

# Reactive and Proactive Aggression Differentially Predict Later Conduct Problems

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This study tested whether proactive and reactive aggression were differently predictive of later externalizing problems such as delinquency and DSM-related disruptive behaviors (i.e. oppositional defiant and conduct disorders). It also tested whether these two subtypes of aggressive behaviors interacted in predicting externalizing problems. A community sample of low SES boys participated in the study. Proactive and reactive aggression were rated by teachers when boys were 12 years old. Delinquency, oppositional disorders, and conduct disorders were assessed during mid-adolescence. Proactive but not reactive aggression predicted delinquency and disruptive behaviors. Moreover, high levels of reactive aggression weakened the link between proactive aggression and delinquency. Reactive aggression, however, did not moderate the link between proactive aggression and disruptive behaviors. We conclude that reactive and proactive aggression are two distinct types of aggressive behaviors with different predictive abilities. We also offer tentative explanations to account for the present findings.

*Keywords:* Aggression, conduct disorder, delinquency, adolescence, school children.

*Abbreviations:* CD: Conduct Disorder; DISC: Diagnostic Interview Schedule for Children; ODD: Oppositional Defiant Disorder; SBQ: Social Behavior Questionnaire; SRDQ: Self-Reported Delinquency Questionnaire.

## Introduction

Aggressiveness has repeatedly been shown to be a risk factor for later delinquency and conduct disorders (Farrington, 1991; Loeber & Dishion, 1993; Parker & Asher, 1987). Subtypes of aggressive behavior have been identified in hopes of better understanding the aetiology and prognosis/treatment of aggression. For example, the DSM-III (American Psychiatric Association, 1980) proposed a distinction between socialized and under-socialized aggressive conduct. That distinction gave way to a solitary aggressive subtype, which appeared in the DSM-III-R (American Psychiatric Association, 1983). When the DSM-IV (American Psychiatric Association, 1994) was published, it distinguished between childhood- and adolescent-onset conduct disorders in its subtyping of aggression. In addition, aggressiveness items for conduct disorders in the DMS-IV are more predatory and proactive, whereas those for oppositional-defiant disorder are more anger-like and reactive. This distinction is reminiscent of the distinction between reactive and proactive aggression, which has been popular over the

past decade (Day, Bream, & Paul, 1992; Dodge, 1991; Dodge & Coie, 1987; Dodge, Lochman, Harnish, Bates, & Pettit, 1997). Researchers had made this distinction before, but they had used different labels for reactive (i.e. hostile, affective) and proactive (i.e. instrumental, predatory) aggression (see Dodge, 1991).

Proactive aggression is goal-oriented requiring neither provocation nor anger. It can be directed toward possessing objects (object oriented) or dominating people (person oriented or bullying). Reactive aggression, on the other hand, involves angry outbursts in response to provocation. Although they are distinct, the two forms of aggression may co-occur in the same subject (Dodge, 1991).

Some concurrent correlates of proactive and reactive aggression in children are known. Reactively aggressive children interpret others' ambiguous provocations as hostile more readily than proactively or reactively-proactively aggressive children. They also display more problem-solving deficits in difficult social situations (Day et al., 1992; Dodge & Coie, 1987; Dodge et al., 1997). As a result, reactively aggressive children are likely to be rejected, whereas proactively aggressive children are accepted by their peers (Dodge, Coie, Pettit, & Price, 1990; Dodge et al., 1997). However, conflicting results appear in the literature for different subtypes of

proactively aggressive children. For example, person-oriented proactively aggressive first-graders are not always well accepted by their peers (Price & Dodge, 1989).

Day and colleagues (1992) have also reported teacher-rated behavioral differences between proactively and reactively aggressive school-aged boys. Reactively-aggressive and reactively-proactively aggressive boys (but not proactively aggressive boys) were less skilled than nonaggressive boys at responding to teasing, sharing, negotiating, handling failure, compromising, and displaying sportsmanship. Reactively aggressive boys were also less able to handle peer pressure than nonaggressive boys. They performed more poorly at school and had more internalized symptoms (e.g. unhappiness). Reactively-proactively aggressive boys also had more difficulty staying out of fights than reactively aggressive and nonaggressive boys. Conversely, proactively aggressive boys did not have more school problems and did not manifest more internalized symptoms than nonaggressive boys. Dodge et al. (1997) have also reported that reactive-only and reactive-proactive third-graders manifested more social problems than proactive-only and reactive-proactive children. Along with the proactive-only group, they also experienced more teacher-rated internalizing problems than did non-aggressive classmates.

