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Adolescent aggression: Effects of gender and family and school environments

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Abstract

The present study examined the influence of family and classroom environments on the development of particular individual characteristics, including level of empathy, attitude to institutional authority and perceived social reputation, and the role these characteristics may in turn play in school aggression. Participants were 1319 adolescents aged 11–16 (47% male) drawn from state secondary schools in Valencia (Spain). Since previous studies suggest that these variables may contribute differentially to aggressive behaviour depending on adolescent gender, two different mediational structural models were calculated, respectively, for boys and girls. Results obtained confirmed the associations expected among the variables considered in the structural equations tested and pointed out different paths for boys and girls. Overall, our findings suggested that a positive family environment seems to be a stronger protective factor for girls in the development of problems of behaviour at school, whereas for boys this is the case for a positive classroom environment. This model accounted for 40% of the variance in aggression at school for boys and 35% for girls.
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Keywords: Aggression at school; Family environment; Classroom environment; Empathy; Attitude to authority; Social reputation

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Introduction

Since the 1980s there has been a steady increase in research analysing problems of aggressive behaviour among children and adolescents at school, reflecting the growing seriousness of these problems in some European countries and the United States (Olweus, 2001; Skiba, 2000; Smith, 2003). These behaviours involve aggression against school property and that of other classmates, as well as aggression against teachers and peers themselves (Astor, Pitner, Benbenishty, & Meyer, 2002; Herrero, Estévez, & Musitu, 2006). The present research specifically focused on aggression towards peers at school, following the classification of aggressive behaviours propose by Little, Henrich, Jones, and Hawley (2003). These authors distinguish between overt aggression, a type of behaviour which involves direct and manifest violence (e.g., hitting, pushing), relational aggression or harming others through manipulation of interpersonal relationships (e.g., spreading rumours, excluding a peer from a group), and instrumental aggression, used by aggressors to achieve their immediate goals (e.g., hitting a peer to get money).

Regarding factors that may underlie these problems, previous research has documented the association between aggressive behaviour in adolescence and particular individual and social factors, these later relating mainly to the family and school contexts, the most important social contexts for development and psychosocial adjustment in this period of life (Musitu & García, 2004). Prior studies examining the link between individual variables and aggressive behaviour in adolescence have demonstrated, for instance, that aggressive adolescents are normally unable to anticipate the negative consequences of their behaviours for the victim, showing lower levels of empathy (Dykeman, Daehlin, Doyle, & Flamer, 1996; Evans, Heriot, & Friedman, 2002; Olweus, 2005).

Other recent studies conclude that aggressive adolescents at school show a very strong need for social recognition; they would like to be considered as powerful, socially accepted, different, and rebellious by their classmates (Rodríguez, 2004). In other words, some authors suggest that the desire for popularity, leadership, and power leads to the involvement of many adolescents in disruptive behaviours (aggressive acts, drugs consumption), providing them the opportunity to construct the social reputation they desire (Buelga, Ravenna, Musitu, & Lila, 2006; Carroll, Hattie, Durkin, & Houghton, 1999; Emler & Reicher, 2005; Kerpelman & Smith-Adcock, 2005). This wish to be recognized as a rebel implies, moreover, that these adolescents hold rather negative attitudes towards authority. In fact, it has been documented that aggressive adolescents normally show somewhat negative attitudes to institutional authorities such as the police, the law, and also the school and teachers (Adair, Dixon, Moore, & Sutherland, 2000; Emler & Reicher, 1995; Estévez, Herrero, Martínez, & Musitu, 2006). But how do they develop these attitudes, goals and deficits?

The family environment and the school environment have regularly been linked in the scientific literature to psychosocial and behavioural adjustment problems in the adolescent period (Estévez, Musitu, & Herrero, 2005; Murray & Murray, 2004; Stevens, De Bourdeaudhuij, & Van Oost, 2002). The quality of adolescent–parent, adolescent–peer and adolescent–teacher interactions influence, and may determine, the way adolescents perceive themselves in relation to others, their attitudes, and their behaviours (Jessor, 1991; Lila, Buelga, & Musitu, 2006; Werner, 2004). For example, prior studies have shown that a negative family environment, characterized by high levels of family conflict (Crawford-Brown, 1999; Cummings, Goeke-Morey, & Papp, 2003), poor

or negative communication with parents (Dekovic, Wissink, & Meijer, 2004; Stevens, De Bourdeaudhuij, & Van Oost, 2002), and lack of parental support (Barrera & Li, 1996; Sheeber, Hops, Alpert, Davis, & Andrews, 1997), has a substantial and negative effect on the development of particular social skills in children, such as the capacity to identify non-aggressive solutions to interpersonal problems (Demaray & Malecki, 2002; Lambert & Cashwell, 2003), or to put oneself in another's place (Eisenberg-Berg & Mussen, 1978; Henry, Sager, & Plunkett, 1996).

