

Identified Title Page

Running-head: FORMS AND FUNCTIONS OF AGGRESSION IN PORTUGUESE
ADOLESCENTS

Title: Forms and functions of aggression in adolescents: Validation of the Portuguese
version of the Peer Conflict Scale

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Aggressive behavior can be conceptualized as a group of actions intending to cause harm or injury to others, who in turn perceive harm as a consequence of the aggressor's act (Heilbron & Prinstein, 2008). Such behaviors are becoming a common experience among adolescents (Coyne, Archer, & Eslea, 2006), driving the need to prepare psychometrically sound instruments for its assessment, either for specific or for normative samples. Such instruments are scarce in Portugal, and so the present work intends to examine the process of translating and adapting the *Peer Conflict Scale* (PCS) for the Portuguese language and of psychometrically evaluating this version of the instrument using a school-based sample of adolescents. Secondly, we also aim to compare aggression levels by gender, in order to make inferential conclusions on the construct validity of the Portuguese version of the PCS.

The PCS is one of three instruments known to the authors that are commonly used to assess a more recent perspective on aggression, based on its forms and functions. They are the *Self-report Instrument of Aggression*, used with early and mid-adolescents (Little, Henrich, Jones, & Hawley, 2003); the *Peer Conflict Scale*, used with early, mid and late adolescents (Marsee et al., 2011); and the *Self-report of Aggression and Social Behavior Measure*, used with adults (Linder, Crick & Collins, 2002). None of these measures are currently validated within the Portuguese population. Developmental and longitudinal studies require the use of instruments that are able to grasp the heterogeneous experience of youths throughout adolescence, including early, mid and late adolescence. This is the case with the PCS, and for this reason it was chosen for validation purposes. Additionally, the PCS was designed to expand on existing self-report measures (including the *Self-report Instrument of Aggression*). Items from this and other instruments (see Marsee et al., 2011) were firstly pooled and selected if they clearly mentioned the intent of doing harm. Secondly, selected items were reworded so that there was direct correspondence between overt and relational items. Finally, these reworded items were analyzed on their understandability and development appropriateness (Marsee et al., 2011). Thus was created the final 40 item version of the PCS, which evaluates the possible combinations of forms and functions of aggression in adolescence (*i.e.* proactive overt, reactive overt, proactive relational and reactive relational aggression; Marsee & Frick, 2007; Marsee, Weems, & Taylor, 2008). The psychometric properties of the PCS have been investigated and ascertained by Marsee et al. (2011) using a sample of 12 to 19 year old adolescents from school (19.42%) and detained settings (18.47%), and youths who had dropped-out of school and were residing in a voluntary military-style intervention program (62.11%). These authors found that a four-factor model was the best fit to the data, for both girls and boys and for both school and detained

plus dropped-out of school samples. The four factors achieved adequate internal consistency values, as well as construct validity in relation to external variables, such as arrest history, which was specifically associated with reactive types of aggression, callous-unemotional traits, which in turn were associated particularly with proactive types of aggression, and delinquency, which correlated with both proactive and reactive types of aggression (Marsee et al., 2011).

Up to this point, research on the factor structure of the PCS has been primarily conducted with “at-risk” (dropped-out of school) and detained adolescents in the Southeastern United States, although initial evidence supports good fit for a subsample of high school students as well (Marsee et al., 2011). However, more research is needed on the factor structure of this instrument across diverse populations of community and non-referred youth in order to determine whether the model is adequate for adolescents of different cultural and behavioral backgrounds. The types of aggression assessed by the PCS are common in schools across cultures, and a reliable and valid instrument is needed to adequately assess both the forms and functions of aggression in such various contexts.

Concerning the forms of aggression, they may be relational, verbal or physical. The relational form includes manipulative and concealed behavior, intending to damage the other person’s social status, relationships or provision of social support (Archer & Coyne, 2005). Coyne et al. (2006) suggest that direct (*e.g.* spreading rumors) and indirect (*e.g.* threatening to end a relationship) types of relational aggression are demonstrations of one single form of aggression, which can be distinguished from verbal and physical direct, face-to-face forms of aggression. Relational aggression is considered as the more long-lasting hurtful form of aggression and is more frequently witnessed and practiced by girls (versus overt aggression); on the other hand, boys usually witness and practice direct or overt forms of aggression, which have more limited and short-term harmful effects (Coyne et al., 2006; Prinstein, Boergers, & Vernberg, 2001; see Card, Stucky, Sawalani & Little, 2008 for a meta-analysis of psychosocial adjustment indicators associated with overt and relational aggression).

