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Running head: PROTECTIVE AND COMPENSATORY FACTORS

Protective and compensatory factors mitigating the influence of deviant
friends on delinquent behaviors during early adolescence

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Abstract

This study examined factors that could moderate or compensate the link between exposure to deviant friends and delinquent behaviors in a sample of 265 early adolescents. The putative moderating or compensatory factors referred to the behavioral domain (i.e., novelty seeking, harm avoidance), the biological domain (i.e., physical maturation), the sociofamily domain (i.e., sociofamily adversity, parental practices), the school domain (i.e., academic performance), and the social domain (i.e., peer acceptance). A series of regression analyses showed that novelty seeking and puberty status moderated the link between friends' self-reported delinquency and participants' self-reported delinquency. In addition, all the factors except peer acceptance also had main effects that, cumulatively, reduced the association between friends' delinquency and self-rated delinquency through compensatory main effects. These results are discussed in light of the differential roles of moderating and of compensatory factors.

Protective and compensatory factors mitigating the influence of deviant
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In recent years there has been growing research into the impact of deviant peer affiliations on adjustment in young people (for reviews see, Dishion, French, & Patterson, 1995; Kandel, 1986; Vitaro, Tremblay, & Bukowski, 2001). This research has found that young people who affiliate with delinquent or substance using peers are at increased risks of crime (Elliott & Menard, 1996; Farrington, Ohlin, & Wilson, 1986; Fergusson & Horwood, 1996), substance use (Kandel, 1978), and mental health problems (Brendgen, Vitaro, & Bukowski, 2000; Fergusson, Beautrais, & Horwood, in press). In part, at least, these associations appear to reflect the fact that, through a number of processes, deviant peer affiliations act to increase risks of behavioral difficulties and, particularly, externalizing behaviors in young people. Specifically, it may be suggested that as a result of processes of social imitation, peer pressure, and social facilitation young people who affiliate with deviant peers show an increase in various forms of risk taking behaviors that in turn leads to increased rates of crime, substance use and mental health problems in this group (Fergusson, Wanner, Vitaro, Horwood, & Swain-Campbell, 2003).

Although linkages between deviant peer affiliations and the behavioral adjustment of young people have been well established, it is not the case that all young people who affiliate with deviant peer groups develop subsequent behavioral difficulties (Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). Such findings raise the important question of the factors that distinguish between those young people who succumb to the influence of deviant peer groups and those who prove to be resistant to this influence.

There are potentially two almost interchangeable explanations of the factors and processes that determine individual responses to peer group affiliations.

- a) *Vulnerability*: First, it may be suggested that those who succumb to peer group influences do so because they have pre-existing vulnerabilities to problem behavior, with peer group affiliations acting to shape and refine these vulnerabilities. This explanation is consistent with findings that suggest that those who most often enter or form deviant peer groups tend to: come from disadvantaged backgrounds; have been exposed to childhood or family adversity, and often show early onset conduct problems and difficulties (Brendgen, Vitaro, & Bukowski, 1998; Dishion, Patterson, Stoolmiller, & Skinner, 1991). Given this evidence it may be proposed that the processes leading to deviant peer group formation tend to select individuals who are vulnerable to later problem behaviors with peer affiliations acting to further encourage such behaviors. Under this explanation, differences between those who succumb to deviant peer group influences and those who are resistant to such influence, reflect differences in pre-existing levels of vulnerability to later problem behaviors.
- b) *Protection*: An alternative explanation of differences in responses to peer group affiliations is that these differences may reflect the fact that those who do not succumb to peer group affiliations are characterized by the presence of factors that protect them from responding to negative peer group influences. For example, it may be proposed that young people characterized by such factors as strong parental attachment, strong attachment to school, etc may be relatively protected from deviant peer group influences (Vitaro, Brendgen, & Tremblay, 2000). Under this explanation, differences in responses to deviant peer affiliations reflect the presence of factors that protect some young people from deviant peer group influences.

The vulnerability and protection explanations are, to some extent, interchangeable because they both refer to moderating processes. For example it may be suggested that if childhood

adversity is a factor that increases susceptibility to deviant peer influence then absence of such adversity is a protective factor that reduces such influence. Some factors, however, may have main effects opposite to risk factors. These factors would decrease the overall risk of exposure to deviant friends through a compensatory process (i.e., their positive main effect would compensate the negative main effect of a risk factors.) There are a number of ways by which distinctions between, on the one hand, vulnerability and protective factors and, on the other hand, risk and compensatory factors, have been proposed. In particular, it has been suggested that what distinguishes vulnerability and protective factors (i.e., moderators) from conventional risk or compensatory factors is that the former two factors combine interactively with the exposure variable (in this case deviant peer affiliations) to determine outcome risks whereas the latter two factors imply main effects. Thus, for example Brown and Harris (1978) argued that absence of supportive relationships was a vulnerability factor that combined interactively with exposure to adverse life events to determine risks of depression so that only those with both an absence of supportive relationships and exposure to adverse life events developed depression. Rutter (1985) has proposed a very similar approach to defining protective factors by suggesting that these factors are beneficial for those who are exposed to a given risk factor but have no benefit (or lesser benefit) for those not exposed to the risk factor.

