

Ecological-transaction model approach of adolescents' parental maltreatment and peer-bullying: the moderating role of bullying at the classroom

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Abstract

Introduction. The present study examined the ecological-transactional model delineated by Cicchetti and Lynch (1993) and the nature of the association between adolescents' parental maltreatment and victimization and bullying at school.

Method. Multivariate multilevel regression analyses were conducted on a sample of 2.852 adolescents between the ages of 12 and 17 from 25 secondary schools. Data was nested across 133 classrooms. Classrooms level variables and individual variables in relationship to parental maltreatment, behavioural disorders, sex, and bullying and victimization were included in the analysis.

Results. Results indicated that adolescents who reported suffering violence at home, showed more vulnerability to becoming victims of bullying at school, with the relationship being moderated by the level of bullying in the classroom. It was also examined the role of behavioural disorders and a relation between these factors was found amongst the bullies but not the victims.

Discussion and Conclusion. This study uses the systemic perspective of ecological-transactional model on child maltreatment to show the importance between the school and home microsystems in the perpetuation of victimization. The results imply that what children experience at home might cause emotional and behavioural differences in varying classroom climates at school. Therefore, understanding the interactions between systems' transaction of socialisation mechanisms might contribute for effective anti-bullying programs.

Keywords: Bullying; ecological transactional model; parental maltreatment; victimization

Resumen

Introducción. Este estudio examina el modelo ecológico-transaccional propuesto por Cicchetti and Lynch (1993) y la naturaleza de la asociación entre adolescentes expuestos a maltrato parental y la victimización y bullying en la escuela.

Método. Se realizó un análisis multivariado multinivel de regresión en una muestra de 2.852 adolescentes entre 12 y 17 años pertenecientes a 25 escuelas de secundaria. Los datos fueron anidados en 133 clases. Se utilizaron en el análisis, variables grupales relacionadas con el maltrato parental, trastornos comportamentales, género, victimización y abuso.

Resultados. Los resultados indicaron que las víctimas de maltrato parental mostraban más vulnerabilidad para convertirse en víctimas de bullying, siendo esta relación moderada por el nivel de bullying en el aula. Además, se examinó el papel de los trastornos comportamentales encontrándose una relación significativa entre estos factores en los agresores.

Discusión y Conclusión. Este estudio examina la perspectiva sistémica del modelo ecológico-transaccional sobre el maltrato infantil para demostrar la importancia entre los microsistemas escolares y familiares en la perpetuación de la victimización. Los resultados indican que lo que los niños experimentan en el hogar puede causar diferencias emocionales y comportamentales en función del clima del aula en la escuela. Por lo tanto, la comprensión de las interacciones entre los sistemas de socialización podría contribuir a diseñar programas efectivos contra el bullying.

Palabras clave: Bullying; maltrato parental; modelo ecológico transaccional; victimización

Introduction

Bullying and victimization in a school context is considered a serious problem (OECD, 2017; Rivara & LeMenestrel, 2016), affecting at least 7% of the student population, with significant cross-national variance between 4% to 45% of its prevalence amongst them (Craig et al., 2009; Solberg & Olweus, 2003). Bullying has been defined as a subtype of aggression among peers characterized by intentionally inflicting injury, repetition over time and an imbalance of strength where the victims are incapable of defending themselves. Victimized students are subject to different forms of negative actions by one or several students including social isolation, verbal or physical aggression (Olweus, 1993).

Some scholars have focused on examining the relationship between family socialisation and bullying (Cerezo et al., 2018; Cross & Barnes, 2014; Duncan, 1999; Seeds, Harkness & Quilty, 2010). Studies have demonstrated that there are negative short and long-term consequences related to children's negative socialization experiences for those who have been exposed to abuse at home (Finkelhor, Ormrod & Turner, 2009; Herrera & McCloskey, 2001; Kolbo, Blankely & Engleman, 1996). However, the studies of violence at home and its influence at school have not yet considered the influence of the average level of violence and bullying dynamics within the classroom. This point of view was theorised in the ecological-transactional model delineated by Cicchetti and Lynch (1993) to explain child maltreatment and social development at different contexts. Based on the integrated works of Belsky (1980), Bronfenbrenner (1977), and Cicchetti and Rizley (1981), an ecological systems theory was proposed. This comprises a set of systems (microsystem, macrosystem and exosystem) that interact with each other and are simultaneously affected by potentiating and protecting factors. This may be used to explain the occurrence of violent behaviours for each context. According to this, parental maltreatment takes place in the family microsystem when the potentiating factors outnumber the protective (factors that reduce the risk of suffering from maltreatment). Students, who have suffered from parental maltreatment in their family microsystem, may adopt the victim role more easily, if immersed in bullying dynamics within the school microsystem. More recently, this ecological systems approach is now named as the social-ecological model for bullying (Hong & Espelage, 2012) and provides a framework that acknowledge that some group dynamics may also act as potentiating factors, for instance, an increased occurrence of bullying and violent behaviour. These ecological approaches in bullying research are of great importance to

