

**Applied Research Branch
Strategic Policy
Human Resources Development Canada**

**Early Offending: Understanding the Risk and
Protective Factors of Delinquency**

W-01-1-9E

by

**Jane B. Sprott, Jennifer M. Jenkins and Anthony N. Doob
2000**

The views expressed in papers published by the Applied Research Branch are the authors' and do not necessarily reflect the opinions of Human Resources Development Canada or of the federal government.



The Working Paper Series includes analytical studies and research conducted under the auspices of the Applied Research Branch of Strategic Policy. Papers published in this series incorporate primary research with an empirical or original conceptual orientation, generally forming part of a broader or longer-term program of research in progress. Readers of the series are encouraged to contact the authors with comments and suggestions.

This report is part of a set of research studies on the National Longitudinal Survey of Children and Youth. /
Le présent rapport fait partie d'un ensemble d'études sur l'Enquête longitudinale nationale sur les enfants et les
jeunes.



Publication date/Date de parution – Internet 2002
ISBN: 0-662-32014-X
Cat. No./N° de cat. MP32-28/01-1-9E-IN



**General enquiries regarding the documents
published by the Applied Research Branch should be
addressed to:**

HRDC Publications Centre
Human Resources Development Canada
140 Promenade du Portage
Phase IV, Level 0
Hull, Québec, Canada
K1A 0J9

Facsimile: (819) 953-7260
<http://www.hrdc-drhc.gc.ca/arb>

**Si vous avez des questions concernant les
documents publiés par la Direction générale de la
recherche appliquée, veuillez communiquer avec :**

Centre des publications de DRHC
Développement des ressources humaines Canada
140, Promenade du Portage
Phase IV, niveau 0
Hull (Québec) Canada
K1A 0J9

Télécopieur : (819) 953-7260
<http://www.hrdc-drhc.gc.ca/dgra>

Abstract

This study explores risk and protective factors for both violent and non-violent delinquency among 12 and 13 year olds. Environmental risks, being aggressive early in life, and having delinquent peers (at age 10 and 11) are all generally related to increased involvement in both violence and property-offending (at age 12 and 13). However, school attachment sometimes serves as a protective factor – protective factors being those factors that produce the largest beneficial effects (i.e., reductions in delinquency) in “high-risk” groups. Generally, high levels of school attachment protects children with numerous “environmental risks” of violence and property offending.

School attachment also protects early-aggressive children from violence, but not from property-offending. Finally, school attachment acts as a protective factor against the influence of delinquent peers: those who have delinquent friends but are attached to school are no more likely to be involved in property-offending than are those without delinquent friends. This protective effect, however, is limited to those who are not early-onset aggressive children. High attachment to school does not seem to reduce property-offending for those who are both early-aggressive children and who have delinquent peers.

From a policy perspective, the fact that high levels of “school attachment” has positive influences on violence and property-offending reminds us of the potential impact of schools. Specifically, these findings suggest that zero-tolerance policies that exclude “problem” children through suspensions or expulsions would be counterproductive.

Acknowledgements

The authors wish to thank the Statistics Canada staff at the Toronto, Ontario, office for patient cooperation and help throughout this project.

Table of Contents

1. Introduction	1
1.1 Risk factors and protective factors.....	1
1.2 The role of school in children’s lives.....	4
1.3 Different types of offenders and different types of delinquency.....	6
2. Description of Measures	9
2.1 Violent and non-violent delinquency.....	9
2.2 Environmental risk.....	11
2.3 Early aggressiveness.....	11
2.4 Peer risk.....	12
2.5 School attachment.....	12
3. Results	13
3.1 Risk factors for violent and non-violent delinquency.....	13
3.1.1 Environmental risk	
3.1.2 Early aggressiveness	
3.1.3 Peer group delinquency	
3.2 Protective effects of school attachment on violent and non-violent delinquency.....	16
3.2.1 Environmental risk	
3.2.2 Early aggressiveness	
3.2.3 Peer group delinquency	
4. Conclusion	26
4.1 Policy implications.....	26
4.2 The implications for future research.....	27
Appendix: An alternative approach.....	29
References.....	33

Foreword

The National Longitudinal Survey of Children and Youth (NLSCY) is a unique Canadian survey designed to follow a representative sample of children from birth to early adulthood. It is conducted in partnership by Human Resources Development Canada (HRDC) and Statistics Canada. Statistics Canada is responsible for data collection, while HRDC, the major funder, directs and disseminates research. Data collection began in 1994 and continues at two-year intervals.

