

Patterns of Physical and Relational Aggression in a School-Based Sample of Boys and Girls

Ann Marie Crapanzano · Paul J. Frick ·
Andrew M. Terranova

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Abstract The current study investigated the patterns of aggressive behavior displayed in a sample of 282 students in the 4th through 7th grades (M age=11.28; SD =1.82). Using cluster analyses, two distinct patterns of physical aggression emerged for both boys and girls with one aggressive cluster showing mild levels of reactive aggression and one group showing high levels of both reactive and proactive aggression. Both aggressive clusters showed problems with anger dysregulation, impulsivity, thrill and adventure seeking, positive outcome expectancies for aggression, and higher rates of bullying. However, the combined cluster was most severe on all of these variables and only the combined aggressive group differed from non-aggressive students on their level of callous-unemotional traits. Similar patterns of findings emerged for relational aggression but only for girls.

Keywords Relational · Proactive · Reactive · Aggression · Callous-unemotional traits

Aggression has long been viewed as an important construct to study because, by definition, it involves behaviors that are intended to hurt or harm others (Berkowitz 1993). One critical issue that has been the focus of a great deal of recent research is whether or not there are important distinctions between different types of aggression. Specifically, research has

frequently distinguished between reactive and proactive forms of aggression (Card & Little 2006). Reactive aggression is generally defined as aggression that is impulsive and occurs as an angry response to a perceived provocation or threat. In contrast, proactive aggression is generally defined as more planned and premeditated aggressive acts that are for instrumental gain or dominance over others.

In support of this distinction, separate dimensions have consistently emerged in factor analyses across many different types of samples and using various assessment formats (Little et al. 2003; Poulin & Boivin 2000; Salmivalli & Nieminen 2002). In addition, research has consistently documented differences in the emotional and cognitive correlates to the two types of aggression. For example, reactive aggression has been consistently linked to low frustration tolerance, poorly regulated emotional responses to provocation, impulsivity, and a tendency to misinterpret ambiguous behaviors as hostile provocation (Atkins et al. 2001; Hubbard et al. 2001; Munoz et al. 2008; Phillips & Lochman 2003). In contrast, proactive aggression has been associated with the tendency to have more positive views of aggression as an effective means to reach goals (i.e., positive outcome expectancies), a reduced emotional responsiveness to negative emotional stimuli, and a callous-unemotional interpersonal style (i.e., lacking guilt and empathy; a callous manipulation of others) (Crick & Dodge 1996; Frick et al. 2003; Hubbard et al. 2002). Based on this research, any adequate causal theory of aggressive behavior needs to explain these different correlates to the two types of aggression.

There are several critical issues that are important for interpreting this research. The first issue involves the high correlation between these two types of aggression, which ranges from 0.40 to 0.90 across samples of youth and with the typical estimate being about 0.70 (Little et al. 2003; Poulin & Boivin 2000). This high degree of correlation

A. M. Crapanzano · P. J. Frick (✉)
Department of Psychology, University of New Orleans,
2001 Geology & Psychology Bldg.,
New Orleans, LA 70148, USA
e-mail: pfrick@uno.edu

A. M. Terranova
Department of Psychology, Stephen F. Austin State University,
Nacogdoches, USA

leads to several methodological and theoretical considerations. One methodological consideration is whether this high correlation appropriately reflects the expression of aggressive behavior in youth or whether it is an artifact of limitations in the methods used to assess it (Card and Little 2006). Further, if it does appropriately reflect the expression of aggressive behavior, it presents problems in the choice of the most appropriate methods for data analysis. That is, it is important to use some method for controlling for the co-occurrence of the two patterns of aggression when studying differential correlates (Little et al. 2003; Marsee and Frick 2007).

Importantly, research has consistently shown an asymmetry in the overlap between the two types of aggression. Specifically, there appears to be a significant number of children who only show reactive forms of aggression, whereas most children who show high levels of proactive aggression also show high rates of reactive aggression (Brown et al. 1996; Dodge and Coie 1987; Frick et al. 2003; Munoz et al. 2008; Pitts 1997). Therefore, there appears to be two groups of aggressive children, one which is highly aggressive showing both types of aggressive behavior and the other being less aggressive overall and typically only showing reactive types of aggression. As a result, methods for studying the different patterns of aggression must account for this specific typology in aggression scores.

Unfortunately, the degree and pattern of overlap between the two types of aggression makes studying the differential correlates difficult because it violates the assumption of bivariate normality required for typical variable centered and correlational approaches (e.g., partial correlations, multiple regression) to testing independent effects (Cohen 1983). That is, because both groups of aggressive youth show high rates of reactive aggression, correlates specific to the purely reactive aggressive group may not be apparent or appear weak in simple correlations with measures of reactive aggression (Raine et al. 2006). Also, linear interactions between reactive and proactive aggression measures using multiple regression procedures may not emerge as significant or may be misleading due to the absence of a group high on proactive aggression but low on reactive aggression. Alternatively, interactions may not be significant and suppressor effects may emerge (e.g., reactive aggression being more strongly related to measures of emotional dysregulation when controlling for proactive aggression) which are difficult to unambiguously interpret (Lynam et al. 2006). As a result, simply identifying distinct correlates to reactive and proactive aggression does not clearly translate into potential differences in characteristics in children within the various aggressive typologies. This has led many researchers to advocate for the use of person-centered approaches to analyses when studying correlates to the different types of aggression (Barker et al. 2006; Frick 2006).

The high correlation between the two types of aggression and the fact that the combined aggressive group is typically more aggressive overall also have important theoretical implications. Specifically, some researchers have questioned the importance of distinguishing between reactive and proactive aggression (Bushman and Anderson 2001; Walters 2005). That is, an alternative way of interpreting these findings is that proactive aggression is simply a marker of a more severe pattern of aggression, and not a different type of aggression. Thus, research needs to consider whether children who only show purely reactive aggression show qualitative differences on important emotional and cognitive variables from those in the combined proactive/reactive group rather than being simply less impaired. Again, such tests are more directly tested through person-centered group comparisons, rather than testing differences in correlations with the two types of aggression. Also, such tests are important to conduct in non-referred samples, to minimize potential referral biases resulting from the most impaired children (i.e., those high on both types of aggression) being over-represented in clinic-referred or forensic samples (Costello and Angold 2006).

Another issue in the study of aggression subtypes is whether the distinct patterns of aggression are found for both boys and girls. That is, most of the studies on physical aggression have been conducted primarily on male samples (Card and Little 2006). The few studies of girls do suggest that physical aggression can be problematic for girls and that it can be divided into both proactive and reactive aggression forms in girls (Marsee and Frick 2007). However, recent research has also suggested that, when girls behave aggressively, they are more likely to choose relational forms of aggression rather than physical aggression (Crick 1996; Crick et al. 1997; Crick and Grotpeter 1995; Lagerspetz et al. 1988; Ostrov and Keating 2004). Relational aggression focuses on harming others by harming their social relationships (e.g., gossiping or telling lies about them; excluding them from groups).¹

As a result, it is important to determine whether there are subtypes of relational aggression in girls that are similar to those found for physical aggression. In support of this possibility, Little et al. (2003) studied a large normative sample of German youth (grades 5 through 10) and found

¹ The label relational aggression is sometimes used interchangeably with the terms “social aggression” and “indirect aggression” (see Card et al., 2008 for a more extended discussion of the similarities and differences in the use of these terms). We chose to use the term “relational aggression” because the conceptualization that guided this study and the measure used to assess this construct in the current study focused on behaviors related to harming others through hurting their social relationships (e.g., spreading rumors and lies about another person; excluding others from a friendship group).

that both physical aggression and relational aggression could be divided into proactive and reactive subtypes. In a sample of detained adolescent girls, Marsee and Frick (2007) further demonstrated that these subtypes of relational aggression showed divergent emotional and cognitive correlates, similar to the findings on physical aggression. That is, reactive relational aggression was uniquely associated with poorly regulated emotion and anger to perceived provocation, whereas proactive relational aggression was uniquely associated with callous-unemotional (CU) traits and positive outcome expectations for aggression.