As Paley, Conger, and Harold (2000) remark, children establish their first social relations with parental figures and the nature of those parent–child relationships and the context in which they are sustained may determine the social skills and social relations the child will develop with others later in life. Consistent with this, Henry et al. (1996) found that adolescents having parents who engage in positive reasoning to solve problems, and who described their families as high in cohesiveness, are more likely to report higher levels of perspective taking when trying to understand another individual's feelings or emotional state. These authors conclude from their findings that the family fosters adolescent empathy development in multiple ways; it not only provides the training ground for empathy skills, but also establishes a precedent for the use of an empathic response which the adolescent can then draw upon in the course of interactions with peers and other adults such as teachers. Taking into account these findings, as a first aim of this study, we addressed the possible mediational effect of adolescents' level of empathy upon the relation between family environment and aggressive behaviour. We examined these relationships separately by gender, since some differences between boys and girls have been found with respect to the influence of quality of family interactions on the development of behavioural problems in adolescence. Some recent studies suggest that family risk factors, such as weak affective cohesion and low parental support, are more strongly related to aggressive behaviour in girls than in boys (Blum, Ireland, & Blum, 2003; Flood-Page, Campbell, Harrington, & Miller, 2000).

Regarding the school environment, being academically successful, perceiving peers in the classroom as friends or colleagues, and having positive interactions with teachers have all recently been singled out as important for the adolescent's psychosocial adjustment (Andreou, 2000; Blankemeyer, Flannery, & Vazsonyi, 2002; Reinke & Herman, 2002). Students sharing these characteristics are likely to perceive the school as a useful learning context the purpose of which is to help them construct a successful future as workers and citizens. Such students will not normally therefore exhibit behavioural problems and will express positive attitudes towards teachers and the school (Jack et al., 1996; Molpeceres, Lucas, & Pons, 2000; Samdal, 1998). A negative school environment, in contrast, damages children's and adolescents' potential (Moote, 1997). Through respect, courtesy, shared responsibility, and a sense of community, teachers may create a successful environment for their students and convince them that they are all valued members of the classroom benefiting from working together (Haberman, 1995). This approach could have value in preventing negative attitudes to school and teachers, reducing the number of unruly students and aggressive acts in the classroom and the school more generally (Meehan, Hughes, & Cavell, 2003; Vassallo, Smart, & Sanson, 2002).

A second aim of the present study was, therefore, to examine the possible mediational effect of adolescent's attitude to authority and aspiration to a particular social reputation upon the relation between classroom environment and aggressive behaviour. We again analysed relationships among these variables by gender, since some previous studies have shown gender differences in attitude to authority, with girls more likely to show positive attitudes (Emler & Reicher, 1987;

Murray & Thompson, 1985). Additionally, social reputation has been found to predict antisocial behaviour more strongly among girls (Carroll, Houghton, Hattie, & Durkin, 2001). Finally, with regard to factors related to the classroom environment such as the quality of social relationships among peers and teacher–student interactions, girls tend to have more intimate peer relations in the adolescent period (Moffit, Caspi, Rutter, & Silva, 2001) and more positive interactions with teachers (Bearman, Wheldall, & Kemp, 2006).

Although these findings enhance our understanding of the potential causes of school aggression among adolescents, most research has focused on analysing risk factors independently. Fewer studies have jointly examined the contribution of multiple variables and the role of the two primary social contexts for the adolescent psychosocial adjustment, namely family and school. In the same manner, most research has approached the study of aggressive behaviour in boys, but it remains unclear whether the same processes emerge for both boys and girls in the development of this type of behaviour. The general purpose of the present study was to examine the influence of family and classroom environments on the development of particular individual characteristics, including empathy, attitude to institutional authority, and perceived social reputation, and the role these characteristics may in turn play in school aggression. We hypothesized that: (1) the relationship between family environment and involvement in aggressive behaviours at school would be mediated, at least in part, by the adolescent's level of empathy; (2) the relationship between classroom environment and school aggression would be mediated, at least in part, by attitude to authority and reputational goals. Moreover, since the review of past research suggests that these variables may contribute differentially to aggressive behaviour depending on adolescent gender, two different mediational models were executed, respectively, for boys and girls.

Method

Participants

Participants in the study were 1319 adolescents attending secondary education in seven public schools in Valencia, a metropolitan area with a population of one million. Ages ranged from 11 to 16 (mean age 13.7; s.d. 1.6); 47% were boys and 53% were girls.