Both the vulnerability and protective factor explanations suggested by Brown and Harris and by Rutter require the presence of interactive relationships between the exposure variables and the vulnerability/ protective factor in determining outcome risks. Provided such interactive processes are present it also becomes possible to distinguish between vulnerability and protective factors (depending on the nature of the moderating factor and of the interaction). However, in a situation in which the relationship between the exposure variables, the vulnerability/protective

factors, and the outcome are described by a pure main effects model, we speak of risk/compensatory factors, which can also be considered different sides of the same coin. Thus, if for a main effects model, weak parental attachment is a risk factor that increases (i.e., adds to) deviant peer influences, then the presence of strong attachment is a factor that would reduce deviant peer influences, and hence operate as compensatory factor.

Previous research into vulnerability/protective factors regarding deviant peer influence

A number of previous studies have examined factors that may moderate the effects of deviant peer affiliations on the risks of delinquent behaviors. These studies suggest that a number of domains may contribute to vulnerability to/protection from deviant peer influence. These domains include:

1) *Behavioral characteristics*: Disruptiveness and hyperactivity are conceptually related to novelty seeking in Cloninger's personality model whereas anxiety and shyness are conceptually related to harm avoidance (Cloninger, 1986, 1987). Accordingly, some authors have shown low disruptiveness protected early adolescent boys who associated with deviant friends from becoming delinquent (Vitaro et al., 2000; Vitaro et al., 1997). Other externalized behaviors, however, such as attention deficit – hyperactivity, have not been found to moderate the link between exposure to deviant peers and initiation of delinquency in early adolescent boys (Keenan, Loeber, Zhang, Stouthamer-Loeber, & Van Kammen, 1995). Internalized behaviors such as shyness or behavioral inhibition have also been found to protect disruptive children, mainly boys, from becoming delinquent (Kerr, Tremblay, Pagani-Kurtz, & Vitaro, 1996). It is not known, however, whether internalized behaviors would protect children who associate with deviant peers from delinquent behaviors.

2) *Physical maturation*: Early pubertal maturation has been linked to adjustment problems, especially for girls (Magnusson, Stattin, & Allen, 1985, 1986; Simmons & Blyth, 1987). One possible explanation is that early maturers associate with deviant males outside the school system (Stattin & Magnusson, 1990). Hence, early maturation is a risk factor for later adjustment problems through the mediating role of deviant peers. A partly different view has been proposed by Caspi and Moffitt (1991) who stressed that early maturation exacerbates the link between behavior problems and later adjustment problems, although they also found a main effect of early maturation. Despite these important findings, no authors (to our knowledge) examined the possible protective role of delayed puberty with respect to exposure to same age deviant friends (it is possible that late maturers do not associate with older deviant peers but some of them may still associate with same age deviant peers).

3) *Socio-family factors*: Other researchers examined the protective factors that originate in the family. For example, attachment to parents moderated the link between exposure to deviant friends and participants' delinquent behaviors (Mason, Cauce, Gozales, & Hiraga, 1994; Vitaro et al., 2000). However, Keenan et al. (1995) who used a composite score of supervision, discipline, and affectionate relationships found no interaction between family variables and association with deviant peers in predicting severe delinquency. Similarly, Vitaro et al. (2000) found no interaction between parental supervision and exposure to deviant friends in predicting later delinquency but they found that parental supervision had a positive main effect that compensated for the presence of deviant friends.

In addition to parental practices, low SES and socio-family adversity have also been shown to increase delinquent behaviors and association with deviant friends (Farrington & West, 1993; Kolvin, Miller, Fletting, & Kolvin, 1988). However, it is still unknown whether high SES or

absence of sociofamily adversity could moderate or compensate the link between deviant friends and later maladjustment.

4) *Quality of peer relationships*: In some studies, peer rejection has been found to predict delinquent behaviors above and beyond conduct problems (Coie, Lochman, Terry, & Hyman, 1992). Other studies, however, reported divergent results (Fergusson, Woodward, & Horwood, 1999). No study examined whether acceptance by conventional peers moderates the link between deviant friends and delinquency or whether it could compensate the negative effects of deviant friends (i.e., produce a main effect opposite to friends' deviancy). It is reasonable to hypothesize that children who are not well accepted by conventional peers will be vulnerable to the influence of deviant friends whereas children who are well accepted may be less responsive to deviant peers. It is also reasonable to expect that acceptance by conventional peers may compensate the influence of deviant friends because well accepted children also have access to normative socialization experience

5) *School factors and academic performance*: Academic performance and a positive school environment have been shown to negatively predict association with deviant friends and delinquency (Dishion et al., 1991). They also have been shown to moderate the negative effect of an adverse socio-familial environment. However, little is known about its power to moderate or compensate exposure to deviant friends at a period when friends become increasingly important (i.e., by early adolescence).

