel et al. 2007). Empathy is also closely related to EC. In a study on children aged 4 to 8, Valiente et al. (2004) reported that EC is positively related to dispositional empathy in children. Eisenberg et al. (2007) found similar results in a longitudinal research with children under 6 that were evaluated five times, every 2 years. The individual differences in the growth of EC were related to empathic concern in early and middle adolescence. Similarly, Zorza et al. (2013) found that EC positively predicts dispositional empathy among students aged 12 to 14, and empathy partially mediates the effect of EC on academic achievement.

Although there are few studies linking empathy to school climate, it is expected that empathy affects a student's perception of school climate positively. In one of the few studies which link empathy to social climate, Ruiz et al. (2009) observed positive covariations between these two variables in adolescents aged 11 to 16. These authors postulate that the ability to empathize affects the perception of the school climate, given that it leads to better attitudes toward institutional authority and reduces violent behavior among peers.

The present study

The purpose of this study is to determine the influence of EC and dispositional empathy on school climate perception among students starting secondary education. We predict that EC and dispositional empathy facilitate a positive perception of school climate (see Fig. 1), and we wish to determine whether these relationships are due to (a) the positive influence of EC and empathy on academic achievement and peer relationships (sociometric status), (b) the direct

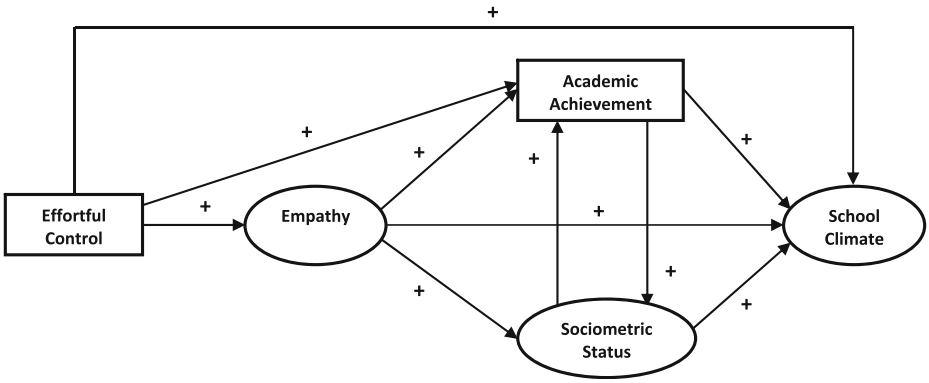

Fig. 1 Conceptual model of the influence of effortful control and dispositional empathy on perception of school climate, mediated by academic achievement and sociometric status

influence of EC and empathy on climate, or (c) both a and b. In addition, we will contrast if the relations between academic achievement and school climate could be reversed (Jia et al. 2009). Further, given that the literature points to gender differences in academic achievement (Valiente et al. 2008) and in other variables included in the model (Wentzel et al. 2007), we wish to determine whether the predictive power of EC and empathy for school climate is the same in males as in females. Confirmation of these predictions will increase our knowledge on the individual factors that determine perception of a positive school climate.

Method

Participants

Participants comprised 398 students (204 females, 190 males) aged 12 to 13, from four state secondary schools (school A=95, school B=102, school C=98, school D=103) in the city of Granada (Spain); the mean age was 12.47 (SD=0.73) for females and 12.50 (SD=0.74) for males. The socioeconomic status of families (levels of parental education and income) attending the four schools was similar, i.e., middle-low. The majority of the students were Caucasian children, born in Spain; only 15 % were Latin American immigrants. Participation was voluntary, and parental consent was obtained. Thirty-two participants were excluded (14 %) from the analysis because they did not complete all the questionnaires.

