The Moderating Effects of Social Problem-Solving in the Relationship between Risk Factors and Peer Victimization in Colombian Early Adolescents

Efectos Moderadores de la Habilidad de Solución de Problemas Sociales en la Relación entre Factores de Riesgo y Victimización en Adolescentes Colombianos

Efeitos Moderadores da Habilidade de Solução de Problemas Sociais na Relação entre Fatores de Risco e Vitimização em Adolescentes Colombianos

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Abstract

This study assessed the moderating effect of social problem-solving (SPS) in the association between risk factors and peer victimization in a sample of Colombian adolescents. Using structural equation modeling techniques, this study assessed the extent to which changes in victimization varied as a function of the interaction between risk factors and social problem-solving. Results showed that both aggression and avoidance were predictive of initial scores on victimization, but only avoidance was found to predict its change over time. Only a main effect of SPS was found at the beginning of the year; no moderating effects were found. Results are consistent with previous findings by confirming that avoidance and aggression are risk factors for peer victimization.

Resumen

Este estudio examinó el rol moderador de la habilidad para resolver problemas sociales (SPS) en la asociación entre factores de riesgo y la victimización, en una muestra de adolescentes colombianos. Mediante el uso de técnicas de ecuaciones estructurales se evaluó qué tanto cambió la victimización a lo largo del tiempo, en función de la interacción entre factores de riesgo y la SPS. Los resultados mostraron que la agresión y la evitación son factores de riesgo y predicen puntajes iniciales en la victimización. Sin embargo, únicamente la evitación predijo los cambios de dicha variable en el tiempo. Adicionalmente, se encontró un efecto de la SPS en la victimización al inicio del año escolar, pero no se encontraron efectos moderadores. Los resultados son consistentes con estudios previos en los que se observa que la evitación y la agresión son factores de riesgo en la victimización.

Resumo

Este estudo examinou o papel moderador da habilidade para resolver problemas sociais (SPS) na associação entre fatores de risco e a vitimização, em uma amostra de adolescentes colombianos. Mediante o uso de técnicas de equações estruturais, avaliou-se quanto a vitimização ao longo do tempo mudou, em função da interação entre fatores de risco e a SPS. Os resultados mostraram que a agressão e a evitação são fatores de risco e predizem pontuações iniciais na vitimização. Contudo, unicamente a evitação prediz as mudanças de dita variável no tempo. Adicionalmente, constatou-se um efeito da SPS na vitimização ao início do ano escolar, mas não se encontraram efeitos moderadores. Os resultados são consistentes com estudos prévios nos quais se observa que a evitação e a agressão são fatores de risco na vitimização.

Keywords: victimization, social problem-solving, latent growth curve, buffering effects, early adolescence, Colombia.

Palabras clave: victimización, solución de problemas sociales, efecto amortiguador, curva de crecimiento latente, adolescentes, Colombia.

Palavras-chave: vitimização, solução de problemas sociais, efeito amortecedor, curva de crescimento latente, adolescentes, Colômbia.

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VICTIMIZATION IS one of the most damaging facets of negative peer relations. Several studies have shown that approximately 10% to 30% of children have reported being victimized at some point in their elementary, middle school, or high school years (Hodges, Boivin, Vitaro, & Bukowski, 1999; Martin & Huebner, 2007; Nansel et al., 2001). A considerable body of research has aimed to disentangle the mechanisms and dynamics that explain victimization. Evidence from these studies suggests that relatively stable personal characteristics that draw harassment from peers are the foremost mechanisms that could explain peer victimization. Physical attributes such as being physically weak or behavioural attributes such as being withdrawn or aggressive, or even having certain deficits in social information processing (e.g., having a hostile cognitive bias) are variables that explain a child's status as a target of abuse (Perry, Hodges, & Egan, 2001).

Another common finding in the peer relations literature is that positive individual characteristics or peer experiences promote development and, at the same time, protect at-risk children against negative outcomes such as peer victimization (Bagwell, Newcomb, & Bukowski, 1998; Bollmer, Milich, Harris, & Maras, 2005; Hodges et al., 1999; Hodges & Perry, 1999; Kochenderfer & Ladd, 1996). This notion, known as the *buffering hypothesis*, states that resources provided by one's interpersonal ties and positive personal experiences play a moderating role in the life-stress/well-being relationship, particularly for those individuals who face higher levels of social stress (Cohen & Hoberman, 1983).

In spite of this evidence, researchers to date have not been able to explain the process that accounts for the protective effect of positive personal experiences in the association between risk factors and victimization. Specifically, it is not clear exactly how positive socio-emotional competencies moderate the association between risk factors and harassment by peers. Accordingly, one goal of this study was to use the *buffering hypothesis* model to assess the moderating effect of positive personal characteristics in the association between internalizing and externalizing risk factors and peer victimization over time. By determining the relative buffering effectiveness of social problem-solving, this study was designed to isolate the mechanisms by which positive social competencies can protect children from maladjustment.

Peer Victimization: Characteristics and Effects of Peer Harassment

Broadly defined, victimization is the experience of being exposed to negative actions and harmful behaviour on the part of one or more peers (Hawker & Boulton, 2000; Olweus, 2001). Peer victimization may be observed in a variety of forms; it ranges from different forms of relational victimization to physical peer victimization.

Evidence from a myriad of studies show that children who are victimized by their peers are at risk for developing a wide range of physical, psychological, social, and academic difficulties that can have severe effects on their well-being (Hodges et al., 1999; Hodges & Perry, 1999; Lamarche et al., 2006). Indeed, peer victimization has been associated with adjustment difficulties such as low self-esteem (Graham & Juvonen, 1998; Junoven & Graham, 2001), depression (Boulton & Underwood, 1992; Kochenderfer-Ladd & Skinner, 2002), anxiety and loneliness (Crick & Bigbee, 1998; Storch, Masia-Warner, & Crisp, 2005), school avoidance (Kochenderfer & Ladd, 1996), and friendlessness (Bagwell et al., 1998; Bollmer et al., 2005; Bukowski, Sippola, & Boivin, 1995).

