

Reactive and Proactive Aggression: Predictions to Physical Violence in Different Contexts and Moderating Effects of Parental Monitoring and Caregiving Behavior¹

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This study aimed at (a) comparing the links of proactive and reactive aggression at 13 years of age to delinquency-related violence and dating violence at ages 16 and 17, and (b) examining the moderating effects of parental supervision, and mother's and father's warmth and caregiving behaviors on these links. Based on a sample of 525 Caucasian boys, the results showed that proactive aggression uniquely predicted delinquency-related violence, whereas reactive aggression uniquely predicted later dating violence. The relation between proactive aggression and delinquency-related violence, however, was moderated by parental supervision. The relation between reactive aggression and dating violence was moderated by mother's warmth and caregiving behavior. The implications of the findings for the theoretical and practical distinction between proactive and reactive aggression are discussed.

KEY WORDS: proactive aggression; reactive aggression; delinquency-related violence; dating violence.

In recent years, researchers have emphasized the distinction between two types of aggressive behavior: proactive and reactive aggression (e.g., Dodge, 1991). Proactive aggression, which has been described as instrumental, offensive, and "cold-blooded," requires neither provocation nor anger. In contrast, reactive aggression has been described as affective, defensive, and "hot-blooded," involving angry outbursts in response to actual or perceived provocations or threats. Although proactive and reactive aggression often co-occur, not all aggressive individuals display both forms of aggressive behavior. Specifically, although around 53% of children who engage in some form of aggressive behavior have been found to be both

proactively and reactively aggressive, around 32% are only reactively but not proactively aggressive. Comparatively few children, around 15%, seem to engage only in proactive but not in reactive aggression, however (Dodge, Lochman, Harnish, Bates, & Pettit, 1997).

The discriminant validity of proactive and reactive aggression on a factorial level has been demonstrated recently in a study by Poulin and Boivin (2000a) who showed in a sample of preadolescent boys that, despite a substantial correlation between proactive and reactive aggression, a two-factor model presented a better fit to the data than a single-factor model. Further evidence supporting the concurrent discriminant validity of the two types of aggression has also been found with regard to social cognitive and behavioral correlates. Thus, reactively aggressive but not proactively aggressive children have been found to attribute hostile intent to others' actions (Dodge & Coie, 1987), and they have more difficulties encoding social cues (Dodge et al., 1997). Reactively but not proactively aggressive children are also less skilled at sharing, negotiating, and compromising in interaction with peers, and they are less able to handle teasing or failure (Day, Bream, & Pal, 1992). On the other hand, proactively aggressive children generally display greater self-efficacy and fewer

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internalizing problems than reactively aggressive children (Dodge et al., 1997).

The longitudinal correlates of proactive and reactive aggression in children also seem to differ. Thus, only proactive aggression in boys during early adolescence has been related to delinquent behavior in midadolescence (Vitaro, Gendreau, Tremblay, & Oligny, 1998) and early adulthood (Pulkkinen, 1996). In contrast, reactive aggression does not predict later externalizing problems once proactive aggression is controlled, not even when physical violence against others is specifically considered as the outcome (Vitaro, 1997). These findings suggest that reactive aggression per se is not a risk factor for future externalizing problems or violent behavior in particular. This conclusion, however, may be misleading. In fact, childhood reactive aggression may be as much a predictor of future physically violent behavior as proactive aggression, albeit not necessarily in the same situational context. Indeed, much of the physical violence assessed in previous studies as an outcome of proactive and reactive aggression occurred in more impersonal, delinquency-related contexts that involved relative strangers as victims (e.g., involvement in gang fights; Vitaro, 1997). The mostly offensive and instrumental nature of these types of violent acts may explain why unique predictive links were only found for proactive but not for reactive aggression. A completely different picture may emerge, however, if violent acts are considered that occur within the contexts of intimate relationships.

Research with male adults (Gelles & Straus, 1988; Prince & Arias, 1994) suggests that physical violence in intimate relationships may follow one of two patterns: On the one hand, physical violence may be used as part of a proactive, instrumental strategy to control and intimidate the partner. Abusive males who mainly follow this first pattern of violence are characterized by high self-esteem, which is also characteristic of proactively aggressive individuals (Dodge et al., 1997). On the other hand, physical violence against the partner may occur in a reactive manner, as a form of defense against feelings of frustration or vulnerability in conflict situations with the partner. Abusive males who mainly follow this pattern of violence often experience internalizing problems such as low self-esteem (Prince & Arias, 1994), which is also characteristic of reactively aggressive individuals (Dodge et al., 1997). These findings suggest that individuals with a disposition toward proactive aggression may be at risk of violent behavior not only in delinquency-related contexts but also in the context of intimate relationships. Perhaps even more importantly, however, the findings further suggest that reactively aggressive individuals may also be at risk of violent behavior in their intimate relationships, even though

they may not be prone to delinquency-related violence. To test this hypothesis, the first goal of the present study was to examine the predictive links of proactive and reactive aggression to boys' subsequent delinquency-related physical violence and physical violence in their dating relationships.

Related to the question of whether reactive as well as proactive aggression increases the risk of later externalizing problems (specifically, physical violence against others) is the question of whether there are protective factors that may help reduce this risk. Of specific interest in this context are protective factors that may be amenable to practical intervention efforts, such as parenting behavior. As such, the second goal of this study was to examine whether the expected predictive links of proactive and reactive aggression to later delinquency-related violence and dating violence would be moderated by the level of adaptive parental behavior experienced in the interim period. Notably, proactive and reactive aggression may differ in regard to which specific parental behavior may moderate the associated risk of subsequent violence, because the two types of aggression are believed to be influenced by different types of parenting behavior.