Questionnaires and measurements

Effortful control EC was assessed using the *Early Adolescence Temperament Questionnaire–Revised Self-Report* (EATQ-R self report; Ellis and Rothbart 2001), translated into Spanish by Checa et al. (2008). This scale has been used in the literature with adolescent populations aged 10 and over (Ellis and Rothbart 2001). The EATQ-R measures four factors of temperament in adolescents: effortful control, extraversion/surgency, negative affect, and affiliation. In this study, we used the total score of the 16 items designed to obtain information on effortful control (α=.72), comprising three subfactors: activation control (e.g., "If I have a hard assignment to do, I get started right away"); attentional control (e.g., "It is easy for me to

really concentrate on homework problems"); inhibitory control (e.g., "I can stick to my plans and goals"). Items were rated on a Likert-type scale ranging from 1 (almost always untrue of you) to 5 (almost always true of you). In this study, internal consistency (α=.73) was similar to that reported in previous studies (Valiente et al. 2008).

Empathy Empathy was measured using an adapted Spanish version (Mestre Escrivá et al. 2004) of the *Interpersonal Reactivity Index* (Davis 1983), which assesses dispositional empathy using 28 items divided into four subfactors: empathic concern, perspective taking, fantasy, and personal distress. This study includes the scores for perspective taking and empathic concern, the two dimensions that provide the most accurate and direct information on empathic resources (Decety and Lamm 2009). Empathic concern evaluates whether a person responds affectively to another s emotional experience ("I often have tender, concerned feelings for people less fortunate than me"). Perspective taking provides information on the cognitive capacity to look at everyday situations from another point of view ("I try to look at everybody s side of a disagreement before I make a decision"). Items were rated on a scale ranging from 1 (does not describe me well) to 5 (describes me very well). In the Spanish version, Mestre Escrivá et al. (2004) confirmed the factor structure identified by Davis (1983), with similar internal consistency indices to those in this study (empathic concern, α=.68; perspective taking, α=.72).

Academic achievement The grade point average (GPA) of each participant, at the end of the course, was included as a measure of academic achievement. The GPA was calculated on grades obtained in the following subjects: Mathematics, Spanish Language, Foreign Language (English), Social Studies (History), Science (Biology), Physical Education, and Drawing/ Music. Grades for each subject may vary on a scale from 0 to 10. A student is considered to have passed a subject when their grade is 5 or higher. This achievement scale is not biased by the teacher/school awarding the grade. The correlation between the mean raw score used in this study and the mean grade obtained after transformation to a z-score was .84.

Sociometric status Sociometric status was evaluated using a sociometric procedure and a prosocial behavior rating scale. In the *sociometric procedure* (Rodríguez Pérez 2005), each student selected three peers from a list of their classmates with whom they were willing to do school or recreational activities, and likewise, three classmates with whom they would not like to do these activities. The number of positive and negative nominations for each student was divided by the number of students in the class to obtain group size-adjusted absolute scores. The final score on *social preference* was obtained for each student by subtracting the adjusted number of negative nominations from the number of positive nominations. Additionally, following the method proposed by Newcomb et al. (1993), students were asked to evaluate each classmate on a single scale according to how much help they provided in different situations (doing assignments, when feeling sad or worried, and in conflict situations with other classmates). These assessments of *prosocial behavior* were made on a Likert-type scale ranging from 1 (provides very little help) to 5 (provides a lot of help) and were standardized for each class.

Perception of school climate To evaluate perception of school climate, the Questionnaire to Assess School Social Climate (Trianes et al. 2006) was distributed to participants. The questionnaire was constructed based on the items in the California School Climate and Safety Survey (Furlong et al. 2005). It includes a total of 14 items that are grouped into two factors and rated on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The

first factor assesses perceptions of helpful behavior, respect, safety, and feeling comfortable at school (7 items, e.g., "People at this school care about each other"); the second factor assesses satisfaction with student-teacher relationships (7 items, e.g., "If I need help, my teachers help me"). Factor reliability in both cases was adequate (related to school, α=.73; related to teaching staff, α=.77) and was similar to that observed in previous studies. Raw scores were transformed to z-scores in order to control the influence of the school variable.

Procedure

Booklets in which self-reports and sociometric questionnaires were presented in random order were distributed to students from the different class groups participating in the study. Prior to distribution, participants were informed that any information provided would be treated confidentially and were given written and verbal instructions on how to complete the questionnaires. Self-reports and sociometric questionnaires were completed during the first term of the school year (in November), during a regular class period, in a 25–30-min group session, supervised by this study's authors. At the end of the school year (in June of the following year), students completed the school climate scale. The GPAs for each participant were obtained from official school records.

