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ORIGINAL ARTICLE

School aggression in adolescence: Examining the role of individual, family and school variables

Teresa I. Jiménez[a,*], Estefanía Estévez[b]

[a] *Universidad de Zaragoza, Spain*
[b] *Universidad Miguel Hernández de Elche, Spain*

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Adolescence;
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Abstract *Background/Objective:* The purpose of the present study was to analyse the role 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 mediational role these characteristics may play in school aggression. Relationships among variables were analysed by gender. *Method:* Participants in the study were 1,494 Mexican adolescents aged 12 to 18, 45% male, and drawn from six secondary schools. Structural equation models were calculated to test mediational effects among variables. *Results:* Findings obtained indicated that the level of empathy, the social reputation, and the attitude to authority mediated the relationship between the environment perceived by boys at home and school, and their aggressive behaviour at school. This mediation was partial for girls. *Conclusions:* Differences between genders and the importance of the adolescent-context interrelations in the explanation of their aggressive behaviour at school were discussed.

PALABRAS CLAVE
Adolescencia;
agresión escolar;
ambiente familiar;
ambiente escolar;
estudio ex post facto

Violencia escolar en adolescentes: un análisis del papel de variables individuales, familiares y escolares

Resumen *Antecedentes/Objetivo:* El propósito del presente estudio fue analizar el papel de los entornos familiares y del aula en el desarrollo de características particulares del adolescente, incluyendo el nivel de empatía, la actitud hacia la autoridad institucional y la reputación social percibida, y el papel mediador que estas características pueden desempeñar en la

* Corresponding author: Universidad de Zaragoza, Departamento de Psicología y Sociología Ciudad Escolar s/n, 44003, Teruel, Spain.
E-mail address: tijimgut@unizar.es (T.I. Jiménez).

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agresión escolar. Las relaciones entre las variables se analizaron en función del género. *Método:* Los participantes fueron 1.494 adolescentes mexicanos de 12 a 18 años, 45% varones, procedentes de seis escuelas secundarias. Se calcularon modelos de ecuaciones estructurales para probar efectos mediadores entre las variables. *Resultados:* Los resultados obtenidos indicaron que el nivel de empatía, la reputación social y la actitud hacia la autoridad mediaron la relación entre el ambiente percibido por los chicos adolescentes en la familia y en el aula y su comportamiento agresivo en la escuela. Esta mediación fue parcial para las chicas. *Conclusiones:* Se discuten las diferencias encontradas en función del género y la importancia de las interrelaciones adolescente-contexto en la explicación de su comportamiento agresivo en la escuela.

Aggressive behaviour among secondary students has been identified as a serious problem in European and American countries (McClanahan, McCoy, & Jacobsen, 2015; Smith, 2016; Vega-Gea, Ortega-Ruiz, & Sánchez, 2016). In Latin America, specifically in Mexico, the recognition of this problem by educational authorities is much more recent (Martínez, 2014) and systematic studies are scarce (Castillo & Pacheco, 2008; Valadez, 2008; Valdés & Martínez, 2014). However, it seems that this behaviour is a significant problem in Mexico. Castillo and Pacheco (2008) used the same instrument as a study completed by the Ombudsman in Spain (Defensor del Pueblo, 2007), and found that prevalence rates in secondary schools were higher in Mexico. For example, 22.2% of Mexican adolescents claimed that some classmates hit them, compared to only 5.3% of adolescents in Spain. Likewise, in the most recent Teaching and Learning International Survey (TALIS) Mexico has the highest percentage of physical injury caused by violence among secondary students (10.8%) and the second highest level of intimidation or verbal abuse (29.5%) after Sweden (Organization for Economic Cooperation and Development, OECD, 2014). As previously noted, despite societal concern and interest demonstrated by authorities, there are only few studies that have rigorously examined the explanatory factors of school aggression in Mexico.

Ecological systems theory applied to school aggression: family, school and individual level

Family and school environments have been consistently linked to aggression problems in adolescence in the international scientific literature (e. g. Estévez, Musitu, & Herrero, 2005; Rothbaum & Weisz, 1994; Steffgen, Recchia, & Viechtbauer, 2013). Specifically, in a recent study on a Mexican sample carried out by Valdés and Martínez (2014) the impact of family and school environments on bullying behaviour in secondary students was studied through linear regression. The study found that both environmental climates were directly related to peer bullying behaviours which explain 74% of the variance.

This research lies within the framework of the ecological systems theory of human development (Bronfenbrenner, 1977). This framework understands violence as a relational phenomenon in which a range of variables interact. These vary in level from individual variables to macrosocial ones. Fittingly, the analysis of school aggression needs to be analyzed while taking into account the progressive mutual adaptation of the characteristics of the developing adolescent and the properties of his or her immediate surroundings. The family and the school are the closest social contexts to a developing adolescent, making its interaction with the individual characteristics of the adolescent a key object of analysis.

In this line, prior studies suggest that characteristics of both environments, family and school, can be linked to individual factors that, in turn, are important predictors of aggressive behaviour. With respect to the family context, a negative family environment characterized by high levels of family conflict, poor or negative communication with parents, and lack of parental support has a negative effect on the development of particular social skills in children. These skills include the ability to anticipate the negative consequences of their behaviours for the victim, demonstrating low levels of empathy (Batanova & Loukas, 2014; Evans, Heriot, & Friedman, 2002; Van Noorden, Haselager, Cillessen, & Bukowski, 2015). Thus, the first aim of this study was to address the possible mediational effect of adolescents' level of empathy upon the relationship between family environment and aggressive behaviour.

As Emler (2009) suggests, the quality of relationships with parents is strongly linked to compliance with norms established by these informal authority figures. The author suggests that negative child-parent relationships may lead to a sense of disappointment in the child with respect the parental figure and remarks that the same effect occurs depending on the quality of student-teacher relationships. A negative relationship with teachers, who are seen as the formal authority and protective figures at school, leads to the student's disappointment with these educational mentors. This perception of a lack of adult protection leads some adolescents in search

of a social reputation based on non-conformism, rebelliousness and aggression (Estévez, Moreno, Jiménez, & Musitu, 2013). These behaviours are mechanisms of self-protection in potentially confrontational interactions with peers (Carroll, Hatti, Durkin, & Houghton, 1999; Emler & Reicher, 2005). In consequence, a second purpose of the present study was to analyse the possible mediational effect of adolescents' social reputation upon the relationship between the family and school contexts and aggressive behaviour.