Finally, although, there is growing evidence that suggests that these factors may moderate the links between deviant peer affiliations and own delinquent behavior, there have been no studies investigating the way in which factors from different domains may combine accumulatively to moderate or compensate these effects.

The present study

In this paper we used data gathered over the course of a longitudinal study of a sample of Canadian early adolescents to explore the extent to which the associations between delinquent friends and self-reported delinquency were moderated or compensated by a series of factors including family factors, school factors, individual factors, and peer factors. More specifically, the following questions were addressed:

- 1) To what extent are affiliations with delinquent friends by age 13 years related to increased risks of delinquent behaviors and substance use?
- 2) To what extent are associations between delinquent friends and self-reported delinquency moderated or compensated by a series of factors reflecting different domains such as family background, puberty status, academic achievement, novelty seeking, harm avoidance, and peer acceptance.
- 3) What are the accumulative compensatory or moderating effects of these factors on the link between deviant peer affiliation and delinquency?

*Method**Participants*

This study involved a sample of 265 young adolescents (137 girls and 128 boys; average age = 13.36; SD = 0.46) from a small city in northwestern Quebec, Canada. The majority of the participants (> 90%) were French speakers of European descent. The socioeconomic status of the sample assessed by the Blishen and McRoberts (1976) occupational prestige scale was similar to the mean SES level in Quebec. The study sample was part of an ongoing longitudinal study on children's and adolescents' behavioral and emotional adjustment that included annual assessments of all same age students from the selected city beginning in kindergarten (N = 385).

Measures for the present study were obtained at age 13 years. This age was selected because it corresponded to first year in high school in the Quebec school system and because it corresponded to the last year in which students attended the same classroom during the whole school year. It also corresponded to the first year when delinquency scores had sufficient variance for distinguishing subgroups of delinquent participants and delinquent friends (defined later). The present sample was comprised of 68.8% of the initial sample. Participants lost through attrition were characterized by lower levels of SES, lower peer nominations of peer acceptance, and higher teacher ratings of both harm avoidance and novelty seeking at kindergarten age compared to the remaining participants. These latter measures were also collected at age 13 years and are described below. Parental permission was obtained for all participants.

Instruments

Main Predictor: Friends' Delinquency and Substance Use. Adolescents were asked to nominate up to four friends in the classroom. Friendship nomination was restricted to the classroom because classroom composition remained stable throughout the year, and adolescents spent all the time within the same classroom. Friends' delinquent behavior scores were determined by using the friends' reports on the Self Reported Delinquency Questionnaire (SRDQ; LeBlanc & Fréchette, 1989). Friends reported whether they had been involved in a variety of delinquent behaviors over the last 12 months: fighting, theft, vandalism (22 items). They also reported about their use of drugs and alcohol (3 items). The adolescents answered whether they had never (1), rarely (2), sometimes (3), or often (4) engaged in each act. This scale has been shown to have satisfactory reliability and good convergent, discriminant, and predictive validity (Hindelang, Hirschi, & Weiss, 1981; Klein, 1989; LeBlanc, 1996). To represent each

participant's degree of deviant peer affiliations, the SRDQ scores for his/her friends were averaged across all nominated friends, following the approach used by Berndt and Keefe (1995). The resulting scale scores were rather normally distributed (skewness = 1.17 and kurtosis = 0.65).

Outcome Measure: Participants' Own Delinquency and Substance Use. Participants were also questioned about their own delinquent behaviors and substance use using the Self-Reported Delinquency Questionnaire (LeBlanc & Fréchette, 1989). In the present study Cronbach's alpha was $\alpha = .91$. The delinquency scores were rather normally distributed (skewness = 1.18 and kurtosis = 0.39).

Putative vulnerability/protective or risk/compensatory factors

Novelty Seeking: Teachers reported their perceptions of participants' novelty seeking behaviors through the use of 11 items that measured hyperactive, impulsive, and novelty seeking behaviors. Examples of items are ("tends to act without thinking and planning"; "doesn't persist and complete after having started something", "is fidgety"; "is easily distracted"; "is impatient when s/he has to wait for his or her turn"). These items have been borrowed from the Social Behavior Questionnaire (Tremblay et al., 1991). Each item was scored on a four-point scale. Internal consistency was high (Cronbach's alpha = .90).

Harm Avoidance: Teachers also reported their perceptions of participants' harm avoidance behaviors through the use of four items that measured shyness, anxiety, and inhibition: "tends to be scared of new and unknown situations"; "cries easily"; "feels uneasy because of many things"; and "was crying when arriving at school". These items have also been borrowed from the Social Behavior Questionnaire (Tremblay et al, 1991). As it was the case for novelty seeking,

teacher indicated whether items did not apply (0), applied sometimes (1), or applied often (2). Internal consistency was satisfactory (Cronbach's alpha = .69).