The survey for the first time provides a single source of data for the examination of child development in context, including the diverse life paths of normal development. The survey and the research program were developed to support evidence-based policy, using a human development view of the early decades of life. This research paper is part of an ongoing series of papers emanating from a program of research that examines NLSCY data collected in the first two cycles (1994, 1996) of the survey.

1. Introduction

Over the past 30 years, research in developmental psychopathology has relied on a conceptual model which suggests that there are factors in children's lives which place them "at risk" of developing behavioural and emotional problems. However, developmental psychologists have, for some time, also been careful to emphasize the importance of person/environment interactions (as early as 1957, for example, Meyer stressed the importance of person/environment interactions). Thus, they have recognized that while many individuals in high-risk environments develop problems, some manage to escape impairment. The phenomenon of remaining healthy in spite of serious adversity has been labelled "resilience." In investigating resiliency, researchers have sought to identify "protective factors" which reduce levels of impairment in high-risk situations.

1.1 Risk factors and protective factors

There has been considerable confusion over the difference between risk factors and protective factors. Conceptually, protective factors could be seen as simply the opposite of risk factors. For example, dysfunctional family environments increase the risk of children developing various problems while healthy family environments decrease the risk of children developing problems. Thus, some have argued that for the study of resiliency to provide insight over and above that gained by the study of risk, we have to look for interactions between risk and protective factors (Rutter, 1983). While the absence of an interaction should not necessarily detract from the importance of isolating a factor that appears to facilitate the healthy development of children, we gain new insight into how children in high risk situations cope when we can isolate a factor that appears to decrease the level of disturbance in high risk children, but has little or no effect on lower risk children.

For the purpose of this paper, a factor which produces only a main effect will be called a "risk" or "compensatory" factor and the term "protective" will therefore be reserved for those factors that produce statistical interactions between high and low risk individuals. Conceptually then, risk and compensatory factors are simply opposite ends of the same continuum. Protective factors, on the other hand, are those factors that produce the largest beneficial effects (i.e. reductions in delinquency) in "high-risk" groups. Clearly, however, a factor could be both a compensatory factor and a protective

factor. That is, a factor may help all children (main effect), but help those at highest risk most (interaction).

From a policy perspective, the distinction between “main effects” and “interactions” in understanding the development of problem behaviours such as youthful offending is important. Findings that might be characterized as “main effects” suggest that interventions on the part of society should be across the board: Changes would help everyone – those at risk and those not at risk. On the other hand, interaction effects in the form of “protective factors” are, as we have suggested, likely to be important only for those “at risk.” To the extent that resources are scarce, and protective factors can be provided or encouraged by state agencies, these resources should only be targeted to that part of the population that is genuinely at risk.

Criminologists have only relatively recently adopted a resiliency model in order to understand the development of offending behaviour. However, the concept of resistance to becoming delinquent has been noted for more than half a century by psychologists and psychiatrists. In a 1936 report of a study of delinquent children and their non-delinquent siblings, Healy and Bronner (1936) asked, rhetorically, “But how does it happen that some people living in the same family environment as the delinquent, with the desires common to youth, with the same social pressures, and always with ideas of delinquency easily obtainable, are able to refrain from antisocial conduct?” (p.8). Generally, the result of that 1936 study has been replicated by more recent findings: delinquent behaviour is thought to be the result of complex interactions of individual traits with social (e.g. family, peers), situational (e.g., school, home) and neighbourhood risk factors (Farrington 1998; Loeber & Farrington, 1998; Klein, Forehand, Armistead & Long, 1997; Sampson & Laub, 1993; Gottfredson & Hirschi, 1990).

Some examples of individual risk factors that have been found to predict delinquent behaviour are the following: lack of self-control, concentration problems, risk taking, aggressiveness, early initiation of violent behaviour, substance abuse, involvement in other forms of antisocial behaviour and attitudes favourable to deviant behaviour (Loeber and Farrington, 1998).