Regarding the school environment, students who perceive a positive classroom climate (perceiving peers in the classroom as friends or colleagues, and feeling respect and support from teachers) will not normally exhibit behavioural problems (Povedano, Cava, Monreal, Varela, & Musitu, 2015) and will express positive attitudes towards teachers and the school (Khouri-Kassabri, 2012). It has been well documented in different countries that aggressive adolescents tend to show negative attitudes toward institutional authorities such as the police, the law, and also the school and teachers (Emler & Reicher, 2005; Martínez-Ferrer, Murgui-Pérez, Musitu-Ochoa, & Monreal-Gimeno, 2008). In Mexico, studies by Valadez (2008) and Gómez (2005) suggested that a poor relationship with teachers is a risk factor for the development of aggressive behaviours among classmates. A third aim of the present study was, therefore, to examine the relationship between perception of classroom environment and aggression towards peers, considering the possible mediational effect of adolescents' attitude to school as institutional authority.

Current study

Fewer studies have been carried out in the Latin American contexts that jointly examine the contribution of multiple variables on school aggression and the role of the two primary social contexts for the adolescent psychosocial adjustment: family and school. Consequently, the main objective of the present study was to examine the role of family and classroom environments on the development of particular individual characteristics (empathy, perceived social reputation and attitude to institutional authority), and the mediational role these individual characteristics may in turn play in the development of school aggression. Moreover, these relationships were examined in boys and girls separately, since the review of past research suggests that some of these variables may contribute differentially to aggressive behaviour according to gender (Estévez & Jiménez, 2015). For example, research suggests that girls are more likely to show positive attitudes towards authority (Emler & Reicher, 2005), stronger relationships between family risk factors and aggressive behaviour (Stephenson, Woodhams, & Cooke, 2014) as well as between social reputation and antisocial behaviour (Carroll et al., 1999), and perceive closer relationships with their teachers (Madill, Gest, & Rodkin, 2014). Theoretical model is presented in Figure 1.

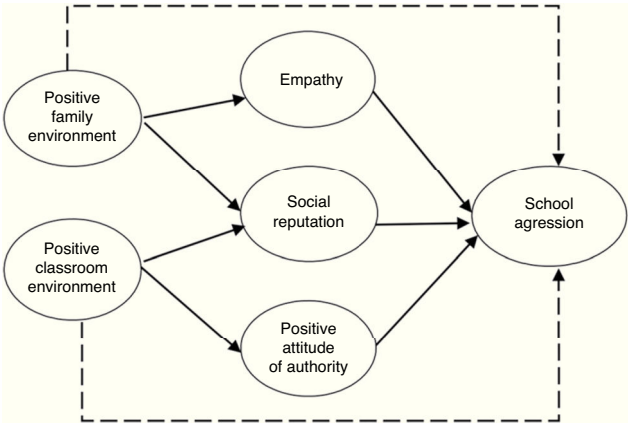

Figure 1 Theoretical model. Continuous lines represent significant paths among latent variables.

Method

Participants

For this *ex post facto* study (Ramos-Álvarez, Moreno-Fernández, Valdés-Conroy, & Catena, 2008), an original multistaged stratified random sample was used to recruit participants. Participants in the study were selected from public and subsidized secondary schools in Culiacán (State of Sinaloa, México). The sampling frame was all public and subsidized schools in the target region, from which schools were selected using probability proportional to school size and the following stratum: 200-399 and 400-600 students. Three schools were selected in the range 200-399 students and three others in the range of 400-600 students. All of the selected schools agreed to participate in the study. Within each school, classrooms were randomly selected according to the academic level (three courses for Secondary education and three courses for *Preparatoria* education). The distribution of students by academic level was: 20.7% in first, 18.4% in second and 17.3% in third grade of Secondary school and 19.8% in first, 12.7% in second and 11% in third grade of *Preparatoria*. The final sample included 1,494 students ranging from 12 to 18 years of age (M = 14.8, SD = 1.7), of which 676 (42.4%) were males, 814 (45.4%) were females, and 9 (0.3%) did not report their gender. Table 1 shows the sociodemographic characteristics of the sample.

Procedure

Initial telephone contact with head teachers from schools was established, followed by a briefing with all teaching staff who were informed about the objectives of the study. In addition, a letter describing the study and requesting parental consent was sent to the parents. The administration of the instruments was carried out by a group of trained researchers. Before data collection, students also attended a short briefing in which they provided written consent. All adolescents agreed to participate. On dates previously arranged with the teaching staff, participants voluntarily and anonymously filled out the scales in their respective schools during a regular class period. The Ethics Committee

Table 1 Participants' sociodemographic characteristics.

	n	%
Gender		
Male	676	45.20
Female	814	54.50
Lost data	9	0.30
Age, years		
12-14	653	43.70
15-16	586	39.20
17-18	255	17.10
Academic level		
1° Secondary	309	20.70
2° Secondary	275	18.40
3° Secondary	259	17.30
1° Preparatoria	296	19.80
2° Preparatoria	190	12.70
3° Preparatoria	165	11.00
Mother's education level		
No response	141	9.40
No formal education	40	2.70
Primary education	300	20.10
Secondary education	388	26.00
Preparatoria education or high school	311	20.80
University graduate	311	20.80
Lost data	3	0.20
Father's education level		
No response	232	15.50
No formal education	42	2.80
Primary education	235	15.70
Secondary education	318	21.30
Preparatoria education or high school	278	18.60
University graduate	379	25.40
Lost data	10	0.70

of the hosting University granted ethical approval. The study met the ethical values required for research on human beings, respecting the basic principles included in the Helsinki Declaration.