account for school contextual variables and refine our understanding about the bullying phenomenon.

Thus, the aim of the present study is to examine whether the mean levels of peer violence act as moderators between being subject of parental maltreatment and students' involvement in bullying in the classroom. The evidence provided might clarify the role of parental maltreatment and its effect under specific group conditions.

Parental maltreatment

Scientific studies have demonstrated how the presence of frequent conflict amongst family members (Cummings, Goeke-Morey & Papp, 2003; Cummings, Koss & Davies, 2015), its intensity, and the quality of members' communication (Demaray & Malecki, 2002; Lambert & Cashwell, 2003) can result in an important indicator of adolescents' psychological and behavioural maladjustment (Gámez-Guadix & Almendros, 2011; Harold & Sellers, 2018; Hébert et al., 2016). Furthermore, additional factors such as substance abuse, parents' antisocial personality, maternal depression, and physical or sexual abuse, among others, can complicate adolescents' development and social interactions (Margolin & Gordis, 2000; Nocentini et al., 2018). Socioeconomic variables, such as poverty and parents' level of education (Hotelling & Sugarman, 1986) might influence the inappropriate use of physical punishment, its arbitrariness and inconsistency (Jackson, 2000). These studies show how certain factors from the family microsystem further threaten adolescents' adaptation. In summary, the family constitutes the base for adolescents' interpretation of other contexts (Bronfenbrenner, 1977), such as the school microsystem. Therefore, it is to be expected that the experience of violence at home would inevitably influence children's socialization in the classroom if the similar violent conditions are present in both microsystems.

A number of authors have found a relationship between parental maltreatment and school adjustment problems. Becoming a bully at school is associated with the child's exposure to violence at home (Baldry, 2003; Corvo & deLara, 2010), although these adjustment problems have been observed in relation to externalization and internalization symptomatology as a consequence. To what externalization is concerned, Sternberg et al., (1993) showed that children who had witnessed or had suffered from parental maltreatment had a higher probability of showing aggressiveness in front of their peer group, especially taking into account violent behaviour is associated with ADHD (Pope & Bierman, 1999). In that line of reasoning, the

importance of ADHD symptoms should not be overlooked. Numerous studies have demonstrated that ADHD constitutes a risk factor for social problems at different systems of the ecological model (Guevremont & Dumas, 1994). Additionally, the difficulties ADHD students have in reading social cues are expected to correlate with rejection by their school peers (Hodgens, Cole & Boldizar, 2000).

However, another group of authors has found a relationship between parental maltreatment and internalization symptoms. Research findings have shown that children who suffer maltreatment display more introverted behaviours and have a tendency to become more isolated in their peer relationships (Bolger & Patterson, 2001). In addition, children display low levels of self-esteem (Toth, Manly & Cicchetti, 1992), depression and high levels of stress (Kazdin, Moser, Colbus & Bell, 1985). These kinds of symptoms can contribute to the occurrence of anxiety problems (Mancini, Van Ameringen, Oakman & Figueiredo, 1999) reducing students' chances of establishing friendship or romantic relationships (Weiss & Hechtman, 1993). A birth cohort study looking at victims of abuse has shown the association with externalized and internalized problems and mental health problems in adulthood, such as anxiety and post-traumatic stress disorders (Kisely et al., 2018). In a recent longitudinal study looking at the relationship between peer victimization and externalisation and internalisation behaviours, the authors concluded that only internalised behaviours related to peer victimization concurrently, and over time, and they are associated with increased risk for peer victimization in the presence of ADHD (Fogleman et al., 2018).