Procedure

Data for this research were collected as part of a larger study of adjustment problems in adolescence. After pre-contacts were made with several public schools selected at random, seven schools finally participated in the study based primarily on their availability and the willingness of staff to collaborate in the investigation. Following initial contact with head teachers, all teaching staff were informed of the objectives of the study during a 2-h presentation. In parallel, a letter describing the study was sent to the parents requesting that they indicate in writing if they did not wish their child to participate in (1% of parents exercised this option). Both teachers and parents expressed a wish be informed about the main results of the investigation in a meeting with the research team; this took place once data analyses were completed. Participants anonymously filled

out the scales during a regular class period, lasting approximately 1 h. All measures were administered within each classroom on the same day in February 2006.

Instruments

Relationship dimension of the Family Environment Scale (FES; Moos, Moos, & Trickett, 1989). This scale consists of 27 binary-choice (true–false) items, forming three subscales: (1) cohesion (nine items referring to degree of commitment and support family members provide for one another, e.g. "Family members really help and support one another"); (2) expressiveness (nine items regarding the extent to which family members are encouraged to express their feelings directly, e.g., "Family members often keep their feelings to themselves" reverse coded); (3) conflict (nine items referring to the amount of openly expressed anger and conflict among family members, e.g. "We fight a lot in our family"). Alpha reliabilities for these subscales in the present study were .85, .80, and .86, respectively.

Relationship dimension of the Classroom Environment Scale (CES; Moos et al., 1989). This scale consists of 27 binary-choice (true–false) items, forming three subscales: (1) involvement (nine items referring to degree of student attentiveness, interest and participation in class activities, e.g. "Students put a lot of energy into what they do here"), (2) affiliation (nine items regarding the concern and friendship students feel for one another, e.g. "Students in this class get to know each other really well"); (3) teacher support (nine items referring to the amount of help, trust and friendship the teacher offers to students, e.g. "The teacher takes a personal interest in the students"). Alpha reliability coefficients for these subscales in the current study were .84, .79, and .89, respectively.

Index of empathy for children and adolescents (IECA; Bryant, 1982; translated into Spanish by Mestre, Pérez Delgado, Frías, & Samper, 1999). The IECA is a 22-item measure, its items describing situations in which empathic feelings may occur (e.g. "Seeing a boy who is crying makes me feel like crying", "I get upset when I see a girl being hurt"). Level of agreement with the statement is indicated on a four-point rating scale (1 = never, 4 = always). Cronbach α for this scale in the present study was .81.

Attitude to Institutional Authority Scale (adapted from Reicher and Emler, 1985; bidirectional translation English–Spanish). This scale consisted of 10 items, each rated on four-point scales (1 = I totally disagree, 4 = I totally agree) and referring to attitudes towards teachers and school. Principal component analysis revealed a two-factor structure; the first factor (25.74% of variance) was defined by six items reflecting a positive attitude to school and teachers (e.g. "I agree with what my teachers say and do"; "It is usual to disobey teachers if there is no punishment", inverse coded), while the second factor (21.71% of variance) was defined by four items referring to perception of injustice (e.g. "Teachers only take care of students with good marks"). Cronbach α's for these subscales in the current sample were .77 and .73, respectively.

Social Reputation at School Scale (adapted from Carroll et al., 1999; bidirectional translation English–Spanish). This 15-item scale assesses the social reputation of school-aged children (e.g. "I'm a bully", "I'm a leader", "I'm a tough guy"), responses being given on a four-point scale (1 = never, 4 = always). Students had to indicate for the 15 items: (1) their perceived reputation ("My classmates believe that…"), and (2) their ideal reputation ("I would like my

classmates to believe that…). Alpha coefficients for measures of real and ideal reputation were .85 and .79, respectively.

School Aggression Scale (adapted from Little et al., 2003; bidirectional translation English–Spanish). On this scale, adolescents indicated the frequency with which they had engaged in 24 deviant and aggressive behaviours at school over the last 12 months, on a five-point scale (0 = I don't want to share this information, 1 = never, 4 = many times). Approximately 7% of respondents chose the "0" response for some items; these were removed from the analysis. Principal component analysis indicated a three factor structure underlying responses on this scale: the first factor (31.72% of variance) was defined by ten items referring to overt aggression (e.g. "I'm the type of person who hits, kicks, or punches others"), the second factor (22.67% of variance) was defined by seven items referring to relational aggression (e.g. "If other have hurt me, I often try to keep them from being in my group of friends"), and the third factor (19.64% variance) was defined by seven items referring to instrumental aggression (e.g. "I often start fights to get what I want"). Cronbach α's for these subscales in the current sample were .82, .73, and .78, respectively.