Instruments

Some of the instruments were adapted into Spanish by the research team using the parallel back-translation procedure (Brislin, 1986). In addition, research collaborators in Mexico made a direct cultural adaptation of the instruments to the linguistic and semantic variations of Spanish spoken in Mexico.

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 (degree of commitment and support family members provide for one another; 9 items, e.g. ''Family members really help and support one another''); (2) Expressiveness (the extent to which family members are encouraged to express their feelings directly; 9 items, e.g. ''Family members often keep their feelings to themselves,'' reverse coded); (3) Conflict (amount of openly expressed anger and conflict among family members; 9 items, e.g. ''We fight a lot in our family''). Alpha reliabilities for these subscales in the present sample were .82, .78 and .84 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 (degree of student attentiveness, interest and participation in class activities; 9 items, e.g. ''Students put a lot of energy into what they do here''); (2) Affiliation (degree of friendship among students; 9 items, e.g. ''Students in this class get to know each other really well''); (3) Teacher support (amount of help, trust and friendship the teacher offers to students; 9 items, e.g. ''The teacher takes a personal interest in the students). Alphas for these subscales in this sample were .82, .77, and .87 respectively.

Index of Empathy for Children and Adolescents (IECA; Bryant, 1982; Spanish version of Mestre, Pérez-Delgado, Frías, & Samper, 1999). This is a 22-item measure where the items describe 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 4-point rating scale (1 = *never*, 4 = *always*). Cronbach's alpha for this scale in this study was .67.

Attitude to Institutional Authority Scale (Reicher & Emler, 1985). This scale consists of 10 items, each rated on four-point scales (1 = *I totally disagree*, 4 = *I totally agree*) and referring to attitudes towards teachers and the school. It measures two dimensions: positive attitude to school and teachers (e.g. ''School rules are there to help the pupils''; ''I agree with what teachers say and do''), and perception of injustice (e.g. ''Most policemen are honest''; ''The law is loaded against people like me''). Cronbach alphas on the current sample were .67 and .70 respectively.

Social Reputation at School Scale (Carroll et al., 1999; Spanish version of Cava, Estévez, Buelga, & Musitu, 2013). This 30-item scale assesses the social reputation of school-aged children as non-conformist and rule-breaking individuals. Students had to indicate the following for each item: their perceived reputation (''Others think about me...''), and their ideal reputation (''I would like others think about me...''). Example items: ''I get into trouble with the police'', ''I am a bully'', ''I do things against the law'', ''I am rebellious''. Alpha coefficients for this sample were .64 and .60 respectively.

School Aggression Scale (Little, Henrich, Jones, & Hawley, 2003). Adolescents indicated the frequency with which they had engaged in 25 aggressive behaviors towards peers at school over the last 12 months, on a four-point scale (1 = *never*, 4 = *many times*). The scale measures two types of aggressive behavior -overt or direct, and relational or indirect- and three functions of violence -pure, reactive, and instrumental-, leading to six dimensions of aggression: pure overt (e.g. ''I'm the kind of person who often fights with others''), reactive overt (e.g. ''When I'm hurt by someone, I often fight back''), instrumental overt (e.g. ''I often threaten others to get what I want''), pure relational (e.g. ''I'm the kind of person who gossips and spreads rumors''), reactive relational (e.g. ''When I am upset by others, I often ignore or stop talking to them''), and instrumental relational (e.g. ''To get what I want, I often ignore or stop talking to

others''). Alphas for these subscales in the present sample were and .89 and .82 respectively.

Analytic strategy

First, descriptive statistics (bivariate correlations, means and standard deviations) were calculated using SPSS (Version 22.0). Next, multivariate inferential analyses were conducted using structural equation modeling (SEM). Data were analyzed using the Structural Equation Program EQS 6.1 with Robust Maximum Likelihood estimator, which does not require normal distribution of observed variables. Missing data were addressed by the full-information maximum likelihood procedure. A series of structural models were tested to examine the mediational role of empathy, social reputation, and attitude to institutional authority in the relationship between family and classroom environments and aggressive behavior at school. We performed the causal steps approach (Holmbeck, 1997) according to which a variable must meet the following three conditions to be considered a mediator.

First condition, A-C Model. The fit of the overall model when the dependent variable (C = School aggression) is regressed on the predictors (A^1 = Positive family environment; A^2 = Positive classroom environment) has to be good (A-C model), and the A-C path coefficients have to be significant.

Second condition, Constrained A-B-C Model. The fit of the overall model when the dependent variable (C) is regressed on the mediators (B^1 = Empathy; B^2 = Social reputation; B^3 = Positive attitude to authority), and the mediators are simultaneously regressed on the predictors (A) with the A-C paths constrained to zero, has to be good and the A-B and B-C path coefficients must also be significant.

Third condition, Unconstrained A-B-C Model. The fit of the overall A-B-C model with the A-C paths not constrained to zero has to be good. If there is a mediational effect, the addition of the A-C paths in the unconstrained model should not significantly improve the fit over the constrained model. In order to obtain a significance test of the comparison of these two last structural models, a Log-likelihood Chi-Square Difference Test was performed. Fulfillment of these conditions proves complete mediation.

Fourth condition, indirect effect test. To test partial mediation, an additional condition has to be added. This fourth condition involves testing the significance of the indirect effects, which is mathematically equivalent to testing whether the drop in the total effect is significant upon inclusion of the mediator in the model (MacKinnon & Dwyer, 1993). In our study, we evaluated this condition independently of the result in condition 3, since it provides an index of the magnitude of the mediational effect. When condition 3 was satisfied, the indirect effect was calculated on the Constrained A-B-C Model. In all other cases, the indirect effect was calculated on the Unconstrained A-B-C Model. As the satisfaction of condition 3 indicates a non-significant A-C path coefficient, the calculation of the indirect effect in the Constrained A-B-C model should lead to a model with higher statistical power in relation to the Unconstrained A-B-C model. This is a consequence of having one parameter less to calculate. To perform the test of the indirect effect, confidence intervals were calculated on the unconstrained model using the bootstrap method with 2,000 samples.