Physical maturation. The measure of pubertal status was based on three items developed by Petersen, Crockett, Richards, and Boxer (1988). The participants reported on a scale from one to four the extent to which their body had started to change on these three items (for girls: growth of body hair, growth of breasts, menstruation; for boys: change in voice, growth of body hair, spurt in growth). Validity of self-reports on physical maturation has been established by different groups of researchers (Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987; Duke, Litt, & Gross, 1980; Morris, & Udry, 1980). The total scores were used to classify the participants into one of Tanner's five-stages of physical maturation (i.e., from very early to very late maturing).

Socio-family background. In order to reduce the number of predictors while reflecting as completely as possible the participants' socio-family background, we constructed an aggregate score that included socio-familial adversity and parenting practices such as monitoring and positive/non punitive discipline. Socio-familial adversity combined information on: family structure (two parent or single), educational level of both parents (or the parent with whom the child was living), occupational status of both parents (or occupation of the parent with whom the child was living) based on Blishen and McRoberts (1976) occupational prestige scale, and mother's age at the birth of the first child. With regard to the latter measure, early motherhood was considered to represent a risk factor. For each continuous variable (i.e., educational level, occupational status, and mother's age at birth of the first child), children who were in the bottom tertile received a score of 1 whereas the remaining children received a score of 0. Children of single parent families also received a score of 1. For two-parent families the total socio-familial adversity score was divided by 6. For single-parent families this score was divided by 4. This

information was based on questioning the child's parents (principally mothers). The resulting measure ranked children from those exposed to high family adversity throughout the assessment periods to those who were exposed to little or no family adversity.

Participants' reported on parental monitoring practices through the use of two items. The two monitoring items assessed whether the participants' parents knew where and with whom the participants spent time when they were not at home. Participants answered those items on a four-point scale which ranged from 1 = "never" through 4 = "always". The resulting score ranked children from those exposed to close monitoring by parents to those exposed to more neglectful parental monitoring. This scale was of satisfactory reliability ($\alpha = .84$).

Participants also responded to five items assessing parental punishment practices as disciplinary sanctions (i.e., hitting, yelling, calling names, removing privileges, and manipulating affect). Participants answered those items on a four-point scale which ranged from 1 = "never" through 4 = "always". The resulting score ranked children from those exposed to positive parenting discipline to those exposed to harsh and controlling parental punishment practices. This scale was of satisfactory reliability ($\alpha = .63$).

As already mentioned, an aggregate score of socio-familial adversity, parental monitoring, and positive/non punitive discipline was constructed based on median splits of each of the three variables. The aggregate score counted whether participants scored below the median of sociofamily adversity and parental monitoring and whether participants scored above the median of punitive discipline. Thus, a higher value of the aggregate score reflected higher levels of adversity/inadequate parenting across the three measured variables.

Academic performance. Information on academic performance was gathered using the participants' report cards at the end of the school year. This report card assessed achievement in

French (i.e., reading, composition, comprehension) and mathematics on five-point scales.

Academic achievement ranged from 'less than average', 'somewhat less than average', 'average', 'somewhat better than average', to 'better than average'. A global score was obtained by averaging the marks for French and mathematics (Cronbach's $\alpha = .91$).

Peer acceptance. Participants' popularity was assessed through peer nominations. Specifically, a list of names of all the children in a given class were handed out to the participants. The children were then asked to circle the names of three children they most liked to play with (positive nominations) and the names of three children they least liked to play with (negative nominations). The criteria outlined by Coie, Dodge, and Coppotelli (1982) were used to compute the social preference score for each participant. This score represents the difference between the number of positive and negative peer nominations, which is standardized across classrooms and gender.

Treatment of missing data. Only 2.8% of the data were missing. Missing values were estimated employing saturated regression equations using all scales to estimate any missing value from non-missing values (Lösel & Wüstendorfer, 1974).

Procedure

All measures, except for socio-family adversity, were collected at school towards the end of the school year. Socio-family adversity measures were collected through mailed questionnaires to parents' homes. All instruments were administered in French by a trained research assistant in small group format. Total confidentiality was guaranteed to the participants.

Results

a) Association between delinquent behavior and friends' delinquency

Table 1 shows the sample of 265 young people classified into quartile groups on the basis of the measure of friends' delinquency at age 13. For each group, the Table shows the mean score on the self-reported delinquency measure. The Table shows that with increases in friends' delinquency there were corresponding increases in mean self-reported delinquency scores: young people in the highest quartile of the friends' delinquency score had mean self-rated delinquency scores of 10.02, compared to mean scores of 3.86 for those in the lowest quartile. The significance of the association was tested using one-way analysis of variance for a linear trend. This analysis showed the presence of a highly significant ($F(1, 263) = 46.99, p < .0001$) linear association between friends' delinquency and self-reported delinquency.