Examples of social interactions within the family that relate to delinquency include the following: harsh discipline, physical abuse, neglect, drug use and criminal activity within the family, and low levels of

parental involvement with the child (Loeber and Farrington, 1998). Academic failure, association with delinquent peers and a low commitment to school are examples of risk factors within the school that relate to delinquency (LeBlanc, Vallières, and McDuff, 1993). And finally, some examples of neighbourhood risk factors that correlate with delinquent behaviour are poverty, community disorganization, a high concentration of neighbourhood adults involved in crime, and the easy availability of drugs (Loeber and Farrington, 1998).

The traditional criminological approach conceptualizes “risk” as an accumulation of negative environmental factors. That is, researchers usually add together all of the individual, social, situational and neighbourhood risk factors to create a scale ranging from zero risk factors to the highest number of risk factors present in the child’s life (see, for example, Farrington 1998; Jenkins and Keating, 1998; Loeber and Farrington 1998; Landy and Tam 1998; Born, Chievalier and Humblet 1997; Jessor, Van Den Bos, Vanderryn, Costa and Turbin 1995). Generally research using cumulative risk factors has demonstrated that the more risk factors children experience, and the more realms (individual, social, situational and neighbourhood) they experience them in, the more likely they are to be engaging in delinquency. Research with the first wave of data from the NLSCY also reveals that the more risk factors children experience, the more likely they are to be exhibiting problem behaviours (see, for example, Jenkins and Keating 1998; Landy and Tam 1998).

There are, however, a few specific risk factors that appear, on their own, to be strongly and consistently related to delinquency: early childhood aggressiveness and association with a delinquent peer group. Some studies have found that the level of continuity in externalizing (aggressive) behaviors is quite high (Olweus 1979; Huesman, Eron, Lefkowitz and Walder, 1984). Olweus has argued that the stability of violent or aggressive behavior is as high as the stability of IQ over time. Some have argued that early childhood aggressiveness (or conduct disorder) is a sign of the “life-course persistent” offender (Moffitt 1993). Indeed, the stability of aggressiveness that Olweus refers to is likely the stability of the “early onset” children. Thus, early aggressive behaviour is an important predictor of later involvement in delinquency, and could possibly be a marker for the “life-course persistent” offender.

In addition to early aggressiveness, having delinquent peers is also a strong correlate of a child’s involvement in delinquent behaviours (Thornberry 1996; Elliot, Huizinga & Menard 1985). The

influence of peers appears to be felt strongest during early adolescence and then decreases into adulthood (Jang, 1999; Thornberry, Lizotte, Krohn, Farnworth, Jang 1994). It is unclear, at this point, what factors may serve to protect children from engaging in delinquency once they are socializing with a delinquent peer group.

More generally, however, factors that serve to “protect” high-risk children – however defined – are not well understood. Thus, the purpose of this report is to identify factors that protect Canadian children who are at the highest risk of engaging in delinquency. We sought to identify protective factors from the child’s social environment with the idea that this might be something that state agencies could encourage or support. Thus, we selected the school and the school environment as a potential protective factor.

1.2 The role of school in children’s lives

The idea that school plays an important role in children’s lives is certainly not a new phenomenon. In the early 1936 study (referred to above) by Healy and Bronner, it was found that about 40% of the 105 delinquent children “expressed marked dislike for school in general... and... a mere 4% of the controls [a non-delinquent sibling] evinced any such dislikes” (p.62). Similarly, in that three city comparison of delinquent and non-delinquent siblings, it was found that “definitely poor scholarship was registered for... 34% of the delinquents as against 18% of the controls” (p.61). Thus, there is little dispute that school plays an important role in children’s lives.

In more recent research, school has consistently been identified as a risk/compensatory factor for delinquency (see, for example, Agnew & Brezina 1997; Blumstein, Farrington & Moitra, 1985; Elliot, Huizinga & Menard, 1989; Farnworth, Schweinhart & Berrueta-Clement 1985; Figueira-McDonough 1983; Jenkins 1997; Krohn & Massy 1980; LaGrange & White 1985; Lane 1980; Rosenbaum & Lasley 1990; Sampson & Laub, 1993; Simpson & Elis 1995; Thornberry, Moore & Christenson 1985; Thornberry, Lizotte, Krohn, Farnworth & Jang 1991; Williams, Ayer, Abbott, Hawkins & Catalano 1999; Zingraff, Leiter, Johnson & Myers 1994) . That is, low attachment to school (or “weak school bonds”) increases the likelihood that children will engage in delinquency; conversely, high attachment to school (“strong school bonds”) decreases the likelihood that children will engage in delinquency.