As is the case between reactive and proactive forms of aggression, physical and relational aggression are also highly correlated, with a recent meta-analysis showing an overall correlation of 0.76 across 148 studies (Card et al. 2008). However, despite this high level of associations, factor analyses of teacher (Crick 1996; Rhys and Bear 1997), self (Marsee et al. 2006; Prinstein et al. 2001), and peer ratings (Crick and Grotpeter 1995) provide some support for the distinctiveness of relational and physical aggression. Further, while many studies have shown that both boys and girls can act both relationally and physically aggressive (e.g., David and Kistner 2000; Putallaz et al. 2007), relational aggression predicts social-psychological maladjustment above and beyond the variance accounted for by physical aggression for girls but not boys (e.g., Crick and Grotpeter 1995; Marsee and Frick 2007; Prinstein et al. 2001).

Thus, these studies suggest that relational and physical aggression share about 50% of their variance but show incremental prediction of important outcomes at least for girls. An important issue that has not been addressed in past research is documenting how many children, especially girls, who show significant levels of relational aggression would not score high on measures of physical aggression and whether these girls show problems in adjustment that may warrant intervention. This is an important question to test in a non-referred sample because relational aggression may not lead a child to be referred for treatment as frequently as physically aggressive behavior, even though relational aggression can have significant negative effects on the victims of such behavior (Prinstein et al. 2001; Putallaz et al. 2007). Thus, the incremental effects of relational aggression in predicting problems in adjustment may not be as apparent in clinic-referred samples in which those high on both types of aggression may be over-represented.

A final important issue when studying the subtypes of aggression in samples of youth is to clarify the association between patterns of aggression and bullying. Bullying has been defined as aggression specifically against a person who is perceived to be weaker and less able to defend him or herself than the aggressor (Olweus 1991). It has recently received significant attention in schools because it has been shown to lead to significant and long-term problems for its

victims (Storch et al. 2005). Unlike the distinction between reactive and proactive aggression, which focuses on the function and motivation of the aggressive act (e.g., in response to perceive provocation; to obtain dominance), the definition of bullying focuses largely on the characteristics of the victim. Thus, it is unclear how this form of aggression would relate to the reactive and proactive typologies. Further, in two studies that did investigate the associations between bullying and types of aggression, there did not appear to be clear associations between bullying and specific types of aggression (Camodeca et al. 2002; Unever 2005). Instead, like the study of aggression overall, both studies suggested that some youth who bullied were high on both proactive aggression and reactive aggression and others were high largely on reactive forms of aggression.

Based on this background literature, we tested whether the profiles documented in past samples (i.e., low aggression, high on reactive aggression, high on both proactive and reactive aggression) could be found in a school-based sample of both boys and girls. Further, we tested whether these patterns could be identified with both physical and relational aggression. Second, we compared the resulting aggression groups on theoretically important cognitive and emotional variables that have shown to differentiate aggressive subtypes in past research (i.e., measures of emotional dysregulation, impulsivity, CU traits, thrill and adventure seeking, positive outcome expectancies for aggression). Importantly, we tested whether group differences supported a distinct typology model (i.e., qualitative differences among aggressive groups) or a severity model in which the differences were mainly due to differences in the level of risk. Again, we tested whether any group differences were similar when studying physical and relational forms aggression. Third, we compared subgroups of aggressive youth on their level of bullying, using both self-report and peer-report of bullying, to provide a direct test of whether or not bullying behaviors are associated with specific patterns of aggressive behavior. Fourth, we compared subgroups of aggressive youth, formed based on physical and relational aggression measures, to determine the differences in which youth, especially girls, would be classified based on the different types of aggression.

Methods

Participants

Participants were recruited from the 4th through 7th grades at four schools in a semi-rural public school system in the southeastern United States. All of the schools were Title I schools, meaning a substantial proportion of students (at

least 66%) received free or reduced lunches due to low family incomes. Boys and girls in special education classes were excluded from the study. Participants were all between the ages of 9 and 14, with a mean age of 11.28 ($SD=1.82$). Of the participants, 37% were 4th graders, 32% were 5th graders, 24% were 6th graders, and 7% were 7th graders. Girls made up 54.2% of the sample and nearly half of the sample reported being Caucasian (49.3%) as their ethnicity and 38.4% as African-American, 3% as Hispanic-American, 1% as Asian-American, and the rest self-reported other ethnicities. The gender and ethnic composition of the sample was representative of the participating public schools based on data published by the school system. Specifically, data published by the school system indicated that for all school age children in their population (K-12), 51.4% were Caucasian, 46.1% were African-American, 1.8% were Hispanic-American, and 0.5% were Asian-American.

Procedures

Institutional Review Board approval was obtained prior to data collection. Students were contacted for the study via letters with consent forms sent home to parents. Once consent was obtained from parents, the questionnaires were administered to small groups of students during portions of the school day that minimized disruptions to instructional time (e.g. study period, guidance counseling time). Students were asked to sign an assent form before participating. Any students who did not wish to participate in the study or whose parents did not sign a consent form were asked to do an alternative activity while the questionnaire was administered. To control for differences in reading ability, the questionnaires were read out loud. During the questionnaire administration, participants were spaced far enough apart to make it difficult to determine other participants' responses. Additionally, participants were provided with a cover sheet to hide their responses.

Parental consent was returned for 349 (70%) of approximately 500 eligible students. Of this 349, 53 students did not participate in data collection, either due to absences or other activities on data collection days or due to unwillingness to provide assent. Another 14 students did not complete forms or did not complete forms correctly, leading to the final sample of 282. No data are available on those that did not participate in data collection. However, of the 14 students who were partial completers, 68% were African-American and 50% were boys.

Measures

Peer Conflict Scale (PCS; Marsee and Frick 2007; Munoz et al. 2008) The PCS is a 40-item measure developed to

assess the various types of aggressive behaviors and is available at <http://fs.uno.edu/pfrick/>. It includes four 10-item scales. The two reactive subscales, Reactive-Physical (e.g., "If others make me mad, I hurt them"; "I have gotten into fights, even over small insults from others") and Reactive-Relational (e.g., "If others make me mad, I tell their secrets" "When others make me mad, I write mean notes about them and pass them around") have items worded such that there is a clear provocation, and the reaction is either to hurt or fight the other person (physical) or to harm them socially (relational). In contrast the Proactive-Physical subscale (e.g., "I carefully plan out how to hurt others", "I start fights to get what I want") also involves hurting others or fighting, but in a way that is clearly planned or for gain. Similarly, the Proactive-Relational subscale (e.g., "I deliberately exclude others from my group, even if they haven't done anything to me", "I gossip about others to become popular") involves hurting others socially but again in a way that is clearly not in reaction to a perceived provocation or for gain. Each item was scored either 0 (Not at all true), 1 (Somewhat true), 2 (Very true), or 3 (Definitely true). In the current sample, the internal consistency of the four aggression scales was adequate: reactive relational aggression $\alpha=0.85$; reactive physical aggression $\alpha=0.88$; proactive relational aggression $\alpha=0.85$; proactive physical aggression $\alpha=0.85$.