Results

Data analyses

First, a descriptive and correlational analysis of all variables was made. Then, the predictions proposed in the initial predictive model (Fig. 1), and in the models subsequently developed, were tested with structural equation modeling (SEM), using AMOS statistical software, version 18.0. Finally, a mediation and moderation gender analysis was made in order to attain a better understanding of the predictive variables. The script PROCESS (Hayes 2013) was used to evaluate mediations, using bootstrap method with 2000 resamples, and the OLS/ML method to calculate the confidence intervals (CI), set at 95 %, and corrected following the "bias corrected" method. A multiple group SEM analysis was performed to determine whether gender is a moderator in the model proposed for P-SC.

Preliminary analyses

Participants means and standard deviations for each of the variables are shown in the first (females) and second (males) columns of Table 1. Results of the correlation analysis are shown in the third and following columns. It can be seen that EC is positively correlated to measures of empathy, academic achievement, prosociality, and perception of school climate. Scores on perspective taking are also positively correlated to academic achievement and school climate. Empathic concern is positively correlated to perspective taking, prosocial behavior, social preference, and school climate. Last, academic achievement, prosocial behavior, and school climate are positively correlated. These correlation patterns suggested that it was appropriate to test the predictions proposed in the model.

Considering that the correlations among the majority of subfactors in each questionnaire were high, some latent variables were created to simplify the analysis. The high positive

Table 1 Means, standard deviations, and Pearson correlations among the measures obtained in this study

Variable	F M (*SD*)	M M (*SD*)	PT	EmC	AA	SP	PB	SC-S	SC-T
EC	10.20 (1.63)	10.24 (1.59)	.22**	.16**	.37**	.09	.17**	.36**	.36**
PT	21.69 (3.71)	21.22 (4.43)		.42**	.15**	.06	.09	.29**	.35**
EmC	24.44 (5.06)	22.58 (4.63)			.22**	.10**	.14**	.16**	.24**
AA	6.19 (1.75)	5.66 (1.75)				.29**	.39**	.23**	.26**
SP	.03 (.14)	.02 (.15)					.62**	.11**	.05
PB	3.06 (.54)	2.94 (.60)						.19**	.15**
SC-S	26.46 (6.48)	25.84 (6.00)							.62**
SC-T	21.36 (5.03)	21.59 (4.96)							-

EC effortful control, *PT* perspective taking, *EmC* empathic concern, *AA* academic achievement, *SP* social preference, *PB* prosocial behavior, *SC-S* school-related social climate, *SC-T* teacher-related social climate

There were not statistical differences between genders using Fisher r-to-z transformation

correlations between perspective taking and empathic concern suggested that a latent variable is created for empathy. Based on the same criterion, a further latent variable was created for perception of school climate (P-SC), composed of the perception of helpful behavior among classmates and safety at school, and the perception of satisfaction in the teacher-student relationship. The third latent variable, sociometric status, was composed of the social preference index and the assessments of prosocial behavior.

Predicting perception of school climate

The results obtained from the analysis of the initial predictive model, in which EC and empathy are related to P-SC, mediated by academic achievement and sociometric status, were not satisfactory, indicating poor model fit: χ^2=106.28, *df*=15, *p*=.000; χ^2/df=7.09; *RMSEA*=.12, *CFI*=.87, *NFI*=.86. However, model modification indices suggested the convenience of including a direct relationship of EC and empathy with P-SC. In the following two models, these two direct relationships were included successively. There is evidence that students with good EC resources are more respectful of school norms and respond more positively to school demands (Eisenberg et al. 2010c; Rueda et al. 2010). Therefore, it is possible that EC has a direct positive influence on perception of the school environment and on teacher-student relationships, without the need for mediation of academic achievement or sociometric status. As shown in Table 2, model 2, which includes a direct relationship between EC and P-SC, shows a good fit and improves the fit indices of the first model. EC continued to have a direct influence on academic achievement (β=.35, *p*<.001), empathy (β=.31, *p*<.001), and a high predictive power for P-SC (β=.41, *p*<.001). When the direct relationship between EC and P-SC was included, the prediction of academic achievement for P-SC decreased from β=.27, *p*<.001 (model 1) to β=.12, *p*<.05 (model 2), and prediction of social status for P-SC was similar (β=.11, *p*<.10).