According to these authors, reactive-only and reactive-proactive children were rated as more inattentive by teachers than proactive-only and nonaggressive children. The latter were also rated as more impulsive. Finally, these authors showed that reactive-only subjects experienced more physical abuse and harsh discipline than nonaggressive children whereas proactive-only and reactive-proactive children did not. On the other hand, reactive-proactive children had a lower socioeconomic status, thus supporting earlier speculations by Dodge (1991) concerning the aetiology of reactive and proactive aggressiveness.

Overall, research has found discriminative validity for reactive and proactive aggression in that reactively and proactively aggressive children differ on concurrent social-cognitive measures, peer popularity, and behavioral dimensions. However, only one study has examined whether different subtypes of aggression are associated with differential risk for later adjustment problems (Pulkkinen, 1996). In this study, proactive but not reactive males were more prone to externalizing behaviors and criminality during adulthood, whereas proactive females were more prone to internalizing problems and neuroticism. However, because subjects were classified as proactive or reactive when they were 14 years old and outcomes were assessed at age 27, the question remains whether proactive but not reactive aggressiveness during childhood predicts adjustment problems during adolescence. In addition, Pulkkinen did not include proactive-reactive subjects, who represent the majority of aggressive individuals (Day et al., 1992; Dodge et al., 1997). Reactive aggressiveness is related to peer rejection and deficits in social-cognitive skills, whereas proactive aggressiveness is related to fighting and anticipating positive consequences for using aggression (Dodge et al., 1997), so we might expect these

separate aggressive behaviors during childhood to cumulate or interact in predicting adolescent adjustment problems. An interaction between proactive and reactive aggressiveness would imply that higher levels of one type of aggression (e.g. reactive aggression) would potentiate the other type (e.g. proactive aggression) in predicting delinquency and other externalizing problems. The effect might also be the opposite. That is, higher levels of one type of aggression (e.g. reactive aggression) might weaken the predictive link between the other type (e.g. proactive aggression) and later adjustment problems. This possibility cannot be ruled out given that reactive aggression has been related (1) to internalizing problems, which, in turn, have been shown to protect aggressive children from delinquency (Tremblay, Pihl, Vitaro, & Dobkin, 1994) and (2) to lack of friends, which also predicts less delinquency for aggressive children (Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). In that case, reactive aggression would not contribute as a main effect in predicting later adjustment problems. Only proactive aggression would.

The present study addresses these issues with a community sample of boys. Boys were studied because aggression is more prevalent in boys than girls. Reactive and proactive aggression was based on teachers' ratings of aggression when boys were 12 years old. Outcome measures were self-reported delinquency at age 15 and DSM-related oppositional and conduct disorders assessed at about age 15. Sociodemographic measures and measures of internalizing problems and friends' characteristics were also collected and used as control or explanatory variables, respectively.

## Method

### *Subjects*

The 742 boys who were included in the present study were part of an ongoing longitudinal study that started with 1037 kindergarten boys from low socioeconomic areas of a large metropolitan city in Quebec, Canada. All were French-speaking and born in Quebec to French-Canadian parents. Their parents' average score on the Blishen, Carroll, and Moore (1987) scale for occupational prestige in Canada was 37.95 ( $SD = 14.39$ ) for mothers and 41.29 ( $SD = 11.77$ ) for fathers. These scores represent low to average socio-economic levels. These 742 were included because they had complete data on teacher-rated reactive and proactive aggressiveness when they were 12.01 years old ( $SD = .29$ ) and on self-rated delinquency when they were 15 years old ( $SD = .30$ ). For 664 of these 742 boys, diagnostic interviews with them and their mothers were also available between the ages of 14 and 16 years (average = 14.9 years,  $SD = .70$ ). Of 1037 boys who were part of the sample in kindergarten (i.e. at age 6), those who were lost because they had moved, had refused to participate, or had occasional missing data on some measures were more disruptive according to their kindergarten teachers than the 742 boys who remained in the sample.