In an effort to understand the precursors and dynamics of peer victimization several researchers have developed models that use individual features as mechanisms for explaining the origins of this phenomenon (Bukowski & Sippola, 2001; Hodges et al., 1999; Hodges, Malone, & Perry, 1997; Hodges & Perry, 1999). These models conceptualize victimization as an individual process by emphasizing stable personal qualities as the mechanisms by which children become abused

by their peers. These studies show that victimized children display behaviours that could invite and reinforce attacks against them. For example, children who exhibit internalizing behaviours (e.g., anxiety or withdrawn behaviour), and who are physically weak, may be signalling their incapability to defend themselves successfully against attacks. In contrast, children who exhibit externalizing behaviours, such as physical aggression, may be targets of abuse because they are more likely to irritate and provoke other children, especially aggressors (Egan & Perry, 1998).

These studies and models indicate that peer victimization has been found to be predicted by risk factors such as social withdrawal or aggressive behaviours. However, researchers have not been able to account for the variables and processes that have a potential corrective effect in these associations. Clarifying the dynamics and mechanisms of the buffers that could moderate the negative association between risk factors and peer victimization is therefore warranted.

Social Problem-Solving

An important body of research has demonstrated that a strong association exists between children's abilities to resolve social problems, and the quality of their social interactions. Indeed, social problem-solving has been found to be a central cognitive appraisal and coping process that serves both a moderating and a mediating role in the relationship between life events and psychosocial adjustment (Crick & Dodge, 1994; Dodge & Price, 1994; Mayeux & Cillissen, 2003).

Social problem-solving is defined as "the self-directed cognitive behavioural process by which a person attempts to identify or discover effective or adaptive ways of coping with problematic situations encountered in everyday living" (D'Zurilla & Maydeu-Olivares, 1995, p. 410). Solving everyday problems entails a wide variety of challenges related to personal and interpersonal problems, as well as community and social challenges. According to D'Zurilla and Maydeu-Olivares (1995), the concept of social problem-solving is a multidimensional construct that comprises five different dimensions: positive problem orientation, or the use of constructive problem-solving skills; negative problem orientation, defined as a dysfunctional or inhibitive cognitive-emotional processing; rational problem solving, or the knowledge and use of effective problem-solving skills; impulsivity/carelessness style, which refers to ineffective or inadequate efforts to apply problem-solving skills; and avoidance style, defined as a defective problem-solving pattern characterized by procrastination, passivity, and dependency. These authors also explain that the process of solving social problems can be divided in two different parts: solving a problem and implementing a solution. The main distinction between these two parts is that while problem solving is defined as the process of finding solutions to specific problems, implementing a solution is the process that requires applying them to specific problematic situations. Therefore, these two domains require different sets of skills. As the former entails the use of cognitive and emotional competencies, the latter requires different coping and performance strategies, which could be, but are not necessarily related to the ones used for problem-solving.

Empirical research on social problem-solving has been largely based on the premise that a social information-processing pattern is generally associated with children's engagement in a particular type of behaviour (e.g., prosocial or deviant behaviour) (Crick & Werner, 1998). In support of this view, a number of studies have found that children who are aggressive or have conduct disorders commonly have deficits in their social problem-solving skills. These studies have shown that aggressive children tend to evaluate situations as hostile, select inappropriate and aggressive goals, and see aggressive responses as adequate alternatives. Furthermore, aggressive children have been found to generate few problem-solving solutions, which are generally qualitatively poor, ineffective, and aggressive (Keltikangas-Järvinen, 2001).

For example, evidence from the work conducted by Dodge and colleagues (1980, 1982) found that boys and girls who were identified by their peers or teachers as being aggressive, were more prone to assume that ambiguous social situations require aggressive responses, and to react in a more reflexive and aggressive manner in social problems compared with their nonaggressive counterparts, even when it was not clear that an act was motivated by a hostile intention. In the same way, Crick, Grotpeter, and Bigbee (2002) found that both relationally and physically aggressive children used a hostile attributional bias to evaluate situations of relational provocation and instrumental provocation, respectively. This finding indicates that the information-processing pattern used by aggressive children has an effect on how they react to problematic situations.

The Protective Effect of Social Problem-Solving

Despite the ample number of studies that have examined the association between the lack of social problem-solving skills and negative developmental outcomes, there is a paucity of empirical research on the possible buffering effect of this variable on the relationship between risk factors and children's psychosocial adjustment. According to Frye and Goodman (2000), there are only a few studies that have given support to the buffering effect of social problem-solving, and the majority of these studies have mainly focused on the moderating effect of this variable on the relationship between stress and depression. In a study conducted by Goodman, Gravitt, and Kaslow (1995) it was found that the ability to generate alternative solutions buffered the relationship between stress and depression in a sample of 50 children (ages 8 to 12) from a low-income minority population. Evidence from this study showed that children who experienced a high impact of negative life events and had less effective social problem-solving skills, reported higher levels of depression compared with children who also had a high impact of negative life events, but had better and more effective social problem-solving abilities. In another study developed by Glyshaw, Cohen, and Towbes (1989) with 530 students from eighth, ninth, tenth and 11th grades, it was found that students from junior and senior high school who used positive problem-solving as a coping strategy showed lower levels of depression, both concurrently and prospectively. Finally, in a study developed by Chang (2002) with 371 college students, the moderating effect of social problem-solving in the association between perfectionist tendencies and depression was tested. Results revealed that although perfectionism accounted for a significant amount of variance in depression, social problem-solving had an important impact on the association between these two variables by augmenting the prediction of each of these maladjustment measures. That is, the magnitude of the positive association between perfectionism and depression was greater in the presence of low problem-solving abilities, suggesting that social problem-solving acts as an effective buffer against the detrimental consequences typically associated with perfectionism.

The Current Study: The Effect of Social Problem-Solving

Given the evidence presented above, it seems plausible to expect that social problem-solving skills have the potential to act as a buffer for at-risk children. However, the literature reviewed also suggests that further work is needed to shed light on the mechanisms that explain this possible buffering effect. Several models have been developed to examine the moderating effect of a lack of social problem-solving skills, however only a limited number of studies have examined the role of this variable as a protective factor in the association between life events and psychological adjustment. Furthermore, to date no studies have examined this moderating role of social problem-solving in the relationship between risk factors and peer victimization.

In the present study, structural equation modeling was used to study the variations in the association between aggression (physical and relational), withdrawn behaviour and peer victimization over time (see Figure 1 and Figure 2).