The factor structure of the PCS was tested in a sample of juvenile justice involved adolescents ($N=470$; age range=12–18) (Marsee et al. 2006). Confirmatory factor analysis (CFA) showed that a hierarchical four-factor model fit the data better than a one factor model (i.e., general aggression factor), a two-factor model (i.e., physical and relational factors), and a four-uncorrelated factor model.² In the same sample, the reactive and proactive physical aggression scales were positively associated with a self-report of the number of violent acts (Kimonis et al. 2008). In another study of detained boys, the aggression scales were also correlated with a laboratory measure of aggressive and the reactive and proactive dimensions showed different responses to provocation (e.g., reactive aggression being associated with aggressive responses to low provocation) (Munoz et al. 2008). In a detained sample of girls, the reactive and proactive subscales for both relational and physical aggression showed differential correlations with

² Given the relatively small sample size for the analyses, the results have to be interpreted with extreme caution. However, a confirmatory factor analysis was performed on the PCS in the current sample and the results were similar to past factor analyses. That is, the four factor structure showed adequate fit (e.g., CFI=.934; RMSEA=.063) and showed significantly better fit than one factor (i.e., general aggression) or two factor (i.e., relational and physical aggression factors) models using a chi-square difference test.

important external criteria (i.e., reactive being correlated with measures of emotional dysregulation and proactive being correlated with measures of CU traits and positive outcome expectations for aggression) (Marsee and Frick 2007). Finally, in an ethnically diverse community sample similar in age (range 6–17; $Mn=11.09$; $SD=3.38$) to the current sample, the reactive and proactive subscales for relational aggression again showed differential correlations with anxiety and cognitive errors (Marsee et al. 2008).

Antisocial Process Screening Device (APSD, Frick and Hare 2001) The APSD is a self-report behavior rating scale with each item scored either 0 (Not at all true), 1 (Sometimes true), or 2 (Definitely true). This scale measures three factors including Impulsivity, Narcissism, and Callous-Unemotional traits. Only the 5-item Impulsivity (e.g., “I act without thinking of the consequences”) and 6-item Callous-Unemotional subscales (e.g., “I feel guilty or bad when I do something wrong”, which is reversed score) were used in this study. Scores from the self-report version of the APSD have been shown to be relatively stable over 3 years in a non-referred sample (Munoz and Frick 2007) and have been associated with greater aggression and violence (Kruh et al. 2005) and with laboratory measures of deficient affective experiences (Loney et al. 2004). The internal consistency of the two scales in the current sample were modest but consistent with findings from past samples (impulsivity $\alpha=0.51$; callous-unemotional $\alpha=0.60$) (Munoz and Frick 2007).

Children’s Emotion Management Scale (Zeman et al. 2001) This questionnaire is a 23-item self-report instrument measuring 6 subscales of anger and sadness. For the purposes of this study, an anger dysregulation scale was formed combining the 3-item anger dysregulation (i.e. I attack whatever it is that makes me mad) and the reverse scored 4-item anger inhibition (i.e. I get mad inside but don’t show it) subscales, as suggested by a factor analysis in a community sample of 227 4th and 5th graders (Zeman et al. 2001). The internal consistency of this scale in the current sample was $\alpha=0.58$.

Thrill and Adventure Seeking Scale (TAS, Frick et al. 2003) The TAS is a 12-item subscale of the modified Sensation Seeking Scale for Children (Russo et al. 1993) that measures self-reported preferences for novel and dangerous activities. The participant chooses between a pair of statements to indicate which one was more true of him or her. For each item one statement (e.g., “I enjoy the feeling of riding my bike fast down a big hill”) describes sensation seeking behaviors. The other statement (e.g., “Riding my bike fast down a big hill is scary for me”) describes a preference for avoiding sensation seeking

behaviors. To increase the variance in scores, the scale was modified to include a question regarding how well the chosen behavior described the child by selecting either sort of true for me or really true for me. This modification created a four-point scale for each item. Both the original (Frick et al. 1999) and revised (Frick et al. 2003) version of the TAS subscale have been associated with conduct problems, including aggression. In the current sample, the internal consistency of the TAS scale was $\alpha=0.78$.

Attitudes and Beliefs Toward Aggression (Vernberg et al. 1999) This self-report measure assesses social-cognitive styles that have been related to aggressive behavior. Two subscales were combined and used in the current study: a 7 item Aggression Legitimate subscale indicating the belief that it is okay to be aggressive or that the victims deserve it and a 4 item Aggression Pays subscale indicating the belief that aggression gets you what you want (Vernberg et al. 1999). Both subscales and their combination have shown to have strong internal consistency in samples of 3rd through 9th grade students (Biggs et al. 2008; Dill et al. 2008; Vernberg et al. 1999). Additionally, these subscales have been associated in expected directions with aggressive behaviors, negative affect, and response to intervention (Biggs et al. 2008, Dill et al. 2008; Vernberg et al. 1999). In this study the combined Aggression Legitimate and the Aggression Pays scales had an internal consistency of $\alpha=0.82$.

Bullying The bullying scale and the definition of bullying were always presented after the PCS, so that the definition of bullying would not influence student’s responses to the PCS. Both self and peer reports of bullying behaviors were assessed. First, students were read the definition of bullying based on the one provided by Olweus (2001): “Bullying is when a student is mean to another student over and over again. The student who is being bullied is usually at a disadvantage, such as being smaller, outnumbered, or having fewer friends. Bullying includes hitting, calling people names, telling stories about people, and ignoring people.” After the definition was read, the students were asked to rate each of the classmates on a class roster that included all those who were in the student’s homeroom and who were also participating in the study. The rating was made on a scale of 1 (never) to 3 (often) to the question, “How often does this classmate bully others?” The children in this study were also asked to rate themselves on a scale of 1 (never) to 5 (always) on the question “How often do you bully classmates?”.

These methods for assessing bullying behavior have been reliably used in several studies (Nansel et al. 2001; Solberg et al. 2007; Sourander et al. 2007). Also, research suggests that bullying behavior using these procedures has

been associated with several indices of poor psychosocial adjustment (Nansel et al. 2001; Sourander et al. 2007). Another study using similar peer and self-report methods found individuals who were reported to frequently engage in bullying behaviors were more likely to be both proactively and reactively aggressive (Salmivalli and Nieminen 2002). In the current sample, the peer and self-report of bullying were correlated $r=0.40$ ($p<0.001$).

Results

Preliminary Analyses

The distributions of all study variables are described in Table 1. The distributions indicate that most variables were relatively normally distributed in this sample, with the exception of the proactive aggression scales. Both the relational and physical proactive aggression scales showed strong positive skewness. As expected from previous studies, the proactive and reactive subscales of the PCS were highly correlated for both physical (0.71) and relational (0.82) aggression. Also, the relational and physical aggression subscales were also highly correlated for both reactive (0.68) and proactive (0.84) aggression.

Defining Aggression Clusters

The first set of analyses tested whether or not the three aggression profiles that have been identified in past research could be identified in the current sample. This was tested by first converting the four aggression subscales from the PCS to standardized z-scores and then using a K-

means cluster analysis. Separate cluster analyses were conducted for the reactive and proactive types of physical aggression and the reactive and proactive types of relational aggression. Also, these cluster analyses were conducted for the full sample and for boys and girls separately. In all analyses, 2, 3, 4, and 5 clusters were compared.