### *Instruments*

*Social Behavior Questionnaire.* Teachers completed the Social Behavior Questionnaire (SBQ; Tremblay, Loeber, Gagnon, Charlebois, Larivée, & LeBlanc, 1991) when the boys were 12 years old (typically in grade 6; grade 5 for 17% of the boys who had repeated a class). The SBQ is a 22-item questionnaire used to rate children on disruptiveness (i.e.

hyperactivity-aggressiveness-opposition; 13 items), inattention (4 items), and anxiety-withdrawal (5 items). Teachers indicated whether items did not apply (0), applied sometimes (1), or applied often (2). Internal consistency was high for the disruptiveness and inattention scales (Cronbach's alphas  $> .85$ ) and moderate for the anxiety-withdrawal scale (Cronbach's alpha = .70).

The three reactive and the three proactive aggression items used by Dodge and Coie (1987) were included in the SBQ. The three reactive items were: "When this child has been teased or threatened, he gets angry easily and strikes back", "This child always claims that other children are to blame in a fight and feels that they started the whole trouble", "When a peer accidentally hurts this child (such as by bumping into him), this child assumes that the peer meant to do it, and then overreacts with anger and fighting". The three proactive items were: "This child gets other children to gang up on a peer that he does not like", "This child uses physical force (or threatens to use force) in order to dominate other children", "This child threatens or bullies others in order to get his own way". The scales for these items were similar to those for the other SBQ items (i.e. 0, 1, 2). Alphas for reactive and proactive items were .86 and .84, respectively.

*Self-Reported Delinquency Questionnaire.* Participants answered the 27-item Self-Reported Delinquency Questionnaire (SRDQ; LeBlanc & Fréchette, 1989) when they were 15 years old. The SRDQ assesses involvement in delinquent behaviors over the last 12 months. Questions can be grouped into four scales: physical violence (7 items), theft (10 items), vandalism (7 items), and drug/alcohol use (3 items). The items were embedded in a series of questions about school, hobbies, social relations, and parent-child relations. The children reported whether they had never (1), rarely (2), sometimes (3), or often (4) engaged in the act described by each item. A total delinquency score was computed by adding scores on all four subscales (alpha = .72).

LeBlanc and McDuff (1991) have verified the temporal stability and concurrent validity of the SRDQ with early adolescent boys. Other investigators have found that self-reports of delinquent behaviour are valid (Hindelang, Hirschi, & Weiss, 1981; Klein, 1989).

*Friends' deviancy.* At ages 12 through 14, subjects reported their exposure to deviant peers over the past 12 months by answering the following two questions: "How many of your close friends have been arrested by the police for an illegal act they had committed?" and "Are you a member of a gang which commits illegal acts?". For the first question, subjects could answer; none; a few; many; or all of them. Answers to the second item were coded 1 (no) or 2 (yes). Consequently, for each subject we were able to assess the degree of exposure to deviant friends, with scores ranging from 2 to 6 for each year. Internal consistency of this Exposure-to-Deviant-Friends scale ranged from .53 at age 10 to .65 at age 14.

*Conduct and oppositional disorders.* The Diagnostic Interview Schedule for Children (DISC-2; Shaffer, Fisher, Piacentini, Schwab-Stone, & Wicks, 1991) was used when subjects were between 14 and 16 years old (14.9 on average). The DISC-2 is a structured interview designed to assess symptoms over the past 6 months. An earlier version of the DISC-2 has proven valid (Costello, Edelbrock, & Costello, 1985).

The DISC-2 was administered to the subject and one parent, usually the mother. Answers from both sources were pooled and used to establish diagnoses according to DSM-III-R criteria. Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), and other diagnostic categories were computed using the scoring algorithm supplied by the authors of the DISC-2. Following Cohen, Velez, Kohn, Schwab-Stone, and Johnson's (1987) recommendation that information from different sources should be pooled at the symptom level rather than

at the diagnostic level, DSM-III-R diagnoses were computed using total number of symptoms coming from the child or the mother. This method was used in most studies combining information from both informants (Piacentini et al. 1993) and has proved to be as effective as more sophisticated statistically derived procedures in aggregating data from multiple informants (Bird, Gould, & Staghezza, 1992).