Aggressive behavior has also been classified according to the functions it may serve. It may be a way of impulsively expressing one’s frustration or anger as a reaction to a perceived provocation from others (*i.e.*, reactive aggression), or it may represent a rational and premeditated mean to achieve an end (*i.e.*, proactive aggression; Hubbard, McAuliffe, Morrow, & Romano, 2010). The impulsive/reactive and the instrumental/proactive functions of aggression are moderately correlated, indicating that they represent two associated but not overlapping constructs. Research suggests that youths can be

distinguished according to their levels of reactive or proactive aggression, with some youths showing high levels of both, some showing high levels of reactive aggression only, and some showing high levels of proactive but not reactive aggression (Crapanzano, Frick, & Terranova, 2010; Crick & Dodge, 1996; Little, Brauner, Jones, Nock, & Hawley, 2003). It is important to point out that reactive and proactive functions of aggression are associated with different psychosocial adjustment indicators (see Card & Little, 2006 for a meta-analysis of adjustment indicators associated with reactive and proactive aggression). Specifically, reactive aggression tends to be associated with emotional deregulation and anger, whereas proactive aggression tends to be associated with callous and unemotional traits and cognitive biases favoring aggressive responses (Marsee et al., 2011; Marsee & Frick, 2007). This divergence in adjustment indicators for reactive and proactive aggression suggests possible differences in developmental pathways to aggression, and has important implications for intervention strategies with aggressive youths (Marsee & Frick, 2010).

Given the pertinence of these constructs to evaluate and understand aggression in adolescence, this paper primarily intends to present the development and analysis of the factor structure of the Portuguese version of the PCS, using a school-based sample. We expect to find that the same four factor structure (Marsee et al, 2011) will represent a good fit for the data, and for both boys and girls. As a secondary goal of this work, and in an effort to make inferential analyses pertaining to construct validity of the Portuguese version of the PCS, we considered gender differences on the levels of aggression. If the results were in line with those previously found for the same constructs (*i.e.* the forms and functions of aggression), one can infer that the PCS evaluates these same constructs. As for the comparison between gender, we expect that boys will report higher levels of overt aggression than girls, and girls and boys will endorse similar levels of the relational form of aggression (Prinstein, et al., 2001; Verona, Sadeh, Case, Reed, & Bahttacharjee, 2008), and of both functions of aggression (Connor, Steingard, Anderson & Melloni, 2001). Concerning within-gender comparisons of the forms of aggression, we expect that girls will favor relational to overt aggression, and that boys will endorse both forms of aggression equally (Card et al., 2008).

Methods

Participants

The participants in this study included 785 pupils from seven Portuguese secondary schools (499 females [63.6%] and 286 [36.4%] males). Regarding their school grade, 112 attended the 7th and 8th

grades (14.3%) and 670 attended the 10th to 12th grades (85.4%); due to curricular constraints, the participating schools did not authorize 9th graders to take part in this investigation. Three students did not provide information on school grade (0.4%). The majority of these students had never been retained in the same school grade ($n = 572$; 72.9%) and 209 had been retained from one to three times (26.6%)¹. Four students did not provide information on their retention history (0.5%). As for socioeconomic status², 422 adolescents belonged to a low socioeconomic status (53.8%), 298 to a medium socioeconomic status (38.7%) and 48 to a high socioeconomic status (6.1%). Seventeen students (2.2%) did not provide interpretable information on their parents' profession so that socioeconomic status for their cases could be determined.

Data analysis indicates that boys and girls were distributed similarly by socioeconomic status ($\chi^2_{(2)} = 4.89, p = .09$), but not by school grade ($\chi^2_{(4)} = 13.04, p < .001$) nor by history of grade retention ($\chi^2_{(2)} = 7.48, p = .006$). More boys than expected attended the 7th, 8th and 10th school grades, and the reverse was true for the 11th and 12th school grades; girls were more prevalent in the group with no history of retentions (76.4%). The mean age for this sample group was 15.97 years old ($SD = 1.49$), and boys were significantly younger than girls ($M = 15.80, SD = 1.63$ for boys and $M = 16.07, SD = 1.40$ for girls; $t_{(789)} = 2.49, p = .013$).

Materials

The Peer Conflict Scale (PCS) – Portuguese version

The original version of the PCS includes 40 items, to which participants answer using a 0 (*not at all true*) to 3 (*definitely true*) scale. The items are organized into four ten-item aggression scales (*i.e.*, reactive overt, proactive overt, reactive relational, and proactive relational) with possible scores ranging from 0 to 30; the higher the score on each scale, the higher the level of self-reported aggression. Previous research found general good scale reliabilities (alphas ranging from .79 to .89) and construct validity in relation to other variables (Marsee et al., 2011).

The 40 original PCS items were translated and adapted into the Portuguese language following a translation and back-translation process (Hambleton, Merenda, & Spielberger, 2005). The translation was undertaken by two Portuguese researchers who are fluent in English and Portuguese. They had previous

¹This represents a higher percentage than that of the national statistics for Portugal. However, multi-group analysis on the four factor measurement model of the PCS (Marsee et al., 2011) proved that it is invariant across students with or without history of grade retention; the adequacy of this measurement model is not dependent on this particular characteristic of the present sample.

