Bullies, Not Victims? Multiple Discriminant Analysis of Chilean Preadolescents

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Abstract

Mainstream literature depicts specific features that distinguish bullies from victims. However, during the last decade, researchers have argued that bullies and victims are not quite so distinguishable from each other. This paper presents results of a multiple discriminant function analyses based on Chilean preadolescent´s self-report and peer nominations of peer intimidation and victimization that supports this argument. 1,118 participants completed a peer-nomination and a self-report scale of victimization. The correlation between intimidation and victimization was .65 for peer-nomination and .58 for self-report measures, respectively, indicating collinearity. These results defy the notion of bullies as distinct from victims and, contrary, shed light on the complexity of identifying peer intimidation and victimization within the school context.

Key words: bullying, discriminant analysis, peer victimization

Purpose and rationale

This paper provides evidence from a South American sample, in favor of the argument that peer aggression and victimization are not distinct and separate categories, but rather, that preadolescents in the middle-school years tend to report both aggressive as well as victimizing behavior.

Theoretical framework

Olweus (1993) characterized bullying as a specific form of abuse among students, where one or several students inflict, repeatedly and intentionally, verbal and/or physical damage to another student, without this student provoking or being able to symmetrically respond to the aggression (Batsche & Knoff, 1994). Olweus (1993, 1998) proposed certain distinct features which characterized bullies, such as male sex and physical strength; Crick and Dodge (1996) have identified hostile attribution bias as characteristic of students with aggressive behavior. In turn,

certain distinct features characterized victims, such a poor social skills, passive and with low self-esteem (Olweus, 1998; Ortega, 1998).

However, during the last decade, researchers have argued that bullies and victims are not quite so distinguishable from each other. Espelage and colleagues (Bosworth, Espelage, & Simon, 1999; Espelage & Swearer, 2003) have argued that research results with North American samples show that adolescents do not fall neatly into "pure" categories of bullies or non-bullies. Students reported as bullies, or as perpetrators of aggressive behavior, also report themselves as victims of aggression. Espelage and Swearer (2003) propose viewing bullying as a continuum of behaviors, where, instead of stable classifications of "bully" or "victim", what occurs is frequent engagement of many students in low to moderate bullying behavior.

Current research on peer victimization distinguishes four categories of students: (the traditional three) bullies, victims, observers, and (a fourth category, recently aggregated) bully/victims (Cunningham, 2007; Haynle, Nansel, Eitel, Davis Crump, Saylor et al., 2001). This last category takes into consideration the discussion of whether it is pertinent to consider only the former three categories, given the close relation between aggressive and victimizing behavior reported by students, to the point that a separate group of adolescents rate high on both measures (Ma, 2001).

The problem that this paper deals with is the relation between peer aggression and victimization, and the possibilities of using classifications of "bullies" and "victims" as separate and discrete groups for research purposes. The scientific or scholarly significance of this study is the provision of research-based evidence concerning this relation, a) with a South American sample (Chile), b) contrasting peer-nomination as well as self-report measures, and c) using multiple discriminant function analysis. As a data analysis tool, discriminant function analyses allows studying the possibilities of classifying participants according to groups, given a set of pre-defined variables (Hair, Anderson, Tatham, & Black, 1999); in this case, aggression and victimization from peer-nomination and self-report measures.

Research design

The study was quantitative. The design was cross-sectional and non-experimental.

Method.

Participants. 1,117 Chilean students enrolled in sixth, seventh, and eight-grade participated in this study. All students were enrolled in urban schools pertaining to the V Region of Chile.

Instrument. The INSEBULL battery (Avilés & Elices, 2007) was used. This battery contains

a self-report measure, a peer-report measure and a teacher-report measure. In this study, the self-report and peer-report measures were used. Factor analyses reported by the authors extracted two factors – intimidation and victimization- with loadings over .20. Both indicators were used in this study, considering self-report and peer-report as separate measures.

Procedure. A letter of informed consent was signed by parents, and students also signed an agreement of participation. The scale was administered in the schools. Data was analyzed using SPSS 15.0. Multiple discriminant function analyses were performed in order to study if the participants could be grouped into two groups (bullies and victims). The purpose of discriminant function analysis is to define k discriminant functions from the original variables (in this case, intimidation peer-report; intimidation self-report; victimization peer-report; victimization self-report) that maximizes the difference between groups and minimizes the difference within groups.