Generally, “children who do poorly in school, reject the authority of schools and their officials, have low

aspirations concerning their probable life chances upon completion of school, and drop out of school before graduation are at risk of subsequent delinquency” (Zingraff et al. 1994; p. 67).

Hirschi’s (1969) social control theory is the theory most widely used to explain the school-delinquency relationship. Social control theory suggests that the school and school experiences serve as social bonds that restrain children and adolescent involvement in delinquency. Hirschi identified four elements of the social bond: attachment (caring about others and what others think), commitment (commitment to educational values), involvement (participating in school related activities) and belief (accepting school rules, and school authority as fair). Hirschi hypothesized that these elements of the social bond work to build a stake in conformity and thus limit involvement in normatively unconventional activities.

Many researchers have investigated the relative importance of each of the four elements of the school bond. Several have found that poor educational achievement and academic failure are most strongly and consistently linked with delinquency (see, for example, Gottfredson & Hirschi 1990; Hirschi 1969; Jensen 1976; Jenkins 1997; Kercher 1988; Loeber & Dishion 1983; Maguin & Loeber, 1996; Zingraff, et al. 1994). However, while school commitment and grades have been clearly identified as risk/compensatory factors for involvement in delinquency, a question remains about whether the school bond is simply a risk/compensatory factor or whether elements of the school social bond might have an additional function – that of a protective factor.

There is some evidence that various elements of the school social bond “protect” high-risk children. Tiet et al. (1998), for example, explored factors that characterized the resilient children from high-risk environments. They found that “children at high risk [for numerous problem behaviours] because of higher levels of adverse life events exhibited a greater degree of resilience when they had a higher IQ, better family functioning, closer parental monitoring, more adults in the household, and higher educational aspirations” (Tiet et al. 1998: p. 1191). Thus a strong commitment to school and education served to protect high-risk children.

This suggests that school bonds may act as protective factors. However, it may be that other aspects of the school bond (aside from commitment) serve protective functions. Therefore, using data from the NLSCY we will investigate the protective effect of school attachment on delinquency among “high-risk”

children. We operationalized school attachment to encompass some measures of academic achievement (if the child does his or her homework and if the child thinks good grades are important) as well as feelings about the school including social belonging, feelings of safety and whether the child was having positive experiences in school. We included these measures because we wanted to capture more than academic achievement; we also wanted to capture feelings about school, and feelings of connectedness with the school. Our underlying theory was that positive experiences in school could act to insulate a child from an otherwise unpleasant or difficult life. While academic achievement is clearly important, it may be that the more emotional feelings of belonging and positive school social interactions are also important. If this is true, then policies which serve to remove children and isolate them from the school (i.e. zero tolerance policies) may be counterproductive.

1.3 Different types of offenders and different types of delinquency

Thus far, we have been speaking of “delinquency” as if it were a unitary concept – a youth is to be considered either “delinquent” or not or, alternatively, “delinquency” might be considered to be a single dimension (running from “not at all delinquent” to “very delinquent”). Such simple notions of delinquency do not seem to be completely adequate for two reasons. First, in terms of understanding *why* young people commit offences, it appears to be important to differentiate violence from other types of offending. Most young people, during adolescence, do things that could be considered to be offences, and most of these “offences” (which never get reported to the police) are of a non-violent nature. Second, it appears that it is helpful to differentiate two types of “delinquent” youth (Moffitt, 1993):

- “early-onset” (often violent) offending behaviour that tends to persist into adulthood and to involve fairly small proportion (perhaps 5-10% of youth), and
- “adolescent limited” delinquent behaviour (largely involving property offences) that tends to drop off dramatically in late adolescence.

Moffitt (1993) suggests that these are completely different phenomena and that they are under quite different types of controls. The idea that there are two types of adolescents is important since it helps explain how there can be “continuity” in offending along with enormous declines in offending as youth get older. Most adolescent offenders – the adolescent limited offenders – do not go on to be adult

offenders. “A very large group participates in antisocial behavior during adolescence [adolescent-limited]. A much smaller group [perhaps 5% or 10%], [that] continues serious antisocial behavior throughout adulthood, is the same group whose antisocial behavior was stable across the years from early childhood” (Moffitt 1993; page 678-679).