As proposed by Dodge (1991), proactive aggression may be fostered through explicit or implicit parental endorsement, for example through a lack of parental discipline, monitoring, and control, which encourages the child to view and use aggression and violence as an acceptable, successful means of goal achievement. As such, high levels of parental monitoring should reduce the risk of later violence in delinquency-related and dating-related contexts associated with proactive aggression. Indirect support for this notion is provided through intervention studies that showed that aggressive children's delinquency-related violence significantly decreased after improving parental monitoring skills (e.g., Vitaro, Brendgen, & Tremblay, *in press*). In contrast to proactive aggression, reactive aggression is assumed to be promoted by parenting behaviors that result in a poor attachment relationship between the parents and the child, for example through a lack of warmth and caregiving behavior toward the child, which in turn may foster feelings of insecurity, vulnerability, and eventually hostility and aggression in social relationships (Dodge, 1991). Thus, the experience of warmth and caregiving from parents should diminish the risk of later violence in dating relationships associated with reactive aggression.

In summary, the present study examined the predictive relations of proactive and reactive aggression in early adolescent boys to delinquency-related physical violence and physical violence against the dating partner during midadolescence. It was hypothesized that proactive

but not reactive aggression would uniquely predict later delinquency-related physical violence. Unique predictive effects of both proactive and reactive aggression, however, were expected for the perpetration of physical violence against the dating partner. We further examined (a) whether the degree of experienced parental monitoring and control moderates the expected predictive relations of proactive aggression to later delinquency-related violence and violence against the dating partner, and (b) whether the degree of experienced parental warmth and caregiving moderates the expected predictive link of reactive aggression to later violence against the dating partner. We expected that low levels of adaptive parenting (i.e., low levels of parental monitoring or caregiving behavior) would increase the expected predictive links, whereas high levels of adaptive parenting should diminish the expected relations.

Proactive and reactive aggression were assessed when the boys were 13 years of age. At this age, aggressive behavior problems are well established (Loeber & Hay, 1997), but delinquent behavior patterns have not yet fully emerged and most boys have not yet engaged in social dating (Laursen & Williams, 1997). Delinquency-related physical violence and physical violence against the dating partner were assessed when the boys were 16 and 17 years of age. At that time, violent delinquent behavior reaches its peak (Loeber & Hay, 1997) and already a substantial proportion (at least 11%) of adolescents engage in or sustain physical violence in their dating relationships (Malik, Sorenson, & Aneshensel, 1997; Roscoe & Kelsey, 1986). Because both types of violent behavior nevertheless only occur in a minority of youth, we also aimed at maximizing the variability in the two measures of violence by using 2 years of assessment (age 16 and 17) of delinquency-related physical violence and physical violence against the dating partner. In order to avoid the problem of shared source variance (Bank, Dishion, Skinner, & Patterson, 1989), teacher reports were used to assess boys' proactive and reactive aggression and self-reports were used to assess boys' perpetration of violent behavior. The prospective moderator variables (i.e., parental supervision and parental warmth and caregiving behavior) were collected between the assessment of the predictors and the outcomes in order to examine whether these parental behaviors could alter the relations of proactive and reactive aggression to later violence.

METHOD

Participants

The participants of this study were 525 Caucasian boys from low socioeconomic areas of Montreal, Canada.

All the boys' parents were French-speaking and indicated that they had, on average, 10.71 years of schooling ($SD = 2.69$). In addition, the parents' average occupational prestige according to the Blishen and McRoberts's Occupational Prestige Scale (Blishen & McRoberts, 1976), which was also assessed through parents' reports, was somewhat lower than the national norm (occupational prestige averaged across both parents or of working parent, $M = 38.81$, $SD = 10.01$, compared with $M = 42.08$, $SD = 12.09$ for a representative sample of parents with sons of the same age living in the Province of Quebec). The study sample was part of an all-male sample ($N = 866$) who had been assessed at 13 years of age. From the initial sample, 132 boys (15.2%) were lost through attrition over time. Of the remaining 734 participants, only those boys who had dated at ages 16 and 17 (71.5%) filled out the questionnaire on physical violence against the dating partner (see description below), which reduced the final sample size to 525 boys. The boys in the final study sample differed from those who were dropped through attrition or because they had not dated in that the former were less proactively and less reactively aggressive than the latter, $M = 0.53$, $SD = 1.03$ versus $M = 1.14$, $SD = 1.81$ for proactive aggression, $t(864) = 6.33$, $p < .001$, and $M = 0.97$, $SD = 1.38$ versus $M = 1.63$, $SD = 2.09$ for reactive aggression, $t(864) = 5.64$, $p < .001$. Moreover, the parents of the boys in the study sample had more years of schooling than parents of the boys who were dropped from the study, $M = 10.71$, $SD = 2.69$ versus $M = 10.16$, $SD = 2.87$, $t(864) = -2.84$, $p < .01$, but they did not differ with respect to occupational prestige. A detailed description of the assessment procedure has been given in previous work (Vitaro et al., 1998).

Measures

Proactive and Reactive Aggression

In keeping with the existing studies on proactive and reactive aggression, teachers completed the three proactive and the three reactive items used by Dodge and Coie (1987) when the boys were 13 years of age. The construct validity of teacher-rated child behavior, as indicated by the relation with peer-rated behavior and behavior observations, has been demonstrated in previous research (Achenbach, McConaughy, & Howell, 1987). The three proactive aggression items were "This child uses (or threatens to use) physical force in order to dominate other children," "This child threatens or bullies others in order to get his way," "This child gets other children to gang up on a peer he does not like." The three reactive aggression items were "When this child has been teased or

threatened he gets angry easily and strikes back," "When a peer accidentally hurts this child (such as bumping into him) this child assumes that the peer meant to do it and then overreacts with anger and fighting," "This child always claims that other children are to blame in a fight and feels that they started the whole trouble." The 3-unit response scale for these items ranged from 0 "does not apply," and 1 "applies sometimes," to 2 "applies often." Internal consistency for the total proactive and reactive aggression scores, which were computed by summing the respective items, was satisfactory [Cronbach's alpha (α) for proactive aggression = .86, $M = 0.53$, $SD = 1.02$, Skewness = 2.35, Kurtosis = 6.13; α for reactive aggression = .86, $M = 0.97$, $SD = 1.37$; Skewness = 1.57, Kurtosis = 2.05].