Results

Descriptive analyses and study of assumptions. Tables 1, 2, and 3 show the mean, standard deviation, and range of the observed variables, together with asymmetry and kurtosis indexes. Since the latter were not sufficient, given the size sample, the variables were logarithmically transformed. All the analyses presented below are based on these transformed variables.

Table 1
Descriptive data, total sample (N = 1,118)

	N	Mean	Std. Dev.	Trimmed mean	Min	Max	Range	Skew ness	Kurtosis
Peer nomination									
Intimidation	1118	8.60	4.40	7.89	3.90	28.20	24.30	1.52	2.24
Victimization	1118	6.77	2.78	6.40	2.90	22.20	19.30	1.34	2.30
Self report									
Intimidation	1118	13.77	4.01	13.47	5.00	35.00	30.00	0.84	1.14
Victimization	1118	9.51	2.82	9.24	5.00	25.00	20.00	0.90	1.17

Table 2
Descriptive data, peer-nomination scale

Peer nomination						
Intimidation						
	N	Mean	Median	Std. Dev.	Min	Max
Victims	121	10.01	8.6	5.02	4	27
Other	912	7.99	6.5	4.06	3.9	28.2
Bullies	85	13.16	12.2	3.84	9	25.1
Total	1118	8.6	7	4.4	3.9	28.2
Victimization						
Victims	121	9.64	8.8	2.48	6.9	19.6
Others	912	6.34	5.7	2.59	2.9	22.2
Bullies	85	7.26	6.6	2.64	3.4	15.2
Total	1118	6.77	6	2.78	2.9	22.2

Table 3
Descriptive data, self-report scale.

			Self report			
Intimidation						
	N	Mean	Median	Std. Dev.	Min	Max
Victims	121	13.85	14	3.29	8	31
Others	912	13.3	13	3.81	5	35
Bullies	85	18.8	18	3.54	15	28
Total	1118	13.77	13	4.01	5	35
Victimization						
Victims	121	11.97	11	2.35	10	22
Others	912	9.13	9	2.74	5	25
Victims	85	10.06	9	2.48	6	17
Total	1118	9.51	9	2.82	5	25

Analysis of collinearity. Figures 1 and 2 show the bivariate behavior of the transformed variables through peer-nomination and self-report, respectively, in order to detect outliers and collinearity. As can be observed, the correlation between peer intimidation and victimization through peer nomination was .65, and through self-report .58. This indicates collinearity between variables; that is, that some of the independent variables are almost (or practically) predicted by the other independent variables, making it difficult to reliable estimate regression coefficients, since the specific contribution of each variable cannot be determined.
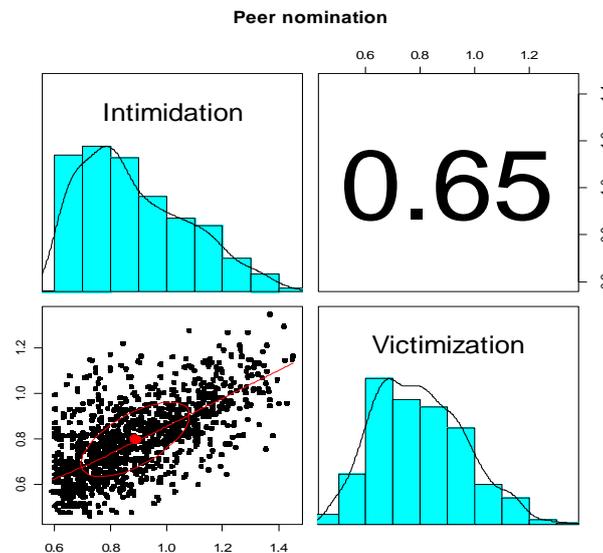

Figure 1. Dispersion diagrams, histograms and correlation coefficients between intimidation (aggression) and victimization for peer-nomination measure.
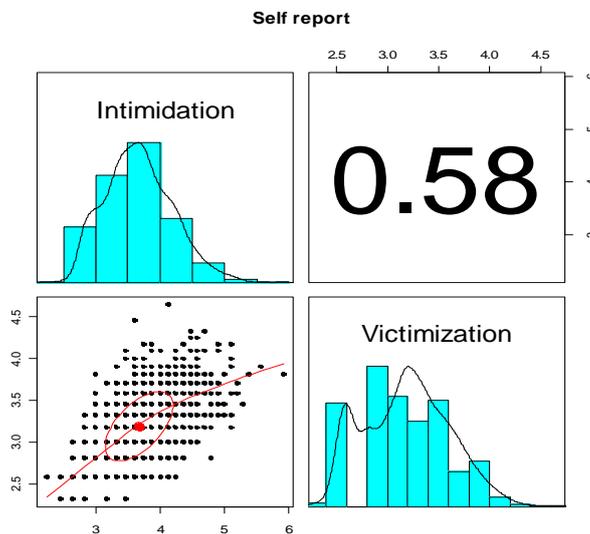
Figure 2. Dispersion diagrams, histograms and correlation coefficients between intimidation (aggression) and victimization for self-report measure.