Despite the good fit of the second model, modification indices continued to suggest a possible improvement from the inclusion of a direct effect of empathy on academic achievement and P-SC. As explained in the introduction to this paper, empathic abilities foster cooperation and intergroup relations (Eisenberg et al. 2010a; Hoffman 2008). It is possible that these abilities not only influence positive peer assessment, but also facilitate school adjustment and the establishment of

Table 2 Fit indices for each of the models assessed using structural equation analysis

	χ^2	Df	CFI	NFI	RMSEA	AIC	$\Delta\chi^2$
P-SSC							
Model 1	106.28	15	.87	.86	.12	164.28	-
Model 2	58.61	14	.94	.92	.09	118.61	47.67*
Model 3	17.52	12	.99	.97	.03	81.52	41.09*
Modelo 4	23.23	13	.98	.97	.04	85.23	-

P-SSC perception of school social climate

Model 2 compared to model 1; model 3 compared to model 2. The difference test $\chi 2$ confirmed that model 3 had better goodness-of-fit indices. The same result was obtained using the Akaike information criterion (AIC): model 3 had the lowest values, which shows that it had a better fit

* $p = < 0.01$

positive student-teacher relationships, thus improving the perception of social climate. A direct relationship between empathy, P-SC, and academic achievement was included in model 3. Model fit, $\chi 2$=17.52, *df*=12, *p*=.13; $\chi 2/df$=1.46; *RMSEA*=.03, *CFI*=.99, *NFI*=.97, was better than for previous models (see Table 2). Empathy had a positive influence on academic achievement (β=.15, *p*<.05) and P-SC (β=.41, *p*<.001), although it no longer had a direct influence on sociometric status. In this model, the predictive value of EC for P-SC shifted from β=.40 to β=.24 (*p*<.001); the effect of academic achievement decreased from β=.12 to β=.07, and that of sociometric status from β=.11 to β=.06. Significance was not reached in either case (*p*>.05).

Finally, the forth model was tested. Academic achievement was predicted by school climate and sociometric status. There is evidence to suggest that the perception of positive relations between peers and teachers enhances academic achievement. The fit of the model was good, χ2= 23.23, df=13, *p*=.039; χ2/df=1.78; RMSEA=.04, CFI=.98, NFI=.97, but lower than model 3.

In summary, model 3 includes direct relationships between EC and empathy, and P-SC, and manages to explain 39 % of their variance. Besides the aforementioned direct effects (see Fig. 2), EC was observed to have an indirect predictive power of .16 for P-SC, making a total of .45. Empathy had a total predictive power of .42 for P-SC, showing a minimal direct relationship. When the direct effects of EC and empathy were taken into consideration, the influence of academic achievement and sociometric status on the P-SC decreased significantly. Overall, the third model enabled us to corroborate the positive influence of EC on empathy measures (R^2=.10), and the prediction of both measures for academic achievement (R^2=.16). Empathy and academic achievement predict sociometric status (R^2=.18); however, contrary to expectations, the influence of sociometric status on academic achievement is not significant.

Mediation analysis

The model with the best fit contains mediations that require analysis in order to attain a better understanding of the predictive variables. In the third model (see Fig. 2), there is a direct effect of empathy on sociometric status, and a further indirect effect through the mediation of academic achievement that was not taken into consideration in our first model (mediation 1: empathy→ academic achievement→ sociometric status). Furthermore, EC has a direct influence on academic achievement and through the mediation of empathy (mediation 2: EC→ empathy→ academic achievement). In mediation 1, EC was included as covaried. The effect