Of the 525 boys in the sample, 374 or 71.2% received a total proactive aggression score of 0, indicating that they had never engaged in proactively aggressive behavior, whereas 151 or 28.8% received a total proactive aggression score of 1 or more, indicating that they had engaged at least sometimes in at least one proactively aggressive behavior. Regarding reactive aggression, 288 or 54.9% of the boys in the sample received a total score of 0 and 237 or 45.1% of boys received a score of 1 or more. As in previous studies (e.g., Vitaro et al., 1998), there was a significant association between proactive and reactive aggression. Specifically, 276 boys (52.6%) were not rated by their teachers as either proactively or reactively aggressive, 12 boys (2.3%) were rated as only proactively aggressive, 98 boys (18.7%) were rated as only reactively aggressive, and 139 boys (26.5%) were rated as both proactively and reactively aggressive, $\chi^2(1) = 188.35$, $p < .001$. The relative percentages of boys in the three aggression groups were relatively similar to that found in previous studies (e.g., Dodge et al., 1997).

Following recommendations by Tabachnik and Fidell (1996) for L-shaped distributions, inverse transformations were conducted with the total continuous proactive and reactive aggression scores to reduce the skew and kurtosis of the distributions for statistical analysis. Prior to the transformations, the proactive and reactive aggression scores were rescaled so that they had a minimum score of 1. The transformed scores were then reflected so that a score of 0 again represented no aggressive behavior ($M = 0.18$, $SD = 0.28$, Skewness = 1.10, Kurtosis = -0.54 for proactive aggression, and $M = 0.29$, $SD = 0.33$, Skewness = 0.39, Kurtosis = -1.63 for reactive aggression).

Delinquency-Related Physical Violence and Physical Violence Against the Dating Partner

At 16 and again at 17 years of age, the participants completed four items referring to their level of endorse-

ment of delinquency-related physical violence. Self-reports have been found to be valid measures of delinquent behavior as indicated by the correlation with official arrest records (Hindelang, Hirschi, & Weiss, 1981; Klein, 1989). The four items, which are part of a larger scale assessing overt and covert delinquency (LeBlanc & Tremblay, 1988), inquired whether the participant had (a) beaten up other boys, (b) engaged in a gang fight, (c) thrown objects (e.g., rocks, bottles) at other people, and (d) used a weapon in a fight. These items were chosen to closely match the delinquency-related physical violence items used by Vitaro (1997), thus facilitating the comparability of the present results regarding delinquency-related physical violence with those of previous research. The participants were asked to indicate whether they had never (1), rarely (2), sometimes (3), or often (4) engaged in each act. Internal consistency for the total scale of delinquency-related physical violence, which was created by summing up the individual item scores across the 2 years, was satisfactory ($\alpha = .82$). Of the 525 boys in the sample, 317 or 60.4% had a total delinquency-related violence score of 8, indicating that they had never engaged in any delinquency-related physical violence during the 2 years, whereas 208 or 39.6% of the boys had a score of 9 or more, indicating that they had at least occasionally engaged in at least one act of delinquency-related physical violence during the 2 years of assessment ($M = 9.24$, $SD = 2.34$, Skewness = 2.54, Kurtosis = 6.40).

In addition to completing the delinquency-related physical violence items, participants were asked whether they had dated someone (i.e., had a girlfriend) during the past 12 months. The boys who had dated completed seven items adapted from the Physical Aggression subscale of the Conflict Tactics Scale (Straus, 1979). The items inquired whether the participant had thrown an object at their dating partner, pushed or shoved her, smacked her, kicked her, hit her, beaten her up, or threatened her with a knife. Participants indicated whether they had never (0), once or twice (1), three to 10 times (2), 11 to 20 times (3), or more than 20 times (4) engaged in each described behavior. Notably, males' self-reports about their perpetration of physical violence against their partner show high concordance with their female partners' reports ($r = .83$, Moffitt et al., 1997). Therefore, Moffitt et al. (1997) conclude that males' reports about their own perpetration are sufficiently valid sources for research on the correlates of partner violence. Internal consistency for the total dating violence scale, which was created by summing up the individual item scores across the 2 years, was satisfactory ($\alpha = .82$). Of the 525 boys in the sample, 402 or 76.6% had a score of 0 on the total scale, indicating that they had never engaged in any physically violent act against a

dating partner during the 2 years of measurement, whereas 123 or 23.4% participants received a total score of 1 or more, indicating that they had engaged in at least one act of physical violence against a dating partner ($M = 0.67$, $SD = 2.15$, Skewness = 4.20, Kurtosis = 19.33).

Frequency analysis revealed a significant association between perpetration of delinquency-related physical violence and perpetration of physical violence against the dating partner. Specifically, 264 boys (50.3%) were not physically violent, 138 boys (26.3%) engaged in delinquency-related physical violence but not in physical violence against the dating partner, 53 (10.1%) engaged in physical violence against the dating partner but not in delinquency-related physical violence, and 70 boys (13.3%) engaged in both forms of physical violence, $\chi^2(1) = 20.08$, $p < .001$. As was done with the aggression measures, inverse transformations were conducted with the total continuous delinquency-related violence score and the total dating violence score to reduce the skew and kurtosis of the distributions. Also, the two violence measures were rescaled prior to the transformations so that they both had a minimum score of 1. The transformed scores were then again reflected so that a score of 0 in the respective measure represented no violent behavior ($M = 0.27$, $SD = 0.34$, Skewness = 0.63, Kurtosis = -1.36 for delinquency-related violence, and $M = 0.15$, $SD = 0.28$, Skewness = 1.51, Kurtosis = 0.69 for dating violence).

Parental Supervision

Parental supervision was assessed at ages 13, 14, and 15, separately, through the boys' reports on two items (Le Blanc, 1992; Le Blanc & Fréchette, 1989). These two items referred to whether the parents knew (a) where their son spent his free time outside the home and (b) with whom. The participants answered the items on a 4-point scale which ranged from 1 = *never* through 4 = *always*. A total supervision score across the 3 years of assessment was calculated by summing the individual item scores to increase reliability of the supervision measure during the early and midadolescent years ($\alpha = .72$, $M = 6.22$, $SD = 1.19$, Skewness = -0.50 , Kurtosis = -0.01).