Results

We used the EQS 6.0. (Bentler, 1995) Structural Equation Program to analyze the influence of the family and classroom environments in the development of aggressive behaviours at school, treating level of empathy, attitude to institutional authority and social reputation as possible mediating variables in this relationship. We carried out these analyses for boys and girls separately, following Holmbeck's (1997) procedure to testing mediational effects in structural equation models. This author describes the following three steps in establishing mediation: (1) assuming that there is a latent predictor variable A (family and classroom environments), an hypothesized latent mediator variable B (empathy, attitude, and reputation), and a latent outcome variable C (school aggression), first the fit of the direct effect $A \rightarrow C$ model must be assessed; (2) the next step is to assess the fit of the indirect effect $A \rightarrow B \rightarrow C$ model with the $A \rightarrow C$ path constrained to zero; and (3) the final step is to assess the fit of the mediational effect $A \rightarrow B \rightarrow C$ model with the $A \rightarrow C$ path not constrained. There is a mediational effect if the model calculated in step 3 provides a significant improvement in fit over the model calculated in step 2, that is to say, if the effect of A on C is lower or reduced to non-significant when the mediator is taking into account.

To examine these relationships and influences, we first computed zero-order correlations to establish what relationships existed among the study variables (see Table 1). Next, we constructed the latent factors from these observed variables. Table 2 reports the factor loadings of the observed variables on their latent factor. The latent variables included in the structural models were: Family Environment (indicators: conflict, expressiveness, and cohesion), Classroom Environment (indicators: affiliation, involvement, and teacher support), Attitude to Authority (indicators: positive attitude and perception of injustice), Social Reputation (indicators: perceived and ideal reputation), Empathy (indicator: level of empathy; factor loading 1 with an error 0), and School Aggression (indicators: overt, relational, and instrumental aggression).

To determine the mediational effect, in the first step we calculated the direct effects model of Fig. 1 for both genders. This model showed a reasonably good fit with the data: χ^2

Table 1
Pearson correlations among observed variables, means and standard deviations by gender[a]

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Family environment—cohesion	–													
2. Family environment—expressiveness	.40*** .51***	–												
3. Family environment—conflict	.55*** .58***	.21*** .27***	–											
4. Classroom environment—involvement	.11** .08	.05 .04	.09* .01	–										
5. Classroom environment—affiliation	.34*** .31***	.21*** .22***	.26*** .18***	.33*** .37***	–									
6. Classroom environment—teacher support	.27*** .31***	.11** .18***	.19*** .19***	.30*** .19***	.27*** .19***	–								
7. Empathy	.18*** .18***	.16*** .13**	.15*** .09	.11** .03	.07 .09*	.13** .13**	–							
8. Attitude to authority—positive attitude	−.24*** −.28***	−.13** −.14**	−.19*** −.17***	−.21*** −.08	−.12** −.04	−.25*** −.25***	−.34*** −.17***	–						
9. Attitude to authority—perception injustice	.23*** .21***	.15*** .14**	.15*** .13**	.31*** .22***	.15*** .09*	.39*** .36***	.27*** .25***	−.37*** −.41***	–					
10. Perceived social reputation	−.24*** −.21***	−.14*** −.14**	−.21*** −.24***	−.19*** −.07	−.16*** .03	−.19*** −.10*	−.19*** −.10*	.45*** .40***	−.39*** −.36***	–				
11. Ideal social reputation	−.16*** −.17***	−.03 −.13**	−.13** −.17***	−.13** −.03	−.14** .05	−.15*** −.05	−.16*** −.06	.35*** .32***	−.26*** −.32***	.66*** .70***	–			
12. Overt aggression	−.23*** −.27***	−.09* −.13**	−.24*** −.23***	−.19*** −.05	−.13** −.07	−.19*** −.18***	−.30*** −.17***	.37*** .29***	−.26*** −.31***	.48*** .42***	.32*** .30***	–		
13. Relational aggression	−.22*** −.29***	−.08* −.15***	−.21*** −.21***	−.24*** −.07	−.16*** −.05	−.16*** −.18***	−.29*** −.20***	.36*** .32***	−.28*** −.33***	.43*** .39***	.29*** .34***	.598*** .61***	–	
14. Instrumental aggression	−.23*** −.20***	−.13** −.09*	−.25*** −.15***	−.18*** −.09*	−.14** −.02	−.20*** −.11*	−.35*** −.18***	.42*** .33***	−.26*** −.23***	.42*** .35***	.28*** .28***	.69*** .67***	.58*** .59***	–

Table 1 (*continued*)

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Mean	15.58	14.04	12.11	14.10	16.20	15.71	58.68	7.80	15.44	12.40	10.61	6.61	8.07	7.52
	15.63	*14.30*	*12.10*	*13.99*	*16.14*	*15.95*	*66.11*	*6.77*	*15.73*	*10.62*	*9.44*	*5.84*	*6.26*	*6.36*
Standard deviation	2.35	1.729	1.99	2.15	2.00	2.69	6.97	3.04	3.91	4.20	4.02	2.00	2.79	2.48
	2.48	*1.851*	*2.01*	*2.12*	*2.15*	*2.66*	*6.93*	*2.88*	*3.81*	*3.46*	*3.30*	*1.66*	*2.19*	*1.97*

Levels of significance: ***$p<.001$; **$p<.01$; *$p<.05$.