The results in Table 1 were further subdivided by gender to test the presence of gender x friends' delinquency interaction. No significant interaction ($F(1, 263) = 2.00; p = .11$) was found, indicating that the associations between friends' delinquency and self-rated delinquency were similar for males and females.

b) Associations between own delinquency and vulnerability/protective (V/P) or risk/compensatory (R/C) factors

Table 2 shows the sample divided into quartiles on the basis of the extent of self-reported delinquency. For each group, the Table reports the mean scores for a series of potential V/P or R/C factors. These factors are: family background; academic achievement; puberty status; novelty seeking; harm avoidance; peer acceptance. Each comparison was tested for statistical significance using one-way analysis of variance for a linear trend. Table 2 indicates that increasing delinquency was associated with: increasing family adversities ($p < .0001$), declining

academic achievement ($p < .0001$), increasing puberty status ($p < .0001$), and increased novelty seeking ($p < .0001$). Each of these associations could potentially modify the linkage between friends' delinquency and self-rated delinquency shown in Table 1 through a moderating or a compensatory role. However, delinquent behaviors were not related to either harm avoidance or peer acceptance.

c) Multivariate Model

The associations between self-rated delinquency, friends' delinquency, and the V/P or R/C factors in Table 2 were analyzed using a multiple linear regression model in which the self-rated delinquency score was the dependent variable and the other measures were predictor variables. Multiplicative interaction terms between the friends' delinquency measures and each of the V/P or R/C factors were tested following the procedures proposed by Aiken and West (1991). Variables were centered before calculating interaction terms. Significance of each interaction term was tested separately and only significant interaction terms were entered in the final regression model. Results of the analyses are shown in Table 3, which shows the significant main effects and interaction terms. The Table shows that in addition to the association between friends' delinquency and self-reported delinquency there were:

- i) Significant main effect associations between self reported delinquency and family background ($p < .001$), academic achievement ($p < .05$), puberty status ($p < .01$), novelty seeking ($p < .01$), and harm avoidance ($p < .05$). These findings showed that self-rated delinquency was more frequent amongst: those from disadvantaged backgrounds; those with impaired academic achievement; those with advanced puberty; those prone to novelty seeking behaviors; and those who were low on harm avoidance.

ii) In addition, two of the predictor variables showed interactive relationships with the friends' delinquency measure. These predictor variables were novelty seeking and puberty status. The nature of these interactions is shown in Figure 1, which shows the associations between friends' delinquency and self-reported delinquency subdivided by the third variables classified into three ranges (high, medium, and low). These plots show that in both cases, the regression lines between friends' delinquency and self-reported delinquency were non parallel across the levels of the third variable. In the case of the novelty seeking x friends' delinquency interaction, the plot shows that the association between friends' delinquency and self-rated delinquency was strongest for those with low novelty seeking and weakest for those with high novelty seeking. These results suggest that the interaction between friends' delinquency and novelty seeking reflected what could only be described as a “negative protective relationship“ in which abstinence from deviant peer affiliation was most beneficial for those with low levels of novelty seeking.

In the case of puberty status, the plot shows that the associations between friends' delinquency and self-rated delinquency were strongest for those with advanced puberty and weakest for those with delayed puberty. This finding suggests that a delayed puberty was potentially a protective factor that mitigated the effects of friends' delinquency.

d) *Accumulative effects of V/P and R/C factors*

A limitation of the analysis reported in Table 3 is that this analysis does not describe the accumulative effects of the V/P and R/C factors on the relationships between friends' delinquency and self-reported delinquency. However, from the model in Table 3, it was possible to explore the ways that variations in the V/P and R/C factors (family background, academic achievement, novelty seeking, harm avoidance, and puberty status) modified the associations

between friends' delinquency and self-rated delinquency. This analysis was conducted in the following way:

- i) For each participant, a V/P and R/C composite score was created by summing the factors with each factor weighted by the relevant regression coefficient. This score estimate included both main effects and interaction terms and ranked participants from those with a low V/P and R/C composite score (high family adversity, low academic achievement, high novelty seeking, low harm avoidance, and high puberty status) to those with a high V/P and R/C composite score (low family adversity, good achievement, low novelty seeking, high harm avoidance, and low puberty status).
- ii) For purposes of data display, this accumulative score was divided into thirds (tertiles) corresponding to low, medium, and high V/P or R/C factors.

Table 4 shows the sample cross-classified by the degree of friends' delinquency (in quartile groups) and the V/P or R/C composite score (in tertile groups). The cells of the Table report mean self-rated delinquency scores. A performed two-way analysis of variance (ANOVA) using the self-rated delinquency scores as dependent variable and both friends' delinquency and V/P or R/C composite score as independent variables was significant, $F(11, 253) = 7.80, p < .0001$. The main effects of both the V/P or R/C composite score ($F(2, 262) = 22.64, p < .0001$) and friends' delinquency ($F(3, 261) = 12.20, p < .0001$) were significant while their interaction was not significant ($F(6, 258) = 0.65, p = .69$). The Table shows that within each friends' delinquency group, rates of self-rated delinquency varied according to the composite score. For example, amongst those with high delinquent friends but a high V/P or R/C composite score the mean delinquency score was 7.16 compared to a mean of 12.20 for those with high delinquent friends but a low V/P or R/C composite score. Although pair wise conducted post hoc Tukey tests

showed that this mean-level difference was not significant due to the small size of the latter group, these tests indicated that the corresponding mean-level differences were significant for two of the remaining levels of deviant peer affiliation. A lack of statistical power of the conducted post hoc tests may also explain why the mean levels of delinquency did not differ across all levels of deviant peer affiliations, despite the high linear association of these variables (see Table 1). However, Table 4 clearly shows that a high composite score mitigates risks of delinquency at all levels of friends' delinquency rather than being beneficial for only those with high levels of exposure to delinquent friends.