Classroom context

As well as family, school is considered to be part of the microsystem, within the ecological-transactional model. Within this context, bullying is one of the most negative social dynamics that might occur at school, peer support interventions often look at school climate and its changes as part of the ecological framework (Gómez & Gaymard, 2014). However, this phenomenon takes place in a social context or system where different actors take part of the group processes and play different roles, the classroom. An increasing number of studies on bullying explain how group norms affect children's evaluation of bullying behaviour and consequently their further involvement in it (Espelage, Holt & Henkel, 2003; Pouwels et al., 2017; Sentse et al., 2015). In alignment, a recent meta-analysis found supportive peer interaction and positive school climate as a protective factor against bullying perpetration (Zych, Farrington, Ttofi, 2019). The researches that analyse the influence of the group on bullying, have found

that its effects may modify the level of acceptance of bullies. This depends on how normative this type of violence is in the classroom or school. Rejection towards bullies tended to increase in classes where bullying was not part of the social norm, whilst in classes where was part of the social norm, bullies tended to not be rejected as much in the classroom. Furthermore, the group analysis of the bystanders' positioning towards bullying would also influence the level of aggression that a victim would experience (Salmivalli, Voeten & Poskiparta, 2011).

Another group of scholars (Ahn, Garandean & Rodkin, 2010; Huitsing, Veenstra, Sainio & Salmivalli, 2012) have centred on the analysis of group characteristics and the way they moderate the first level variables within bullying such as the individual level of aggression. Ahn et al., (2010) discovered that the hierarchical structure and the density of the friendship bonds in the classroom would influence the perceived popularity of victims and aggressors. Aggressors' perceived popularity would be greater in classes with greater hierarchy and group density, while victims would be expected to be less popular. Additionally, Huitsing et al., (2012) found that the levels of school bullying in a class moderated the adjustment between victimization, depression and self-esteem.

A longitudinal study showed that victims targeted by the same bullies are likely to defend each other and corroborated retaliation hypothesis, which proposes that defenders of victims may increase the risk of being victimized by the bullies of the victims they defend (Huitsing, Snijders, Van Duijn, & Veenstra, 2014). Finally, Schäfer et al., (2005) studied the structural hierarchies of social networks in the classroom and their relationship to bullying. According to these authors, in a class with a low degree of hierarchical structuring, bullies would have a wider range of targets or victims. If, however, the hierarchical structure of the class was higher, victims would be more likely to have asymmetric powers; therefore, they are more likely to be harassed in a more consistent way and less likely to avoid those harmful situations or to receive help from their peers.

Objectives and hypotheses

We examined the ecological-transactional model of child maltreatment in combination with social learning theory (Bandura, 1977) to explain that if victimization that takes place in the family microsystem, it will also take place in the school microsystem whenever the potentiating factors are sufficiently alike. We used the mean level of bullying in order to measure the classroom' social climate. It was hypothesized a positive relationship between having suffered

from parental maltreatment and victimization (Hypothesis 1a) and aggression (Hypothesis 1b) at school. This tendency would be reinforced in classrooms where the average level of bullying is higher. This context implies a more stressful social climate for the adolescents at risk, in line with the ecological-transactional model, is expected to act as a potentiating factor for the students who have suffered from parental maltreatment at home. Consequently, this places them in a vulnerable position in relation to school bullying. This is the reason why the victims of parental maltreatment would be more likely to display behaviours related to being a victim in classes with a high average classroom level of bullying (Hypothesis 2). However, in classrooms with higher average levels of bullying, a moderation effect on the parental maltreatment-aggression association is not expected (Hypothesis 3). Finally, we expect to find some relationship between the behavioural problems investigated in the study, showing an association between all the externalising behaviours explored as predictors of bullying in the individual level variables (Hypothesis 4).

Method

Participants and procedure

A total sample of 2.852 students (47% girls, 53% boys) aged 12 to 17 ($M= 13.73$, $SD= 1.39$) from 25 secondary schools in Madrid (Spain) participated. The selection of the schools was based on the size and the territorial distribution of the school. Thus, the sample was representative of three types of schools classified by number of students: large (more than 800 students), medium (between 800 and 400) and small (less than 400). From the 25 secondary schools included in the study, a total 133 classrooms were identified in the sample across four courses that compose compulsory secondary education in Spain (1st E.S.O.: 32%, 2nd E.S.O.: 26%, 3rd E.S.O.: 22%, and 4th E.S.O.: 20%).