²Socioeconomic status was assigned according on parents' profession, and taking into account the Portuguese profession classification. Examples of professions in the high socioeconomic status groups are judges, higher education professors, or M.D.s; in the medium socioeconomic status group are included nurses, psychologists, or school teachers; in the low socioeconomic group are included farmers, cleaning staff, or undifferentiated workers (Instituto do Emprego e Formação Profissional, 1994).

clinical practice with adolescents, which allowed them to adapt the items to the language commonly used by this group. The items were then analyzed for validity based on item content, in order to gather empirical evidence on the adequacy of the items, in as much as they represent and are relevant to the content domain the test aims to evaluate (American Psychological Association, 1999). Five Portuguese postgraduate psychology students were briefed on the forms and functions of aggression, and then asked to place each item under one of four constructs (*i.e.* proactive overt, reactive overt, proactive relational and reactive relational aggression), thus empirically judging on each item's adequacy to represent the constructs they were supposed to evaluate. Agreement was not reached for items 4, 11, 13, 16, 18, 22, 27, 30 and 38 (22.5% of 40 items). For items 11 and 18, it was suggested that the kind of threat (*i.e.* open aggression) the item was referring to should be clarified; for items 4, 16, and 22 it was proposed that the motivation associated with the emotional activation of anger should be presented explicitly (*i.e.* others as the cause of anger-reactive aggression); for items 13 and 27 it was recommended to exclude any reference to an antecedent of the behavioral response, even if it had happened a long time ago (*i.e.* proactive and self-convenient aggression); for items 30 and 38 it was suggested to emphasize the impulsiveness (*i.e.* reactivity) of the behavior. These suggestions did not contradict nor question the definition of the construct the items were intended to address. Therefore, the items were adapted for the Portuguese version of the instrument (see Table 3), and great effort was put into assuring that the adapted items intended to, and were worded, in such a way as to address the same constructs as the original versions of them. The original and back-translated versions of one item from each group of suggested adaptations are shown in Table 1. The 40 Portuguese items were back-translated into English by a Portuguese researcher, unrelated to this study, who had lived in England for five years.

[Insert Table 1]

The back-translation was sent for revision to the author of the original PCS, who judged both versions to be equivalent. The items were then subjected to thinking aloud analysis, using a sample of twenty two adolescents attending the 11th school grade (22.7% female). The think aloud procedure, also known as the concurrent verbal protocol, was used to assess test usability, as it allows verbalizations of the cognitive processes of encoding and interpreting written language. For this procedure, participants were asked to perform a given task, in this case, to read the instruction and items, and talk aloud about all the thoughts that might occur to them (Ericson & Simon, 1993). Participants were particularly instructed to verbalize out loud any doubts or ambiguities they might find with these materials, and to suggest

adjustments if they so desired. Students suggested that the instructions should state clearly that the items refer to general behaviors that are usually enacted towards peers and not to behaviors enacted in specific contexts, such as, for instance, when practicing any kind of sports like boxing. They also suggested making the response options more self-related. So, for the Portuguese PCS, the items are rated from 1 (it has very little to do with me) to 4 (it has everything to do with me), with possible scores ranging from 10 to 40. Our preliminary experience with this instrument led us to expect that community and school-based samples would show a marked tendency for socially desirable answers, and so very frequently would choose a 0 (has nothing to do with me) option. To avoid this and gather more statistically valid results, by decreasing the skewness of the responses, this “no-behavior” option was not included in the Portuguese version of the instrument. The psychometric characteristics of the results of this Portuguese version³ are presented in the results section of this paper.

Procedure

Authorization for this work was sought and granted by the national evaluation committee on ethics and procedures to be followed by studies conducted in school settings. Next, authorization was asked in the participating schools, who in turn sought parental consent of participating students under 18 years old. For convenience reasons, schools were located in the north of Portugal, but were nonetheless selected based on their position in the national ranking of schools, which is based on students' academic achievement; two schools presented below average results, three schools offered within average results and two schools obtained above average results. One member of the research team went to every school and classroom to explain to the students the objectives of the study, to guarantee the confidentiality of the data, and to deliver and collect the questionnaire, which was filled voluntarily in the classroom, using about 15 minutes of time granted by the teachers. No student refused to participate; in order to protect the identity of students and their families, no information was given to the research team on parents who refused to consent to their child's participation. The instrument was presented alongside an information sheet where the main objectives of the study were stated (*i.e.* to develop instruments for evaluating and understanding aggression in youth), the confidentiality of the data was guaranteed and several socio-demographic variables were collected, namely gender, years in school, number of grade retentions, and parents' profession.

³ The Portuguese version of the Peer Conflict Scale may be obtained by contact with the first author.