Together, these results suggest a compensatory model in which the composite factor decreases the risk associated with deviant peer affiliation for all individuals rather than a protective model in which deviant peer affiliation poses a risk only at certain levels of the composite factor. These features of the accumulative V/P or R/C score reflect two general features of the statistical model relating the composite score to self-reported delinquency. First, all of the factors had significant main effects suggesting that all variables had some additive (or subtractive) effect in conjunction with delinquent friends. Second, only two of the factors (novelty seeking and puberty status) showed an interactive protective role. This state of affairs, in which all variables had main effects and only two variables exhibited a weak moderating effect resulted in a situation in which variations in the composite score modified the effects of friends' delinquency at all levels of this variable.

Discussion

This study used data gathered on a sample of Canadian 13 year olds to examine the linkages between delinquency and deviant peer affiliations. The focus of this analysis was upon

identifying V/P or R/C factors that may modify risks of delinquency amongst those with high levels of exposure to deviant peers. The findings and their implications are reviewed below.

a) Delinquent Friends and Delinquency

In confirmation of previous research, increasing levels of friends' delinquency was found to be associated with increasing rates of self-reported delinquency: those with high levels of friends' delinquency had mean delinquency scores of 10.20 compared to scores of 3.20 for those with low levels of friends' delinquency. This association persisted when a series of other factors (i.e., family background, academic achievement, puberty status, novelty seeking, and harm avoidance) were taken into account statistically.

A particular strength of the present study was the fact that friends' delinquency was based on the reports of the friends about their delinquent activities whereas the assessment of delinquency was based on self-report. This use of different informants to describe friend-delinquency and self-delinquency ensures that common method effects do not contaminate the association between friends' delinquency and delinquency. This is a potentially important result since much previous research into peer affiliations and delinquency has been criticized on the grounds that the use of self-report measures leads to inflated estimates of the association between deviant peer affiliations and delinquency because of method effects (Thornberry & Krohn, 1997). What the present results demonstrate is that even when friends' delinquency is measured using friends' reports and delinquency is assessed using self-report, thus controlling method effects, there was still a very substantial relationship between the extent of affiliation with delinquent friends and rates of delinquent behaviors. It is equally important, however, to underline the cross-sectional nature of this relationship and its limited contribution in clarifying whether there is a selection or an influence effect at work, or both at the same time. A selection effect indicates that delinquent

adolescents tend to affiliate with delinquent friends whereas the influence effect would suggest that association with delinquent friends produces delinquent adolescents.

b) Vulnerability/protective and risk/compensatory factors

The second stage of the analysis explored the possible factors that may have acted to moderate or to modify (through addition or subtraction) the relation between friends' delinquency and participants' delinquency. In this analysis, consideration was given to an array of factors that may act as either as moderators (i.e., vulnerability/protective factors) or as main effects (i.e., risk/compensatory factors). These factors spanned a series of domains including family factors, biological factors, school factors, peer factors, and individual factors, which have been linked to adolescent delinquency in previous research. To explore the relationships between these factors, friends' delinquency, and self-reported delinquency a statistical model was fitted permitting each of the factors to have a main effect and to interact with the friends' delinquency. This analysis suggested that family factors, academic achievement, puberty status, novelty seeking, and harm avoidance all contribute to rates of delinquency in addition to the contributions of friends' delinquency. Specifically, the configuration of circumstances that increased own delinquency was: impaired family background, limited academic achievement, advanced puberty status, high novelty seeking, and low harm avoidance. Conversely, the circumstances that minimized own delinquency were positive family background, good academic achievement, delayed puberty status, low novelty seeking, and high harm avoidance. These risk/compensatory factors increased/reduced the risk associated with friends' delinquency for all individuals. The present results support past studies that showed the importance of similar factors in the prediction of delinquent behaviors (Dishion et al., 1991; Fergusson et al., 1999; Magnusson et al., 1985; Vitaro et al., 2000). The present findings, however, do not support

results from Coie et al. (1992) that low social acceptance by peers contributes to delinquent behaviors above and beyond other relevant factors.