Evaluation of the goodness-of-fit. Throughout the study, the reported path coefficients were standardized values. To evaluate the goodness-of-fit between the models and the data the following indices were reported: Chi-square test of model fit (χ^2), Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI) and Standardised Root Mean Squared Residual (SRMR). For the χ^2, 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, the other fit indexes must be jointly considered. For the SRMR and RMSEA, values below .08, and for the CFI a value above .90 indicates an acceptable fit for the model (Yuan, Chan, Marcoulides, & Bentler, 2016). Finally, *R* Square for the dependent variable was calculated in each model.

Results

Table 2 shows the descriptive statistics (bivariate correlations, means and standard deviations, skewness and kurtosis) for the studied variables by gender. As we can see, most of the univariate skewness and kurtosis indices are lower than 2. This indicates a similarity to a standard curve (Bollen & Long, 1993), except for overt pure, overt instrumental, relational pure and relational instrumental aggression in girls.

The proposed structural model consisted of six factors, each of which was derived from several observable indicators or variables. The indicators correspond to the dimensions of the instruments used for data collection and described in the methods section. Latent factors included in the model were: (1) Positive Family Environment, composed of three indicators: conflict, expressiveness and cohesion; (2) Positive Classroom Environment, composed of three indicators: involvement, affiliation, and teacher support; (3) Empathy, consisting of a single indicator; (4) Social Reputation, composed of two indicators: perceived reputation and ideal reputation; (5) Positive Attitude to Authority, composed of two indicators: positive attitude to school and teachers, and perception of injustice; (6) School Aggression, composed of two indicators: overt aggression and relational aggression.

Table 3 shows the results of the mediation analyses conducted for each gender. We observed that for boys, all conditions were satisfied and this was indicative of a complete mediation. For girls, all conditions were satisfied except for condition 3, since the difference test was statistically reliable ($p < .001$). This exception indicated that there was partial mediation for the girls' sample.

Importantly, condition 4 showed significant indirect effects. For boys, significant negative associations were found for all paths; that is, between Positive family environment and two mediators (Empathy and Social reputation), between both mediators and School aggression, between Positive school environment and two mediators (Social reputation and Positive attitude to authority), and between both mediators and School aggression. For girls, we only found significant negative associations when Empathy and Positive attitude to authority were mediators. The first negative association was found between Positive family environment

Table 2 Pearson correlations among observed variables, means, standard deviations, skewness and kurtosis by gender.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Family Environment – Cohesion	-	.51†	-.53†	.19†	.18†	.18†	.06	.28†	-.23†	.03	-.09**	-.22†	-.19†	-.20†	-.23†	-.17†	-.19†
2. Family Environment – Expressiveness	.40†	-	-.22†	.14*	.18†	.12**	.15**	.11**	-.14**	.06	.01	-.26**	-.27†	-.22*	.12**	-.10**	-.07*
3. Family Environment – Conflict	-.49†	-.21†	-	-.11**	-.14**	-.09*	-.08*	-.20†	.17†	-.06	-.16**	.25†	.27†	.22†	.20†	.13**	.18†
4. Classroom Environment – Involvement	.14**	.11**	-11**	-	.43†	.41†	.10**	.25†	-.15**	-.09*	-.02	-.12**	-.17**	-.09*	-.09*	-.10**	-.07
5. Classroom Environment – Affiliation	.20†	.12**	-.15**	.48†	-	.36†	.13**	.15**	-.11*	-.08*	.04	-.17**	-.16**	-.13**	-.16**	-.16**	-.12**
6. Classroom Environment – Teacher Support	.20†	.16**	-.17†	.47†	.39†	-	.14**	.36†	-.20†	-.02	-.04	-.11**	-.18†	-.12**	-.11**	-.10**	-.08*
7. Empathy	.13**	.09*	-.15†	.09*	.15**	.19†	-	.14**	-.17**	-.15**	-.09**	-.19**	-.20†	-.30†	-.26†	-.13**	-.26†
8. Attitude to Authority – Positive Attitude	.25†	.17**	-.30†	.20†	.20†	.27†	.24†	-	-.14**	.01	.007	-.15**	-.19†	-.18**	-.13**	-.12**	-.10**
9. Attitude to Authority – Perception Injustice	-.19†	-.15†	.19†	-.13**	-.13**	-.17†	-.25†	-.17**	-	.12**	.14**	.36†	.38†	.37†	.27†	.22†	.30†
10. Perceived Social Reputation	.07	.15**	-.009	-.004	-.06	-.03	.03	.02	.19†	-	.59†	.18**	.15**	.14**	-.03	-.12**	-.07
11. Ideal Social Reputation	.05	.08*	.03	-.13**	-.01	-.01	.01	.02	.11†	.53†	-	.18**	.20†	.15**	-.04	-.13**	-.10**
12. Overt Pure	-.20†	-.12**	.20†	-.18†	-.14**	-.18†	-.22†	-.19†	.37†	.20†	.15**	-	.58†	.69†	.56†	.36†	53†
13. Overt Reactive	-.10**	-.07	.10†	-.22†	-.12**	-.20†	-.26†	-.15**	.35†	.26†	.20†	.62†	-	.57†	.39†	.36†	.45†
14. Overt Instrumental	-.24†	-.14**	.22†	-.14†	-.16**	-.17†	-.29†	-.19†	.36†	.19†	.13**	.72†	.59†	-	.59†	.39†	.65†
15. Relational Pure	-.49†	-.12**	.15**	-.05	-.12**	-.06	-.20†	-.09*	.24†	-.16†	.12**	.48†	.40†	.62†	-	.50†	.68†
16. Relational Reactive	-.07	-.003	.07	-.13**	-.09*	-.08*	-.11**	-.04	.19†	-.20**	.16**	.34†	.41†	.40†	.46†	-	.49†
17. Relational Instrumental	-.19†	-.19†	.19†	-.06	-.10**	-.08*	-.25†	-.12**	.31†	-.13**	.12**	.57†	.44†	.70†	.68†	.47†	-
Mean	1.69	1.55	1.64	1.38	1.57	1.48	2.60	2.34	2.49	2.48	2.04	1.60	1.96	1.46	1.52	1.90	1.52
	1.73	*1.58*	*1.65*	*1.36*	*1.58*	*1.51*	*2.84*	*2.33*	*2.49*	*2.66*	*1.77*	*1.40*	*1.57*	*1.25*	*1.39*	*1.89*	*1.36*
Standard Deviation	0.23	0.17	0.20	0.20	0.19	0.23	0.29	0.38	0.37	0.61	0.71	0.54	0.76	0.58	0.56	0.58	0.58
	0.24	*0.20*	*0.20*	*0.20*	*0.19*	*0.23*	*0.34*	*0.32*	*0.30*	*0.56*	*0.68*	*0.45*	*0.59*	*0.42*	*0.45*	*0.54*	*0.47*
Skewness	-0.65	-0.19	-0.32	0.41	-0.17	-0.00	0.13	0.05	0.42	0.05	-0.36	0.91	0.73	1.44	1.38	0.49	1.78
	-0.70	*-0.21*	*-0.35*	*0.64*	*-0.23*	*-0.13*	*-0.15*	*0.11*	*0.85*	*0.03*	*-0.31*	*1.64*	*1.20*	*2.44*	*1.50*	*0.45*	*1.60*
Kurtosis	-0.16	-0.44	-0.32	-0.31	-0.03	-0.71	0.47	-0.30	-0.46	0.25	1.64	0.25	-0.11	1.58	1.94	-0.08	0.884
	-0.15	*-0.47*	*-0.32*	*0.03*	*-0.18*	*-0.66*	*0.14*	*-0.34*	*0.25*	*0.49*	*1.56*	*3.49*	*1.15*	*7.13*	*2.37*	*-0.08*	*2.69*