This study was also concerned with the mechanisms through which social problem-solving might play a moderating role in the relationship between risk factors and peer victimization. Level 1 of the tested model corresponded to the longitudinal association between risk factors and changes in peer victimization. The relationship between aggression (i.e., physical and verbal), withdrawn behaviour and peer victimization was explored, and it was expected: (a) that high levels of aggression (i.e., physical and relational) and withdrawn behaviour would positively predict peer victimization and (b) there would be significant differences in victimization scores at the beginning and across the school year.

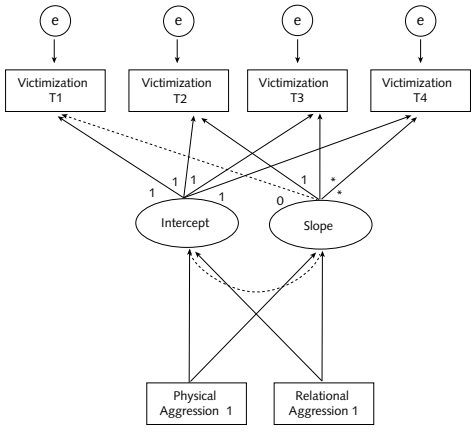

Figure 1. Path diagram for the hypothesized relationships between aggression and the trajectory of peer victimization. The asterisks represent the factor loadings that were freely calculated by the program.

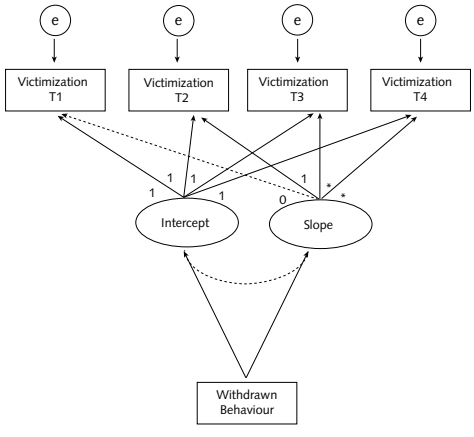

Figure 2. Path diagram for the hypothesized relationships between withdrawn behaviour and the trajectory of peer victimization. The asterisks represent the factor loadings that were freely calculated by the program.

Level 2 corresponded to the moderating role of social problem-solving. It was expected that a decrease in the strength of the association between risk factors and peer victimization would be found when children had high scores on social problem-solving skills. Based on the buffering hypothesis model, this decrease was expected in children who had high levels of aggression (i.e., physical and relational) and high levels of withdrawn behaviour. More specifically, a reduction in victimization scores at the beginning and across the school year was expected for: (a) children who were high in relational or physical aggression and who had high scores in social problem-solving skills, and (b) children who were highly avoidant and who had high scores in social problem-solving skills.

Method

Participants

Participants were a subsample of a larger longitudinal study (Velásquez, Bukowski, & Saldarriaga, 2012) that included 1,594 school age boys (n=842) and girls (n=752) (M=10.28 years, SD=0.97) from fourth, fifth and sixth grade in nine schools in Bogotá, Colombia. Students were enrolled in mixed-sex schools that represented an urban population of low (n=633), middle (n=828) and upper (n=133) socio-economic status (SES). The particular subsample used in the present study consisted of 623 boys (n=351) and girls (n=272) (M=10.27 years, SD=0.98) from three of the nine schools included in the

larger project. These three schools represented a diverse population, not only due to their variations in socio-economic status (two from low-middle SES and one from middle upper SES), but also in their size, administrative structure, pedagogical models, infrastructure and neighbourhoods where they are situated.

Procedure

Initial permission for participation was obtained from school principals or the academic coordinators of the schools. Following this, active consent was requested from the parents of the potential participant pool. Consent letters, informing parents of the objectives and procedures of the study, were sent home with the students. Only participants whose parents returned a signed letter of consent were included in the study. Of the potential pool of participants, over 79% of parents provided consent for their children.

Using a group administration procedure, participants completed a multi-section questionnaire during their homeroom class time. The students' rights as participants were explained to the class before children started answering the questions by the researchers. Children completed measures designed to assess (a) characteristics of the children in the class (i.e., aggression, avoidance and victimization) and (b) social problem-solving skills.

Data were collected at four times points during the academic year. In all these schools the academic year starts in February and ends in November, therefore data were collected approximately every 10 weeks during that period, depending on the exact schedules of the schools.

Instruments

Behavioural characteristics of the participants. The different behaviours that characterize the students in the classrooms were measured using an unlimited choice peer assessment questionnaire (see Rubin, Bukowski, & Parker, 2006 for a description). Four characteristics were measured for the current study: physical and relational aggression, withdrawn behaviour and victimization.

The peer assessment questionnaire consisted of a set of items representing characteristic behaviours of children in their classrooms. Children were asked to nominate the classmates that fit each characteristic on the list. They could choose as many or as few classmates as they wanted, excluding themselves. Each child was given a score on each item indicating how often she/he had been nominated for it by her/his participating classroom peers. The average of the items corresponding to each type of aggression was calculated to obtain a score for each variable. Two items in the questionnaire assessed *physical aggression* (i.e.,"someone who hits or pushes people" and "someone who gets involved in physical fights") (α=.92) and two were indices of *relational aggression* (i.e.,"someone who tries to keep others out of the group" and "someone who talks badly about others behind their backs to hurt them") (α=.86). Victimization and withdrawn behaviour were also measured using two items. For *victimization* the items were "others treat them badly" and "others call him/her bad names" (α=.80), and for *withdrawn behaviour* "someone who would rather play alone than with others" and "someone who likes to be by him/herself" (α=.80).

Adjustment for peer-nomination scores based on classroom size differences. One of the most controversial aspects in the use of class play and peer nomination techniques is related to the potential for variations in the size of the observed scores due to differences in the number of children in classrooms. Given that classrooms vary in size, and therefore in possible nominators for a peer assessment (in this particular case they ranged from 9 to 31), the scores for aggression, avoidance and victimization were mathematically corrected to control for these differences in size.