Two factors also significantly moderated the link between deviant friends and self-reported delinquency. These two factors were, in line with previous findings, novelty seeking and physical maturation (Caspi & Moffitt, 1991; Vitaro et al., 1997). However, given that the V/P or R/C factors in part were associated with delinquency, the statistical power to detect moderating effects may have been limited in the present study. Thus, we cannot rule out that some of the remaining variables may show moderating effects if tested in larger samples.

c) Vulnerability/protective and risk/compensatory processes

Aside from the substantive findings of this study, the results serve to illustrate a number of important conceptual issues regarding the ways in which various factors may contribute to adjustment or maladjustment. In particular, most research into the origins of protective factors has centered on the definition developed by Rutter (1985). Rutter argued that to distinguish protective factors from risk factors it is necessary for protective factors to be something more than the opposite of risk factors. From this position, Rutter then proposed that protective factors had an interactive relationship with the risk factor such that the risk factor only posed a risk in the absence of the protective factor but no risk (or less risk) in the presence of the protective factor.

While there is no doubt that Rutter's conceptualization draws a clear distinction between protective and risk factors, it raised a further problem that has dogged the study of protective factors. In particular, it is now clear that the processes that contribute to adjustment in the face of adversity do not always conform to the interactive model of protective processes suggested by Rutter. This point is very clearly shown by this study in which the factors that contribute to

adjustment have varied in their associations with the exposure variable (i.e., friends' delinquency). In all cases there was evidence of additive (subtractive) main effects suggesting that for the most part these factors contributed to adjustment (or maladjustment) in an additive way by “canceling out” the effect of exposure to delinquent friends. However there was also evidence to suggest that delayed puberty status was a protective factor, which minimized the risk associated with deviant peer affiliation for adolescents' own delinquency. Finally, as noted above there was also evidence of a negative protective effect in which associations between friends' delinquency and self-reported delinquency were strongest amongst those with low levels of novelty seeking. In other words, abstinence from deviant peer affiliation was only beneficial for those young people who were low on novelty seeking.

These results illustrate the important point that the distinction drawn by Rutter between risk factors and protective factors may not be sufficient to describe the complex processes that may contribute to adjustment or maladjustment. As the present study illustrates, these process may involve additive (compensatory) effects, interactive protective effects, and even negative protective effects. Thus, ascertaining the process by which protective processes may operate requires, first, establishing the statistical model linking the outcome measure, the exposure variable, and the protective factors and, then, using this model to ascertain the ways in which various protective factors may modify the link between the exposure variable and the outcome variable through either compensation or moderation. As the present study illustrates, what is likely to confer protection with respect to effects of exposure to deviant peers is not a single factor but rather accumulations of factors that may involve both interactive and main effects relationships.

In recent years there has been a growing literature, which has tended to imply that the study of protective factors which are also referred to as 'resiliency' factors is, in some way, more insightful and valuable than the study of traditional risk factors. Moreover, some authors argue that studying the compensatory (additive or subtractive) effects of protective factors is useless and misleading. For example, Resnik and colleagues (1997) have suggested,

“Although this emphasis may have been valuable in focusing the attention of research on a search for the factors that may confer resiliency in the face of adversity, it is also potentially misleading in situations in which the resiliency factors combine additively with the exposure variable to determine the outcome. Under these circumstances resiliency proves to be nothing more than the obverse of risk and it is quite misleading to argue that the study of resiliency processes is somehow superior and more insightful than the study of risk when these approaches are merely different ways of describing the same set of relationships.” (Resnik et al., 1997)

However, this is somewhat analogous to arguing that business should attend to profit but ignore loss. Clearly a balanced social science is one that takes account sources of both vulnerability and protection and weights these up in ascertaining individual risk. As we suggest above, the surest route to addressing this issue is to develop well specified models of the linkages between the outcomes, the exposure variable, and the protection factors and, then, to use the parameters of these models to characterize the various ways in which protection factors may combine to increase or decrease maladjustment (or adjustment). As we show in this paper, what appears to determine individual vulnerability or protection to the influence of delinquent friends involves a series of family, school, and individual factors that combine both additively and interactively to modify rates of delinquency in young people with varying levels of exposure to delinquent friends.

As is often the case, the present study is not without limitations. For example, because of the cross-sectional design, it is not possible to determine the direction of the links between friends' and youngsters' own delinquency. Also, friends' delinquency was limited to peers in the same classroom to be able to use friends' self-rated delinquency scores. It should be noted, however,

that most young adolescents tend to select friends from the same classroom even if friendship nominations are not limited to the classroom (Espelage, Holt, & Henkel, 2003). Another limitation of the present study is the fact that only relatively young adolescents (i.e., age 13 years) from French-speaking parents living in a small Canadian city participated in the study, thus limiting the generalizability of the findings to other age, ethnic, or linguistic groups. Finally, it is important to acknowledge that investigated vulnerability/protective or risk/compensatory factors are not the only ones that could have played a moderating or compensatory role in this study. The factors that were tested in this study include the “usual suspects”. Because of their known associations with the outcome and the limited statistical power of the present study, these “usual suspects” seemed to mostly operate as risk/compensatory factors. There may be other vulnerability/protective factors, however, that were not included in the present set of variables (see, for example, Cleveland & Wiebe, 2003; Crosnoe, Erickson, & Dornbusch, 2002; Vitaro et al., 2000). Moreover, even the factors investigated in the present study may play a different role at other points in the development of delinquency. Factors found to be compensatory in this study, may in fact protect adolescents by preventing them from getting involved with delinquent peers in the first place. Despite these limitations, the results from the present study offer a starting point to re-open the debate about the differential role of risk versus protective factors in the development of delinquent behavior.