*Sociodemographic information.* Mothers provided information pertaining to family structure, educational levels of parents (or the parent with whom the child was living), occupations of parents (or the parent with whom the child was living), and ages of parents at participants' births. The Blisshen et al. (1987) scale for occupational prestige was used to score each parent's occupation on a continuous scale. Family structure and parental education and occupation have been linked to children's behavior problems or delinquency (Huesmann, Eron, Lefkowitz, & Walder, 1984; Robins, 1978; Velez, Johnson, & Cowen, 1989). Mother's age at the child's birth has also been negatively related to prevalence and persistence of children's externalizing problems (Tremblay, Charlebois, & Gagnon, 1986). These variables were combined into an index of family socioeconomic disadvantage in the following manner: parental age at the birth of the first child, number of years in school, and occupation were each given scores of 1 if the parent was in the lowest 30th percentile, and scores of 0 if the parent was above the 30th percentile. Children living with both biological parents received scores of 0, and all others were scored 1. For single-parent families, only the custodial parent's occupation, education, and age at the child's birth were considered. A sociofamily adversity index ranging from 0 to 1 was computed by dividing the total score by the number of variables used.

### Procedure

All instruments were administered in French. The SBQ was administered in person to teachers in April or May when boys were 12 years old. The SRDQ was administered at school near the end of the school year when boys were 15 years old. The sociodemographic questionnaire was administered to mothers by mail when their sons were 12 years old. Finally, the DISC-2 was administered in the homes over a 2-year period, when the boys were aged between 14 and 16 years (average age: 14.9).

### Data Analysis

For all outcomes (i.e. delinquency, ODD, CD), a continuous approach using multiple regressions was taken first, followed by a categorical approach using logistic regressions. For ODD and CD, number of symptoms was used as a continuous measure in multiple regressions. Adding a person-centered categorical approach to the variable-centered continuous approach will make the findings more clinically relevant. For the person-oriented analyses, both outcome measures and predictors (i.e. reactive and proactive aggressiveness) were made categorical. A cut-off of one standard deviation above the mean was used for delinquency as the outcome measure. Hence, two groups were formed: a delinquent group and a nondelinquent group. For ODD and CD, diagnoses based on DSM-III-R criteria served as categorical outcomes. For the predictors, a step-function revealed that scores of 0 or 1 on reactive aggressiveness and of 0 on proactive aggressiveness were related to significantly less delinquency than scores of 2 or above for reactive aggressiveness and 1 or more for proactive aggressiveness. No significant differences were found between adjacent levels of reactive or proactive aggressiveness beyond scores of 1 for reactive aggressiveness and 0 for proactive aggressiveness. Consequently a score of 2 or more on reactive and 1 or more on proactive aggressiveness were used as cut-offs for categorical analyses.

These cut-offs correspond to the 60th percentile on both subtypes of aggressiveness. Consequently, two categories were formed: proactively aggressive boys (above the cut-off on proactive aggression and below the cut-off on reactive aggression) ( $N = 33$ ) and reactively aggressive boys (below the cut-off on proactive aggression and above the cut-off on reactive aggression) ( $N = 52$ ). Combining these two categories yielded two additional categories: proactively-reactively aggressive boys (above the cut-off on proactive and reactive aggression) ( $N = 122$ ) and nonaggressive boys (below the cut-off on proactive and reactive aggression) ( $N = 292$ ).

About two-thirds of subjects (62.9%) received scores of 0 on proactive aggression. This proportion was 44.7% for reactive aggression. An equal proportion received scores of 1 on proactive (14.5%) and reactive aggression (15.5%). An additional 16.4% received scores of 2 or 3 on proactive aggression (22.5% for reactive aggression). Finally, 6.2% of boys received scores of 4, 5, or 6 on proactive aggression compared with 17.3% for reactive aggression. These data indicate that both subtypes of aggressive behaviors are skewed but that ranges of scores are not more restricted for one subtype than another (possibly more for proactive than for reactive aggressiveness if anything).

## Results

### Bivariate Analysis

Bivariate analyses between predictors (reactive and proactive aggression) and between predictors and out-

comes (delinquency and ODD or CD symptoms) are presented first. Table 1 illustrates Pearson's product-moment correlation coefficients between proactive and reactive aggression. As can be seen, the correlation of .71 is highly significant. On the other hand, the bivariate correlations between proactive and reactive aggression and delinquency, ODD, or CD symptoms are equivalent and moderate in size, although significant.