Cluster Analyses of Physical Aggression Subscales In the full sample using the two physical aggression subscales of the PCS, a 2 cluster solution resulted in clusters differentiating children into high and low aggression clusters. The 3 cluster solution showed aggressive groupings corresponding with predictions, and the clusters descriptions are provided in Table 2. This cluster solution resulted in a large group of children low on aggression ($n=176$), another cluster that was relatively high on reactive aggression only ($n=84$), and a third cluster high on both types of aggression ($n=18$). When 4 and 5 clusters solutions were inspected, in no case did a pure proactive group emerge, consistent with expectations. Also, in support of the 3 cluster solution, the R^2 showed a dramatic jump in variance explained from the 2 ($R^2=0.38$) to 3 ($R^2=0.67$) cluster solution with only modest increases when 4th ($R^2=0.76$) and 5th clusters ($R^2=0.81$) were isolated. Further, the pseudo F statistic increased significantly from the 2 (331.08) to 3 (474.25) cluster solution but decreased with the 4 cluster solution (455.38). Importantly, the cluster analyses were all run using the child's ID number to determine the initial starting value but the same cluster solutions emerged after randomly resorting the data set and repeating the cluster analysis twice. Further, a very similar cluster solution emerged when the cluster analyses were repeated for girls and boys separately.

Table 1 Distributions of All Study Variables

	Mean(SD)	Min-Max	Skew	Kurtosis
Aggression				
Reactive	29.00(9.17)	20–75	1.66	3.66
Physical	15.12(5.57)	10–37	1.36	1.73
Relational	13.87(4.42)	10–38	1.89	4.73
Proactive	23.87(6.5)	20–65	3.66	14.03
Physical	11.63(3.14)	10–33	3.39	13.70
Relational	12.24(3.47)	10–34	3.16	13.85
Social/behavioral/emotional				
Anger dysregulation	9.96(2.42)	6–16	0.12	–0.81
Impulsivity	6.72(1.61)	4–11	0.52	–0.12
Callous-unemotional traits	7.54(2.03)	5–15	1.16	1.35
Thrill and adventure seeking	35.48(6.40)	22–48	0.01	–0.82
Positive expectation	27.33(7.96)	16–58	1.06	1.04
Bullying				
Peer report bullying	13.51(3.29)	9–22	0.59	–0.62
Self report bullying	1.52(0.98)	1–5	1.9	3.4

Table 2 Description of Aggression Clusters Formed Using the Peer Conflict Scale

	Low (n=176)	Hi reactive (n=84)	Combined(n=18)	Cluster effect	Eta ²
Full sample physical				Wilk's Lambda F(4, 548)=303.00***	0.69
Reactive	-0.63 (0.31) ^a	0.81 (0.56) ^b	2.34 (0.83) ^c	F(2,275)=557.65***	0.80
Proactive	-0.39 (0.24) ^a	0.15 (0.57) ^b	3.15 (1.40) ^c	F(2,275)=408.72***	0.75
Girls only relational	Low (n=105)	Hi reactive (n=38)	Combined (n=10)	Cluster effect	Eta ²
				Wilk's Lambda F(4, 298)=141.51***	0.66
Reactive	-0.53 (0.32) ^a	0.78 (0.57) ^b	2.30 (0.85) ^c	F(2,150)=268.40***	0.78
Proactive	-0.48 (0.25) ^a	0.27 (0.54) ^b	2.55 (0.96) ^c	F(2,150)=264.00***	0.78

***p<0.001; **p<0.01; *p<0.05; Means with different superscripts differ significantly in pairwise comparisons

Cluster Analyses of the Relational Aggression Subscales
 Similar cluster analyses were conducted using relational aggression subscales of the PCS. However, unlike for physical aggression, these analyses showed very different patterns of aggression for boys and girls. Thus, the cluster analysis in the full sample was not interpreted. For girls, a pattern very similar to the results found for physical aggression emerged. Specifically, the 2 cluster solution differentiated girls into high and low aggression clusters. The 3 cluster solution showed aggressive groupings similar to the physical aggression clusters. This cluster solution resulted in a large group of girls low on aggression (n=105), another cluster that was relatively high on reactive aggression only (n=38), and another group consisting of individuals high on both reactive and proactive relational aggression (n=10), as describe in Table 2. When the 4 and 5 cluster solutions were inspected, again no purely proactively aggressive group emerged. Also in support of the 3 cluster solution, the pseudo F statistic increased from the 2 (343.22) to 3 (476.37) cluster solutions, while the 4 cluster solution resulted in a decrease in the pseudo F statistic (422.10). Similarly, the R2 showed a dramatic jump in variance explained from the 2 (R2=0.41) to the 3 (R2=0.68) cluster solution but only a modest increase when a 4 cluster solution was isolated (R2=0.76). Importantly, the cluster analyses were all run using the child's ID number to determine the initial starting value but the same results were found after randomly resorting variables in the data set and repeating the cluster analyses twice.

For boys, the relational aggression clusters were very different. The 2 cluster solution, like the previous versions, divided the groups into a high relational aggression group and a low relational aggression group. However, the 3 cluster solution resulted in one large group low on both types of aggression (n=76), one group that was moderate on both types of relational aggression (n=44) and a third group high on both types of aggression (n=5). Thus, for

relational aggression in boys, there was no evidence for distinct patterns of reactive and proactive aggression in this sample but simply clusters based on the level of aggressive behaviors.

Validating the Aggression Clusters

In order to validate the clusters, we compared the aggression clusters using constructs that have been differentially associated with reactive and proactive aggression in past research. Three MANCOVA's were conducted to compare the clusters on 1) variables predicted to be most strongly associated with reactive aggression, 2) variables predicted to be most strongly associated with proactive aggression, and 3) bullying behavior from both self and peer report, while controlling for important demographic covariates. Thus, a p-value of p<0.01 was used in these overall tests to adjust for the multiple omnibus tests. Further, given that the results were very similar for boys and girls on the physical aggression cluster, only results from the full sample are reported. Also, given that the relational aggression clusters for boys were only based on level of aggression and not type of aggression, only the comparison of relational aggression clusters in girls are reported.

Differences Among Physical Aggression Clusters: Full Sample
 The physical aggression cluster was first compared on age, gender, and race. The groups differed significantly on age (F (2,264)=4.12, p<0.01) with the combined proactive and reactive aggression group being significantly older (Mn=12.00; SD=1.18) than the low aggression cluster (Mn=11.06; SD=1.85) but not the high reactive cluster (Mn=11.64; SD=1.80). Also, the groups differed in the percentage of Caucasian students (X² (df=2)=12.35, p<0.01) and percentage of girls (X² (df=2)=12.55, p<0.01). Specifically, the low aggression cluster had a greater percentage of Caucasian students (58%) and girls (63%)

than the cluster high on reactive aggression (36% and 42%, respectively) and the cluster high on both forms of aggression (35% and 39%, respectively). Thus, all analyses of group differences were conducted controlling for age, gender, and ethnicity.

Using the more conservative level to determine significance, the overall MANCOVA was significant for the variables predicted to be most associated with reactive aggression, namely, anger dysregulation and impulsivity (Wilk's Lambda; $F(4, 512)=23.31$, $p<0.001$, $\text{Eta}^2=0.15$). The follow up ANCOVA's for both variables were also significant (Eta^2 0.24 and 0.12, for anger dysregulation and impulsivity, respectively). Results of these analyses are presented in Table 3 and this table includes the means and standard deviations for all dependent variables for each cluster. Pairwise comparisons indicated that the three clusters were significantly different from each other on the measure of anger dysregulation. The combined proactive and reactive group had the highest level of anger dysregulation, followed by the high reactive group which was significantly higher than the low aggression group. For impulsivity, pairwise comparisons showed the same pattern of results.