Note. Correlation values obtained for boys are shown below the diagonal and for females above. Mean and standard deviation values for boys are shown above and for girls below and in italics. Levels of significance:

* $p < .05$.

** $p < .01$.

† $p < .001$.

Table 3 Fit indices and path coefficients for structural models.

Gender	Cond.	Model	Fit index							R^2	Path coefficient			
			χ^2	*df*	RMSEA	95% CI		CFI	SRMR		Relation	β	95% CI	
						LL	UL						LL	UL
Boys	1	A-C	130.68†	48	.05	.04	.06	.97	.04	.11	A^1-C	-.24†	-.35	-.13
											A^2 -C	-.16†	-.28	-.03
	2	Cons. A-B-C	291.03**	102	.05	.04	.06	.94	.06	.43	A^1-B^1	.14**	.06	.22
											A^1-B^2	-.20†	-.31	-.09
											A^2-B^2	-.10*	-.14	-.08
											A^2-B^3	.46†	.31	.61
											B^1-C	-.27†	-.32	-.21
											B^2-C	.15**	.09	.22
											B^3-C	-.52†	-.60	-.44
	3	Uncons. A-B-C	286.40*	100	.05	.05	.06	.94	.07	.43	A^1-C	-.17	-.58	.24
											A^2 -C	-.11	-1.2	.94
											A^1-B^1	.29†	.18	.39
											A^1-B^2	-.41†	-.68	-.14
											A^2-B^2	-.40†	-.45	-.34
											A^2-B^3	.67†	.10	1.23
											B^1-C	-.17†	-.22	-.11
											B^2-C	.30†	.20	.40
											B^3-C	-.21†	-.31	-.11
		Diff. test	4.64	2										
	4	Indirect effect test									A^1-B^1-C	-.10**	-.17	-.04
											A^1-B^2-C	-.08*	.01	.15
											A^2-B^2-C	-.68*	-1.57	-.04
											A^2-B^3-C	-.77†	-1.04	-.49
Girls	1	A-C	151.62†	48	.05	.04	.06	.96	.04	.11	A^1-C	-.24†	-.30	-.18
											A^2 -C	-.17†	-.28	-.06
	2	Cons. A-B-C	386.76**	102	.06	.05	.06	.92	.07	.49	A^1-B^1	.10*	.02	.16
											A^1-B^2	-.03	-.11	.03
											A^2-B^2	.08	-.03	.19
											A^2-B^3	.54†	.40	.69
											B^1-C	-.29†	-.33	-.24
											B^2-C	.15**	.08	.21
											B^3-C	-.58†	-.77	-.39
	3	Uncons. A-B-C	363.99*	100	.06	.051	.063	.92	.06	.49	A^1-C	-.18†	-.27	-.09
											A^2 -C	-.00	-.32	.31
											A^1-B^1	.11**	.04	.18
											A^1-B^2	-.08	-.20	.04
											A^2-B^2	-.03	-.17	.11
											A^2-B^3	.61†	.25	.97
											B^1-C	-.24†	-.28	-.20
											B^2-C	.25†	.18	.32
											B^3-C	-.33†	-.39	-.26
		Diff. test	22.77†	2										
	4	Indirect effect test									A^1-B^1-C	-.05*	-.08	-.01
											A^1-B^2-C	-.01	-.04	.02
											A^2-B^2-C	-.03*	-.02	.08
											A^2-B^3-C	-.75†	-1.14	-.37

Note. Cond. = Casual step condition; *df* = degrees of freedom; RMSEA = Root mean square error of approximation; CFI = Comparative fit index; SRMR = Standardized root mean square residual; CI = Confidence interval; LL = Lower limit; UL = Upper limit; β = Standardised beta weight; Cons. = Constrained; Uncons. = Unconstrained; Diff. test = Loglikelihood chi-square difference test; A = Independent variable (A^1 = Positive family environment; A^2 = Positive classroom environment); B = Mediator (B^1 = Empathy; B^2 = Social reputation; B^3 = Positive attitude to authority); C = Dependent variable (School Aggression).

* $p < .05$.

** $p < .01$.

† $p < .001$.

and School aggression, and the second between Positive school environment and School aggression. This is due to the non-significant relationships between both environmental variables and the Social reputation in this sample. In addition, we observed that for girls, the A^1-C path from Positive family environment to School aggression continued to be significant in the unconstrained A-B-C model and indicated partial mediation.