### Hierarchical Multiple Regressions

Hierarchical multiple regressions were used next to see how much teacher-rated proactive and reactive aggression collected at age 12 predicted self-reported delinquency at age 15 and number of oppositional defiant disorder or conduct disorder symptoms reported between ages 14 and 16. In all the analyses sociofamily adversity was controlled by forcing its entry first. A simultaneous block entry was used at the second step for reactive and proactive aggression as there is no theoretical basis for ordering their entry. All the predictors were centered at zero to minimize multicollinearity. An interaction term between proactive and reactive aggression was added in the final step to see whether the two subtypes of aggression would potentiate or temper each other.

As can be seen in Table 2, proactive aggression significantly contributed to predicting delinquency in step

Table 1  
*Intercorrelations among Predictor and Outcome Variables*

Variable	1	2	3	4	5	6
Predictor						
1. Proactive aggression		.71**	.16*	.30*	.18*	.19*
2. Reactive aggression			.14*	.25*	.18*	.20*
Outcome						
3. Delinquency				.51**	.24*	.05
4. CD symptoms						.10
5. ODD symptoms						.10
Control variable						
6. Sociofamily adversity						

\*  $p < .05$ ; \*\*  $p < .01$ .

Table 2  
*Summary of Hierarchical Multiple Regression Analysis in which Proactive and Reactive Aggression Predict Self-reported Delinquency ( $N = 742$ )*

Variable	<i>B</i>	<i>SE B</i>	<i>Beta</i>	$R^2$	$\Delta R^2$
Step 1					
Sociofamily adversity	1.82	1.44	.050	.002	
Step 2					
Sociofamily adversity	0.35	1.46	.010		
Proactive aggression	0.67	0.33	.100*		
Reactive aggression	0.37	0.26	.070	.029*	.027*
Step 3					
Sociofamily adversity	0.18	1.44	.004		
Proactive aggression	1.91	0.43	.300*		
Reactive aggression	0.32	0.26	.060		
Proactive $\times$ Reactive aggression	-0.56	0.13	-.240*	.054*	.025*

\*  $p < .05$ .

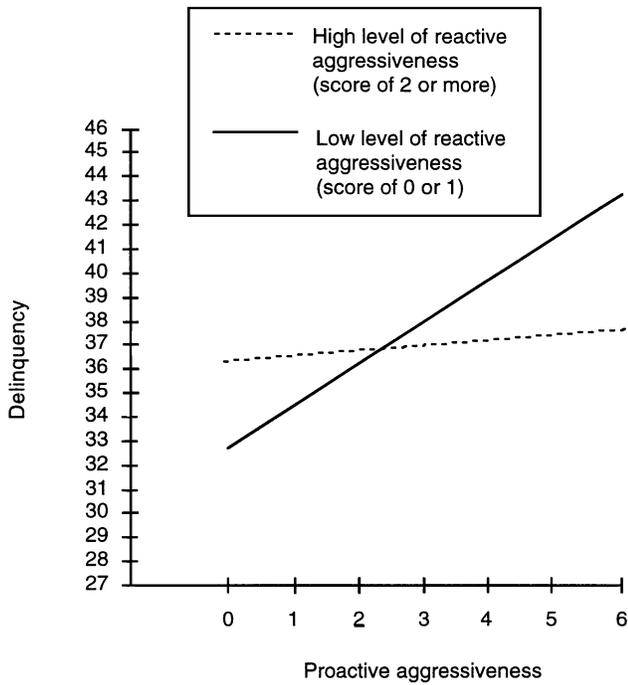


Figure 1. The interaction of proactive and reactive aggression predicting delinquency (for ease of interpretation, unstandardized slopes are graphed).

2, whereas reactive aggression did not. The interaction between proactive and reactive aggression (step 3) contributed significantly and negatively. The proportion of explained variance increased significantly after the introduction of the interaction terms.

The Reactive X Proactive Aggression interaction is depicted in Fig. 1, which shows that proactive aggression predicted delinquency only when reactive aggression was low. Specifically, for boys low on reactive aggression (i.e.,

with scores of 0, 1) the relationship between proactive aggression and delinquency was relatively high ( $\beta = .21, p < .001$ ). Conversely, for boys high (i.e. with scores of 2 or more) on reactive aggression, proactive aggression did not predict delinquency ( $\beta = .04, n.s.$ ).

We also explored whether the different dimensions of the delinquency scale (i.e. physical violence, which corresponds to the overt dimension of delinquency, and theft, vandalism, and drug use, which correspond to the covert aspect of delinquency) were differently predicted by proactive and reactive aggression. These results are not reported because they confirmed in every way the findings from the total delinquency scale.