For the variables predicted to be associated with proactive aggression (e.g., CU traits, positive outcome expectations for aggressive behavior, thrill and adventure seeking), the overall MANCOVA was also significant (Wilk's Lambda; $F(6, 508)=14.04$, $p<0.001$, $\text{Eta}^2=0.14$). All three ANCOVA's were also significant (Eta^2 0.05–0.21). Results of these analyses are presented in Table 3.

Follow up pairwise comparisons indicated that the combined group had the highest level of CU traits. Both the reactive only group and the low aggression group showed significantly lower levels of these traits and did not significantly differ from each other. In contrast, pairwise comparisons for positive expectations for aggression indicated that all three groups differed significantly, with the combined group showing the highest level followed by the high reactive and the low aggressive groups. Finally, for the thrill seeking measure, the high reactive cluster and the combined cluster did not differ significantly from each other, although they each differed significantly from the low aggression group.

The third MANCOVA examined differences among the physical aggression clusters on peer reported and self reported bullying behaviors and this also resulted in a significant overall effect (Wilk's Lambda; $F(4, 514)=19.57$, $p<0.001$, $\text{Eta}^2=0.13$). Results of these analyses are also presented in Table 3. Follow up ANCOVA's revealed significant differences for both variables (Eta^2 of 0.14 and 0.21 peer-report and self-report, respectively). Pairwise comparisons indicated that both peer and self-reports of bullying were highest in the combined aggressive group, followed by the reactive only cluster, and the low aggressive cluster.

Differences Among Relational Aggression Clusters: Girls Only Using similar analyses, we examined differences among the relational aggression clusters that emerged in

Table 3 Comparison of Physical Aggression Clusters in Full Sample

	Low ($n=168$)	Hi Reactive ($n=81$)	Combined ($n=15$)	Cluster Effect	Eta^2
Reactive correlates				Wilk's Lambda $F(4, 512)=23.31^{***}$	0.15
Anger dysregulation	4.45 (1.29) ^a	5.82 (1.40) ^b	6.90 (1.21) ^c	$F(2,257)=40.57^{***}$	0.24
Impulsivity	6.32 (1.54) ^a	7.10 (1.23) ^b	8.31 (1.60) ^c	$F(2,257)=16.80^{***}$	0.12
Proactive correlates				Wilk's Lambda $F(6,508)=14.04^{***}$	0.14
CU traits	7.31(1.96) ^a	7.69 (2.09) ^a	9.27(2.13) ^b	$F(3,256)=6.58^{**}$	0.05
Positive expectations	24.79 (6.21) ^a	29.77(7.65) ^b	38.03(5.91) ^c	$F(3,256)=34.72^{***}$	0.21
Thrill seeking	34.28 (6.24) ^a	37.21(6.63) ^b	37.39 (5.38) ^b	$F(3,256)=6.78^{**}$	0.05
Bullying				Wilk's Lambda $F(4, 514)=19.57^{***}$	0.13
Peer report bullying	12.73(2.90) ^a	14.16(2.88) ^b	17.15(3.15) ^c	$F(2,258)=20.10^{***}$	0.14
Self report bullying	1.24(0.69) ^a	1.81(1.00) ^b	3.02(1.44) ^c	$F(2,258)=34.79^{***}$	0.21

*** $p<0.001$, ** $p<0.01$, * $p<0.05$

CU Traits Callous-Unemotional Traits. Effects are the between cluster effects from a one-way MANCOVA followed by individual ANCOVA with age, sex, and ethnicity as the covariates. Means reported are least square means adjusted for the covariates. Means with different superscripts differ significantly in pairwise comparisons

girls. The relational aggression clusters did not differ significantly on age ($F(2, 146) = 8.10, p = n.s.$) but did differ on the percentage of youth who were Caucasian ($X^2(df=2) = 5.70, p < 0.05$) with the non-aggression cluster having a higher percentage of Caucasian students (53%) than the reactive relational aggression (37%) and combined relational aggression (20%) clusters. Thus, ethnicity was included as a covariate in analyses.

The results of these analyses for relational aggression clusters are reported in Table 4 which includes the means and standard deviations across groups for each dependent variable. Overall, the results of these analyses were very similar to what was found for physical aggression in the full sample. Specifically, the MANCOVA for the variables predicted to be associated with reactive relational aggression was significant (Wilk’s Lambda: $F(4, 288) = 15.18, p < 0.001, \eta^2 = 0.17$). Follow up ANCOVA’s on each of the variables were also significant (η^2 of 0.20 for both) and these results are also reported in Table 4. Pairwise comparisons indicated that for anger dysregulation, both relational aggressive clusters differed from the non-aggressive cluster. For impulsivity, the combined cluster had the highest scores followed by the high reactive and the low aggressive clusters.

For the variables predicted to be associated with proactive aggression, the overall MANCOVA was again significant (Wilk’s Lambda: $F(6, 288) = 15.18, p < 0.001, \eta^2 = 0.17$) but only two of the three follow-up ANCOVA’s reached significance. For CU traits, the ANCOVA was also

significant ($\eta^2 = 0.06$) and indicated that only the combined group differed from the low aggression group on these traits. The follow-up ANCOVA for positive expectations for aggression was also significant ($\eta^2 = 0.13$) and revealed that that each cluster differed significantly, with the combined cluster showing the most positive expectations for aggression, followed by the high reactive and the low aggression clusters. The follow-up ANCOVA did not indicate significant differences across relational aggression clusters on thrill seeking.

When comparing the relationally aggressive clusters on bullying behaviors, the MANCOVA was again significant (Wilk’s Lambda: $F(2, 290) = 12.32, p < 0.001, \eta^2 = 0.15$) and the follow up ANCOVA’s (see Table 4) conducted for both peer- ($\eta^2 = 0.22$) and self-reports ($\eta^2 = 0.16$) were also significant. Pairwise comparisons indicated that all of the clusters differed on both self and peer reported bullying, with the most bullying behaviors being displayed by the combined group, followed by the high reactive group, and low aggressive groups.

Overlap Between Physical Aggressive and Relational Aggressive Clusters-Girls Only

A chi-square analysis was conducted to examine the overlap between the two aggressive clusters in girls. The results of this analysis are reported in Table 5 and it resulted in a significant chi-square ($X^2(df=4) = 76.01; p < 0.001$). Several interesting patterns emerged from these analyses.