[a] *Note*: Values obtained for boys are shown above and for girls below and in italics.

Table 2
Unstandardized parameter estimates, standard errors, and significance levels

Variables	Factor loadings	Standard errors
Family environment		
Conflict	−.815***	.075
Expressiveness	.603***	.070
Cohesion	1[a]	0
Classroom environment		
Affiliation	.758***	.101
Teacher support	.490***	.047
Involvement	1[a]	0
Empathy	1[a]	0
Attitude to authority		
Perception of injustice	−.843***	.0721
Positive attitude to school and teachers	1[a]	0
Social reputation		
Perceived	.694***	.049
Ideal	1[a]	0
School aggression		
Relational	.916***	.043
Instrumental	.898***	.039
Overt	1[a]	0

Robust statistics. [a]Fixed to 1.00 during estimation.
***$p<.001$ (two-tailed test).

(17, $N = 620$) = 32.661 ($p<.01$). CFI = .98, IFI = .98, NNFI = .97, and RMSEA = .04 for boys, and χ^2 (17, $N = 699$) = 71.793 ($p<.01$). CFI = .95, IFI = .95, NNFI = .94, and RMSEA = .05 for girls. For the χ^2 likelihood-ratio statistics, a non-significant value indicates that the model is well adjusted to the data (however, since this fit index is very sensitive to the sample size, other fit indexes must be consider when testing goodness of fit); for the CFI, IFI, and NNFI, values above .95 or higher are acceptable, and for the RMSEA values of .05 or less are acceptable (Batista & Coenders, 2000). This model accounted for 18% of the variance in School Aggression for boys and 11% for girls. In the case of boys, only a significant negative direct association was found between positive classroom environment and school aggression ($\beta = -.32$, $p<.001$). For girls, school aggression was significantly and negatively related only to positive family environment ($\beta = -.34$, $p<.001$).

Since in this first model, the direct effect A→C was non significant in some cases, namely family environment for boys and classroom environment for girls, mediational effects could not be tested with these factors, but indirect effects could be tested. In the second step, we calculated the indirect effects model of Fig. 2, with the A→C paths constrained to zero. The fit indices obtained in this case were considerably better in comparison with the previous model: χ^2 (44, $N = 620$) = 58.149 ($p<.07$). CFI = .99, IFI = .99, NNFI = .98, and RMSEA = .03 for boys, and χ^2 (44, $N = 699$) = 89.068 ($p<.01$). CFI = .96, IFI = .96, NNFI = .95, and

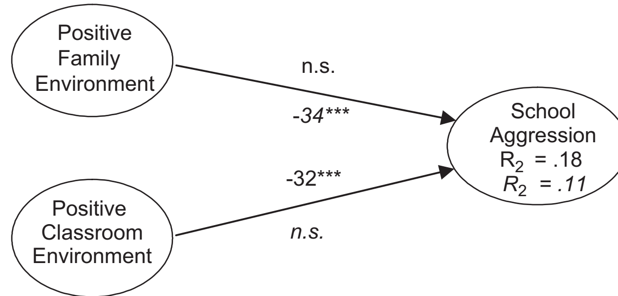

Fig. 1. Model of direct effects between the predictor variables and the outcome variable. *Note*: Continuous lines represent significant paths among latent variables. Coefficients obtained for boys are shown above the line, and for girls below the line and in italics. Robust standard errors were used to determine the significance of the standardized paths: ***$p<.001$; **$p<.01$; n.s. = non significant.

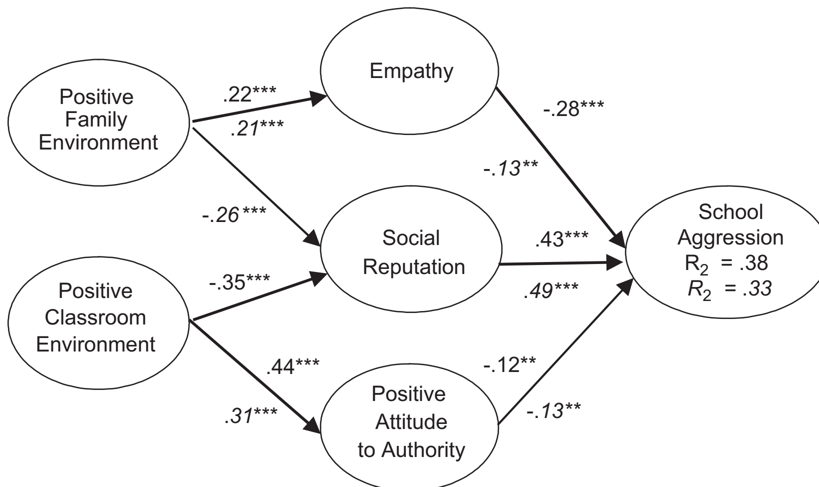

Fig. 2. Model of indirect effects, A→C paths constrained to zero. *Note*: Continuous lines represent significant paths among latent variables. Coefficients obtained for boys are shown above the line, and for girls below the line and in italics. Robust standard errors were used to determine the significance of the standardized paths: ***$p<.001$; **$p<.01$.