Data analysis was undertaken using the *Statistical Package for the Social Sciences* (SPSS; v18.0) and *Mplus* (v6.2; Muthén & Muthén, 2010). SPSS was used for internal consistency analysis, and to compare aggression levels across gender, controlling for age, school grade, and number of grade retentions. *Mplus* was used to determine validity based on the internal factor structure of the instrument and for multi-sample analysis considering gender groups. The MCAR test for missing data, which represented 0.1% of possible responses, was significant ($\chi^2(1038) = 2039.03, p < .001$), meaning that missing values were not random and so a particular pattern of missingness might be in place. However, investigating this pattern was beyond the scope of this paper, and it might only account for 0.1% of the possible answers gathered with this sample. Also considering that there were no significant differences in gender, school grade, socioeconomic status, age or history of grade retentions between respondents and non-respondents, a listwise deletion approach was used for participants presenting any number of missing values (*i.e.* only complete protocols were considered; Allison, 2001), leading to the exclusion of 33 protocols, which were not considered in the sample or results sections.

Results

Confirmatory Factor Analysis

In order to define the measurement model underlying the PCS, a series of confirmatory factor analyses were performed to test the goodness of fit of several models for the internal factor structure of the PCS. Three models were tested that overlap with those proposed by Marsee et al. (2011), namely a one factor solution including 40 items; a two factor solution, distinguishing overt and relational aggression, each with 20 items; and a four factor solution, diverging between proactive overt, proactive relational, reactive overt and reactive relational aggression, each with 10 items. Additionally, and given the literature that distinguishes the functions of aggression (Hubbard et al., 2010), a two factor solution differentiating reactive and proactive aggression, each with 20 items, was also tested. The four factor measurement model, which proposes four measures that combine the forms and functions of aggression, should best represent the constructs under evaluation by the PCS, in comparison with a one factor model for aggression, or a two factor model for the forms of aggression only, or a two factor model for the functions of aggression only.

Analysis of the responses indicated that the data for this analysis deviated from the normal distribution (multivariate kurtosis for 40 items = 2.16; 12 items (30%) with univariate kurtosis values ≥ 7

and 24 items (60%) with univariate skewness values ≥ 2) and consequently the *Weighted Least Squares Means and Variance Adjusted* method was used for data analysis (Finney & diStefano, 2006).

The fit indexes were always reasonable and are presented in Table 2 (*i.e.* CFI and TLI $\geq .90$ and RMSEA $\leq .07$; Hair Jr, Black, Babin & Anderson, 2009). The four factor solution achieved a significantly ($p < .001$) better fit, in comparison with the one-factor model ($\Delta\chi^2 = 352.76$, $df = 6$), the two-factor model for the forms of aggression ($\Delta\chi^2 = 27.16$, $df = 5$), and the two-factor model for the functions of aggression ($\Delta\chi^2 = 317.78$, $df = 5$). In turn, the models for the forms and functions of aggression were better fits in comparison with the one-factor model ($\Delta\chi^2 = 115.54$, $df = 1$ and $\Delta\chi^2 = 55.79$, $df = 1$, respectively). Comparing the two-factor models for the functions and for the forms of aggression, the best fit indexes were found for the two-factor model for the forms of aggression (*i.e.* lower values for the RMSEA and WRMR and higher values for the CFI and TLI adjustment indexes; Kline, 2005).

[Insert Table 2]

Item loadings on the four factor solution for the complete sample were always superior to .55 (Table 3). The internal consistency values for the four constructs proposed for the PCS were excellent, according to the reference value of .70 (Nunnally, 1978): $\alpha = .90$ for proactive overt, $\alpha = .89$ for proactive relational, $\alpha = .91$ for reactive overt, and $\alpha = .87$ for reactive relational aggression.

[Insert Table 3]

The values for univariate skewness and kurtosis and the values for multivariate kurtosis found for each separate factor (see Table 4) indicate an evident deviation from the normal distribution, particularly for the proactive measures. Consequently, and aiming for consistency in presentation of the results, correlations among aggression measures were carried out using the Spearman correlation coefficient (Field, 2009). The four aggression measures were significantly and positively correlated, at $p < .001$ (Table 4).

[Insert Table 4]

In order to assess the configural, metric and scalar invariance of the four-factor measurement model, multi-group comparisons were undertaken. Configural invariance indicates that the same basic factor structure is stable across groups, while metric invariance in addition determines that the item loadings on each factor are also identical, and finally scalar invariance adds to this the imposition of equality of the measured variable intercepts or thresholds on the construct. At least partial scalar invariance is required if groups are to be compared on mean levels of latent constructs (Hair et al., 2009).

A unit loading identification constraint on the first item of each measure was used to assign a scale for the model to be identified (Kline, 2005). Results are presented in Table 2.