Analyses of the discriminant function. Figures 3 and 4 show box diagrams for peer nomination and self-report, respectively. These graphs depict the capacity of the variables to discriminate between groups. The variable intimidation through self-report distinguishes to some degree aggressors from victims; similar results can be observed for the variable victimization through peer report. Peer intimidation and victimization through peer nomination suggest a regular capacity to group students according to these two categories. On the other hand, intimidation and victimization reported through the self-report scale show that aggressors have slightly higher scores on self-reported intimidation than victims, and that victims have slightly higher scores on self-reported victimization than aggressors.
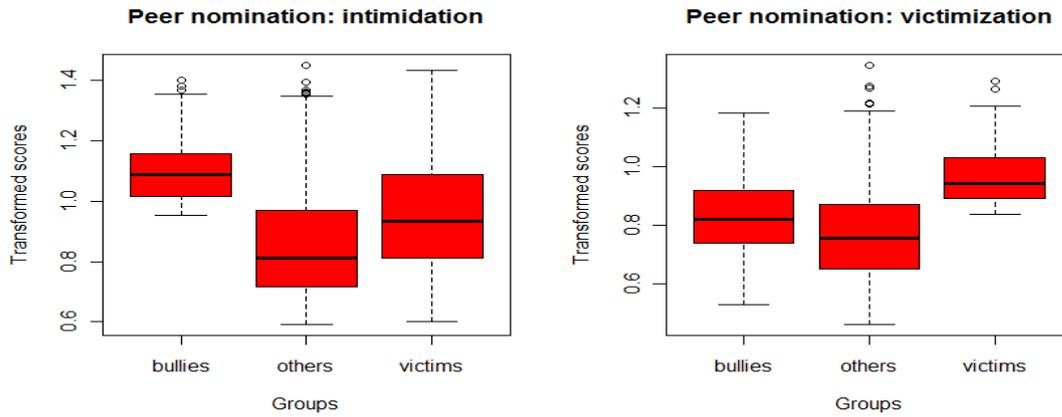
Figure 3. Box diagrams for intimidation and victimization for the peer-nomination measure.
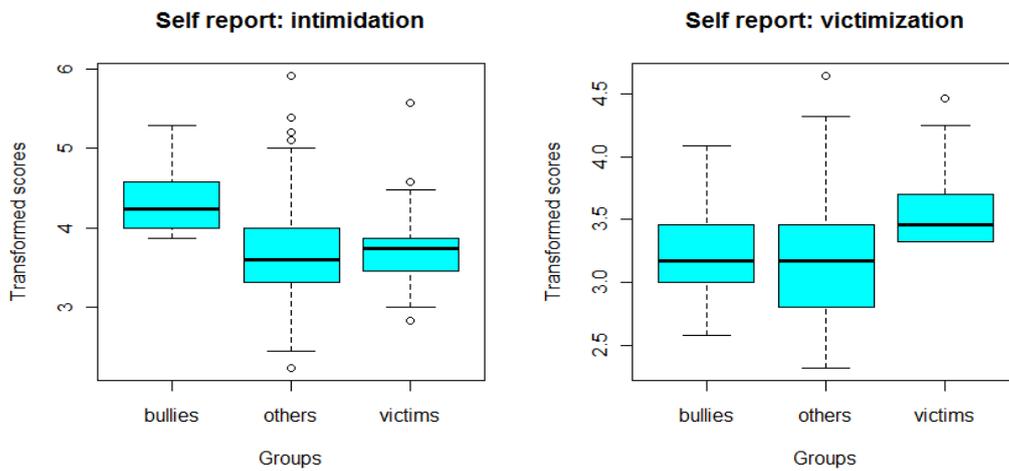

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Figure 4. Box diagrmas for intimidation and victimization for the self-report measure.