RMSEA = .04 for girls. The model accounted for 38% of the variance in School Aggression for boys and 33% for girls. We found both for boys and girls a relationship between family environment and aggression through level of empathy (boys: family environment and empathy, $\beta = .22$, $p<.001$; empathy and aggression, $\beta = -.28$, $p<.001$; girls: family environment and empathy, $\beta = .21$, $p<.001$; empathy and aggression, $\beta = -.13$, $p<.01$). Also in both genders, the model showed that positive classroom environment was associated with positive attitude to authority (boys: $\beta = .44$, $p<.001$; girls: $\beta = .31$, $p<.001$), which was in turn negatively related to school aggression (boys: $\beta = -.12$, $p<.01$; girls: $\beta = -.13$, $p<.01$). Finally, the model suggested different paths for boys and girls regarding the factor social reputation, although in both cases it was associated with aggression (boys: $\beta = .43$, $p<.001$; girls: $\beta = .49$, $p<.001$). For girls, social reputation showed a negative relationship with positive family environment ($\beta = -.26$, $p<.001$);

for boys, the significant negative association was with positive classroom environment ($\beta = -.35$, $p < .01$).

In the third step, we calculated the model of mediational effects shown in Fig. 3, with the A→C paths not constrained. This model accounted for more variance in School Aggression, 40% for boys and 35% for girls, and showed a better fit with the data compared with the constrained model: χ^2 (43, $N = 620$) = 47.733 ($p < .28$), CFI = .99, IFI = .99, NNFI = .99 and RMSEA = .02 for boys, and χ^2 (43, $N = 699$) = 77.184 ($p < .01$), CFI = .97, IFI = .97, NNFI = .96, and RMSEA = .04 for girls. Finally, we carried out complementary analyses in order to check whether the differences in the χ^2 between the models calculated in the second and third steps were significant. Values obtained with the χ^2 difference test confirmed these differences: incremental adjustment in the models for boys 10.0359, $p < .001$, and for girls 12.1457, $p < .001$. This suggested that the mediational effects model provided a significant improvement in fit over the indirect effects model.

When comparing the first direct effects model in step 1 and the final mediational model, some differences in the significant paths and their β coefficients were found. For girls, we found in Fig. 1 a significant strong negative direct association between positive family environment and school aggression ($\beta = -.34$, $p < .001$); this association was also significant but considerably lower in the model shown in Fig. 3 ($\beta = -.18$, $p < .001$), suggesting that the relationship between family environment and school aggression for this group may be mediated, at least in part, by level of empathy and social reputation (family environment and empathy, $\beta = .20$, $p < .001$; empathy and

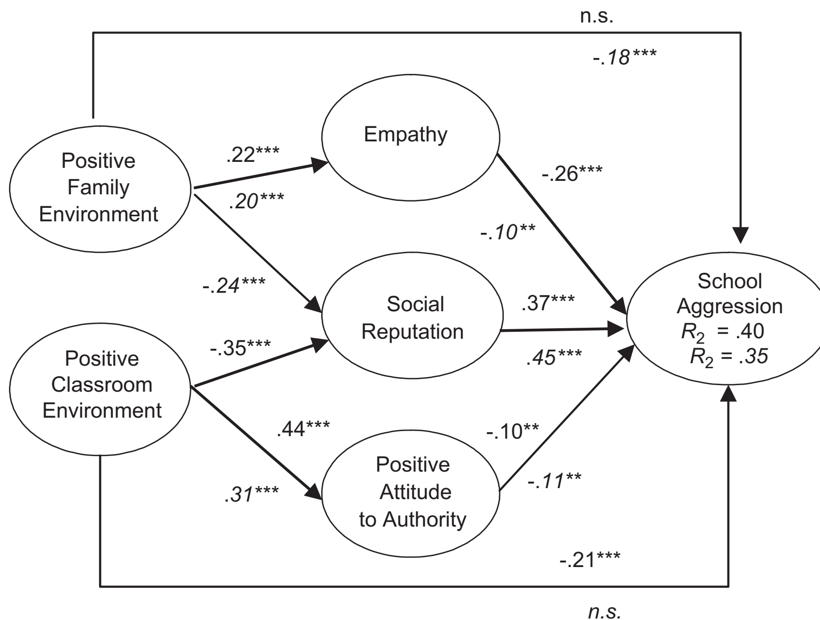

Fig. 3. Model of mediating effects, A→C paths not constrained. *Note*: Continuous lines represent significant paths among latent variables. Coefficients obtained for boys are shown above the line, and for girls below the line and in italics. Robust standard errors were used to determine the significance of the standardized paths: ***$p < .001$; **$p < .01$; n.s. = non-significant.