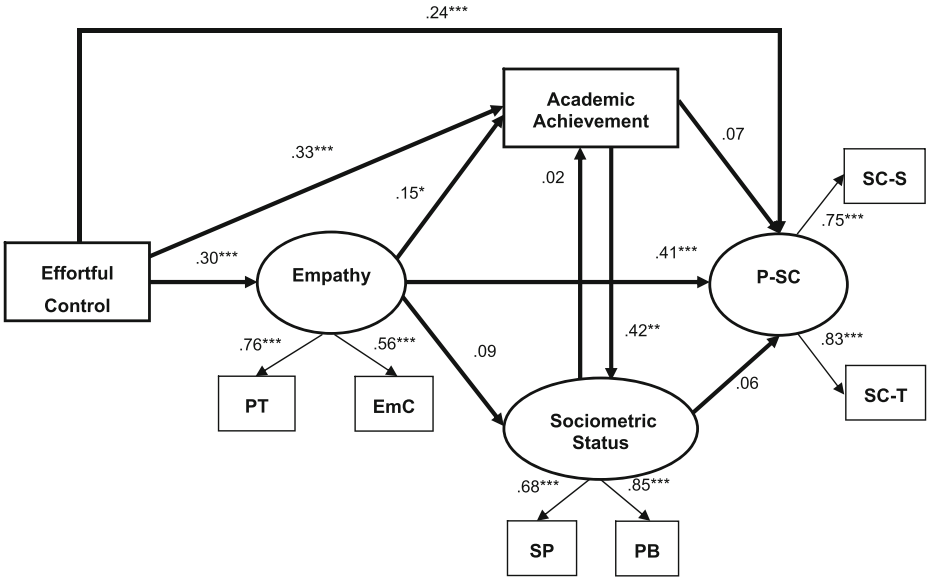

Fig. 2 Analysis of a structural equation model taking into consideration the influence of *effortful control and empathy on academic achievement, sociometric status, and perception of school climate.* Model 3 showed an adequate fit, χ^2=17.52, *df*=12, *p*=.13; χ^2/df=1.46; *RMSEA*=.03, *CFI*=.99, *NFI*=.97, and explained 39 % of the variance in the *perception of school climate. PT* perspective taking, *EmC* empathic concern, *SP* social preference, *PB* prosocial behavior, *SC-S* school-related social climate, *SC-T* teacher-related social climate, *P-SC* perception of school climate. **p*<0.05, ***p*<0.01, ****p*<0.001

of empathy on academic achievement (a path) was β=.16, *p*<.001, *t*=3.15 (*p*<.001, *df*=395); the direct effect of academic achievement on sociometric status (b path) was β=.37, *p*<.001, *t*=7.33 (*p*<.001, *df*=394); the total effect of empathy on sociometric status (c path) was β=.12, *p*=.027, *t*=2.21 (*p*<.001, *df*=394); and the direct effect of empathy on sociometric status (c' path) was β=.06, *p*=.23, *t*=1.17 (*p*<.001, *df*=394). This resulted in a predictive model of the sociometric status where *R*=.39, R^2=.15, *F*=24.28, *df*=395, *p*<.001. The indirect effect of empathy through academic achievement was .061 (CI 0.028 and 0.097). Results obtained from the Sobel test show significant values for path ab, z=3.59, *p*<.001; the BCa method shows a significant confidence interval between 0.0006 and 0.002 (95 %). Therefore, the influence of empathy on sociometric status was significantly mediated by academic achievement. Empathy positively influenced academic achievement, and those students with good school grades are the ones more selected by their peers.

In mediation 2, the effect of EC on empathy (a path) was β=.23, *p*<.001, *t*=4.72 (*p*<.001, *df*=395); the direct effect of empathy on academic achievement (b path) was β=.34, *p*<.001, *t*=7.24 (*p*<.001, *df*=395); the total effect of EC on academic achievement (c path) was β=.49, *p*<.001, *t*=10.24 (*p*<.001, *df*=395); and the direct effect of EC on academic achievement (c' path) was β=.37, *p*<.001, *t*=8.10 (*p*<.001, *df*=395). This resulted in a predictive model of academic achievement where *R*=.40, R^2=.16, *F*=38.57, *df*=395, *p*<0.001. The indirect effect of EC on academic achievement mediated by empathy was .034 (CI 0.013 a 0.067). The test assuming normality for indirect effects (Sobel) was significant, z=2.58, *p*<.01, and method BCa provided a significant confidence interval between 0.012 and 0.076 (95 %). Thus, EC has a direct positive influence on academic achievement and also an indirect positive influence through empathy.