Figures 5 and 6 show the dispersion diagrams through peer-nomination and self-report, respectively (note: aggressors are marked in red; victims in blue; participants without classification in yellow). Figure 5 suggests that aggressors may be recognized by their low scores on the variable illustrated on axis *x* and by their high scores on axis *y*, as could be expected theoretically. Although aggressors and victims can be recognized, a significant proportion of them are not far away from each other, illustrating that the relationship between aggression and victimization is moderately strong. The difference between these two groups and participants with no classification (yellow) are narrow, and some degree of collapsing can be observed.
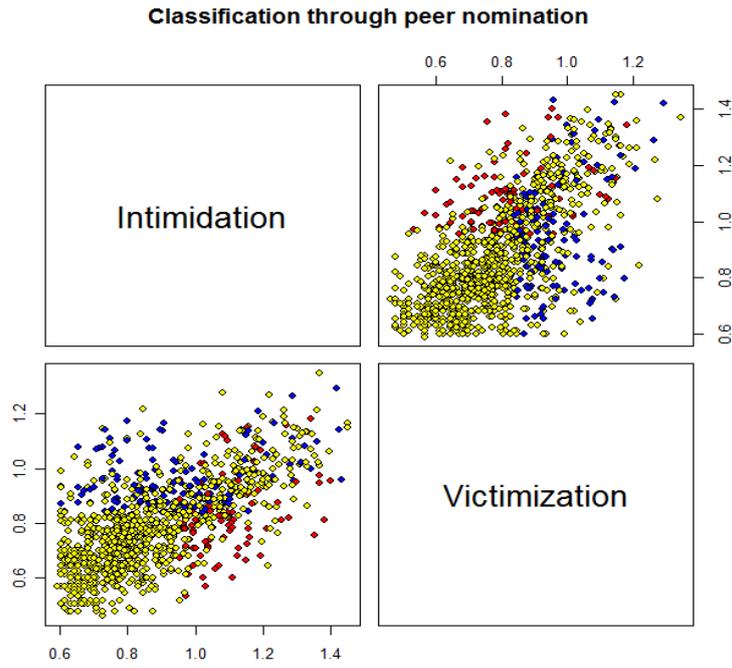
Classification through peer nomination

Figure 5. Classification through peer nomination.

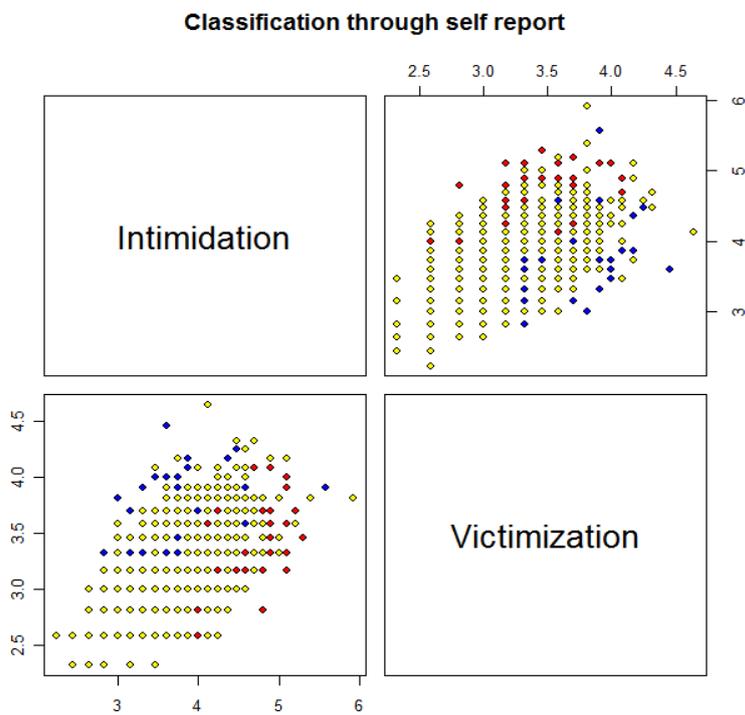**Classification through self report**

Figure 6. Classification trough self-report.

Two discriminant functions have been extracted from the variables included for analysis

Table 4). Table 5 shows the percentage of variance explained by the discriminant functions extracted. As can be observed, the first function provides the major contribution of the variables intimidation and victimization through peer-nomination, and of the variable intimidation through self-report. However, these results must be considered in light of the collinearity between both measures of peer nomination (intimidation and victimization). In the second function, the major contribution stems from the variables intimidation and victimization through peer-nomination.

Table 4
Coefficient of the variables in the discriminant functions extracted

Variables	DF1	DF2
Peer nomination		
Intimidation	-4.06885729	2.157105317
Victimization	6.13353705	2.523740097
Self report		
Intimidation	-1.69187464	0.788144595
Victimization	2.00141195	0.984826354

Table 5
Percentage of variance explained by the discriminant functions extracted.