aggression, $\beta = -.10$, $p < .01$; family environment and reputation, $\beta = -.24$, $p < .001$; reputation and aggression, $\beta = .45$, $p < .001$). The direct effect of classroom environment on school aggression in Fig. 1 was, however, non significant in this group. This fact does not allow us to talk about mediational effects regarding the associations found in Fig. 3 for classroom environment. In this case, results indicated a negative *indirect* effect: positive classroom environment was related to positive attitude to authority ($\beta = .31$, $p < .001$), which in turn showed an association with school aggression ($\beta = -.11$, $p < .01$). At this point, it is important to note that in the mediating process the mediator variable is considered one of the factors explaining *why* the predictor and the outcome are related; an indirect effect, however, indicates that the predictor and the outcome may show an association as long as there is a third independent variable (Y) related to both, so that $X \rightarrow Y$ and $Y \rightarrow Z$ paths are significant.

With regard to boys, we observed in Fig. 1 a significant and strong negative direct relationship between classroom environment and school aggression ($\beta = -.32$, $p < .001$). This significant association was also found in the final model of Fig. 3, but the β coefficient was lower ($\beta = -.21$, $p < .001$). This finding suggests that the relationship between classroom environment and aggressive behaviour at school for this group may be partly mediated by attitude to institutional authority and social reputation among classmates (classroom environment and attitude, $\beta = .44$, $p < .001$; attitude and school aggression, $\beta = -.10$, $p < .001$; classroom environment and reputation, $\beta = -.35$, $p < .001$; reputation and aggression, $\beta = .37$, $p < .001$). As for family environment, no direct effect was found in Fig. 1 for boys; however, we found an *indirect* effect of this factor on school aggression through level of empathy in Fig. 3: positive family environment showed a direct association with level of empathy ($\beta = .22$, $p < .001$), which was in turn related to aggression ($\beta = -.26$, $p < .01$).

Discussion

The present study aimed to analyse the influence of perceived family and classroom environments in the development of particular individual characteristics in adolescence, namely level of empathy, attitude to institutional authority, and perceived social reputation, and to examine the relationships among these characteristics and the student's involvement in aggressive acts at school. These relationships were examined separately by gender. The results obtained partially confirmed our hypothesis with regard to the mediational effect of the individual factors considered in the structural model, and the type of relationships observed among the study variables. Results also pointed out different paths for boys and girls. Overall, our findings suggest that a positive family environment is a stronger protective factor for girls in the development of problems of behaviour at school, whereas for boys this is the case for a positive classroom environment. Nevertheless, both social contexts seem to play an important role in both genders, although with a different strength.

In the first place, we hypothesized that the relationship between family environment and involvement in aggressive behaviours at school would be mediated, at least in part, by the adolescent's level of empathy. Indeed, what our results suggested is that a positive interpersonal climate, that is to say, a social construction of interactions between parents and children based on affective cohesion and expressiveness of feelings and opinions sharing an open communication

style, is an important influence on the acquisition of skills for social interaction and, thus, for empathic learning. Moreover, the development of empathy in the adolescent period seems to be a relevant protective factor for antisocial and aggressive behaviour, as other authors also suggest (Evans et al., 2002; Hoffman, 2000). The association among these three variables in the structural model was established through a mediational effect of empathy for girls, while for boys this relationship was indirect but not mediational. Since the mediational effect specifies *how a given effect occurs* (Baron & Kenny, 1986), this finding points out that for girls the nature of relationships with parents and the quality of the context in which they are sustained, may have a direct impact on behaviour at school, as a consequence of its influence on the development of the empathic response, that inhibits the participation on aggressive acts against others. These findings are in line with those reporting that girls are more likely to develop aggressive behaviours because of the impact resulting from poor parenting practices (Blum et al., 2003; Farrington & Painter, 2003; Kats, 2000). Nevertheless, although there is some evidence of differences in family correlates of aggressive behaviour between boys and girls, new theories are needed to explain these findings.