A regression-based procedure was used in order to maintain the original scale of the items (i.e., number of nominations received) (Velásquez,

Bukowski, & Saldarriaga, 2012). Linear and quadratic effects of the classroom size (minus the person receiving the nominations) were used as predictors of the variables' scores at Times 1 and 2. This procedure permitted an examination of the ways in which changes in the classroom size impacted the number of nominations received on each variable. An average number of nominations received for the peer assessment items was calculated. This average was included as the dependent variable in the regression analysis. Results indicated that classroom size explained 12% of the variance of peer assessment scores at Time 1 and 8% at Time 2. In this case, the linear *B*s at Times 1 and 2 were 0.159 and 147, respectively, and the quadratic *B*s at Times 1 and 2 were -0.006 and -0.001, respectively. The scores for the variables used in the three studies were then adjusted according to the procedure described above.

Social problem-solving skills. One of the most common methods used for evaluating children's cognition is the use of vignettes to help children generate multiple responses to hypothetical problematic situations. According to Mayeux and Cillissen (2003), vignettes typically describe situations that children face in their everyday school interactions, such as conflicts with peers or teachers. For the present study, a new instrument that used hypothetical vignettes was developed (see Appendix A). This scale measured an individual's perceptions of one's problem-solving behaviour by assessing a list of possible reactions and responses to a specific problematic situation. Children were presented with one hypothetical story about an ambiguous social situation, more specifically a misunderstanding with some classmates. After reading the story, students were asked to rate a series of possible reactions, behaviours and feelings using a standard five-point Likert scale that ranged from 1 = *not true for me* to 5 = *really true for me*. For this study, only positive dimensions of social problem-solving were used to create a general score: non-hostile cognitive bias (α=.71), assertive solutions (α=.73) and generation of alternatives (α=.78).

Results

Descriptive Statistics and Bivariate Correlations

Table 1 provides descriptive information for the variables included in the study. As it was expected, the mean scores for peer victimization decreased across the school year ranging from 2.24 to 3.68. Means for the additional variables were also in the expected ranges. Pearson correlations were computed to examine the stability across assessments, the relationship between the variables and the predictive associations between them. All the correlations were found to be in the expected direction, and the majority were significant at a p value<.01. As expected, correlations between the four time points for the peer victimization scores were fairly high (they ranged between .75 and .83). Correlations among the predictors and the criterion variables were all significant but moderate, however, they were consistent with evidence reported by previous studies in this area. Finally the correlations among the predictors and the outcome were modest but mostly significant, except for the case of social problem-solving (see Table 2).

Table 1
Descriptive Statistics for the Variables Included in the Model

Variable	*M*	*SD*
Level 1		
T1 Physical aggression	3.51	4.39
T1 Relational aggression	3.32	2.79
T1 Avoidance	1.64	2.07
T1 Victimization	3.68	2.97
T2 Victimization	2.64	2.77
T3 Victimization	2.42	2.50
T4 Victimization	2.24	2.52
Level 2		
Social problem-solving	3.04	0.74

Table 2
Bivariate Correlations between Aggression, Avoidance, Peer Victimization, and Social Problem-Solving

Variable	1	2	3	4	5	6	7	8
1. T1 Physical aggression	-	0.623**	0.214**	0.503**	0.507**	0.505**	0.456**	-0.057
2. T1 Relational aggression		-	0.151**	0.332**	0.363**	0.365**	0.295**	0.009
3. T1 Avoidance			-	0.523**	0.468**	0.441**	0.466**	-0.011
4. T1 Victimization				-	0.801**	0.780**	0.753**	-0.063
5. T2 Victimization					-	0.835**	0.768**	0.002
6. T3 Victimization						-	0.809**	-0.046
7. T4 Victimization							-	-0.020
8. Social problem-solving								-

Note: $^{**}p<.01$.

Multiple Imputation

Preliminary analyses were conducted to determine the percentage of missing data in the sample. It was determined that the majority of the variables had between 1.6% and 10.9% of missing data. After conducting the MCAR test (Little, 1995), to identify the sources of missingness in the data, it was determined that the data were not missing completely at random ($\chi 2(2256, N=1{,}594)=3280.306$, $p<.001$). Multiple imputation of 20 data sets was conducted using AMELIA II - version 1.2-17. The general procedure for analyzing the data required three main steps (Troop-Gordon & Ladd, 2005): the creation of 20 imputed data sets, the analyses of these data sets, and the combination of the results across data bases. Analyses were conducted using the statistical package M-plus version 5 (Muthén & Muthén, 2007). The 20 imputed data sets were used as the input for the analyses, using the "TYPE=IMPUTATION" option in M-plus. This type of analysis corrects for differences in standard errors using Rubin's rules. The imputation model included all the variables measured in this study, as well as additional information that was collected as part of a larger project. All the results presented below, including correlation, means, standard deviations and path coefficients (standardized and unstandardized) were computed using the procedures mentioned above.

Longitudinal Changes in Peer Victimization

The goal of the first analysis was to predict developmental changes in peer victimization over a period of one year as a function of children's baseline on aggression and withdrawn behaviour. In order to accomplish this goal, a latent growth curve analysis was used to examine two aspects of this relationship: changes in victimization across the school year and the effect that risk factors (i.e., aggression and avoidant behaviour) had on the initial levels and the changes of victimization over time. Models were run separately for aggression and for withdrawn behaviour.

Changes in victimization across the school year. For the growth curve analyses, two latent variables were created: an intercept and a slope. For the intercept, the loadings of the measures from Time 1 to Time 4 were set at 1.0 to represent the starting point of the students on victimization at the beginning of the school year. Change over time was modeled using the slope variable. Initially, an unconditional model for change (level and shape model) was tested by setting the loadings of Times 1 and 2 to 0 and 1.0 respectively, and allowing the program to freely estimate the values for Times 3 and 4. The intercept and the slope were allowed to covary, as well as the variables that represented the same measure at different time points. Variances on the four time points were set to be equal.

Due to the large sample sizes for these studies, the goodness of fit of the models was evaluated using a combination of the CFI, NNFI and RMSEA indices, and the χ^2. Likewise, a robust maximum likelihood estimator was used to test the models. This estimator corrected the fit indices for the non-normal distribution of the peer victimization data.