Parental Warmth and Caregiving Behavior

When the boys were 15 years of age, they were asked about their mother's and their father's warmth and caregiving behavior, respectively, over the past years using the Parental Bonding Instrument (PBI; Parker, Tuplin, & Brown, 1978). This retrospective self-report measure assesses two dimensions of parental behavior, "care" and "overprotection." For the present study, only the 12 items

of the "care" scale were assessed, e.g., "My mother has always understood my problems and worries," "My father has always been able to make me feel better when I am upset." For each item, the participants were asked to indicate whether the described behavior was very unlike (1), moderately unlike (2), moderately like (3), or very like (4) the respective parent's actual behavior. A global score of warmth and caregiving behavior was calculated for mothers and fathers, separately, by averaging the individual item scores. Negatively worded items were reversed prior to creating the global score. Used with adolescents and adults, the PBI has shown excellent psychometric properties in normative and clinical samples (Parker et al., 1978). In the present study, internal consistency was also acceptable ($\alpha = .84$, $M = 2.32$, $SD = 0.52$, Skewness = -0.98 , Kurtosis = 0.87 for mother's warmth and caregiving behavior and $\alpha = .70$, $M = 2.06$, $SD = 0.59$, Skewness = -0.63 , Kurtosis = 0.42 for father's warmth and caregiving behavior). Because mother's and father's warmth and caregiving behaviors were only moderately correlated, $r = .48$, $p < .001$, the two variables were kept separate for the analyses.

RESULTS

Prior to analysis we examined the study sample for the presence of multiple outliers, which might attenuate the results (Tabachnik & Fidell, 1996). Inspection of Mahalanobis' distance scores, based on a probability of $p < .01$, revealed nine multiple outliers that were subsequently excluded from the analysis. Thus, the final sample size for statistical analysis was reduced to $N = 516$. The zero-order correlations among all the variables that were included in the subsequent analyses are presented in Table I. As can be seen, most variables were significantly, albeit moderately, related with each other.

Preliminary Analysis: Testing the Predictive Relations of Proactive and Reactive Aggression to Delinquency-Related Violence and Dating Violence, Using Dichotomous Aggression Variables

In the first set of analysis, we used a person-oriented approach to examine whether and how boys who were nonaggressive, proactively aggressive only, reactively aggressive only, or both proactively and reactively aggressive differed in terms of their levels of delinquency-related violence and dating violence in midadolescence. For this purpose, the dichotomized aggression variables (i.e., never vs. ever aggressive) described previously were used to

Table I. Zero-Order Correlations Among the Study Variables

	A	B	C	D	E	F	G
A. Proactive aggression	1.0						
B. Reactive aggression	.68***	1.0					
C. Parental supervision	-.22***	-.15***	1.0				
D. Mother's warmth and care	-.11**	-.11*	.24***	1.0			
E. Father's warmth and care	-.08	-.02	.27***	.48***	1.0		
F. Delinquency-related violence	.31***	.23***	-.32***	-.13**	-.11*	1.0	
G. Dating violence	.15***	.21***	.16***	-.20***	-.14**	.24***	1.0

Note. $N = 516$.

* $p < .05$. ** $p < .01$. *** $p < .001$.

classify each boy into one of the four groups. Because of the reduction of sample size due to multivariate outliers, the group sizes for analyses were $n = 275$ in the nonaggressive group, $n = 11$ in the proactive only group, $n = 93$ in the reactive only group, and $n = 137$ in the proactive-reactive group.

A MANOVA with one factor (aggression group) and two dependent variables (delinquency-related violence and dating violence) was performed. Evaluations of assumptions of normality and linearity yielded satisfactory results but the significant Box's M test indicated heterogeneity of the covariance matrices of the dependent variables in the aggression groups. Therefore, Pillai's criterion was used to evaluate the significance of the multivariate F test. The results showed a significant multivariate effect of aggression group on delinquency-related violence and dating violence, $F(6, 1024) = 9.85$, $p < .001$. Because of the significant correlation between the two dependent variables, the separate effects of aggression group on delinquency-related violence and dating violence were further investigated in two sets of ANCOVAs, one for each of the two dependent variables, where the respective other dependent variable served as a covariate. To adjust for inflated Type I error in the two dependent variables, overall α levels were set to .025 in these analyses. Preliminary evaluations confirmed homogeneity of regression in the aggression groups.

The results of the two separate ANCOVAs showed that the four aggression groups significantly differed in regard to their mean levels of delinquency-related violence, stepdown $F(3, 511) = 13.13$, $p < .001$, and they also differed in regard to dating violence, stepdown $F(3, 511) = 4.32$, $p < .01$. The estimated and observed means of delinquency-related violence and dating violence in the four aggression groups are presented in Table II. Subsequent simple contrasts with the nonaggressive group as the comparison group revealed that the reactive-only group did not differ significantly from the nonaggressive group with respect to delinquency-related violence. In contrast, both the proactive-only group and the proactive-reactive group showed significantly higher levels of delinquency-related violence than the nonaggressive group, $p = .01$ and $p < .001$, respectively. Notably, the mean levels of delinquency-related violence were almost identical in the proactive-only group and the proactive-reactive group. The simple contrasts for dating violence showed the opposite pattern. Specifically, the proactive-only group did not differ significantly from the nonaggressive group in regard to dating violence. In contrast, both the reactive-only group and the proactive-reactive group showed significantly higher levels of dating violence than the nonaggressive group, $p = .01$ and $p < .001$, respectively, and the mean levels of dating violence in the reactive-only and the proactive-reactive group were almost identical. Notably,

Table II. Mean Scores of Delinquency-Related Violence and Dating Violence by Aggression Group

	Nonaggressive	Proactive only	Reactive only	Proactive-reactive
Delinquency-related violence				
Observed	.19 (.30)	.42 (.42)	.25 (.33)	.42 (.37)
Estimated	.20 (.02)	.45 (.10)	.23 (.03)	.40 (.03)
Dating violence				
Observed	.10 (.23)	.05 (.15)	.19 (.31)	.21 (.31)
Estimated	.11 (.02)	.02 (.08)	.19 (.03)	.19 (.02)

Note. $N = 516$. For observed means, standard deviations are reported in parentheses. For estimated means (controlling for the respective other dependent variable), standard errors are reported in parentheses.