The following hierarchical multiple regressions used ODD and CD symptoms as separate outcome variables. As mentioned before, information collected from subjects and parents was combined to compute number of ODD and CD symptoms. The results are presented in Table 3. Again, the predictors (family adversity and proactive and reactive aggression) were entered. Proactive and reactive aggression were entered as a block in the second step after controlling for family adversity in the first step.

Proactive aggression significantly predicted conduct disorder symptoms, but only marginally predicted oppositional disorders. Reactive aggression made no further contribution in step 2 for either type of disruptive behavior. A trend ( $p < .08$ ) was, however, noted for reactive aggression with respect to ODD symptoms. In step 3, the interaction term between reactive and proactive aggression was included but made no further contribution in predicting either ODD or CD symptoms. Consequently, it is not presented in Table 3.

Logistic Regressions

In order to make these findings more clinically relevant, we dichotomized the predictors (except for family adversity) and outcomes and then applied a logistic

Table 3  
Summary of Hierarchical Multiple Regression Analysis in which Proactive and Reactive Aggression Predict ODD and CD symptoms (N = 677)

Variable	B	SE B	Beta	R <sup>2</sup>	ΔR <sup>2</sup>
<i>ODD symptoms</i>					
Step 1					
Sociofamily adversity	.93	.35	.10*		
				.01	
Step 2					
Sociofamily adversity	.51	.35	.06		
Proactive aggression	.15	.08	.10(*)		
Reactive aggression	.37	.26	.07		
				.041*	.031*
<i>CD symptoms</i>					
Step 1					
Sociofamily adversity	.69	.25	.10*		
				.011*	
Step 2					
Sociofamily adversity	.23	.25	.03		
Proactive aggression	.24	.06	.22*		
Reactive aggression	.07	.04	.08		
				.08*	.073*

\*  $p < .05$ ; (\*)  $p = .06$ .

Table 4  
*Numbers of Boys in Delinquent and Nondelinquent Groups and with ODD or CD Diagnosis Depending on High or Low Reactive and Proactive Aggression*

Status	Proactive aggressiveness <sup>a</sup>				<i>N</i>
	High		Low		
	Reactive aggressiveness <sup>b</sup>		Reactive aggressiveness		
	High	Low	High	Low	
Delinquent/Nondelinquent <sup>c</sup>	60/155	20/36	17/64	48/342	742
ODD or CD/non ODD and non CD	37/137	7/37	5/63	19/326	631

<sup>a</sup> High proactive aggression: 1 or more; Low proactive aggression: 0.

<sup>b</sup> High reactive aggression: 2 or more; Low reactive aggression: 0 or 1.

<sup>c</sup> Delinquent:  $\geq 1$  *SD* above mean; Nondelinquent: others.

Table 5  
*Means, Standard Deviations (in parentheses), and Univariate *F* Values for Teacher-rated Behaviors at age 12 and Self-reported Friends' Deviancy from Ages 12 to 15*

Measure	Group				<i>F</i> (3, 783)
	High proactive/ High reactive	Low proactive/ High reactive	High proactive/ Low reactive	Low proactive/ Low reactive	
Teacher-rated SBQ					
Disruptiveness	11.17 (4.63)	6.22 (3.81)	3.91 (3.04)	1.59 (2.20)	389.62*
Anxiety-withdrawal	3.28 (2.39)	3.77 (2.53)	1.80 (1.68)	1.97 (2.22)	25.64*
Inattention	5.23 (2.15)	3.99 (2.33)	3.20 (2.36)	2.63 (2.55)	55.09*
Friends' deviancy	7.54 (1.72)	7.00 (1.31)	7.43 (1.62)	6.79 (1.18)	14.24*

regression to the categorical data. As mentioned previously, we dichotomized delinquency using the score one standard deviation above the mean as a cut-off score, thus yielding delinquent and nondelinquent groups. We also dichotomized reactive and proactive aggression using the cut-off scores described previously. Concordant with results from multiple regressions, being in the proactively aggressive category significantly increased the risk of being in the delinquent group (odds ratio = 2.44,  $B = .89$ , Wald = 13.71,  $p < .01$ ), whereas being in the reactively aggressive category did not. The nonproactive and nonreactive categories served as the reference groups. These results were obtained after controlling for family adversity, as in earlier analyses. The overall model was significant, likelihood-ratio LR test  $\chi^2(2) = 26.75$ ,  $p < .001$ . At the next step, the analysis yielded a significant interaction between proactive and reactive group membership ( $B = -.99$ , Wald = 4.98,  $p < .05$ ). Being high on reactive aggression decreased proactively aggressive boys' chances of being in the delinquent group by almost two-thirds (odds ratio for the interaction = .37). Overall, the addition of the interaction significantly improved the model ( $-2 \text{ Log LR} = 4.78$ ,  $p < .05$ ).