Fit indices for the unconditional model suggested a good fit to the data χ^2 (4, n=623)=8.23 p<.05; RMSEA=.042; NNFI=.997; CFI=.998 (see Table 3). The loadings for Times 3 and 4 were estimated to be λ_3=1.2 and λ_4=1.4 respectively. These values suggested that the change observed between Times 1 and 3 was 1.2 times the change observed between Times 1 and 2. Likewise, the loading for Time 4 indicated that the change observed between Times 1 and 4 was only 1.4 times the change observed between Times 1 and 2.

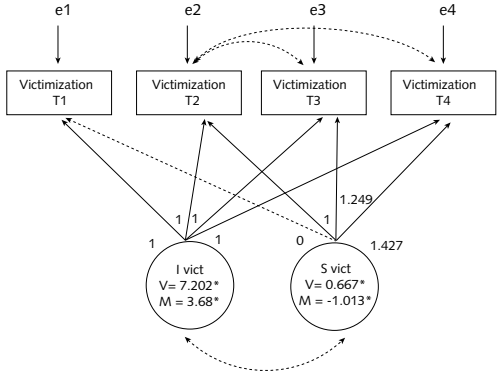

Figure 3. Final latent growth curve obtained for the changes on peer victimization over time. *p<.01

As hypothesized, significant differences in victimization scores were observed at the beginning and across the school year (see Figure 3). The latent growth curve resulted in a mean intercept value of M_i=3.68, p<.01 (testing if the parameter was significantly different from 0.0), and mean slope of M_s=-1.013, p<.01. The variance of the intercept was D_i=7.70, p<.001 and the variance of the slope was D_s=0.66, p<.01. The estimated correlation between initial status and slope scores was R_{is}=-.58, p<.01. These findings show substantial variation of individual differences in peer victimization levels at the beginning of the school year and in the trajectories of change. More specifically, it seems that students experienced a decline in their victimization scores across the school year, and that this decline was especially strong for the students who had the highest levels of victimization at Time 1.

Effect of risk factors on victimization. To determine whether initial scores and changes on victimization varied as a function of individual risk factors, a series of path models were estimated (see Table 3). More specifically, several models in which individual scores on aggression or withdrawn behaviour predicted initial scores and growth on victimization were tested. Because both sex and grade are known to correlate with peer victimization, withdrawn behaviour and aggression, these variables were controlled for in all the models.

Table 3
Goodness-of-fit Indices for all the Structural Models Tested

Model	*df*	X^2	RMSEA	CFI	NNFI	*N*
Latent Growth Curve	4	4*	0.04	0.99	0.99	623
Model 1	19	52.61**	0.05	0.98	0.97	623
Model 2	15	31.45**	0.04	0.99	0.98	623
Model 3	19	48.04**	0.05	0.97	0.98	623
Model 4	15	36.57**	0.04	0.98	0.98	623

Note: *p<.05; **p<.01.

Aggression. Having effectively modeled the latent growth curve for peer victimization, a model that tested the effect of physical and relational aggression was then estimated (Model 1).

Fit indices suggested that the model adequately represented the data $\chi 2(19, n=623) = 52.61$, $p<.001$; RMSEA=.05; NNFI=.97; CFI=.98. Estimated regression paths showed that both physical (β=0.26, $p<.001$) and relational (β=0.12, $p<.05$) aggression increased initial levels of victimization (intercept), but had no effect on changes of this variable over time (slope) after controlling for the effects of sex and grade. These positive path coefficients from aggression to the intercept of victimization show that children who are more aggressive tend to have higher scores on victimization at the beginning of the school year. A main effect of sex (β=0.18, $p<.001$) and grade (β=-0.11, $p<.001$) was also found to be significant. Taking into account the coding of sex (female=0, male=1), findings revealed that being a boy significantly predicted higher scores on victimization at the beginning of the school year. No effect of sex was found for the slope. Likewise, it was found that students who were in the lower grades were more victimized at the beginning of the year, compared with the students who were in higher grades. No effect was found at the slope level for this variable.

Avoidance. To examine the impact of avoidance on the developmental trajectory of victimization a similar path model was tested (Model 2). Fit indices for this model revealed a good fit to the data $\chi 2(15, n=623)=31.45$ $p<.05$; RMSEA=.042; NNFI=.985; CFI=.991. Again, this model controlled for the effect of sex and grade. Sex had a significant main effect both at the intercept (β=0.28, $p<.001$) and the slope (β=-0.17, $p<.05$), indicating that boys had higher levels of victimization at the beginning of the school year, and that they showed a stronger decrease in peer victimization over time. Grade was found to have an effect on the intercept only (β=-0.08, $p<.001$), meaning that being in a lower grade increased students' initial levels of peer victimization. As hypothesized, a main effect for avoidance was found both at the intercept (β=0.48, $p<.001$) and the slope (β=-0.64, $p<.001$). This finding indicates that avoidance has an important impact on children's baseline victimization scores and in the ways in which these scores change across the school year. More specifically, these results indicate that avoidance increases initial levels of peer victimization, after controlling for the effect of sex and grade. Likewise, the effect on the slope shows that avoidance leads to negative growth in peer victimization over time. Figure 4 depicts the effect of avoidance on victimization changes over time. As illustrated, children who were one standard deviation above the mean had higher levels of victimization at the beginning of the school year, and experienced a faster rate of decrease in their scores from Time 1 to Time 2 compared with the other two groups. In contrast, children who were one standard deviation below the mean of avoidance were the most stable. They began the school year with the lowest scores on victimization, and their change rate across the year was not as strong as the rate that the other two groups experienced.

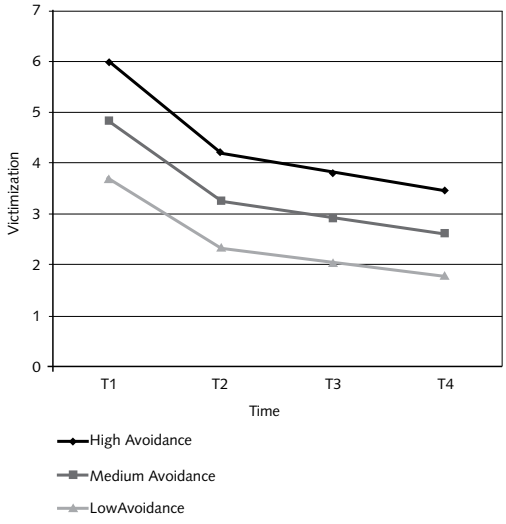

Figure 4. Predicted scores for changes in peer victimization for avoidant children.