Table III. Hierarchical Multiple Linear Regression Analysis to Test the Moderating Effect of Parental Supervision, and Mother's and Father's Warmth and Caregiving Behavior on the Relations of Proactive and Reactive Aggression on Delinquency-Related Violence ($N = 516$)

Predictor	<i>b</i>	<i>t</i>	<i>F</i> change (<i>df</i>)	<i>R</i> ² change
Step 1			26.99(2, 513)***	.10
Proactive aggression	.28***	4.82		
Reactive aggression	.05	0.80		
Step 2			14.11(3, 510)***	.07
Parental supervision	-.26***	-5.99		
Mother's warmth and care	-.04	-0.76		
Father's warmth and care	-.00	-0.06		
Step 3				
Proactive aggression × parental supervision	-.10	-2.43	5.91(1, 509)*	.01
Reactive aggression × parental supervision	-.03	-0.79	0.63(1, 509)	.00
Proactive aggression × mother's warmth and care	.04	1.06	1.12(1, 509)	.00
Reactive aggression × mother's warmth and care	.04	1.04	1.09(1, 509)	.00
Proactive aggression × father's warmth and care	-.05	-1.26	1.59(1, 509)	.00
Reactive aggression × father's warmth and care	-.03	-0.83	0.70(1, 509)	.00

Note. Interaction terms are tested separately, one at a time, on the third step.

* $p < .05$. ** $p < .01$. *** $p < .001$.

these results were the same when tested through simple univariate analyses of variance. Overall, these results suggest that proactive but not reactive aggression is predictive of delinquency-related violence, whereas reactive but not proactive aggression predicts violence against the dating partner.

Testing the Moderating Effects of Parenting Behavior on the Predictive Relations of Proactive and Reactive Aggression to Delinquency-Related Violence and Dating Violence

Two sets of hierarchical multiple linear regressions were conducted to examine whether parental supervision or the warmth and caregiving behavior of the mother or the father moderate the predictive relations of proactive and reactive aggression to delinquency-related violence and dating violence, respectively. These analyses were conducted using the transformed continuous scores of proactive and reactive aggression. In the first set of regressions, delinquency-related physical violence served as the dependent variable, whereas physical violence against the dating partner was the dependent variable in the second set. In each set of the hierarchical regressions, proactive and reactive aggression were entered in the model on the first step, followed by the three putative moderator variables (i.e., parental supervision, mother's warmth and caregiving behavior, and father's warmth and caregiving behavior) on the second step. On the third step, the multiplicative interaction terms were entered, separately, into the equation to assess whether the predictive effects of proactive

aggression or reactive aggression on the dependent variable were moderated by parental supervision, mother's warmth and caregiving behavior, or father's warmth and caregiving behavior.⁶ To avoid multicollinearity and to facilitate interpretation of the results, the dependent and the independent variables were *z*-standardized prior to creating the interaction terms and the *z*-standardized variables were used in the analyses (Jaccard, Turrissi, & Wan, 1990). First, the results from the hierarchical regression analysis predicting to delinquency-related violence are presented in Table III. The results from the hierarchical regression analysis predicting to violence against the dating partner are presented in Table IV. For each step of the regression analyses, the *F*-change, the change in *R*², the regression coefficients, and the corresponding *t* values are provided.

As can be seen in Table III, proactive and reactive aggression, together, explained 10%, $p < .001$, of the variance of delinquency-related violence. Only proactive aggression, however, contributed uniquely to the prediction of delinquency-related violence, $b = .28$, $p < .001$, confirming the results obtained in the previous analyses of variance with categorical independent variables. The three parenting variables (parental supervision, mother's warmth and caregiving behavior, and father's warmth and caregiving behavior), entered on the second step, together also explained a significant portion (7%) of the variance of delinquency-related violence, $p < .001$. Only parental supervision, however, had a unique main effect on delinquency-related violence, $b = -.26$, $p < .001$. Of the

⁶These analyses were conducted again while entering all six interaction terms together on the third step. The results were the same.

Table IV. Hierarchical Multiple Linear Regression Analysis to Test the Moderating Effect of Parental Supervision, and Mother's and Father's Warmth and Caregiving Behavior on the Relations of Proactive and Reactive Aggression on Dating Violence ($N = 516$)

Predictor	<i>b</i>	<i>t</i>	<i>F</i> change (<i>df</i>)	<i>R</i> ² change
Step 1			11.93(2, 513)***	.04
Proactive aggression	.00	0.07		
Reactive aggression	.21***	3.54		
Step 2			7.56(3, 510)***	.04
Parental supervision	-.09*	-2.02		
Mother's warmth and care	-.14**	-2.76		
Father's warmth and care	-.04	-0.89		
Step 3				
Proactive aggression × parental supervision	-.02	-0.39	0.16(1, 509)	.00
Reactive aggression × parental supervision	-.04	-0.93	0.86(1, 509)	.00
Proactive aggression × mother's warmth and care	-.01	-0.25	0.06(1, 509)	.00
Reactive aggression × mother's warmth and care	-.12	2.92	8.55(1, 509)**	.02
Proactive aggression × father's warmth and care	.05	1.17	1.38(1, 509)	.00
Reactive aggression × father's warmth and care	-.01	-0.18	0.03(1, 509)	.00

Note. Interaction terms are tested separately, one at a time, on the third step.

* $p < .05$. ** $p < .01$. *** $p < .001$.

interaction terms entered on the third step, only the interaction between proactive aggression and parental supervision reached statistical significance, $b = .10$, $p < .05$, explaining an additional 1% of the variance of delinquency-related violence.