The next logistic regression analysis used ODD and CD diagnoses as the outcome variable. ODD and CD diagnoses were combined because they were both relatively rare. The overall predictive model was significant, likelihood-ratio LR test  $\chi^2(2) = 24.56$ ,  $p < .001$ . Con-

cordant with results from multiple regression, being in the proactively aggressive category tripled the risk of having a disruptiveness diagnosis ( $B = 1.12$ , Wald = 11.00, odds ratio = 3.06) compared with being in the nonproactively aggressive category. Being high on reactive aggression made no contribution. It did not moderate the risk associated with being proactively aggressive as revealed by the nonsignificant interaction between the proactively and the reactively aggressive categories.

#### Complementary Analyses

The following analyses were intended to determine why boys high on both proactive and reactive aggression (proactively-reactively aggressive) were less at risk for later delinquency (but not for ODD or CD problems) than boys high on proactive aggression and low on reactive aggression. The latter might have more externalized problems and/or less internalized problems and/or more deviant friends than the former.

*SBQ ratings.* To examine this possibility, a four-group MANCOVA (with sociofamily adversity as a covariate) was conducted on SBQ ratings. A significant group effect was found,  $F(12, 2208) = 51.66$ ,  $p < .001$ . Univariate *F*-tests revealed that the groups differed on all SBQ scales. Means adjusted to the covariate, standard deviations, and univariate *F* tests appear in Table 5. Post

hoc comparisons revealed that proactively-reactively aggressive boys were more disruptive and more inattentive at age 12 according to their teachers than were proactively aggressive boys. They were also more anxious-withdrawn than proactively aggressive boys but not more than reactively aggressive boys.

*DSM symptoms.* A similar picture emerged when groups were compared on DSM-generalized anxiety and hyper-anxiety symptoms (combined) collected during the DISC-2 interviews. Proactively-reactively aggressive boys and their mothers reported more symptoms of anxiety ( $M = 3.06$ ,  $SD = 5.15$ ) than did proactively aggressive ( $M = 1.96$ ,  $SD = 3.70$ ) or nonaggressive boys ( $M = 2.25$ ,  $SD = 4.21$ ), but they were similar to reactively aggressive boys ( $M = 2.69$ ,  $SD = 5.54$ ). However, these differences did not attain statistical difference because of high within-group variance. The trend was, nonetheless, in the expected direction ( $p < .10$ ). In summary, if boys high on proactive and reactive aggression are somehow protected from delinquency compared with boys high on proactive aggression and low on reactive aggression, it might be because they have more internalizing problems rather than because they have more externalizing problems.

*Friends' deviancy.* On the other hand, lack of association with deviant peers does not protect boys high on both proactive and reactive aggressiveness from delinquency compared with proactively aggressive boys. As can be seen in Table 5, their friends are not less deviant. However, association with deviant peers may explain why the latter proactively aggressive boys became delinquent even though they had fewer behavior problems at age 12. Indeed, post hoc tests revealed that this group associated more with deviant peers than the nonaggressive group, whereas the reactively aggressive boys did not (see Table 5).

## Discussion

It is clear from present results that proactive but not reactive aggression as rated by teachers when boys are age 12 predicts delinquency and ODD and CD problems in mid-adolescence. The present results support Pulkkinen's (1996) findings that proactively but not reactively aggressive male adolescents had later criminal behaviors. The "predatory" nature of most delinquency and CD problems may explain why proactive rather than reactive aggression was a significant predictor. The fact that proactive aggression predicted later externalizing problems so much better than reactive aggression cannot be an artifact of a more restricted range on reactive than proactive aggression since this was clearly not the case.