For gender groups analysis, the last two PCS response options were collapsed, given that girls did not choose option 3 (*has a lot to do with me*) for item 35 and option 4 (*has everything to do with me*) for item 26. Results indicate that full scalar and metric invariance could not be achieved, because the constraints imposed by the model significantly worsen the model fit ($\Delta\chi^2 = 217.98$, $df = 40$, $p < .001$). The modification indexes suggest allowing the threshold for item 30 to vary between groups, meaning that this item's mean may vary across groups, other than the variability accounted for by the variation of the factor mean itself. Allowing the variability of the threshold for item 30 resulted in a non-significant difference between the partially constrained and the unconstrained (configural) model ($\Delta\chi^2 = 34.21$, $df = 34$, $p = .323$). Item loadings on the four factor solution were always superior to .55 for the boys and to .49 for girls (Table 3).

Descriptive Analysis

Gender differences have been consistently found for levels of aggression (*e.g.* Connor et al., 2001; Prinstein et al., 2001); replication of such findings using the PCS may serve as evidence of its construct validity. Analysis of the constitution of the sample for the present work indicated that boys were older than girls, and that boys and girls were not similarly distributed by school grade and number of grade retentions. For this reason, these variables were entered as covariates in the gender differences analysis using ANOVA. This analysis is generally robust in deviations from the normality (Field, 2009), such as the ones found in the present work for each separate factor, according to their univariate skewness and kurtosis values and its multivariate kurtosis values (Table 4).

A mixed design ANOVA with a one within-subject factor of aggression (proactive overt, proactive relational, reactive overt, and reactive relational) and a one between-subject factor of gender (male and female) was carried out; age, school grade and number of grade retentions were entered as covariates. The Greenhouse-Geisser correction was used to account for violations to sphericity in the analysis ($\epsilon = .353$, $p < .001$). The within-subject effect was not significant ($F < 1$); the between-subject effect was significant ($F_{(1,773)} = 78.82$, $p < .001$, $\eta p^2 = .093$). The interaction effect was only significant for interaction by gender ($F_{(1,80, 139..22)} = 13.41$, $p < .001$, $\eta p^2 = .017$). Pairwise comparisons for levels of aggression between boys and girls indicate that boys present higher values of aggression for all measures ($p < .001$). Furthermore, comparisons for levels of aggression within each gender were analyzed. For

boys, proactive overt aggression was higher than proactive relational aggression, even if the difference was not statistically significant ($p = .796$), and reactive overt aggression was significantly ($p < .001$) higher than reactive relational aggression. For girls, on the other hand, proactive relational aggression was higher than proactive overt aggression ($p < .001$), whereas reactive overt aggression was higher than reactive relational aggression ($p < .001$). Both boys alone and girls considered as separate groups reported significantly ($p < .001$) more reactive than proactive aggression, either overt or relational (Figure 1).

Discussion

The Portuguese version of the *Peer Conflict Scale* was developed and adapted through translation, back-translation and thinking aloud procedures; the face validity of the items was also evaluated. All the procedures necessary to assure the linguistic adaptation of the instrument (Hambleton, et al., 2005) were, therefore, followed. The internal structure of the scale was evaluated using a confirmatory factor analysis procedure. The model that best fits the data consisted of four scales, consistent with those originally proposed by the scale's author (Marsee et al., 2011): proactive overt, proactive relational, reactive overt and reactive relational aggression. These four scales have shown excellent reliability, based on their internal consistency values. For the present school-based sample, all of the aggregated aggression measures deviated from the normal distribution, particularly the proactive ones, reflecting the fact that the majority of our school-based and community sample presented, as expected, low levels of aggressiveness; the distribution of the findings had not been previously reported by Marsee and colleagues (2011) but given the high percentage of detained plus dropped-out of school participants for this sample, results should be closer to the normal distribution. Even if aggression can be thought of by using the same constructs on specific and normative samples, the distribution and mean results of these constructs should differ, in line with the findings presented by Marsee and colleagues (2011), where the high school students presented the lower mean values for all aggression measures. The constructs under evaluation were moderately correlated, suggesting that they are modestly associated but do not overlap. This non-overlapping of the constructs under investigation is in line with previous research associating them differently to other pertinent variables, like social information processing (Fontaine et al., 2010), social skills or emotional regulation (Hubbard et al., 2010).

The four factor measurement model for the PCS was invariant across genders (*i.e.*, boys *versus* girls) in our sample, suggesting that the four factor structure fit equally well for boys and girls, and consequently that comparisons of these groups can be informative on whether or not the groups have

equal amounts of the latent constructs (Hair et al., 2009). The invariance of gender had also been found for the combined North-American samples of detained, dropped-out of school and high-school participants. Item 25 had a differential loading for boys and girls in that original sample (Marsee et al., 2011) but was invariant for the present school-based sample. On the other hand, item 30 (*i.e.* Most of the times that I have gotten into arguments or physical fights, it was because I snapped at someone or something and didn't stop to think) had a variable threshold for the present sample, when it had been invariant in the work of Marsee and colleagues (2011). This particular item may differently contribute to the mean value of reactive overt aggression for our school-based sample of boys and girls, but is, nonetheless, a good representative of this construct in both groups.