To interpret the nature of the interaction, we followed the procedure for interaction terms involving continuous predictors described by Jaccard et al. (1990). Specifically, we examined the predictive relation of proactive aggression to delinquency-related violence at three levels of parental supervision: low (= 1 *SD* below the mean), medium (= at the mean or 0), and high (= 1 *SD* above the mean). The regression coefficient and *t* value associated with proactive aggression at a medium level of parental supervision was provided in the third step of the regression equation, $b = .20$, $t = 3.54$, indicating that proactive aggression significantly predicted delinquency-related violence when parental supervision was moderate. When parental supervision decreased by 1 *SD* (i.e., when parental supervision was low), the relation between proactive aggression and delinquency-related violence was even stronger, $b = .30$, $t = 4.29$. In contrast, however, when parental supervision increased by 1 *SD* (i.e., when parental supervision was high), the relation between proactive aggression and delinquency-related violence was very weak and no longer statistically significant, $b = .10$, $t = 1.25$.⁷

⁷The regression coefficients for proactive aggression at low and high levels of parental supervision were calculated by subtracting and adding, respectively, the regression coefficient of the interaction term from the regression coefficient of proactive aggression when parental supervi-

As can be seen in Table IV, proactive and reactive aggression, together, explained 4%, $p < .001$, of the variance of dating violence. Only reactive aggression, however, contributed uniquely to the prediction of dating violence, $b = .21$, $p < .001$, again confirming the results obtained in the analyses of variance with categorical independent variables. The three parenting variables (parental supervision, mother's warmth and caregiving behavior, and father's warmth and caregiving behavior), entered on the second step, together explained an additional 4% of the variance of dating violence, $p < .001$. In addition, both parental supervision and mother's warmth and caregiving behavior had unique, albeit weak main effects on dating violence, $b = -.09$, $p < .05$, and $b = -.14$, $p < .01$, respectively. Of the interaction terms entered on the third step, only the interaction between reactive aggression and mother's warmth and caregiving behavior reached statistical significance, $b = -.12$, $p < .01$, explaining an additional 2% of the variance of dating violence.

Following the same procedure as before, we broke down the interaction by examining the predictive relation of reactive aggression to dating violence at three levels of mother's warmth and caregiving behavior: low (= 1 *SD* below the mean), medium (= at the mean or 0), and high (= 1 *SD* above the mean). The regression coefficient and *t* value associated with reactive aggression provided in the third step of the regression equation, indicated that reactive aggression significantly predicted dating violence when

sion was 0 (i.e., at the mean). The associated *t* values were calculated based on the variances and covariances of the regression coefficients following procedures described by Jaccard et al. (1990).

mother's warmth and caregiving behavior was moderate, $b = .20, t = 3.53$. When mother's warmth and caregiving behavior decreased by 1 *SD* (i.e., when mother's warmth and caregiving behavior was low), the relation between reactive aggression and dating violence was even stronger, $b = .32, t = 4.57$. In contrast, when mother's warmth and caregiving behavior increased by 1 *SD* (i.e., when mother's warmth and caregiving behavior was high), the relation between reactive aggression and dating violence was very weak and no longer reached statistical significance, $b = .08, t = 1.14$.

DISCUSSION

The present study examined (a) the predictive relations of boys' proactive and reactive aggression during early adolescence to delinquency-related physical violence and physical violence against the dating partner during midadolescence, and (b) the potential moderating effects of parental monitoring and parental warmth and caregiving behavior on these relations. It was hypothesized that, in line with previous studies, perpetration of delinquency-related physical violence would be uniquely predicted by proactive but not by reactive aggression. Unique predictive effects of both proactive and reactive aggression, however, were expected for the perpetration of physical violence against the dating partner. Based on theoretical assumptions proposed by Dodge (1991), we further assumed that these predictive relations would be differentially moderated by the degree of parental monitoring and the degree of parental warmth and caregiving behavior experienced in the interim period. Specifically, we hypothesized that the predictive relations of proactive aggression to later delinquency-related violence and dating violence would be moderated by the experienced degree of parental monitoring. In contrast, we expected that the predictive link between reactive aggression and later violence against the dating partner would be moderated by the experienced degree of parental warmth and caregiving.

As expected, and in line with previous findings (Vitaro, 1997), only proactive aggression predicted later delinquency-related physical violence once reactive aggression was controlled. Indeed, boys who were only reactively aggressive were not more violent than nonaggressive boys in delinquency-related contexts, whereas boys who were only proactively aggressive engaged in as much delinquency-related violence as did boys who were both proactively and reactively aggressive. Proactive aggression, which by definition is deliberate and instrumental, thus seems to be an early risk factor of later violent behavior that is of a similarly active and "predatory" nature,

as is often the case with violence in delinquency-related contexts. Although reactive aggression was not related to subsequent delinquency-related violence once proactive aggression was controlled, reactive aggression was uniquely predictive of later violence against the dating partner. Indeed, reactive-only boys were as violent against their dating partner as were boys who were both proactively and reactively aggressive, whereas proactive-only boys were not more violent than nonaggressive boys in this context. Due to the highly affective nature and the potential for conflict in intimate relationships, dating relationships may be especially prone to trigger the type of angry violent outburst that is characteristic of reactive aggression. Reactive individuals' inability to deal with provocative or threatening situations in a constructive way (Day et al., 1992; Dodge & Coie, 1987) may thus prompt them to resort to physical violence for conflict resolution even in interaction with their intimate partner. In line with this notion, many males who are physically violent against their partner have been found to be very similar to reactive aggressive individuals in their lack of adequate responses to situations posing perceived provocations or rejection by the partner (Holtzworth-Munroe, 1992).