Regarding the percentage of variability explained by the models for the School Aggression ranged from 11% (for both genders) in the A-C model to 43% (boys) and 49% (girls) in the constrained A-B-C model, and to 43% (boys) and 49.4% (girls) in the unconstrained A-B-C model. We observed that the addition of the A-C paths in the unconstrained model did not significantly improve the fit over the constrained model for boys (complete mediation) and that there was a small improvement for girls (partial mediation).

Discussion

The aim of the present study was to analyze the role of perceived family and classroom environments on the development of particular individual characteristics in Mexican secondary school students, namely level of empathy, perceived social reputation, and attitude to institutional authority. We also examined the mediational role of these individual characteristics between perceived environments and the students' involvement in aggression towards peers. From an ecosystemic approach to human development, adolescents' self-perceptions are closely related to family and school functioning. Therefore, it seems necessary to jointly analyze the influence of these two contexts due to the consideration of the close relationship between the individual characteristics of the adolescent and the characteristics of the social environments in which they develop (Bronfenbrenner, 1977). In line with this theoretical framework, the obtained results confirmed the mediational role of the individual factors in the relationship between perceived family and school environments and school aggression. These relationships were analysed separately by gender, indicating a complete mediational effect for boys and partial for girls.

Our results suggested that a positive interpersonal family climate may play an important role in the acquisition of skills for social interaction, such as empathic learning. This association was observed in boys and girls. Moreover, a direct link between level of empathy and school aggression was also found in both cases. This result implies that the development of empathy during adolescence seems to be a relevant protective factor against aggressive behavior, in line with previous research (Evans et al., 2002; Van Noorden et al., 2015). The association among these three variables in the structural model was established through the mediational effect of empathy between positive family environment and school aggression. Since the mediational effect specifies how a given effect occurs (Jiménez, Musitu, & Murgui, 2008), this finding points out that the quality of relationships with parents plays a positive role on the development of an empathic response, which in turn inhibits participation in aggression acts against peers at school. For girls, the quality of family relationships also plays a direct protective role. Both European and North American studies have documented the importance of family functioning on behavioral adjustment among girls (Stephenson et al., 2014; Van der Put et al., 2014).

In regards to the role of perceived school environment on school aggression, we observed that this relationship was mediated by the adolescents' attitude to authority, as well as by social reputation goals. For girls this relationship was only found with attitude to authority as mediator. Our results for boys showed that the relationship between the perceived quality of social environment in the classroom and aggressive behavior was explained, in part, by the role this environment plays on the strength of their preference for a particular social reputation among classmates. In other words, positive interactions with peers and teachers in the classroom might act as a preventive factor for the need to be socially recognized as having a bad reputation, which in turn is closely related to show less behavioral problems. Conversely, and in line with previous research (Emler, 2009; Martínez-Ferrer at al., 2008), negative interactions with peers and teachers in the classroom might lead to changes in the self-image (Rodríguez-Fernández et al., 2016) and, in particular, to the search for a social image based on rebelliousness and rule-breaking behavior. This is particularly observed in boys, and is directly related to aggression acts at school as the means for obtaining the desired reputation. One possible explanation for this finding that aligns with conclusions from other research in Europe and the United States, is that aggressive boys want to spread their reputational image above and beyond their aggressive counterparts in a wide range of contexts (Leff et al., 2010), while aggressive girls tend to maintain their reputation within their own peer group (Rodkin, Pearl, & Van Acker, 2003).

Therefore, our results show another important gender difference. We observed complete mediation for boys but only partial mediation with a direct path from family environment to aggression for girls. These results can be explained in relation to the process of gender socialization. In Mexico, the family has a high level of importance in young people's lives and its relevance extends beyond the adolescent autonomy process (Instituto Mexicano de Juventud, IMJUVE, 2012). In addition, the process of children's family socialization in Mexico is noticeably skewed by gender. Social expectations associated with the female gender role are primarily linked to women's increased dependence on their family as compared to men (Loría, 1997). Therefore, it is possible that our gender-differentiated results could be explained by the fact that girls rely more heavily on their families. For girls a positive perception of family context – a sense of union, free expression of feelings and low levels of conflict – seems to constitute a protective resource in itself against their involvement in school aggression.

Finally, for both genders, the perception of a positive classroom environment was also closely related to the configuration of positive attitudes towards the school as an institution and the teachers as authority figures. These attitudes in turn showed a protective relationship regarding school aggression. Our results reinforce the conclusion that positive perceptions of teachers as authority figures have

a protective effect against peer aggression in European and non-European countries (Gómez, 2005; Valadez, 2008; Volungis & Goodman, 2017).

It is important to emphasize the role of the significant indirect effects found. If we only take family and classroom environment characteristics into account in an attempt to explain school aggression, we would be overlooking other crucial individual-level variables related to feelings, thoughts, and attitudes. In our first direct effects model, family environment and classroom environment only accounted for 11% of the variance in school aggression for boys and girls, but when the individual factors were included in the model these values increased to 43% and 49%, respectively. These findings have important implications for social intervention from an ecological perspective: intervention programs should pay attention to both individual characteristics and immediate social contexts (family and school).

Despite the importance of these finding for the scientific literature on the topic, the following limitations of the present study are acknowledged. First, 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, since findings are more likely to be contaminated by shared method variance. However, a comparison with data from independent sources such as parents supports the validity of self-reported measures of aggression in adolescence (Flisher, Evans, Muller & Lombard, 2004). Second, it should 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 available data. The directionality between variables tested in this work was based on theoretical grounding as well as empirical evidence found in previous studies. In spite of this, a longitudinal study would be required to shed more light on these associations and lead to greater confidence about the causal direction of relationships between variables.