Gender moderation analysis

Given that some variation was found between the mean grades of male and female students, and that there is some controversy over the influence of gender on academic achievement and empathy (Jordan et al. 2006; Valiente et al. 2008), a "restricted" model was computed in which all factor loadings and regressions were forced to be equal across both groups. The resulting model had a good fit: χ^2=40.20, *df*=28, *p*=.06; χ^2/df=1.117; *RMSEA*=.03, *CFI*=.98, *NFI*=.95. The difference between the "unrestricted" model (no parameter constraints) and the restricted model, χ^2 (14.32) with 12 degrees of freedom, was not significant (*p*=.280), indicating that the model proposed for P-SC fits the data well for both males and females aged 12 to 14; thus, it can be stated that gender does not moderate the effect (Byrne 2001).

Discussion

The main purpose of this research was to test a structural equation model of the influence of EC and empathy on perception of school climate. A further aim was to determine whether such influence was mediated by students academic achievement and sociometric status. The model also enabled us to examine whether the positive relationship cognitive control has with empathy and academic achievement, previously observed in younger children (Liew et al. 2010; Eisenberg et al. 2010a; Eisenberg et al. 2010c; Rueda et al. 2010; Checa et al. 2008), persists at the start of secondary education. The analyses supported the direct influence of EC and empathy on the perceptions of school climate at the start of secondary education. At the same time, the model corroborated that EC influences academic achievement directly, and through the mediation of empathy.

The direct positive relationship between EC and the students' perception of the school environment and of their rapport with teachers can be explained by the results of other studies that found a significant covariation between EC and some measures of social behavior (Fernández-Vilar and Carranza 2012). Preschoolers with adequate EC resources have fewer conflicts and warmer relationships with their teachers (Myers and Morris 2009; Liew et al. 2010; Valiente et al. 2012; Silva et al. 2011). Behavioral problems and disruptive behavior in class are found more frequently among children and adolescents with low levels of EC (Eisenberg et al. 2010b). These behaviors, which are differentially associated with varying levels of EC, may provoke diverse reactions in peers and teachers, determining the perception of school climate. As some authors suggest, students with behavioral problems and disruptive behavior receive less personal and academic support from their peers (Valiente et al. 2008) and have more conflicts with their teachers (Nurmi 2012). In this negative interpersonal context, it is likely that their motivation to participate in class activities is diminished, causing a negative effect on their desire to attend school (Valiente et al. 2012). Ultimately, this attitude might foster a more negative perception of school climate.

Besides being directly related to climate perception, the influence of EC on perception of school climate would follow two paths. In the first case, even though it was previously suggested that EC would foster a more positive perception of climate as a result of better achievement and better adjustment to the school demands (Rueda et al. 2010), the current study did not find support for this indirect path. In the second case, EC would influence social skills and/or cognitive-emotional processes such as empathy (Eisenberg et al. 2010b), which are strongly linked to the interpersonal relationship style that unfold at school (Eisenberg et al.

2010c). According to the results reported in this study, the influence of the second path through empathy is supported. Future longitudinal studies might explain the causal relationships and define the relative weight of each of these variables on predicting school climate.

Numerous studies have reported positive relationships between EC and student academic achievement (Valiente et al. 2011; Zorza et al. 2013). It is possible that EC encompasses a large part of the control and self-regulation resources required for successful learning and adjustment to the institutional school demands. Attentional control helps focus on the relevant aspects of academic content and enhances flexibility in using the mental representations and complex reasoning required by school assignments (Rueda et al. 2010). Thus, EC facilitates the use of efficient learning strategies (Cermakova et al. 2010) and the acquisition of appropriate academic habits (Zorza et al. 2013). Furthermore, students who are capable of controlling their behavior probably conform more efficiently to school norms and routines, are more engaged in their activities, and keep themselves motivated to perform less appealing tasks; all of which enables them to attain better academic achievement (Eisenberg et al. 2010c).