The somewhat unexpected finding that proactive aggression per se was not predictive of subsequent violence against the dating partner may perhaps be explained by the fact that the vast majority of violent acts in adolescent dating relationships are of a reactive nature. Thus, the most frequently reported causes of violence in adolescents' dating relationships are jealousy (which alone accounts for 67% of reported causes) and similar potentially humiliating incidences (Roscoe & Kelsey, 1986). The instrumental, controlling use of violence more reminiscent of proactive aggression that is sometimes found in adult male batterers (Prince & Arias, 1994) perhaps only emerges in more established relationships of longer duration, which are more typical of adult relationships. Some, albeit indirect support for this notion is provided by findings with adult couples showing that deliberate and premeditated violence used to dominate and control the partner usually only occurs in later stages of the relationship (Douglas, 1991). Further longitudinal research is clearly needed to clarify the potential role of early proactive aggression in the prediction of subsequent partner violence.

In regard to the moderating effects of parenting behavior on the relations of proactive and reactive aggression to later violence in different contexts, the results largely confirmed our hypotheses. Specifically, the relation of boys' proactive aggression in early adolescence to subsequent delinquency-related violence varied depending on the degree of parental monitoring in the interim period. When they experienced low to moderate levels of

parental monitoring, boys' early proactive aggression was predictive of later delinquency-related violence. High levels of parental monitoring, however, seemed to interrupt this dangerous sequence. This finding supports the notion maintained by Dodge (1991) that the course of proactive aggression is influenced by a parenting style that either explicitly or implicitly endorses this type of behavior. As shown by Poulin and Boivin (2000b), proactively aggressive boys tend to affiliate with similarly proactively aggressive peers who then provide some form of continual "deviancy training," which likely also involves the use of violence in delinquency-related contexts. Indeed, delinquent acts often occur in group-settings and are perpetrated with the help of similarly deviant peers who model and reinforce this offensive type of behavior (Elliott, 1994; Warr, 1996). Through insufficient monitoring and control over where and with whom their children spend their free time, parents may present proactively aggressive boys with ample opportunity for such deviant affiliations, thus implicitly paving the way for violent and delinquent behavior in their offspring. As suggested by our data, only high levels of parental monitoring and control over proactively aggressive boys seem to succeed in averting this negative outcome.

In contrast to the link between proactive aggression and subsequent delinquency-related violence, the relation between reactive aggression and later violence against the dating partner was moderated by the level of parental (specifically maternal) warmth and caregiving experienced in the interim period. Under conditions of low to moderate levels of maternal warmth and caregiving, boys' early reactive aggression was predictive of later dating violence. When experiencing high levels of maternal warmth and caregiving, however, a reactively aggressive disposition was less likely to translate into physical violence against the dating partner later in life. Furman and Wehner (1994) proposed that a lack of parental warmth and caregiving and the resulting poor parent-child attachment relationship shape, at least to some extent, individuals' negative expectations about the roles and the behavior of the self and of the other person in romantic relationships. In reactively aggressive boys, these negative expectations may thus reinforce the boys' already existing hostile and aggressive behavior patterns, which are eventually directed against the dating partner. When experiencing high levels of parental warmth and caregiving, however, reactively aggressive boys may develop more positive expectations about close relationships, which may subsequently diminish the risk of aggressive and violent behavior against the dating partner. The fact that the mother is generally the primary parental caregiver and thus considered the key parental attachment figure even during adolescence

(Allen & Land, 1999) may explain why father's warmth and caregiving behavior did not have any explanatory or moderating effect on boy's dating violence above and beyond mother's warmth and caregiving. It is also possible, in line with suggestions by Russell and Saebel (1997), that the opposite-sex parent's behavior has a unique role in shaping individual's expectations about the self and others in general and in heterosexual romantic relationships in particular. Further research with girls is needed to clarify the potential moderating role of father's caregiving behavior on the relation between reactive aggression and later aggressive behavior against the dating partner.

In summary, this study offers an important new perspective on proactive and reactive aggression and their predictive links to later violence. First, the differential predictive relations of proactive and reactive aggression to later delinquency-related violence and dating violence provide further support for the theoretical and practical distinction between these two types of aggression. As argued by Cronbach (1951), even when two measures are highly correlated, they represent distinct constructs if they do not relate to other measures in the same way. The importance of the distinction between proactive and reactive aggression was further supported by the finding that the predictive links of the two types of aggression to later violence were moderated by different types of parenting behavior. This finding also has some practical implications, as it suggests that different strategies in regard to parenting practices may be emphasized for the treatment of different types of aggression in preventive intervention efforts that target general violence and that involve parents as well as children. Secondly, the present results are noteworthy as they show that early reactive aggression may be as strong an indicator of future externalizing (i.e., violent) behavior as proactive aggression, although the violence might occur in different contexts. As such, considering reactively aggressive children who do not display proactively aggressive behavior not to be "at risk" for later externalizing behavior may be an erroneous omission with serious consequences. This latter point is particularly important given the relatively large percentage of boys who display only reactive but not proactive aggression. Finally, the present findings emphasize the necessity of including partner violence as an outcome in future research in order to gain a more complete picture of the longitudinal correlates of childhood behavior problems. The inclusion of adolescent dating violence in future research on the etiology of aggression and violence also seems pertinent in light of the fact that partner violence in adolescent dating relationships is considered the training ground for partner violence during adulthood (O'Keefe, Brockopp, & Chew, 1986). In this context, it will also be necessary to focus

on both genders in future research in light of the fact that, in contrast to the higher prevalence of delinquency-related violence in males, females have been found to use physical violence against their partner at least to the same extent as males (e.g., Magdol et al., 1997). Eventually, it is only through the integration of the different types of aggression in boys and girls that we can hope to understand and ultimately prevent aggression and violence in all its forms and contexts.