Table 4 Comparison of Relational Aggression Clusters-girls Only

	Low (n=105)	Hi Reactive(n=38)	Combined (n=10)	Cluster Effect	η^2
Reactive correlates				Wilk’s Lambda $F(4, 288) = 15.18^{***}$	0.17
Anger dysregulation	4.44 (1.29) ^a	5.78(1.34) ^b	6.05(1.17) ^b	$F(2, 145) = 18.57^{***}$	0.20
Impulsivity	5.89(1.30) ^a	6.87(1.26) ^b	8.22 (1.20) ^c	$F(2, 145) = 18.30^{***}$	0.20
Proactive correlates				Wilk’s Lambda $F(6, 288) = 5.30^{***}$	0.10
CU traits	7.02(1.93) ^a	7.64(1.74) ^{ab}	8.80(1.79) ^b	$F(2, 146) = 4.73^{**}$	0.06
Positive expect.	24.68(6.82) ^a	27.59(7.29) ^b	34.74(3.66) ^c	$F(2, 146) = 11.17^{***}$	0.13
Thrill	32.93(6.64)	34.20(5.84)	35.26(7.22)	$F(2, 146) = 0.96$	0.01
Bullying				Wilk’s Lambda $F(4, 290) = 12.32^{***}$	0.15
Peer report bullying	12.16(2.85) ^a	14.22(2.84) ^b	17.38(2.93) ^c	$F(2, 146) = 20.92^{***}$	0.22
Self report bullying	1.22(.64) ^a	1.82(1.10) ^b	2.44 (1.51) ^c	$F(2, 146) = 13.72^{***}$	0.16

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$

CU Traits Callous-Unemotional Traits

Effects are the between cluster effects from a one-way MANCOVA followed by individual ANCOVA with ethnicity as the covariate. Means reported are least squares means adjusted for the covariates. Means with different superscripts differ significantly in pairwise comparisons

Table 5 Overlap Between the Relational and Physical Aggression Clusters using the Peer Conflict scale- Girls Only

Physical aggression cluster	Low relational	Reactive relational	Combined relational	Chi-square
Low Physical	90	21	0	
Reactive Physical	13	17	5	
Combined Physical	2	0	5	$X^2(df=4)=76.01^{***}$

First, all of the girls in the combined proactive and reactive relational aggression clusters fell into one of the two physically aggressive clusters. Second, there were 15 girls who were in the low relational aggression cluster but who were classified in the reactive physical aggressive cluster ($n=13$) or combined physical aggression cluster ($n=2$). Third, over half ($n=21$, 55%) of the girls who were in the high reactive relational cluster fell in the low physical aggression cluster.

Discussion

The results of our cluster analysis supports past research suggesting that there are two distinct groups of children with aggressive behavior; one group that shows moderate levels of reactive aggression only and one that shows high rates of both reactive and proactive forms of aggression. Such findings have been found in clinic-referred (Dodge and Coie 1987), non-referred (Brown et al. 1996; Frick et al. 2003) and adjudicated (Munoz et al. 2008; Pitts 1997) samples. Given the consistency of these findings, the significant correlation between these two forms of aggression needs to be interpreted in light of this clustering of individuals. Specifically, studies showing different correlates to reactive and proactive aggression need to be interpreted in light of the fact that children with proactive aggression also typically show significant levels of reactive aggression as well (Frick et al. 2003; Hubbard et al. 2002).

We tested predictions from two methods for explaining these clusters of youths. One explanation suggests that the combined aggressive group is largely a more severely disturbed group. The second explanation suggests that there may be qualitatively distinct emotional and cognitive characteristics for the two aggressive groups. Our results were largely consistent with the first model. That is, the combined group consistently showed the highest rates of emotional and cognitive risk factors, including those typically associated with reactive aggression (e.g., emotional dysregulation, impulsivity) and those typically associated with proactive aggression (e.g., positive outcome

expectancies for aggressive behavior). Further, this group also showed the highest rates of bullying behaviors, based on both self-report and peer-report. Thus, this cluster, which accounted for only 7% of this school-based sample, is a group that shows a number of characteristics to suggest that they should be important targets of school-based intervention programs (Lynn et al. 2003).

In the analyses of physical aggression, there was a much larger of group of children with moderate levels of reactive aggression (31%). Although this group was clearly less severe on most measures than the combined group, they also showed several characteristics that could indicate the need for services. Specifically, they showed more problems regulating anger, higher levels of impulsivity, more positive expectancies for aggression, and stronger preferences for thrill seeking behaviors than non-aggressive students. Most importantly, however, they also showed higher rates of bullying. Thus, programs targeting a reduction in bullying in school settings need to consider these children with problems regulating their emotions and integrate treatment components that directly target the emotional and cognitive deficits displayed by these youths (Lochman et al. 2008).

One notable exception to the trend for the two aggressive clusters to differ largely in severity, rather than in type of risk factor, was the finding for callous-unemotional (CU) traits. Specifically, only the group high on both proactive and reactive aggression differed from non-aggressive children on these traits. Although this was only one variable, this finding is important given that CU traits are associated with a severe and stable pattern of antisocial behavior (see Frick and Dickens 2006 for a review) and they tend to be associated with distinct temperament and emotional correlates, such as being associated with a lack of responsiveness to distress cues in others (see Frick and White 2008 for a review). Thus, the presence of CU traits was one of the few indicators in the current study that this group may have unique affective risk factors compared to other aggressive youth. Further, this finding supports the contention that children with only reactive forms of aggression may be distressed by the effect of their behavior on others but have difficulty regulating their emotions sufficiently to inhibit their aggressive behavior (Frick and Morris 2004).

Importantly, our results showed that the different aggression clusters emerged for both boys and girls for physical aggression but only for girls in analyses using relational aggressive behaviors. Further, within girls, the pattern of cognitive and emotional correlates was very similar to what was found for physical aggression. Importantly, this was the case for bullying as well, with both clusters of relationally aggressive girls showing more bullying behaviors by both peer and self-report. These

findings support past research suggesting that relational aggression may be particularly important for understanding aggressive behavior in girls (Archer and Coyne 2005; Crick 1996; Lagerspetz et al. 1988; Ostrov and Keating 2004; Underwood et al. 2001). Also, our results suggest that, although boys may also show relational aggression, the distinct profiles (e.g., reactive aggression only; combined reactive/proactive aggression) may not be apparent. Given that such gender specific patterns have not been studied in previous research, such findings should be replicated before conclusive statements can be made. However, these findings could suggest that the causes of relational aggression in boys may be different from the causes of physical aggression, whereas in girls the two forms of aggression may be related to similar causal factors.

We also tested how many aggressive girls would be missed, if only measures of physical aggression or only measures relational aggression had been used (see Table 5). These analyses indicated that there is fairly strong correspondence between the two methods of clustering the sample, especially for those viewed as non-aggressive and those that fall into the high combined reactive/proactive cluster. The differences between the two approaches largely were due to differences in the moderate reactive aggression cluster. That is, 13 girls (12%) who were low in relational aggression showed moderate levels of reactive physical aggression and 21 girls (19%) in the low physical aggression cluster showed moderate levels of reactive relational aggression. Given the evidence from our analyses that these clusters showed risk factors for problem behavior (e.g., elevated levels of emotional dysregulation and impulsivity) and they showed higher levels of bullying behaviors, it suggests that adequate assessments of aggression in girls should include measures of both relational and physical aggression.

All of these findings need to be interpreted in light of several limitations in the study. First, with the exception of the peer-report of bullying, all other measures were self-report. Thus, the associations with cluster membership could be inflated due to shared method variance among the measures. Importantly, however, the one measure that was not self-report (i.e., peer-reported bullying) showed very similar results to the self-report measures. Also, past studies using the self-report measure of aggression have shown that it is correlated with laboratory measures of aggression and psychophysiological correlates to aggression (Munoz et al. 2008). Further, the differential associations across clusters (all of which were formed by self-report) for the callous-unemotional measure cannot be fully explained by method variance. Second, several of the measures had a relatively low number of items that resulted in poor internal consistency estimates. Thus, improved measurement of these constructs may have resulted in more power to detect significant differences

across groups. Third, the measure of aggression in this study has primarily been used in older samples. Further, some of the items related to physical aggression describe fighting with other children, whereas other items describe “hurting others”, which could be interpreted as including acts other than physical harm. Fourth, although the sample was representative of the participating schools and was ethnically diverse, the schools were from a semi-rural area and, as a result, it is not clear how well the findings would generalize to schools from urban areas. Fifth, the modest participation rate may have influenced the findings, in that the most aggressive children may have been less likely to participate. We feel that even with this level of participation, the range of aggressive behavior in this sample is more typical to that found in middle schools than if a clinic or forensic sample was studied. Further, this participation rate is consistent with the rate of active parental consent found in research conducted in other Title I schools characterized by a high rate of poverty (Esbesnsen et al. 2008). Finally, a large study of 13,195 students from 143 high schools did not find that participation rates differed based on the students’ aggressive behavior (i.e., carried a weapon during the past 30 days; been in a physical fight during the past 12 months) (Eaton et al. 2004).