When considering the case of boys and analysing together the influence of family and school environments on aggressive behaviour at school, the second of these, which is to say the student's perception of quality regarding the teaching process and social interactions with classmates and teachers, seemed to have a greater direct impact on the development of this type of behaviour. We hypothesised in the second place that the relationship between classroom environment and school aggression would be mediated, at least in part, by the adolescent's attitude to authority and social reputation. Our findings confirmed this hypothesis for boys, whereas for girls only an indirect relationship was found with attitude to authority. In the male sample, however, we observed both direct and mediating associations between classroom environment and school aggression. On the one hand, the negative direct association among these variables is indicative of a beneficial and protective effect of a positive classroom climate, understood as a social relational space in which students and teachers respect and support one another. These results are consistent with those reporting the positive influence of the quality of interactions with teachers and the desirability of having a set of friendships for adolescent behavioural adjustment (Hartup, 1996; Murray & Murray, 2004). In contrast, negative interactions with teachers and peers may lead to behavioural problems in students, and this association seems to be stronger for boys. One possible explanation of this finding may be that boys are more likely to show negative interactions with teachers (Bearman et al., 2006; Younger, Warrington, & Williams, 1999) and social integration problems with peers when compared with girls. For instance, they have more problematic relationships with peers in the adolescent period, less intimate relationships and a higher probability of being rejected by classmates (Cillessen, 1996; Coie, Dodge, & Coppotelli, 1982). Furthermore, the results from a recent study suggest that problems of social acceptance and integration among peers have a stronger impact on boys' than on girls' antisocial and aggressive behaviour (McDougall, Hymel, Vaillancourt & Mercer, 2001).

On the other hand, our results also showed that for boys the relation between the classroom environment and school aggression was explained in part by the influence this environment exerts on the attitude they hold towards institutional authorities and their strength of preference for a particular social reputation among classmates. In other words, academic failure and negative interactions with peers and teachers in the classroom might lead to development of attitudes of rejection and rebelliousness regarding the school context, particularly in boys. Some gender

differences were found with respect to the mediational effect of social reputation in the sense that for girls family environment, rather than classroom environment, was more closely linked to the development of a particular desired reputation among peers: a positive climate at home may discourage them from searching for social recognition in other context such as the school, whereas their perception of a deep lack of social capital in the family might be translated into a feeling of insecurity and emptiness that leads them to search for a reputation based on respect and recognition on the part of others, which in turn seems to be a key factor leading these young women to take part in aggressive acts, as the recent study of Barry (2006) stresses.

Along with other works, our results showed for both genders that there is a strong link between these kinds of attitudes and feelings and involvement in antisocial and aggressive acts in adolescence. Thus, it is well documented that adolescents who show negative attitudes to formal figures and institutions, such as teachers and the school context (Emler & Reicher, 1995; Hoge, Andrews, & Leschied, 1996; Loeber, 1996), and who look for social recognition as powerful and rebellious individuals (Carroll, Green, Houghton, & Wood, 2003; Emler & Reicher, 2005), are more likely to participate in aggressive and antisocial activities.

Finally, it is important to emphasise the role of the mediational and indirect effects found. If we only take into account the influence of the family and classroom environments in an attempt of explain school aggression in adolescence, we would be overlooking other crucial individual-level variables relating to feelings, thoughts, and attitudes. Thus, in our first direct effects model, family environment and classroom environment only accounted for 18% of variance in school aggression for boys and 11% for girls, but when the individual factors were entered into the model, these values increased to 40% and 35%, respectively. These findings have important implications for social intervention from an ecological perspective: intervention programs should pay attention to both the individuals involved and to their immediate social contexts (Cava & Musitu, 2002; Miller-Heyl, MacPhee, & Fritz, 1998; Olweus, 1994).

In conclusion, the current research contributes to our understanding of the role of particular individual and social—family and school—variables, with respect to adolescent involvement in aggressive behaviours at school, and how these variables behave as a function of gender. In this sense, this study is one of the few in which multiple variables are jointly analysed, for boys and girls separately, in the search for an explanation of school aggression in adolescence. Nevertheless, the following limitations are acknowledged. The use of self-reported data creates vulnerability to response bias that could have an impact upon the validity and generalizability of the study findings. However, comparisons with data from independent sources such as parents (Flisher, Evans, Muller, & Lombard, 2004; Ritakallio, Kaltiala-Heino, Kivivuori, & Rimpelä, 2005), does support the validity of self-reported measures of aggressive and delinquent behaviours in adolescence.

It should also be noted that the present study used a cross-sectional design, which means we must be cautious about making causal inference on the basis of the data available. Moreover, as Holmbeck (1997) remarks, the relationships among independent variable, mediator, and outcome may not necessarily be *causal*, and the same could be said for indirect effects. In fact, previous studies indicate that some of the relationships among variables considered in this research could have bidirectional influences. A negative climate in the family and school contexts may lead to aggression, but also an adolescent's aggressive behaviour may itself worsen the environment in these contexts (Estévez et al., 2005). Likewise, though a negative attitude to authority seems to be

an important risk factor for deviant behaviour, adolescents who frequently participate in aggressive acts, may *as a result* adopt values consistent with an antisocial schema and express negative opinions and attitudes about authority figures and institutions (Nihart, Lersch, Sellers, & Mieczkowski, 2005). To shed clearer light on these associations and have greater confidence about the causal direction of influences, a longitudinal study would be required.

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