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REFERENCES

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101*, 213–232.
- Allen, J. P., & Land, D. (1999). Attachment in adolescence. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research, and clinical applications* (pp. 319–335). New York: Guilford Press.
- Bank, L., Dishion, T. J., Skinner, M., & Patterson, G. R. (1989). The glop problem in structural equation modeling. In G. R. Patterson (Ed.), *Family social interaction* (pp. 247–280). Hillsdale, NJ: Erlbaum.
- Blishen, B. R., & McRoberts, H. A. (1976). A revised socioeconomic index for occupations in Canada. *Canadian Review of Sociology and Anthropology, 13*, 71–79.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297–334.
- Day, D. M., Bream, L. A., & Pal, A. (1992). Proactive and reactive aggression: An analysis of subtypes based on teacher perceptions. *Journal of Clinical Child Psychology, 21*, 210–217.
- Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201–218). Hillsdale, NJ: Erlbaum.
- 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.
- Dodge, K. A., Lochman, J. E., Harnish, J. D., Bates, J. E., & Pettit, G. S. (1997). Reactive and proactive aggression in school children and psychiatrically impaired chronically assaultive youth. *Journal of Abnormal Psychology, 106*, 37–51.
- Douglas, H. (1991). Assessing violent couples. *Families in Society, 72*, 525–535.
- Elliott, D. S. (1994). Serious violent offenders: Onset, developmental course, and termination (The American Society of Criminology 1993 Presidential Address). *Criminology, 32*, 1–21.
- Furman, W., & Wehner, E. A. (1994). Romantic views: Toward a theory of adolescent romantic relationships. In R. Montemayor, G. R. Adams, & G. P. Gullotta, (Eds.), *Personal relationships during adolescence. Advances in adolescent development: An annual book series* (Vol. 6, pp. 168–195). Thousand Oaks, CA: Sage.
- Gelles, R. J., & Straus, M. A. (1988). *Intimate violence*. New York: Simon & Schuster.
- Hindelang, M. J., Hirschi, R., & Weiss, J. (1981). *Measuring delinquency*. Beverly Hills, CA: Sage.
- Holtzworth-Munroe, A. (1992). Social skill deficits in maritally violent men: Interpreting the data using a social information processing model. *Clinical Psychology Review, 12*, 605–617.
- Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction effects in multiple regression* (Sage Series: Quantitative applications in the social sciences). London: Sage.
- Klein, M. W. (1989). *Cross-national research in self-reported crime and delinquency*. Dordrecht, Germany: Kluwer, Academic Press.
- Laursen, B., & Williams, V. A. (1997). Perceptions of interdependence and closeness among adolescents with and without romantic partners. In S. Shulman & W. A. Collins (Eds.), *Romantic relationships in adolescence: Developmental perspectives. New directions for child development* (No. 78, pp. 3–20). San Francisco, CA: Jossey-Bass.
- Le Blanc, M. (1992). Family dynamics, adolescent delinquency, and adult criminality. *Psychiatry, 55*, 336–353.
- Le Blanc, M., & Fréchette, M. (1989). *Male criminal activity from childhood through youth: Multilevel and developmental perspective*. New York: Springer-Verlag.
- LeBlanc, M., & Tremblay, R. E. (1988). A study of factors associated with the stability of hidden delinquency. *International Journal of Adolescence and Youth, 1*, 269–292.
- Loeber, R., & Hay, D. (1997). Key issues in the development of aggression and violence from childhood to early adulthood. *Annual Review of Psychology, 48*, 371–410.
- Magdol, L., Moffitt, T. E., Caspi, A., Newman, D. L., Fagan, J., & Silva, P. A. (1997). Gender differences in partner violence in a birth cohort of 21-year-olds: Bridging the gap between clinical and epidemiological approaches. *Journal of Consulting and Clinical Psychology, 65*, 68–78.
- Malik, C., Sorenson, S. B., & Aneshensel, C. S. (1997). Community and physical violence against the dating partner among adolescents: Perpetration and victimization. *Journal of Adolescent Health, 21*, 291–302.
- Moffitt, T. E., Caspi, A., Krueger, R. F., Magdol, L., Margolin, G., Silva, P. A., & Sydney, R. (1997). Do partners agree about abuse in their relationship? A psychometric evaluation of interpartner agreement. *Psychological Assessment, 9*, 47–56.
- O'Keefe, N. K., Brockopp, K., & Chew, E. (1986). Teen physical violence against the dating partner. *Social Work, 31*, 465–468.
- Parker, G., Tuplin, H., & Brown, L. B. (1978). A parental bonding instrument. *British Journal of Medical Psychology, 52*, 1–10.
- Poulin, F., & Boivin, M. (2000a). Reactive and proactive aggression: Evidence of a two-factor model. *Psychological Assessment, 12*, 115–122.
- Poulin, F., & Boivin, M. (2000b). The role of proactive and reactive aggression in the formation and development of boys' friendships. *Developmental Psychology, 36*, 233–240.
- Prince, J. E., & Arias, I. (1994). The role of perceived control and the desirability of control among abusive and nonabusive husbands. *American Journal of Family Therapy, 22*, 126–134.
- Pulkkinen, L. (1996). Proactive and reactive aggression in early adolescence as precursors to anti- and prosocial behaviors in young adults. *Aggressive Behavior, 22*, 241–257.
- Roscoe, B., & Kelsey, T. (1986). Physical violence against the dating partner among high-school students. *Psychology, 23*, 53–59.
- Russell, A., & Saebel, J. (1997). Mother-son, mother-daughter, father-son, and father-daughter: Are they distinct relationships? *Developmental Review, 17*, 111–147.
- Straus, M. A. (1979). Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scale. *Journal of Marriage and the Family, 41*, 75–88.

- Tabachnik, B. G., & Fidell, L. S. (1996). *Using multivariate statistics* (3rd ed.). New York: Harper Collins.
- Vitaro, F. (1997, November). *Reactive and proactive aggression are differentially predictive of externalizing problems during adolescence*. Paper presented at the meeting of the Association for Advancement of Behavior Therapy, Miami.
- Vitaro, F., Brendgen, M., & Tremblay, R. E. (in press). Preventive intervention: Assessing its effects on the trajectories of delinquency and testing for mediational processes. *Applied Developmental Science*.
- Vitaro, F., Gendreau, P. L., Tremblay, R. E., & Oligny, P. (1998). Reactive and proactive aggression differentially predict later conduct problems. *Journal of Child Psychology and Psychiatry*, 39, 377–385.
- Warr, M. (1996). Organization and instigation in delinquent groups. *Criminology*, 34, 11–37.