Students who had obtained parental consent to participate in the study were requested to fill in an internet-based questionnaire in the schools' computer laboratories. Instructions were provided and included information on the way the software works, as well as on the aims of the research of using the results to improve the social climate of the classrooms. They were shown an array of questions that included photos and names of their classmates on a screen on which they had to click on, in order to answer each question. Detailed instructions were given to students in order to complete the questionnaire. Moreover, additional support by phone and e-mail was provided to those where required. Referral suggestions were also made to the school.

Instruments

Individual victimization and bullying

A peer nomination questionnaire was used to obtain this measure. The nominations were made from a bystander's point of view and a definition of bullying retrieved from Olweus' Bully/Victim Questionnaire (1996) was presented to participants in the questionnaire. Students were shown two specific items aimed at the identification of verbal (i.e. 'which classmate is insulted or humiliated by others?') and relational aggression (i.e. 'which classmate is isolated or ignored by others?'). The obtained scores on these formed a reliable scale and were averaged (Cronbach's alpha = .80 for the bullying and $\alpha = .78$ for the victimization). Each item was computed considering the number of nominations divided by the number of participants in the group and an average score for the 3 items was calculated (range from .00 to .58; $M = .04$, $SD = .07$).

Students were also asked questions to identifying aggressors, 'which classmate has ignored or rejected other people?' (relational bullying) and 'which classmate has insulted or humiliated others?' (verbal bullying), and an average score for the two items was calculated ($\alpha = .94$). In addition, each item was also computed considering the number of nominations divided by the number of participants in the group and an average score for the two items was calculated (range from .00 to .53; $M = .05$, $SD = .07$).

Parental maltreatment

This measure was based on the information obtained from a self-reported questionnaire. This scale was composed of 6 items, which each contained two elements related to physical abuse (i.e., "My parents beat me in order to punish me when I have done something wrong") two items related to verbal abuse (i.e., "My parents insult me") and the last two items related to emotional neglect (i.e., "I don't feel beloved and accepted by my parents") ($\alpha = .72$; range from 0 to 24).

Behavioural problems

This measure was based on a modified version of the ESPERI questionnaire (Parellada, San Sebastián & Martínez Arias, 2009). A total of 21-items from the adolescent version were selected. An inattention-impulsiveness factor formed by items that represented behavioural

dimensions whose inappropriate levels characterize subtypes of ADHD (American Psychiatric Association, 2000). This factor included items like: “I get easily distracted” ($\alpha = .70$) (range from 0 to 24; $M = 8.64$, $SD = 5.06$). A second factor included items based on observable behaviour that promotes anti-social traits, it is also known as dissocial conducts ($\alpha = .83$) (range from 0 to 24; $M = 2.03$, $SD = 2.90$). It was composed by items like: “I humiliate other people”. A third factor, psychopathy, is defined a lack of empathy, egocentrism and guilt. Items such as “I only mind my own business” composed this factor ($\alpha = .91$) (range from 0 to 12; $M = 3.00$, $SD = 2.36$). Finally, a fourth factor referred to the hyperactivity domain, characterized by excessive and/or inappropriate activity in relation with tasks or objectives ($\alpha = .78$) (range from 0 to 24; $M = 6.56$, $SD = 5.59$).

Classroom average of victimization and bullying

This measure has been previously used in the study by Huitsing et al. (2012). The same peer nomination questionnaire for measuring individual bullying and victimization was used to calculate the classroom average levels., a proxy for bullying and victimization classroom climate. Classroom average level of victimization was obtained by using two specific questions about verbal and relational victimization. The nominations received by each student was divided by the total number of students that answered the questionnaire. Finally, those two questions were sum and classroom average victimization was calculated (range from .10 to 7.46; $M = 2.85$, $SD = 1.45$). The same process was followed to calculate the average level of bullying at classrooms, but instead taking into account two questions on relational and verbal aggression (range from .20 to 8.04; $M = 3.16$, $SD = 1.63$).