Moderating Effect of Social Problem-Solving Skills

Aggression. A model was created to estimate the impact of aggression and social problem-solving skills on the latent growth curve of victimization (Model 3). Indices show a good fit of the model to the data $\chi 2(19, n=623) = 48.041$, $p<.001$; RMSEA=.05; NNFI=.98; CFI=.97. Direct effects of physical aggression (β=0.39, $p<.001$), relational aggression (β=0.12, $p<.02$), grade (β=-0.14, $p<.001$) and sex (β=0.16, $p<.001$) were found. Relational and physical aggression were found to be predictive of higher scores on victimization at Time 1. On the other hand, it was observed that being a boy was predictive of higher scores on victimization at the beginning of the year, and that being in fourth grade also predicted higher scores on victimization at Time 1. No effect was found at the slope level for any of the variables.

Social problem-solving skills were found to be moderators of the relationship between relational aggression and peer victimization only for the intercept (β=0.12, $p<.05$). Contrary to the hypotheses proposed, this finding revealed that for relationally aggressive students, having social problem-solving skills actually increased their victimization scores at Time 1. To explain, using a non-hostile cognitive bias and being able to generate alternative and assertive solutions seemed to increase the risk of highly relationally aggressive children for peer victimization. It is worth mentioning that for low relationally aggressive children, social problem-solving skills had virtually no effect on their victimization scores (see Figure 5).

Avoidance. The model designed to determine whether social problem-solving skills moderated the relationship between avoidance and victimization showed good fit (Model 4), $\chi^2(15, n=623)=36.57$ $p<.001$; RMSEA=.048; NNFI=.981; CFI=.989. However, contrary to what was predicted, no moderating effect of social problem-solving skills was found. Only direct effects of the predictor and the control variables were significant. Similarly to what previous models showed, it was found that sex had a significant main effect at the intercept (β=0.28, $p<.001$), indicating that boys had higher levels of victimization scores at the beginning of the school year. Similarly, grade was found to negatively predict the victimization intercept (β=-0.08, $p<.001$), suggesting that fourth grade students had higher levels of victimization at Time 1, compared with fifth and sixth graders.

As anticipated, avoidance was found to predict initial scores of peer victimization (β=0.51, $p<.001$) and changes of this variable over a one year period (β=-0.31, $p<.001$). That is, avoidance predicted an increase in children's baseline victimization scores, after controlling for the effect of sex and grade. Similarly, being avoidant was predictive of a more negative growth of peer victimization over time. No other effects were found to be significant in this model.

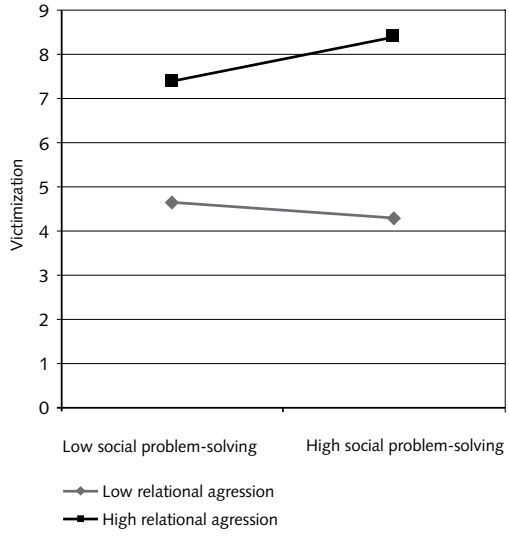

Figure 5. Interaction between relational aggression and social problem-solving skills for the scores on peer nominated victimization.

Discussion

This longitudinal study was designed to examine the developmental trajectories of peer victimization in a sample of early adolescents and the relative buffering effectiveness of social problem-solving skills in the relationship between risk factors and peer victimization.

In general, the results obtained supported the idea that victimization is a changing phenomenon that is experienced differently by children. Results also showed that social problem-solving did not predict baseline scores or changes in victimization scores over time. Moreover, it was determined that for this specific sample and context, social problem-solving did not act as a buffer from the detrimental effects of peer victimization. In fact, the only moderating effect observed showed that social problem-solving predicted higher scores on victimization at the beginning of the year for students who were also high in relational aggression.

Longitudinal Changes in Peer Victimization

As expected, significant individual differences in children's victimization scores were found both at the beginning and over the school year. The negative mean trajectory of victimization suggested that children experienced an important decline on this variable over time, and the negative association between initial levels of victimization and change over time indicated that this decline was greatest for those children who had the highest victimization scores at the beginning of the year. This finding supports evidence from previous studies that have also shown that peer victimization declines over time (Ladd & Troop-Gordon, 2003; Troop-Gordon & Ladd, 2005).

A possible explanation for the observed decline in victimization scores comes from the peer relation literature related to group processes (Bukowski & Sippola, 2001). Within this framework victimization is conceptualized as the outcome of potential conflicts between individuals' characteristics and the group's goals. In that sense, victimization becomes a group strategy aimed at isolating and minimizing the participation of those members who interfere with the attainment of group goals (i.e., aggressive and avoidant children). Specifically, in the case of the present study it seems that victimization acts as a control mechanism that starts operating at the beginning of the school year. Once the group goals and rules are defined and its members become aware of their role in the group, victimization significantly decreases as control is no longer needed. Indeed, the strongest decline in victimization is experienced by the children who are either highly aggressive or avoidant, which suggests that victimization is in fact an effective control mechanism for the children who jeopardize adequate group functioning (Bukowski & Sippola, 2001). The strong reduction in victimization scores observed from Time 1 to Time 2 demonstrates the effectiveness of this variable as a control mechanism in the formation of new groups. Unfortunately, the design of the study was not able to capture in detail the processes that explain how this control operates. Therefore, this issue should be further explored in future research.