The possible differential use of aggression by boys and girls at the mean level was presently evaluated using measures that combine the forms and functions of aggression, whereas previous works had particularly focused on one or the other. Results for the present work only partially concur to our hypothesis concerning the forms of aggression, that boys would report higher levels of overt aggression than girls, but no differences would be found for relational aggression (Card et al., 2008; Prinstein et al., 2001; Verona et al., 2008). On the contrary, for the present sample, boys not only reported more overt but also more relational aggression than girls. These results also contradict the findings reported by Marsee and colleagues (2011): even if we found the smallest effect size for reactive relational aggression, it still favored boys, whereas girls had achieved the highest scores for this particular type of aggression in that pivotal study. It seems that, for school-based community samples, relational aggression is not merely a female issue (Swearer, 2008) but also affects boys, who are more versatile in their use of aggression (Card et al., 2008; Merrell, Buchanan, & Tran, 2006). It may only be by adulthood that gender differences for proactive and reactive relational aggression tend to fade (Bailey & Ostrov, 2008). Regarding the functions of aggression, boys in the current sample again reported using more reactive and more proactive aggression than girls. Connor and colleagues (2001) had found that boys and girls were equally as likely to be reported as proactive or reactive aggressors, but analysis of the descriptive measures for their work indicate that boys are more proactive and more reactive than girls, which means that the between gender difference might become significant in the context of a wider sample size (Connor et al., 2001), as is the case in the present work.

Considering within-gender comparisons of the levels of aggression, which had been addressed infrequently previously, adolescent boys in the present sample reported higher levels of overt rather than

relational aggression, but so did adolescent girls for the reactive function of aggression. It seems that impulsive/ reactive aggression generally tends to be overt, at least among youths in this school-based community sample. It is only when aggression is a premeditated and instrumental response that boys and girls may take the time to ponder and select a form of aggressive behavior that will grant them a better social status: overtly showing force and dominance for boys, and using relationships to achieve social integration and admiration for girls (Heilbron & Prinstein, 2008; Moretti, Holland, & McKay., 2001; Smith, Rose, & Schwartz-Mette, 2010).

Understanding how the forms and functions of aggression conjugate to characterize gender types of aggression may be a future venue for approaching the gender and aggression equation. Intervention guidelines have focused on overt aggression, whereas instruction on the implications of relational aggression for both victim and aggressor, and intervention programs that neglect none of the forms of aggression are strongly advised (Merrell et al., 2006), particularly if the forms of aggression may be differently seen as an instrumental response by boys and girls. In turn, the different functions of aggression may also warrant specific intervention guidelines. Youths who engage in proactive aggression may benefit from cognitive restructuring, social learning and behavior management intervention components, while the reactive aggressors may do better with impulse control training, social problem solving, and cognitive restructuring of their hostile attributions to others' intentions (Bailey & Ostrov, 2008; Merk, de Castro, Koops, & Matthys, 2005; Moretti et al., 2001).

This work is not without limitations, namely the fact that it is a cross-sectional study with a school-based community sample, using only self-report instruments. A longitudinal design is needed to determine whether aggression levels change over school grades, which was the only significant covariate for aggression levels in the present work, in order to contribute to a socio-cognitive and developmental perspective on adolescent aggression. Additional research on the role of age, grade retentions or socioeconomic status may also help to better define at-risk groups for aggression. Further, results from this study using a Portuguese school-based community sample may not be generalizable to more aggressive youth, although previous work suggests that the four-factor structure does fit well for dropped-out of school and detained youths (Marsee et al., 2011). A wider and more diverse sample is required to create specific norms for aggressive behavior in Portuguese adolescents. Additionally, the investigation of convergent or divergent construct validity of the PCS is essential to better corroborate the four aggression factors measurement model. Even if our findings regarding gender differences are generally in line with

the literature and concur to the convergent validity of the constructs under evaluation, more research is needed that relates the PCS measures to other important social behavior measures like assertiveness, victimization, or bullying. Finally, the change in scaling on individual items from the North-American to the Portuguese version of the PCS, warrants caution in future comparative and multi-cultural studies. The scaling on individual items should be further tested using at-risk Portuguese samples, to verify its necessity in characterizing Portuguese samples or merely school-based community ones.

Nonetheless, this work fulfills its intent, namely preparing and presenting an evaluation instrument for the forms and functions of aggression in Portuguese adolescents, which may now be addressed using the same framework of the forms and functions of aggression which has long been in use in North-American samples. Results from this research suggest that the PCS is a reliable and valid, structurally sound measure of aggression in this Portuguese school-based community sample, indicating that aggression may be conceptualized taking into account the same general constructs for both aggressive and normative samples. The use of this measure may assist researchers and clinical practitioners in gaining a better understanding of adolescent aggression, and may aid in the design of specific intervention strategies.