Data analysis

It was ran descriptive analyses and correlations to contrast the values of the measurements on parental maltreatment (students who were often and very often mistreated at home) and the different indicators of bullying and behavioural problems. In addition, a multilevel regression analysis using the software program HLM 7.0 was used (Raudenbush, Bryk & Congdon, 2010). The multilevel analysis allowed to take into consideration the nested structure of our data: students and classrooms. Multilevel regression method allowed the possibility to determine to which extent the correlations of the dependent variables influenced the individual or group level variables. Furthermore, it allowed us to examine of the cross-level interactions and the moderation effect amongst variables at the first and second level.

Results

Descriptive analysis and correlations

The results are shown in Table 1. As concerns to the violence exerted during the episodes of bullying, we found relevant correlations with the anti-social ($r = .32$) and the hyperactivity factor ($r = .28$). However, victimization did not show significant correlations with the factors related to the behavioural problems. The results showed a low significant correlation ($< .20$) between parental maltreatment and the rest of the variables in the study. The factors related to the behavioural disorders showed high and significant correlations among each other. The inattention-impulsiveness factor correlated positively with the anti-social, psychopathy and hyperactivity factors ($r = .45$, $r = .44$ and $r = .73$ respectively). In turn, the anti-social factor correlated with psychopathy ($r = .41$) and with hyperactivity ($r = .45$). Finally, psychopathy also correlated with hyperactivity ($r = .38$).

Table 1. Means, Standard Deviations and Correlations for the Study Variables

Variables	<i>M (SD)</i>	1	2	3	4	5	6
1. Victimization	.04 (.07)						
2. Aggression	.05 (.07)	.16**					
3. Parental Maltreatment	4.67 (3.16)	.05	.12**				
4. Inattention-Impulsiveness	8.64 (5.06)	-.03	.26**	.15**			
5. Anti-social	2.03 (2.90)	-.05	.32**	.19**	.45**	.41**	
6. Psychopathy	3.00 (2.36)	-.04	.13**	.09**	.44**		
7. Hyperactivity	6.56 (5.59)	-.02	.28**	.17**	.73**	.45**	.38**

** $p < 0.01$

Multilevel analysis

Random-coefficient regression models were tested for each variable in the student-level analysis as outcomes (i.e. inattention-impulsiveness, hyperactivity, psychopathy, parental maltreatment, sex, bullying and victimization), while bullying and victimization were tested as predictors. The aim was to explore how the measured individual variables influenced or moderated bullying and victimization in classrooms. The intraclass correlation coefficient (ICC) was calculated for the nested data determined from an *intercept-only* model (null model), it refers to correlation among observations within a cluster $ICC = .05$, this means that a 5% of the

variance for both model outcomes (bullying and victimization) was explained by the classroom level-2 cluster. For aid interpretation, we also computed squared multiple correlation coefficients (Hox, 2010; Raudenbush & Bryk, 2002), following the procedure explained by Snijders and Bosker (1999), that accounts the proportion of variance of the outcome explained by level-1 and level-2 predictors in the model, for the model of bullying as an outcome $R^2_1=.40$; $R^2_2=.36$ and for the model of victimization as an outcome $R^2_1=.10$; $R^2_2=.36$. The results of the multi-level analysis are shown in Table 2.

Table 2. *Multivariate Multilevel Regression Analysis of Classroom-Level Effects of Victimization and Bullying, and their Interaction with Parental Maltreatment on Individual Bullying and Victimization*

	Victimization		Bullying	
	<i>B</i>	<i>SE</i>	<i>B</i>	<i>SE</i>
Intercept	.112***	.007	.091***	.006
Individual Level				
Sex	.053***	.010	.120***	.010
Parental maltreatment	.003***	.001	.009	.004
Attention-impulsiveness	-.002	.001	.002**	.001
Hyperactivity	.001	.001	.004***	.001
Anti-social	-.002	.001	.016***	.002
Psychopathy	-.000	.002	-.002	.001
Classroom level				
Classroom average victimization	.001	.012	.905***	.026
Classroom average bullying	.840***	.032	.012	.029
Cross-level interactions				
Classroom average victimization x Parental maltreatment	-.006	.003	.003	.003
Classroom average bullying x Parental maltreatment	.007**	.003	.001	.003

** $p < 0.01$, *** $p < 0.001$.

In relation to individual level variables ($n = 2.852$ students), it was found significant relationships between sex ($b = .053$), and parental maltreatment ($b = .003$) as predictor variables for victimization. On the other hand, the variables sex ($b = .120$), hyperactivity ($b = .004$) attention-impulsiveness ($b = .002$), and anti-social ($b = .016$) predicted bullying.