There are many possible reasons why proactive aggression can lead to externalizing problems, whereas reactive aggression does not. One is that boys who are high on proactive aggression might tend to associate with more deviant friends than boys who are high on reactive aggression. This is suggested by our own data and by recent data from Boivin and Poulin (1997), who found that elementary school boys were more similar to their friends than to other classmates on proactive aggression but not on reactive aggression. These results suggest that the tendency observed in aggressive boys to affiliate

(Cairns, Cairns, Neckerman, Gest, & Gariépy, 1988) applies to proactively aggressive boys but not to reactively aggressive boys. A second possible explanation is that reactively aggressive boys are more isolated than proactively aggressive boys because they are often rejected by peers (Dodge et al., 1990) and might have trouble making or keeping friends. In turn, aggressive boys with no friends have been shown to be less at risk for later delinquency than aggressive boys with disruptive friends (Vitaro et al., 1997). A final possible explanation is that boys high on reactive aggression are more anxious-withdrawn than boys high on proactive aggression (and low on reactive aggression). As noted earlier, some studies suggest that anxiety may protect aggressive boys from delinquency (Kerr, Tremblay, Pagani, & Vitaro, 1997; Tremblay et al., 1994).

The previous tentative explanations may also help explain the apparent protective effect of reactive aggression in the presence of high proactive aggression (i.e. that a high level of reactive aggressiveness substantially tempered the link between proactive aggressiveness and later delinquency). The finding, however, that reactive aggressiveness moderated the link between proactive aggression and delinquency but not between proactive aggression and DSM-disruptive problems also requires a tentative explanation. If, indeed, reactive aggression is protective (through isolation from deviant peers or inhibition), then the present results suggest that this "protection" operates only on externalizing behaviors such as delinquency, which require the presence of peers, are mainly manifested in out-of-home settings, and are susceptible to legal sanctions (Miller, 1982; Reiss, 1986). In contrast, many ODD symptoms are manifested in dyadic situations involving adults, mostly parents. This may explain why reactive aggression did not protect against this type of disruptive behavior. Not only was reactive aggressiveness not protective, but it almost made a significant contribution to predicting ODD symptoms, probably because most ODD symptoms are reactive in nature. The lack of protection against CD symptoms is more difficult to explain because many of these symptoms are similar to delinquent behaviors. However, some of them are not (e.g. lying). Moreover, the "pooled" strategy used to compute CD symptoms and diagnosis may be partly responsible for the discrepancy with results involving self-reported delinquency.

This unresolved issue notwithstanding, the present findings show that proactive but not reactive aggression predicts later externalizing problems and that proactively aggressive but not reactively aggressive children are at risk of becoming delinquent and conduct disordered. Consequently, we should distinguish among proactive and reactive aggression and among reactively and proactively aggressive children as already argued by Dodge et al. (1997) on the basis of several concurrent and developmental distinctions between these two types of aggressiveness or these two types of aggressive children. At the same time, however, factor analyses of proactive and reactive items have revealed low eigenvalues in some studies (Dodge & Coie, 1987) but not in others (Day et al., 1992). In addition, the number of children who are characterized by reactive *and* proactive aggressiveness in this study and others outnumbered reactive-only and

proactive-only children combined. As Dodge (1991) stated, these findings yield a mixed picture of the validity of the distinction between reactive and proactive aggression. These difficulties in distinguishing proactive and reactive aggression remind us of previous problems distinguishing hyperactivity from aggression (Hinshaw, 1987). Despite some overlap and high correlations between these two classes of externalizing problems, there is divergent validity between the two dimensions (Hinshaw, 1987), and aggressive, hyperactive, and aggressive-hyperactive children can be distinguished (Soussignan et al., 1992).

The present study has several assets: a large sample, multiple informants, multiple dependent measures, and a longitudinal perspective. It also has clear limitations: lack of data on peer relationships and absence of data on family dynamics. One additional limitation is the exclusive focus on externalizing problems. It is possible that reactive aggression is more predictive of internalizing problems than is proactive aggression. Future research should try to overcome these limitations and address the process mechanisms through which proactive aggression leads to maladjustment. Future research should also try to distinguish between object-oriented and person-oriented subtypes of proactive aggression. Given the nature of the items used in this study, proactive aggression was mostly person-oriented. Different results might have been obtained if proactive aggression was instrumentally oriented. More research is needed to clarify these points and replicate our findings of outcome differences between reactive and proactive aggression, particularly in samples that include girls.

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