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Table 1

Adaptation and back-translation of the Peer Conflict Scale

Item	Construct	Original version	Back translation
4	Reactive relational	<i>I gossip about others when I'm angry at them</i>	When somebody makes me angry, I might badmouth that person.
11	Reactive overt	<i>I threaten others when they do something wrong to me</i>	I have threatened somebody that has done something bad to me
13	Proactive relational	<i>I tell others' secrets for things they did to me a while back</i>	I might tell somebody's secrets, if that's convenient for me.
30	Reactive overt	<i>When I have gotten into arguments or physical fights, it is usually because I acted without thinking</i>	Most of the times that I have gotten into arguments or physical fights, it was because I snapped at someone or something and didn't stop to think

Table 2

Confirmatory factor analysis on four models for the internal structure of the Portuguese version of the Peer Conflict Scale

	χ^2	<i>df</i>	<i>RMSEA (CI)</i>	<i>WRMR</i>	<i>CFI</i>	<i>TLI</i>
Complete sample						
One factor solution	3043.63	740	0.063 (0.060; 0.065)	1.957	0.928	0.924
Two factor forms solution	2463.22	739	0.055 (0.052; 0.057)	1.671	0.946	0.943
Two factor function solution	2995.12	739	0.062 (0.060; 0.065)	1.934	0.930	0.926
Four factor solution	1829.31	734	0.044 (0.041; 0.046)	1.359	0.966	0.964
Multi-group gender analysis						
Male	1349.88	734	0.054 (0.049; 0.058)	1.140	0.971	0.969
Female	1130.34	734	0.033 (0.029; 0.037)	1.118	0.970	0.968
Configural invariance	2352.47	1504	0.038 (0.035; 0.041)	1.585	0.974	0.973
Metric invariance	2364.14	1544	0.037 (0.034; 0.040)	1.612	0.974	0.974

Note: RMSEA = root-mean-square error of approximation; WRMR = weighted root mean square residual; CI for RMSEA = confidence interval for RMSEA; CFI = comparative fit index; TLI = Tucker-Lewis Index. All chi-square values were significant at $p < .001$

Table 3

Item loading on the four factor model, for the complete sample and multi-group analysis

Scale	Complete sample	Gender	
		Male	Female
Proactive overt aggression			
1. I have hurt others to win a game or contest	.612	.579	.497
5. I have start fights to get what I want	.765	.769	.720
12. When I hurt others, I feel it makes me powerful and respected	.836	.816	.810
18. I threaten to hurt others to get what I want*	.846	.842	.819
21. I am deliberately cruel to others, even if they haven't done anything to me.	.884	.899	.812
24. I carefully plan out how to hurt others	.836	.813	.787
27. I hurt others if it is convenient to me*	.871	.850	.864
28. I enjoy hurting others	.914	.918	.897
33. I like to hurt kids smaller then me	.894	.882	.873
35. I threaten others, even if they haven't done anything to me.	.945	.937	.876
Proactive relational aggression			
2. I enjoy making fun of others	.677	.625	.632
6. I deliberately exclude others from my group, even if they haven't done anything to me	.782	.834	.750
9. I try to make others look bad to get what I want	.815	.803	.812
13. I might tell somebody's secrets, if that's convenient for me.*	.773	.824	.676
19. I gossip about others to become popular	.948	.933	.946
23. To get what I want, I try to steal others' friends from them	.917	.936	.827
26. When I gossip about others, I feel it makes me popular	.922	.940	.851
29. I spread rumors and lies about others to get what I want	.913	.926	.830
32. I ignore or stop talking to others in order to get them to do what I want	.734	.788	.647
39. I say mean things about others, even if they haven't done anything to me.	.701	.838	.556
Reactive overt aggression			
3. When I am teased, I will hurt someone or break something	.708	.690	.715
8. When someone hurts me, I end up getting into a fight	.856	.817	.857
11. I have threatened to hurt somebody that has done something bad to me*	.790	.737	.793
14. When someone threatens me, I end up getting into a fight	.857	.811	.822
16. When someone makes me angry, I end up hurting them	.855	.808	.885
20. If others make me mad, I hurt them	.888	.852	.879
25. When someone makes me mad, I throw things at them*	.767	.853	.692
30. Most of the times that I have gotten into arguments or physical fights, it was because I snapped at someone or something and didn't stop to think*	.660	.744	.617
36. When I get angry, I will hurt someone	.931	.936	.862
37. I have gotten into fights, even over small insults from others	.911	.931	.877
Reactive relational aggression			
4. When somebody makes me angry, I might badmouth that person.*	.551	.552	.572
7. I spread rumors and lies about others when they do something wrong to me	.838	.874	.761
10. When someone upsets me, I tell my friends to stop linking that person	.792	.787	.731
15. I make new friends to get back at someone who has made me angry	.580	.646	.596