Función	% varianza explicada
FD1	63,09
FD2	36,91

Cross-validation of the solution. A validation of the solution was done through the jacknife method. This method calculates discriminant functions with multiple samples from the original sample. Reclassification through this method of cross-validation shows 85.4% of participants correctly classified as aggressors and victims (see Table 6).

Table 6
Classification of participants through discriminant analysis

Post classification	Prior classification						
	Bullies		Others		Victims		
	n	%	n	%	n	%	
Bullies	36	0.42	17	0.02	1	0.01	54
Others	49	0.58	868	0.95	69	0.57	986
Victims	0	0	27	0.03	51	0.42	78
	85		912		121		1118

Discussion

Discriminant analyses of intimidation (aggression) and victimization through peer nomination and self-report measures suggest that 42% of participants may be correctly classified as bullies or

victims, respectively (see Table 6). Collinearity, that is, a moderate strong and positive correlation, was found between intimidation and victimization both through the peer-nomination as well as through the self-report measures (see Figures 1 and 2). Therefore, the results suggest that, although classifying participants as bullies or victims is possible for research purpose, there is range or students who show both high intimidation as well as victimization scores.

These results coincide with results from North American samples which suggest that bullying may be viewed as a continuum of aggressive behaviors perpetrated by more students than the "classical bully" (Bosworth, Espelage, & Simon, 1999; Espelage & Swearer, 2003).

Furthermore, the results suggest that, for Chilean preadolescents, it is appropriate to look for a "bully+victim" group when investigating differences between groups (Cunningham, 2007; Haynle, Nansel, Eitel, Davis Crump, Saylor et al., 2001). For example, research on social cognition first indicated that bullies showed hostile attribution bias and poor social-information skills (Crick & Dodge, 1996); other researchers have argued that -at least a subgroup of- bullies actually show high social skills (Sutton, Smith, & Swettenham, 1999); and still other researchers have shown that the bully+victim group shows poor social skills. The results of this study suggest that differences on social cognition should consider not only bullies and victims, but also bully+victims.

Last, the results of the multiple discriminant function analysis suggest that the peer nomination measure of peer victimization discriminates better than the self-report measure. Altogether, these results should be considered as evidence against the notion of bullies as distinct from victims, and shed shed light on the complexity of identifying peer intimidation and victimization within the school context.

References

Avilés, J. M. & Elices, J. A. (2007). INSEBULL: Instrumentos para la evaluación del bullying. Madrid: Editorial CEPE.

Bosworth, K., Espelage, D. L., & Simon, T. R. (1999). Factors associated with bullying behavior in middle school students. The Journal of Early Adolescence, 19(3), 341-86.

G.M. Batsche & H.M. Knoff. (1994). Bullies and their victims: Understanding a pervasive problem in the schools. School Psychology Review, 23, 2, 165-174.

Cunningham, N. J. (2007). Level of bonding to school and perception of the school environment by bullies, victims, and bully victims. The Journal of Early Adolescence, 27(4), 457-478.

Espelage, D. L., & Swearer, S. M. (2003). Research on school bullying and victimization: What have we learned and where do we go from here? School Psychology Review, 32, 365–383.

Hair, J. F.,, Anderson, R. E., Tatham, R. L., & Black, W. C. (1999). *Análisis multivariante.* México D. F.: Prentice Hall.

Haynie, D. L., Tonja Nansel, Patricia Eitel,, Aria Davis Crump , Keith Saylor, Kai Yu Bruce Simons-Morton (2001). Bullies, Victims, and Bully/Victims: Distinct Groups of At-Risk Youth. The Journal of Early Adolescence, Vol. 21, No. 1, 29-49.

Ma, X. (2001). Bullying and Being Bullied: To What Extent Are Bullies Also Victims? American Educational Research Journal, Vol. 38, No. 2, 351-370.

Olweus, D. (1993). Bullying at school: What we know and what we can do. Oxford: Blackwell Publishing.

Olweus, D. (1994). Bullying at school: Basic facts and effects of a school based intervention program. Journal of Child Psychology and Psychiatry, 35: 1171-1190.

Olweus, D. (1998). Conductas de acoso y amenaza entre escolares. Madrid: Morata.

Ortega, R. (1998). *Víctimas, agresores y observadores. Alumnos implicados en situación de violencia.* Madrid, España.