As second level variables or class level variables ($n = 133$ classrooms), we input the average level of bullying and victimization in classrooms. At classroom level, the classroom average of victimization was highly correlated with the classroom average of bullying ($r = .90$). Furthermore, the multilevel analyses allowed for the examination of the cross-level interactions and the moderation effect amongst variables (see Table 2). Moreover, the data suggested that the average classroom level of bullying moderated the relationship between parental maltreatment and victimization at school ($b = .007$).

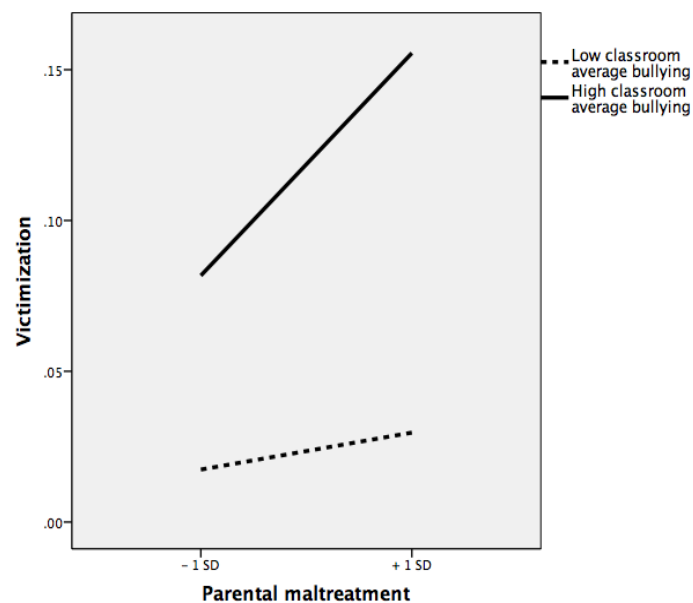


Figure 1. Interaction of Parental Maltreatment and Classroom Average Bullying in Predicting Victimization

To a better understanding simple slopes of this interaction effect were calculated and represented in Figure 1, by following the instructions provided by Aiken and West (1991). Parental maltreatment was positively associated with victimization in all classrooms, however this relationship was stronger in classrooms with high level bullying ($b = .069$, $t = 4.44$, $p < .001$) than in those with low level ($b = .19$, $t = 1.04$, n. s.). Classroom average of bullying,

however, did not moderate the association between parental maltreatment and bullying behaviour. The average classroom level of victimization did not show any moderating effect on individual variables. The most outstanding feature of these results is the evidence we obtained in favour of the explicative value that maltreatment has. The data indicated that parental maltreatment at home is related to becoming a victim in the classroom and this tendency arises when the average levels of bullying and victimization in a class arise.

Discussion and conclusion

The main objective of this study was to test the systemic transaction between the microsystems of parental maltreatment and school bullying through multilevel analysis of the data collected. We believe that this transaction will show an interaction if the potentiating factors reach a significant level in the classroom. The interpretations of our empirical results allowed us to confirm our H1a but not the H1b. Those students who had been maltreated at home showed statistically significant differences in the adoption of a victim role, but not a bully role, compared to those who have not suffered parental maltreatment. These results are consistent with the findings of Marturano, Ferreira and Bacarji (2005) in relationship to victimization. However, these results do not point in the same direction as the findings of authors such as Baldry (2003) who found that there is a relationship between parental maltreatment and becoming a bully at school.

In reference to victimization as a function of the class context, our results support the expectations of the ecological-transactional model on child maltreatment (Cicchetti & Lynch, 1993). In our second hypothesis, we suggested that the process of learned experiences from being exposed to parental maltreatment might activate the latent schemas of the students (Calvete, 2014). This may then lead to the transfer of vulnerability from one context to the other whenever similar conditions are present. Therefore, we expected more victimization behaviours in the students who have suffered abuse at home, and this was more likely when there was an increased level of bullying or present conditions for bullying in the classroom. After the cross-sectional analysis between the first and second level variables, we discovered that the second level variables moderated the relationship between having suffered from parental maltreatment and having behaved as a victim in the classroom. Classrooms that had high average of victimization in bullying behaviours moderated students' victimization, if they have suffered parental maltreatment. The empirical results of this study allowed us to confirm our second hypothesis.