With these cautions in mind, our results have several important implications. First, our findings support previous research to suggest that there is a group of school children who show high levels of both reactive and proactive aggression and they appear to be important targets of intervention. Most importantly, they show high rates of CU traits and these traits in childhood have been linked to a severe and chronic patterns of antisocial behavior that last into adolescence and adulthood (e.g., Burke et al. 2007; Frick et al. 2005; Lynam et al. 2007). In addition, this combined aggression group showed the highest rate of bullying behaviors in this school-based sample. This is a critical finding in light of research showing that the experience of bullying can lead to significant and long-term problems for its victims (Storch et al. 2005). Second, our results suggest that there is a second group of aggressive youth who show less severe problems of reactive aggression. Although not at the level of the combine group, children in the reactive group showed problems in their ability to regulate their emotions (e.g., anger dysregulation) and they showed higher rates of bullying than non-aggressive youth. Thus, they also appear to be in need of services, albeit potentially at a lower level of intensity than the combined group. Third, our results suggest that utilizing either measures of relational aggression or physical aggression alone would not identify a significant number of girls with mild levels of reactive aggression who show a number of problems in adjustment that may benefit from intervention.

References

- Archer, J. & Coyne, S. (2005). An integrated review of indirect, relational, and social aggression. *Personality and Social Psychology Review*, 9, 212–230.
- Atkins, M., Osborne, M., Bennett, D., Hess, L., & Halperin, J. (2001). Children's competitive peer aggression during reward and punishment. *Aggressive Behavior*, 27, 1–13.
- Barker, E. D., Tremblay, R. E., Nagin, D. S., Vitaro, F., & Lacourse, E. (2006). Development of male proactive and reactive physical aggression during adolescence. *Journal of Child Psychology and Psychiatry*, 47(8), 783–790.
- Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control*. New York: Academic.
- Biggs, B. K., Twemlow, S. W., Fonagy, P., & Dill, E. J. (2008). Teacher adherence and its relations to teacher attitudes and student outcomes in an elementary school-based violence prevention program. *School Psychology Review*, 37, 533–549.
- Brown, K., Atkins, M., Osborne, M., & Osborne, M. (1996). A revised teacher rating scale for reactive and proactive aggression. *Journal of Abnormal Child Psychology*, 24, 473.
- Burke, J. D., Loeber, R., & Lahey, B. B. (2007). Adolescent conduct disorder and interpersonal callousness as predictors of psychopathy in young adults. *Journal of Clinical Child and Adolescent Psychology*, 36, 334–346.
- Bushman, B. J. & Anderson, C. A. (2001). Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychological Review*, 108, 273–279.
- Camodeca, M., Goossens, F. A., Terwogt, M. M., & Schuengel, C. (2002). *Bullying and victimization among school-age children: Stability and links to proactive and reactive aggression*. Maryland: Blackwell.
- Card, N. A. & Little, T. D. (2006). Proactive and reactive aggression in childhood and adolescence: a meta-analysis of differential relations with psychosocial adjustment. *International Journal of Behavioral Development*, 30, 466–480.
- Card, N., Stucky, B., Sawalani, G., & Little, T. (2008). Direct and indirect aggression during childhood and adolescence: a meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development*, 79, 1185–1229.
- Cohen, J. (1983). The cost of dichotomization. *Applied Psychological Measurement*, 7, 249–253.
- Costello, E. J. & Angold, A. (2006). Developmental epidemiology. In D. Cichetti & D. J. Cohen (Eds.), *Developmental psychopathology, Vol.1: Theory and method* (2nd ed., pp. 41–75). Hoboken: Wiley.
- Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development*, 67, 2317–2327.
- Crick, N. & Dodge, K. (1996). Social information-processing mechanisms on reactive and proactive aggression. *Child Development*, 67, 993–1002.
- Crick, N. & Grotpeter, J. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development*, 66, 710–722.
- Crick, N. R., Casas, J. F., & Mosher, M. (1997). Relational and overt aggression in preschool. *Developmental Psychology*, 33, 579–588.
- David, C. F. & Kistner, J. A. (2000). Do positive self-perceptions have a “dark side”? Examination of the link between perceptual bias and aggression. *Journal of Abnormal Child Psychology*, 28, 327–337.
- Dill, E. J., Vernberg, E. M., Fongay, P., Twemlow, S. W., & Gamm, B. K. (2008). Negative affect in victimized children: the roles of social withdrawal, peer rejection, and attitudes toward bullying. *Journal of Abnormal Child Psychology*, 32, 159–173.
- Dodge, K. A. & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, 53, 1146–1158.
- Eaton, D. K., Lowry, R., Brener, N. D., Grunbaum, J. A., & Kann, L. (2004). Passive versus active parental permission in school-based research: does the type of permission affect prevalence estimates of risk behaviors? *Evaluation Review*, 28, 564–577.
- Esbesnsen, F. A., Melde, C., Taylor, T. J., & Peterson, D. (2008). Active parental consent in school-based research: how much is enough and how do we get it? *Evaluation Review*, 32, 335–362.
- Frick, P. J. (2006). Developmental pathways to conduct disorder. *Child Psychiatric Clinics of North America*, 15, 311–332.
- Frick, P. & Dickens, C. (2006). Current perspectives on conduct disorder. *Current Psychiatry Reports*, 8, 59–72.
- Frick, P. J. & Hare, R. D. (2001). *Antisocial process screening device: Technical manual*. New York: Multi-Health Systems.
- Frick, P. J. & Morris, A. S. (2004). Temperament and developmental pathways to conduct problems. *Journal of Clinical Child and Adolescent Psychology*, 33, 54–68.
- Frick, P. & White, S. (2008). Research review: the importance of callous-unemotional traits for developmental models of aggressive and antisocial behavior. *Journal of Child Psychology & Psychiatry*, 49, 359–375.
- Frick, P., Cornell, A., Bodin, S., Dane, H., Barry, C., & Loney, B. (2003). Callous-unemotional traits and developmental pathways to severe conduct problems. *Developmental Psychology*, 39, 246–260.
- Frick, P. J., Lilienfeld, S. O., Ellis, M., Loney, B. & Silverthorn, P. (1999). The association between anxiety and psychopathy dimensions in children. *Journal of Abnormal Child Psychology*, 27, 383–392.
- Frick, P. J., Stickle, T. R., Dandreaux, D. M., Farrell, J. M., & Kimonis, E. R. (2005). Callous-unemotional traits in predicting the severity and stability of conduct problems and delinquency. *Journal of Abnormal Psychology*, 33, 471–487.
- Hubbard, J., Cillessen, A., Dodge, K., Coie, J., & Schwartz, D. (2001). The dyadic nature of social information processing in boys' reactive and proactive aggression. *Journal of Personality & Social Psychology*, 80, 268–280.
- Hubbard, J. A., Smithmyer, C. M., Ramsden, S. R., Parker, E. H., Flanagan, K. D., Dearing, K. F., et al. (2002). Observational, physiological, and self-report measures of children's anger: relations to reactive versus proactive aggression. *Child Development*, 73, 1101–1118.
- Kimonis, E., Frick, P., Skeem, J., Marsee, M., Cruise, K., Munoz, L., et al. (2008). Assessing callous-unemotional traits in adolescent offenders: validation of the inventory of callous-unemotional traits. *International Journal of Law & Psychiatry*, 31, 241–252.
- Kruh, I. P., Frick, P. J., & Clement, C. B. (2005). Historical and personality correlates to the violence patterns of juveniles tried as adults. *Criminal Justice and Behavior*, 32, 69–96.
- Lagerspetz, K. M. J., Bjorkqvist, K., & Peltonen, T. (1988). Is indirect aggression typical of females? Gender differences in aggressiveness in 11- to 12-year-old children. *Aggressive Behavior*, 14, 403–413.
- Little, T. D., Jones, S. M., Henrich, C. C., & Hawley, P. H. (2003). Disentangling the “whys” from “whats” of aggressive behavior. *International Journal of Behavioral Development*, 27, 122–133.
- Lochman, J.E., Wells, K., & Lenhart L (2008). *Coping power: Child group facilitator's guide*. Oxford University Press.
- Loney, B. R., Frick, P. J., Clements, C. B., Ellis, M. L., & Kerlin, K. (2004). Callous-unemotional traits, impulsivity, and emotional processing in adolescents with antisocial behavior problems. *Journal of Clinical Child and Adolescent Psychology*, 32, 66–80.