In conclusion, the current research contributes to our understanding of school aggression based on the ecological model of human development, particularly highlighting the role of contextual (family and school) and individual (empathy, social reputation, and attitude towards authority) variables in its explanation for boys and girls separately. This approach is original in the social research field with Latin American adolescent population and has clear practical implications for the design of prevention and intervention programs for social harmony in educational centers. On the one hand, from a general viewpoint, this work verifies the essential role played by the main socialization settings in the development of personal characteristics linked, in turn, to potential behavioral problems in adolescents of both genders. On the other hand, and more specifically, findings of this study suggest two different conclusions based on gender differences: firstly, the family context seems to play a key role in preventing school aggression in Mexican girls and, secondly, adolescents' perception of positive family and classroom climates seems to be a relevant factor to reduce the need for a bad reputation in Mexican boys, which, in turn, is related to lower school aggression. Future research is needed to better clarify these conclusions across cultures.

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References

Batanova, M., & Loukas, A. (2014). Unique and interactive effects of empathy, family, and school factors on early adolescents' aggression. *Journal of Youth and Adolescence*, *43*, 1890–1902.

Bollen, K., & Long, J. S. (1993). *Testing structural equation models*. Newbury Park, CA: Sage.

Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner, & J. W. Berry (Eds.), *Field methods in cross-cultural research* (pp. 137–164). Thousand Oaks, CA, US: Sage Publications, Inc.

Bronfenbrenner, U. (1977). Toward an experimental ecology oh human development. *American Psychologist*, *32*, 515–531. http://dx.doi.org/10.1037/0003-066X.32.7.513

Bryant, B. (1982). An index of empathy for children and adolescents. *Child Development*, *53*, 413–425. http://dx.doi.org/10.2307/1128984

Carroll, A., Hattie, J., Durkin, K., & Houghton, S. (1999). Adolescent reputation enhancement: differentiating delinquent, nondelinquent, and at-risk youths. *Journal of Child Psychology and Psychiatry*, *40*, 593–606. http://dx.doi.org/10.1080/1034912032000120444

Castillo, C., & Pacheco, M. (2008). Perfil del maltrato (bullying) entre estudiantes de secundaria en la ciudad de Mérida Yucatán. *Revista Mexicana de Investigación Educativa*, *13*, 825–842.

Cava, M. J., Estévez, E., Buelga, S., & Musitu, G. (2013). Propiedades psicométricas de la Escala de Actitudes hacia la Autoridad Institucional en adolescentes (AAI-A). *Anales de Psicología*, *29*, 540–548. http://dx.doi.org/10.6018/analesps.29.2.138031

Defensor del Pueblo. (2007). *Violencia Escolar: El maltrato entre iguales en la Educación Secundaria Obligatoria 1999-2006*. Madrid: Informes, Estudios y Documentos.

Emler, N. (2009). Delinquents as a minority group: Accidental tourists in forbidden territory or voluntary émigrés? In F. Butera, & J. Levine (Eds.), *Coping with minority status: Responses to exclusion and inclusion* (pp. 127–154). Cambridge: Cambridge University Press.

Emler, N., & Reicher, S. (2005). Delinquency: cause or consequence of social exclusion? In D. Abrams, J. Marques, & M. Hogg (Eds.), *The social psychology of inclusion and exclusion* (pp. 211–241). Philadelphia: Psychology Press.

Estévez, E., & Jiménez, T. I. (2015). Conducta agresiva y ajuste personal y escolar en una muestra de estudiantes adolescentes españoles. *Universitas Psychologica*, *14*, 111–124.

Estévez, E., Moreno, D., Jiménez, T., & Musitu, G. (2013). From victim to aggressor: An analysis of the relationship between victimization and violent behavior at school. *Spanish Journal of Psychology*, *16*, 1–13.

Estévez, E., Musitu, G., & Herrero, J. (2005). The influence of violent behavior and victimization at school on psychological distress: The role of parents and teachers. *Adolescence*, *40*, 183–195.

Evans, M., Heriot, S. A., & Friedman, A. G. (2002). A behavioural pattern of irritability, hostility and inhibited empathy in children. *Clinical Child Psychology and Psychiatry*, *7*, 211–224.

Flisher, A. J., Evans, J., Muller, M., & Lombard, C. (2004). Brief report: Test–retest reliability of self-reported adolescent risk behaviour. *Journal of Adolescence*, *27*, 207–212. http://dx.doi.org/10.1016/j.adolescence.2001.10.001

Gómez, A. (2005). Violencia e institución educativa. *Revista Mexicana de Investigación Educativa*, *10*, 693–718.

Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Consulting and Clinical Psychology*, *65*, 599–610. http://dx.doi.org/10.1037/0022-006X.69.4.599

Instituto Mexicano de Juventud, IMJUVE (2012). *Encuesta nacional de valores en juventud*. México D.F: Secretaría de Educación Pública. Retrieved from http://www.imjuventud.gob.mx/imgs/uploads/ENVAJ_2012.pdf.

Jiménez, T. I., Musitu, G., & Murgui, S. (2008). Funcionamiento familiar y consumo de sustancias en adolescentes: El rol mediador de la autoestima. *International Journal of Clinic and Health Psychology*, *8*, 139–151.

Khoury-Kassabri, M. (2012). Perpetration of aggressive behaviours against peers and teachers as predicted by student and contextual factors. *Aggressive Behaviour*, *38*, 253–262. http://dx.doi.org/10.1002/ab.21424

Leff, S. S., Waasdorp, T. E., Paskewich, B., Gullan, R. L., Jawad, A. F., MacEvoy, J. P., Feinberg, B. E., & Power, T. J. (2010). The preventing relational aggression in schools everyday program: A preliminary evaluation of acceptability and impact. *School Psychology Review*, *39*, 569–587.

Little, T. D., Henrich, C. C., Jones, S. M., & Hawley, P. H. (2003). Disentangling the ''whys'' from the ''whats'' of aggressive behaviour. *International Journal of Behavioural Development*, *27*, 122–133. http://dx.doi.org/10.1080/01650250244000128

Loría, C. (1997). *Mujeres y hombres en la escuela y la familia. Estereotipos y perspectiva de género*. México D.F: Secretaría de Educación Pública, Comisión Nacional de la Mujer.