Effect of Risk Factors on Victimization

Strong evidence was also found regarding the association between risk factors and peer victimization. Results were consistent with the premise that a good portion of the variance in victimization can be explained by individual characteristics of children, and the ways in which they behave among their peers (Perry et al., 2001). As expected, both aggressive and withdrawn behaviour predicted initial scores on victimization, but only withdrawn behaviour was found to be predictive of changes in victimization. According to Boivin, Hymel, and Hodges (2001), there are two developmental pathways that lead to social rejection and ultimately, to peer harassment. The first one is characterized

by the use of inappropriate and aggressive behaviours, and the second one, is characterized by signs of shyness, social withdrawal and submission. Indeed, evidence from several studies demonstrates that personal and behavioural characteristics associated with these pathways contribute to the likelihood of becoming a target of peer harassment (Hodges & Perry, 1999; Kochenderfer-Ladd & Skinner, 2002).

Evidence from the present study demonstrated that physical and relational aggression were positively associated with high levels of peer victimization at the beginning of the school year, even after the effects of sex and grade were statistically controlled. This finding is consistent with what has been found in the literature. More specifically, in the case of aggressive children, studies have shown that they are significantly more victimized due to their conflictual nature and their tendency to irritate and provoke other children (Egan & Perry, 1998; Hodges et al., 1999). But perhaps one of the most interesting aspects of this finding was that aggression had no effect on the ways in which victimization changed over the year. The lack of a significant effect of aggression on the slope might be partly explained by a ceiling effect on the association between these variables. It might be the case that by the time the data were collected (i.e., Time 1 was collected in February/March), both variables were already so strongly related that further changes in victimization were not be detectable. Thus, an objective for future research would be to explore the association between risk factors and peer harassment at the beginning of the school year in more detail. More frequent and more detailed assessments within the first two months of the year could help researchers capture the variations in this association that were not revealed by the design present design.

Consistent with the hypotheses, initial scores and growth of peer victimization were predicted by children's withdrawn behaviour. This finding is in line with evidence from previous research. For instance, a study conducted by Boivin et al. (2001), investigated the relationship between children's social experiences and their socio-emotional adjustment over time, for withdrawn-rejected, aggressive-rejected and other-rejected children. Results showed that overall rejected children were more harassed by their peers compared with the average status children. However, significant differences were found among the three rejected groups: The withdrawn-rejected children were the most victimized of the three groups. Furthermore, it was found that withdrawn-rejected boys were more victimized than withdrawn-rejected girls.

It was interesting to discover that avoidance had an impact on the ways in which victimization changed across the school year. In contrast to what was observed for aggression, different trends of change were found for children who had different scores on avoidance. Two aspects of these findings are noteworthy: Although the three groups had significant differences in their initial scores, they showed a similar pattern of change (i.e., a sharp decline from Time 1 to Time 2, and a slower one from Time 2 to Time 3 to Time 4); and the strongest reduction in victimization scores was experienced by children who were high in avoidance. Together, findings from the aggression and the avoidance models call for studies that thoroughly explore the impact of these two risk factors on victimization change within the first couple of months of the school year. While speculative, it seems that major changes occur within this period of time, and additional analysis of this period is warranted.

Effect of Social Problem-Solving Skills on Victimization

Results did not provide support for previous findings which reported that social problem-solving skills have a positive effect on children's psychosocial adjustment (Crick & Dodge, 1994; Dodge & Price, 1994; Mayeux

& Cillissen, 2003). And while this direct effect was not the focus of the investigation, it is nonetheless important to discuss the lack of this significant association. One possible explanation for the lack of significance of these findings is related to the measures used in this study. As discussed previously, the majority of the studies that have shown a predictive effect of social problem-solving were focused on understanding how deficiencies in the capacity to solve social problems may increase the risk for developing problematic outcomes. Further, the limited number of investigations that have explored the positive dimension of this variable have also found that it is the lack of the ability to solve social problems that predicts children's adjustment (Frye & Goodman, 2000).

Given that the measure developed for this study assessed only positive dimensions of social problem-solving (i.e., Non-hostile cognitive bias, use of assertive solutions and generation of alternatives), it is plausible that the lack of support for the association between social problem-solving and victimization may have been related to issues of content validity (i.e., how well the instrument captures the construct in question). That is, the measure developed for this study only assessed the degree to which a person used positive strategies associated with competent social problem-solving. The current measure made no attempt to tap into deficiencies on this ability, or even into the use of maladaptive strategies. Consequently, a possible reason why social problem-solving did not predict initial scores or changes in victimization was because the instrument used was not able to tap into the specific aspects of social problem-solving that are predictive of children's adjustment (i.e., social problem-solving deficiencies) (D'Zurilla & Maydeu-Olivares, 1995). Finally, results also suggest limitations of the measure used in terms of discriminant validity; as can be seen in Table 2, there were no significant associations between social problem-solving and other variables included in the study, even though the Chronbach's alphas for the three subscales were acceptable. Future research will need to include a more comprehensive measure of social problem-solving in order to determine the predictive value of this ability on the prevention of peer victimization.

Moderating Effect of Social Problem-Solving Skills

The hypothesis that social problem-solving skills buffered the association between risk factors and peer victimization was not supported in this study. In fact, contrary to expectations, results showed that for relationally aggressive children, the use of positive dimensions of social problem-solving skills predicted an increase in their victimization scores at the beginning of the year, compared with children who were low in relational aggression. The reason why social problem-solving skills were associated with an increase in victimization at Time 1 is not clear. It is possible that this finding indicates that the use of positive strategies only to solve social problems could be interpreted by the peer group as a sign of weakness or vulnerability that makes children more prone to victimization. It might be the case that children who only use positive strategies are being perceived by the peer group as not assertive, indecisive and problematic for adequate social functioning. However, taking into account the issues of content and discriminant validity discussed earlier, caution is necessary in the interpretation of the findings related to social problem-solving.

Conclusion

The study presented above used the buffering hypothesis model to assess the relative buffering effectiveness of positive personal characteristics in the association between risk factors and peer victimization. The basic premise of this model is that resources provided by one's positive interpersonal ties and personal

characteristics have a moderating effect on the stress-well-being relationship, especially for individuals who face conditions of high stress (Cohen & Hoberman, 1983).

Overall, the results from this investigation did not support the idea that some personal experiences have the potential to protect children from the detrimental effects of peer victimization. Moreover, evidence revealed that, in some cases, these personal characteristics can be considered as risk factors.