- Lynam, D. R., Hoyle, R. H., & Newman, J. P. (2006). The perils of partialling: cautionary tales from aggression and psychopathy. *Assessment, 13*, 328–341.
- Lynam, D. R., Caspi, A., Moffitt, T., Loeber, R., & Stouthamer-Loeber, R. (2007). Longitudinal evidence that psychopathy scores in early adolescence predict young adult psychopathy. *Journal of Abnormal Psychology, 116*, 155–165.
- Lynn, C., McKay, M., & Atkins, M. (2003). School social work: meeting the mental health needs of students through collaboration with teachers. *Children & Schools, 25*, 197–209.
- Marsee, M.A., Barry, C.T. Frick, P.J., Kimonis, E.R., Muñoz, L.C., & Aucoin, K.J. (2006). Factor structure of the peer conflict scale in a sample of juvenile justice involved youth. Manuscript in preparation.
- Marsee, M. & Frick, P. (2007). Exploring the cognitive and emotional correlates to proactive and reactive aggression in a sample of detained girls. *Journal of Abnormal Child Psychology, 35*, 969–981.
- Marsee, M. A., Weems, C. F., & Taylor, L. K. (2008). Exploring the association between aggression and anxiety in youth: a look at aggressive subtypes, gender, and social cognition. *Journal of Child and Family Studies, 17*, 154–168.
- Munoz, L. C. & Frick, P. J. (2007). The reliability, stability, and predictive utility of the self-report version of the antisocial process screening device. *Scandinavian Journal of Psychology, 48*, 299–312.
- Munoz, L. C., Frick, P. J., Kimonis, E. R., & Aucoin, K. J. (2008). Types of aggression, responsiveness to provocation and callous-unemotional traits in detained adolescents. *Journal of Abnormal Child Psychology, 36*, 15–28.
- Nansel, R. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Sheidt, P. (2001). Bullying behaviors among US youth: prevalence and association with psychosocial Adjustment. *Journal of the American Medical Association, 285*, 2094–2100.
- Olweus, D. (1991). Bully/victim problems among school children: basic facts and effects of a school based intervention program. In D. Pepler & K. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 441–448). Hillsdale: Erlbaum.
- Olweus, D. (2001). Peer harassment: a critical analysis and some important issues. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: the plight of the vulnerable and victimized* (pp. 3–20). New York: Guilford.
- Ostrov, J. M. & Keating, C. F. (2004). Gender differences in preschool aggression during free play and structured interactions: an observational study. *Social Development, 13*, 256–277.
- Phillips, N. & Lochman, J. (2003). Experimentally manipulated change in children's proactive and reactive aggressive behavior. *Aggressive Behavior, 29*, 215–227.
- Pitts, T. B. (1997). Reduced heart rate levels in aggressive children. In A. Raine, P. A. Brennan, D. P. Farrington & S. A. Mednick (Eds.), *Biosocial bases of violence* (pp. 317–320). New York: Plenum.
- Poulin, F. & Boivin, M. (2000). Reactive and instrumental aggression: evidence of a two factor model. *Psychological Assessment, 12*, 115–122.
- Prinstein, M. J., Boergers, J., & Vernberg, E. M. (2001). Overt and relational aggression in adolescents: social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology, 30*, 479–491.
- Putallaz, M., Grimes, C. L., Foster, K. J., Kupersmidt, J. B., Coie, J. D., & Dearing, K. (2007). Overt and relational aggression and victimization: multiple perspectives within the school setting. *Journal of School Psychology, 45*, 523–547.
- Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., et al. (2006). The reactive-proactive aggression questionnaire: differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior, 32*, 159–171.
- Rhys, G. S. & Bear, G. G. (1997). Relational aggression and peer relations: gender and developmental issues. *Merrill-Palmer Quarterly, 43*(1), 87–106.
- Russo, M. F., Garnett, S. S., Lahey, B. B., et al. (1993). A sensation seeking scale for children: further refinement and psychometric development. *Journal of Psychopathology and Behavioral Assessment, 15*, 69–86.
- Salmivalli, C. & Nieminen, E. (2002). Proactive and reactive aggression among school children: bullies, victims, and bully-victims. *Aggressive Behavior, 28*, 30–44.
- Solberg, M. E., Owleaus, D., & Endresen, I. M. (2007). Bullies and victims at school: are they the same pupils? *British Journal of Educational Psychology, 7*, 441–467.
- Sourander, A., Jensen, P., Ronning, J. A., Niemela, S., Helenius, H., Sillanmaki, L., et al. (2007). What is the early adulthood outcome of boys who bully or are bullied in childhood: the Finnish “From a Boy to a Man study”. *Pediatrics, 120*, 397–404.
- Storch, E. A., Masia-Warner, C., Crisp, H., & Stein, R. G. (2005). Peer victimization and Social anxiety in adolescence: a prospective study. *Aggressive Behavior, 31*, 437–452.
- Underwood, M. K., Galen, B. R., & Paquette, J. A. (2001). Admirations rather than hostilities: response to Archer, Bjorkqvist, and Crick et al. *Social Development, 10*, 275–280.
- Unever, J. D. (2005). Bullies, aggressive victims, and victims: are they distinct groups? *Aggressive Behavior, 31*, 153–171.
- Vernberg, E. M., Jacobs, A. K., & Hershberger, S. L. (1999). Peer victimization and attitudes about violence during early adolescence. *Journal of Clinical Child Psychology, 28*, 386–395.
- Walters, G. D. (2005). Proactive and reactive aggression: a lifestyle view. In J. P. Morgan (Ed.), *Psychology of Aggression* (pp. 29–43). Hauppauge: Nova Science.
- Zeman, J., Shipman, K., & Penza-Clyve, S. (2001). Development and initial validation of the children's sadness management scale. *Journal of Nonverbal Behavior, 25*, 187–205.