In this way, those students who had suffered parental maltreatment showed greater predisposition to behave as victims in those classrooms where the average level of bullying was high. We were unable to establish a relationship between the students who have suffered from parental maltreatment and the average level of bullying in classrooms, even when the conditions of bullying in the class were prominent. We would like to underline the fact that we could not find a significant relationship between the behavioural factors and parental maltreatment, confirming our hypothesis 3. In regards to hypothesis 4, we confirmed that behavioural problems predict bullying behaviour, in particular hyperactivity, attention-impulsiveness, and anti-social variables in the model. Interestingly psychopathy did not have significant association as a predictor of bullying, none of the behavioural problems explored predicted victimisation, these results are in line with investigations that show that bullies report more externalisation problems than victims who often display more internalisation problems (Kelly, Newton & Stapinski, 2015).

The present study managed to confirm empirically with quantitative analytical strategies for the educational research context, the existence of a significant relation between victimization at school and parental maltreatment at home, whilst also considering the social climate of the classroom in the analysis. It fills a gap in literature and uses the systemic perspective of the ecological-transactional model on child maltreatment to show the importance between the school and home microsystems in the perpetuation of victimization, hence supporting the use of ecological approaches in bullying research and educational psychology to better understand mechanism and factors that influence bullying dynamics (Hong & Espelage, 2012).

The practical implications of these results cannot be overlooked. The results imply that what children experience at home might cause emotional and behavioural differences in varying classroom climates at school. As consequence, the lack of understanding of these interactions between systems' transaction of socialisation mechanisms might contribute to inefficient intervention practices and advocates for anti-bullying programmes that include parental engagement and cooperation (Van Niejenhuis, Huitsing & Veenstra, 2019) in their design, and acknowledge the importance of both systems (school and parents) while dealing with bullying at school. In that sense, we recommend obtaining detailed information about students' family atmosphere in terms of exerted violence and our data suggest that the inclusion of programmes that consider parental interventions may increase its effectiveness (Ttofi & Farrington, 2011). It is also advisable to promote the notion of matrix or system of systems and whole school approaches to bullying (Brewer, Brewer & Kulik, 2018). The school environment is not an isolated system

with its own exclusive rules and interaction patterns, but another environment where students bring what they have learned both there and elsewhere. This implies that approaching family members and professionals to raise awareness of the further implications of their roles in the bullying processes it is of great importance for the prevention and reduction of bullying prevalence in schools. This should be a priority for future effective anti-bullying programs and our data suggest and provides evidence about the influences between systems in the bullying phenomenon. Further investigation involving more accurate data collection on this transaction between the school system and the parental system would definitely be helpful in the development of both intervention and prevention programs, as well as, further exploration of the protective and risk factors within each system that may influence the prevalence of bullying within educational settings. Those adolescents who have witnessed scenes of aggression at home frequently constitute a group at risk and recent brain-image studies show the impact of chronic peer-victimization at a neurological level for the adolescent's brain development (Quinlan et al., 2018). The characteristics of this population should be studied more depth in order to provide teachers, schools and other professionals with accurate and effective early detection and evidence-based intervention to deal and mitigate the harm that bullying can have as a traumatic experience in the school context and beyond.

Limitations and future research

A number of limitations should be taken into consideration for the interpretation of our results. First, the cross-sectional nature of the data in this research does not provide any insight on the duration or the stability of the relationships we have discovered in bullying dynamics. In this sense, a longitudinal study is required to determine the consistency of the relationships at classrooms; perpetrators and victims and bullying dynamics or violence at home may change over time. Second, although peer nomination is probably one of the best and most recommended methods of studying bullying behaviour (Bukowski, Gauze, Hoza & Newcomb, 1993), other methods might be additionally used in future studies (i.e. self-report methods) due to concerns about common method variance. Third, due to the importance of the variable maltreatment at home, it is also crucial to focus on the in-depth and reliable tools or selection procedures that can inform about this variable in research. Key questions such as who triggers violent incidents at home, when these incidents have been initiated and what are the beliefs that the student who lives in such environment holds about those episodes, are only some of the key questions that future researchers need to address to improve knowledge in the state of the art.

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