The link between school achievement and climate perception that has been observed in some studies (Fan et al. 2011) takes on fuller significance in the global framework of the relationships confirmed by this study. When the direct relationship of EC to perception of school climate was included in the model, the influence of academic achievement on climate decreased considerably. On de other hand, as model 4 revealed, students who perceive relationships with peers and teachers positively show better academic achievement. Therefore, the relationship between school climate and academic achievement could be considered bidirectional. Future longitudinal studies might explain the causal relationships and define the relative weight of each of these variables on predicting school climate.

Empathy plays an important role in the model. It is predicted by EC and has influence on academic achievement and perception of school climate. The relationships between EC and empathy have been observed in children (Valiente et al. 2004) and adolescents (Zorza et al. 2013). Different authors have stated that self-regulation and cognitive flexibility are core components of empathy (Decety and Lamm 2009; Eisenberg and Eggum 2009). Empathy requires ability to distinguish one s own emotions from others', emotional self-regulation, perspective taking, and dynamic adaptation of individual behavior to the actions, intentions, and responses of others (Decety and Svetlova 2012). The close relationship between empathy and perception of school climate underlines its relevance in students everyday experiences. Children and adolescents with high levels of empathy are able to understand others intentions, share their emotions, and adapt their behavior more efficiently to the normative and moral frameworks of their group (Eisenberg and Eggum 2009). Empathic resources facilitate adjustment to peer group demands and foster helpful behaviors and cooperation (Wentzel et al. 2007), shape positive attitudes toward adults and reduce the risk of violent behavior (Ruiz et al. 2009). Further, it is likely that the capacity to regulate emotions stemming from interpersonal relationships in class enhances student good relations with teachers and increases understanding of the information imparted by them (Immordino-Yang and Damasio 2007). These affective bonds with teachers are an essential part of the teaching-learning process (Hughes 2012; O'Connor 2010). Positive interpersonal experiences, which are facilitated by empathy, lead to a more positive perception of school climate.

Traditionally, empathy has been positively related to students' sociometric status. The capacity to understand others emotions fosters positive peer assessment (Warden and MacKinnon 2003) and greater capacity for group work (Spinrad and Eisenberg 2009). In the first model, this relationship was confirmed. However, in the third model, the relationship

between empathy and sociometric status decreased. In this model, empathy had an indirect effect on sociometric status through academic achievement. Further, sociometric status was not a good predictor of academic achievement. Relationships between these three variables seem complex and require further studies, particularly longitudinal ones. At the start of secondary education, just like in primary education, good academic achievement is considered to be an attribute of popularity among peers (Juvonen and Murdock 1995), and the characteristics of students with a high level of academic achievement (greater academic motivation, class participation, and teacher recognition) influence their choices of classmates. Perhaps, in subsequent secondary grades, academic achievement is not such a determining aspect of sociometric status, and empathy plays a more important and more direct role in sociometric preferences and in peer evaluation of prosocial behavior.

The investigation has some limitations. EC and empathy measures have been evaluated only through self-reports provided by the students. In oncoming investigations, other behavioral measures should be obtained, and the information about students should be completed with that provided by their families and teachers. Moreover, although in the study, the EC and empathy measures are obtained approximately 7 months previous to those of school climate and academic achievement, additional longitudinal studies are required to provide convergent evidence on the results provided by the SEM analysis of the models contrasted in the present study. Last, the generalization of these results requires investigations with samples from students from different sociocultural contexts.

Overall, results suggest that the perception of a positive school climate (helpful classmates, good student-teacher relationships, school safety) at the start of secondary school depends significantly on individual capacities to self-regulate behavior and to empathize with other students. These results complement the findings from other studies on the relationship between certain individual characteristics and the perception of school climate (Thapa et al. 2012). What is more, it should be underlined that this relationship is not gender-moderated; neither was gender found to have modulated these relationships in other studies (Valiente et al. 2008, 2012; Zorza et al. 2013). These results suggest that it is convenient to develop cognitive control activities that include interpersonal elements promoting empathy. In this way, academic performance and positive interpersonal relationships, as well as the perception of the school climate by the students, would be strengthened. Some educational programs are already including training on these skills (Rueda et al. 2010; Posner and Rothbart 2005), although they have not been linked to the perception of school climate.

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Most relevant publications in the field of Psychology of Education:

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