Footnote

¹The composites of family background individually also showed significant linear trends with delinquency, $F(\text{linear}/1, 263) = 3.72; p < .05$; $F(\text{linear}/1, 263) = 7.61; p < .01$; $F(\text{linear}/1, 263) = 12.47; p < .0001$; for SES, parental monitoring, and punishment practices, respectively.

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Table 1

Association between self reports of delinquent behaviors and friends' delinquency at age 13 years

	Statistic	Friends' delinquency				p^1
		1 (low)	2	3	4 (high)	
	N	71	71	58	65	-
Delinquent behaviors	M	3.86	4.31	7.66	10.02	< .0001
	SD	4.61	4.67	6.87	7.09	-

Note. M = mean, SD = standard deviation, N = number of participants; 1) $F(3, 261) = 16.67$; $p < .0001$ / $F(\text{linear}/1, 263) = 46.99$; $p < .0001$; $\eta^2 = .16$.

Table 2

Associations of self reports of delinquent behaviors and vulnerability/protective or risk/compensatory factors (i.e., family background, academic achievement, puberty status, novelty seeking, harm avoidance, and peer acceptance)

V/P or R/C Factor	Statistic	Delinquent Behaviors				F^4	p	F_{linear}^2	p_{linear}
		1 (low)	2	3	4 (high)				
Family background	M	1.01	1.25	1.49	1.57	6.37	< .0001	17.35	< .0001
	SD	0.87	0.79	0.91	0.88				
Academic achievement	M	3.67	3.46	3.37	3.03	4.87	< .001	13.77	< .0001
	SD	0.93	1.15	1.03	0.95				
Puberty status	M	3.25	3.42	3.42	3.51	1.54	.20	3.58	.06
	SD	0.87	0.75	0.73	0.67				
Novelty seeking	M	1.35	2.37	2.80	3.43	4.26	< .001	11.62	< .0001
	SD	2.77	3.73	4.38	3.98				
Harm avoidance	M	0.38	0.65	0.48	0.52	0.93	.43	0.28	.60
	SD	0.83	1.19	1.07	0.82				
Peer acceptance	M	0.06	0.25	0.22	0.18	0.68	0.56	0.52	.47
	SD	0.75	1.01	0.91	0.91				
	N	89	52	63	61				

Note. 1) $df = (3, 261)$ 2) $df = (1, 263)$.

Table 3

Fitted regression model of friends' delinquency and vulnerability/protective or risk/compensatory factors (i.e., family background, academic achievement, puberty status, novelty seeking, harm avoidance, and peer acceptance) with delinquent behaviors

V/P or R/C	<i>B</i>	<i>S. E.</i>	<i>p</i>
Friends' delinquency	0.28	0.06	< .0001
Family background	0.20	0.06	< .001
Academic achievement	-0.15	0.07	< .05
Harm avoidance	-0.12	0.06	< .05
Peer acceptance	0.06	0.05	.30
Novelty seeking	0.17	0.07	< .01
Puberty status	0.15	0.06	< .01
Novelty seeking x friends' delinquency	-0.12	0.06	< .05
Puberty status x friends' delinquency	0.11	0.05	< .05

Note. *S. E.* = standard error. With a single exception, the regression coefficients did not differ between the model which included only the main effects and the model which included in addition the significant interaction terms. Before the significant interaction terms were entered in the model, the regression coefficient of novelty seeking was $B = 0.15$, $S. E. = 0.07$, $p < .05$. The explained variance of the final model was $R^2 = .27$, $F(1, 257) = 11.57$; $p < .0001$.

Table 4

Mean levels of self-reported delinquent behaviors by V/P and R/C composite score and friends' delinquency

V/P and R/C score	Statistic	Deviant peer affiliation			
		1 (low)	2	3	4 (high)
high	<i>M</i>	2.21 ^{ab}	3.14 ^c	4.53 ^a	7.16 ^{bc}
	<i>SD</i>	2.26	3.91	5.08	6.04
	<i>N</i>	28	29	19	12
medium	<i>M</i>	3.79 ^b	4.57	8.13 ^b	7.67
	<i>SD</i>	4.27	4.56	6.86	5.6
	<i>N</i>	24	23	23	18
low	<i>M</i>	6.37 ^{ab}	5.79 ^c	10.69 ^a	12.20 ^{bc}
	<i>SD</i>	6.37	5.57	7.53	7.50
	<i>N</i>	19	19	16	35

Note. The explained variance was $\eta^2 = .25$. Same characters indicate that that the mean levels are significantly different; a refers to pair wise performed post hoc Tukey tests across levels of the V/P and R/C composite score; b and c refer to Tukey tests performed across levels of deviant peer affiliation.

Figure Caption

Figure 1

Relationships of friends' delinquency and self-reported delinquency at three different levels of novelty seeking and puberty status