RUNNING-HEAD: Forms and functions of aggression in Portuguese adolescents

17. When others make me mad, I write mean notes about them and pass them around	.903	.922	.821
22. When someone makes me angry, I try to make them look bad*	.896	.900	.859
31. If others make me mad, I tell their secrets	.833	.890	.746
34. When others make me angry, I try to make them look bad	.963	.963	.874
38. most of the times that I have started rumors about someone, it was because I snapped at someone or something and didn't stop to think*	.798	.898	.683
40. When someone makes me angry, I try to exclude them from my group.	.773	.816	.748

Note: Factor loadings are standardized regression weights. All loadings are significant at $p < .001$; * denotes items that were adapted following analysis of validity based on item content

Table 4

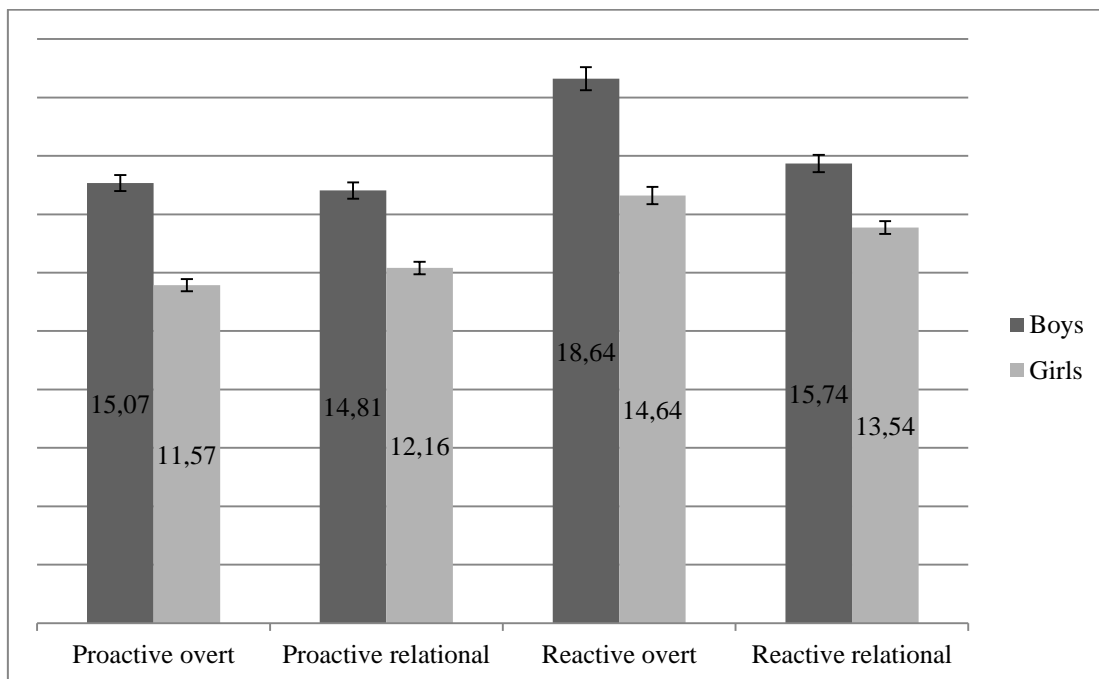
Descriptive measures for the measures of aggression, for the complete sample and sample by gender, and correlation values between measures of aggression

	Complete sample					Gender		Bivariate correlations		
	M (SD)	Mdn	Skewness (SE)	Kurtosis ^a (SE)	Multivariate kurtosis	Male ^b	Female ^c	2.	3.	4.
						M (SD)	M (SD)			
1. Proactive overt	12.84 (4.95)	11	2.68 (0.087)	8.29 (0.174)	3.23	15.27 (6.71)	11.44 (2.73)	.64	.72	.59
2. Proactive relational	13.11 (4.83)	11	2.75 (0.087)	9.12 (0.174)	2.95	14.99 (6.59)	12.04 (2.96)	-	.53	.70
3. Reactive overt	16.09 (6.80)	14	1.45 (0.087)	1.48 (0.174)	1.89	18.88 (7.85)	14.48 (5.53)	-	-	.59
4. Reactive relational	14.32 (5.03)	13	2.19 (0.087)	5.98 (0.174)	2.53	15.95 (6.54)	13.39 (3.61)	-	-	-

Note: SE = standard error

^a univariate; ^b n = 286; ^c n = 499

Figure 1: Agression by gender



Note: Values presented are evaluated at the following values for the covariates: Age = 16.97, School year = 10.40, Number of school holdbacks = .035