Buffering effects have been defined as conditions that enhance the likelihood of a positive developmental outcome. In the present study, buffering effects were not found to be generalizable to the moderator and to all the risk factors. Results indicated that social problem-solving had no protective effect for aggressive or avoidant children, at least in the context of the present study. Nevertheless it should be noted that the results presented here might not be generalizable to other samples and ages, due to limitations of construct validity that were detected in the instruments that assessed this dimension.

One of the most important premises of the peer relations literature states that an individual's relationships with peers are a key component of a healthy development (Sullivan, 1953). By examining growth trajectories of children's victimization and the ways in which these changes are predicted by risk factors, the results from this study added important evidence to the peer relations area. The present findings supported the contention that an important portion of the variance in peer victimization can be explained by both individual characteristics and children's peer experiences. The longitudinal design that was used allowed for a more comprehensive view of the ways in which children relate to each other over the school year, and how they use certain types of behaviours as control mechanism to guarantee adequate group functioning.

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Appendix A

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¿CÓMO SOLUCIONO MIS PROBLEMAS CON LOS DEMÁS?

En esta sección vas a encontrar una historia sobre cosas que les pueden pasar a los niños. Queremos que la leas con atención y que te imagines que lo que sucede te está pasando a ti. Luego, lee las frases que encuentras a continuación y cuéntanos que tan cierto sería para ti lo que dice cada frase.

Vas a encontrar preguntas sobre lo que te pasa a ti:

ANTES DE ACTUAR: Son las cosas que pensarías o sentirías antes de reaccionar.
CUANDO ACTÚAS: Son las cosas que harías, pensarías o sentirías cuando ocurre la situación.
DESPUÉS DE ACTUAR: Son las cosas que pensarías o sentirías después de que hiciste algo frente a la situación.

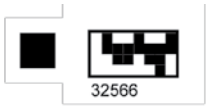
HISTORIA

Imagínate que estás sentado en clase y el profesor hace una pregunta difícil. Tú no estás seguro de saber la respuesta correcta. Después de dar tu respuesta, escuchas a unos niños reírse en el otro lado del salón.

Primero, queremos que pienses en lo que te pasaría ANTES DE ACTUAR.

¿Qué tan ciertas crees que serían cada una de estas frases para ti? Rellena la casilla que consideres que describe mejor lo que tú pensarías o sentirías, según la siguiente escala:	**No sería cierto**	**Pocas veces sería cierto**	**Algunas veces sería cierto**	**Casi siempre sería cierto**	**Siempre sería cierto**
1. Trataría de darme cuenta cómo me estoy sintiendo.	○ 1	○ 2	○ 3	○ 4	○ 5
2. Trataría de pensar en las cosas diferentes que podría hacer frente a la situación.	○ 1	○ 2	○ 3	○ 4	○ 5
3. Trataría de pensar en las consecuencias que tendrían mis acciones.	○ 1	○ 2	○ 3	○ 4	○ 5
4. Pensaría en cuál sería la mejor forma de reaccionar.	○ 1	○ 2	○ 3	○ 4	○ 5
5. Trataría de calmarme.	○ 1	○ 2	○ 3	○ 4	○ 5

Continúa...



¿CÓMO SOLUCIONO MIS PROBLEMAS CON LOS DEMÁS?

Ahora piensa en las cosas que te pasan CUANDO ACTÚAS frente a esta situación.

¿Qué tan ciertas crees que serían cada una de estas frases para ti? Rellena la casilla que consideres que describe mejor lo que tú harías, pensarías o sentirías.	**No sería cierto**	**Pocas veces sería cierto**	**Algunas veces sería cierto**	**Casi siempre sería cierto**	**Siempre sería cierto**
6. Me sentiría triste.	○ 1	○ 2	○ 3	○ 4	○ 5
7. Pensaría que se están riendo de otra cosa.	○ 1	○ 2	○ 3	○ 4	○ 5
8. Pensaría que les parezco divertido.	○ 1	○ 2	○ 3	○ 4	○ 5
9. Pensaría que les caigo bien.	○ 1	○ 2	○ 3	○ 4	○ 5
10. Pensaría que se están burlando de mí.	○ 1	○ 2	○ 3	○ 4	○ 5
11. Pensaría que quieren hacerme sentir mal.	○ 1	○ 2	○ 3	○ 4	○ 5
12. Pensaría que les caigo mal.	○ 1	○ 2	○ 3	○ 4	○ 5
13. Les pediría que no se burlaran.	○ 1	○ 2	○ 3	○ 4	○ 5
14. Les preguntaría si ellos se están riendo de mí.	○ 1	○ 2	○ 3	○ 4	○ 5
15. Les preguntaría por qué se están riendo.	○ 1	○ 2	○ 3	○ 4	○ 5
16. Me burlaría de ellos.	○ 1	○ 2	○ 3	○ 4	○ 5
17. Trataría de hacerlos sentir mal.	○ 1	○ 2	○ 3	○ 4	○ 5
18. Le contaría lo que pasó a mis amigos para que me dijeran qué hacer.	○ 1	○ 2	○ 3	○ 4	○ 5
19. Le diría a un profesor.	○ 1	○ 2	○ 3	○ 4	○ 5
20. Los insultaría.	○ 1	○ 2	○ 3	○ 4	○ 5
21. Le diría cosas malas de ellos a mis compañeros.	○ 1	○ 2	○ 3	○ 4	○ 5

Por último, queremos que pienses en las cosas que te pasarían DESPUÉS DE ACTUAR.

¿Qué tan ciertas crees que serían cada una de estas frases para ti? Rellena la casilla que consideres que describe mejor lo que tú pensarías	**No sería cierto**	**Pocas veces sería cierto**	**Algunas veces sería cierto**	**Casi siempre sería cierto**	**Siempre sería cierto**
22. Después de actuar, trataría de calmarme.	○ 1	○ 2	○ 3	○ 4	○ 5
23. Trataría de darme cuenta cómo me estoy sintiendo.	○ 1	○ 2	○ 3	○ 4	○ 5
24. Pensaría en las consecuencias de mis acciones.	○ 1	○ 2	○ 3	○ 4	○ 5
25. Trataría de pensar en las diferentes cosas que pude haber hecho frente a la situación.	○ 1	○ 2	○ 3	○ 4	○ 5

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