MacKinnon, D. P., & Dwyer, J. H. (1993). Estimating mediated effects in prevention studies. *Evaluation Review*, *17*, 144–158. http://dx.doi.org/10.1177/0193841X9301700202

Madill, R. A., Gest, S. D., & Rodkin, P. C. (2014). Students' perceptions of relatedness in the classroom: The roles of emotionally supportive teacher–child interactions, children's aggressive–disruptive behaviours, and peer social preference. *School Psychology Review*, *43*, 86–105.

Martínez, N. (2014, 26 de junio). México, con el índice más alto de bullying. *Periódico El Universal*.

Martínez-Ferrer, B., Murgui-Pérez, S., Musitu-Ochoa, G., & Monreal-Gimeno, M. C. (2008). El rol del apoyo parental, las actitudes hacia la escuela y la autoestima en la violencia escolar en adolescente. *International Journal of Clinical and Health Psychology*, *8*, 679–692.

McClanahan, M., McCoy, S. M., & Jacobsen, K. H. (2015). Forms of bullying reported by middle-school students in Latin America and the Caribbean. *Advances in School Mental Health Promotion*, *8*, 42–54.

Mestre, V., Pérez-Delgado, E., Frías, D., & Samper, P. (1999). Instrumentos de evaluación de la empatía. In E. Pérez-Delgado, & V. Mestre (Eds.), *Psicología moral y crecimiento personal* (pp. 181–190). Barcelona: Ariel.

Moos, R. H., Moos, B. S., & Trickett, E. J. (1989). *FES, WES, CIES, CES. Escalas de Clima social*. Madrid: TEA.

Organization for Economic Cooperation and Development, OECD. (2014). *Talis 2013 Results: An International Perspective on Teaching and Learning, TALIS*. OECD Publishing. http://dx.doi.org/10.1787/9789364196261-en

Povedano, A., Cava, M. J., Monreal, M. C., Varela, R., & Musitu, G. (2015). Victimization, loneliness, overt and relational violence at the school from a gender perspective. *International Journal of Clinical and Health Psychology*, *15*, 44–51. http://dx.doi.org/10.1016/j.ijchp.2014.09.001

Ramos-Álvarez, M. M., Moreno-Fernández, M. M., Valdés-Conroy, B., & Catena, A. (2008). Criteria of the peer review process for publication of experimental and quasi-experimental research in psychology: A guide for creating research papers. *International Journal of Clinical and Health Psychology*, *8*, 751–764.

Reicher, S., & Emler, N. (1985). Delinquent behaviour and attitudes to formal authority. *British Journal of Social Psychology*, *3*, 161–168. http://dx.doi.org/10.1111/j.2044-8309.1985.tb00677.x

Rodkin, P. C., Pearl, R., & Van Acker, R. (2003, April). *They're cool: Ethnic and peer group supports for aggressive boys and girls*. Tampa, FL: Paper presented at the Biennial Meeting of the Society for Research in Child Development.

Rodríguez-Fernández, A., Ramos-Díaz, E., Fernández-Zabala, A., Goñi, E., Esnaola, I., & Goñi, A. (2016). Contextual and psychological variables in a descriptive model of subjective well-being and school engagement. *International Journal of Clinical and Health Psychology*, *16*, 166–174. http://dx.doi.org/10.1016/j.ijchp.2016.01.003 1

Rothbaum, F., & Weisz, J. R. (1994). Parental caregiving and child externalizing behavior in nonclinical samples: A meta-analysis. *Psychological Bulletin*, *116*, 55–74.

Smith, P. K. (2016). Research on bullying in schools in European countries. In P. K. Smith, K. Kwak, & Y. Toda (Eds.), *School Bullying in Different Cultures: Eastern and Western Perspectives* (pp. 1–27). Cambridge: Cambridge University Press.

Steffgen, G., Recchia, S., & Viechtbauer, W. (2013). The link between school climate and violence in school: A meta-analytic review. *Aggression and Violent Behavior*, *18*, 300–309. http://dx.doi.org/10.1016/j.avb.2012.12.001

Stephenson, Z., Woodhams, J., & Cooke, C. (2014). Sex differences in predictors of violent and non-violent juvenile offending. *Aggressive Behavior*, *40*, 165–177.

Valadez, I. (2008). *Violencia escolar: maltrato entre iguales en escuelas secundarias de la zona metropolitana de Guadalajara. Informe de estudio*. Mexico: Colección Salud Materno Infantil.

Valdés, A., & Martínez, E. A. (2014). Relación entre el autoconcepto social, el clima familiar y el clima escolar con el bullying en estudiantes de secundaria. *Avances en Psicología Latinoamericana*, *32*, 447–457, doi: dx.doi.org/10.12804/apl32.03.2014.07.

Van der Put, C. E., Deković, M., Hoeve, M., Stams, G. J. J., van der Laan, P. H., & Langewouters, F. E. (2014). Risk assessment of girls: Are there any sex differences in risk factors for re-offending and in risk profiles? *Crime & Delinquency*, *60*, 1033–1056.

Van Noorden, T. H., Haselager, G. J., Cillessen, A. H., & Bukowski, W. M. (2015). Empathy and involvement in bullying in children and adolescents: A systematic review. *Journal of Youth and Adolescence*, *44*, 637–657. http://dx.doi.org/10.1007/s10964-014-0135-6

Vega-Gea, E., Ortega-Ruiz, R., & Sánchez, V. (2016). Peer sexual harassment in adolescence: Dimensions of the sexual harassment survey in boys and girls. *International Journal of Clinical and Health Psychology*, *16*, 47–57. http://dx.doi.org/10.1016/j.ijchp.2015.08.002

Volungis, A. M., & Goodman, K. (2017). School violence prevention: Teachers establishing relationships with students using counseling strategies. *SAGE Open*, *7*, 1–11.

Yuan, K. H., Chan, W., Marcoulides, G. A., & Bentler, P. M. (2016). Assessing structural equation models by equivalence testing with adjusted fit indexes. *Structural Equation Modeling: A Multidisciplinary Journal*, *23*, 319–330.