The life-course persistent offenders are, therefore, thought to be very different types of people from the adolescent-limited offenders. For life-course persistent offenders, Moffitt (1993) hypothesized that “children’s neuropsychological problems interact cumulatively with their criminogenic environments across development, culminating in a pathological personality” (Moffitt 1993; page 674).

The adolescent-limited offender, on the other hand, commits delinquencies only when it is socially beneficial and will abandon delinquent activities when prosocial acts are more rewarding. Some suggest that the adolescent-limited delinquency is a means of asserting one’s own independence. However, adolescent-limited delinquency should not be ignored or dismissed – while perhaps a normal part of development, the delinquent acts committed by the adolescent-limited offender could be quite serious and could lead to involvement in the justice system if detected by officials.

It is difficult to identify the life-course persistent group during adolescence because many adolescents participate in delinquent acts during that time. In other words, the offence (or the behaviour) of two youths may be quite similar. This is particularly a problem if one looks at undifferentiated “offences” or “delinquencies.” One must have information about the adolescent’s childhood to attempt to distinguish the life-course persistent offenders from the adolescent-limited offenders. In our analyses, we attempt to distinguish the possible life-course persistent offenders from the adolescent-limited offenders by creating two groups of children: those who displayed high levels of aggressiveness from Cycle one data (when they were age 10-11), and those who did not.

We also differentiated types of crime: violent and non-violent. The same theory which suggests that there are two types of offenders also suggests that the types of crime committed by each during adolescence might differ (Moffitt, 1993). Specifically, “[a]dolescent-limited offenders should engage primarily in crimes that symbolise adult privileges or that demonstrate autonomy from parental control: vandalism, public order offences... theft. Life-course persistent offenders should spawn a wider variety

of offences including types of crimes committed by lone offenders... such as violence and fraud” (Moffitt, 1993; page 695). Therefore, we looked at two types of crime separately: violent crime and non-violent, property crime.¹

Specifically then, we are interested in the relationship among various risk factors, school attachment, and involvement in violent and non-violent offences. We examined three different, but related risk factors: environmental risk factors, early aggressiveness and involvement with delinquent peers. We chose those three categories of risk factors because, as has already been discussed, previous research has found environmental risk and delinquent peers to be important predictors of delinquency and early aggressiveness could be a sign of the life-course persistent offender. In addition, however, examining the protective effect school attachment has across a range of risk factors allows us to speak to the robustness of the findings. If school attachment is consistently found to decrease involvement in violent and non-violent delinquency, across a range of “high-risk” environments, this suggests that school is important in many different circumstances.

Specifically then, we explore two general questions in our report. First, we explore the relationship between our three risk categories (environmental risk, early aggressiveness and peer delinquency) and each type of delinquency (violent and non-violent). Second, we explore the protective effect of school attachment (across all of our risk categories) on violent and non-violent delinquency.

¹ Fraud, as a property crime, is unusual (especially for adolescents). For example, in 1997-8 (the most recent year for which we have youth court statistics in Canada) there were 1,033 cases where fraud (or fraud-like transactions) was the most serious charge brought to court. In contrast, there were 23,711 cases with a violent charge as the most serious charge and there were 28,706 cases where theft or possession of stolen property (typically a theft-related charge) was the most serious charge and an additional 13,409 cases of break-and-enter. Not surprisingly, fraud was not a subject of any NLSCY question for youth.

2. Description of Measures

2.1 Violent and non-violent delinquency

At cycle two the 12 and 13 year olds were asked a total of 8 questions about involvement in violent offences and 10 questions about involvement in non-violent, property offences.² Some of the questions were answered on three point scales ranging from “never or not true” to “often or very true” and some were answered on four point scales going from “never” to “five times or more.” In order not to “weight” the four-point-scale items greater than the three point scale items, we collapsed the four point scales into three point scales by combining the two “highest” choices. This likely had little impact because children at this age were rarely involved in misbehaviours at a high rate.

There were two types of missing data we had to contend with. The first type of missing data occurred when a youth simply did not answer any of the delinquency questions. The second type of missing data occurred when a youth did not answer some number of the delinquency questions. We decided to “keep” as respondents those who had answered at least two thirds of the total set of delinquency questions.³ For those “missing” answers in one third of the questions, we substituted the “modal” response which was, of course, that the youth had not engaged in the misbehaviour. Using this approach, we ended up with a sample of 1,956 12- and 13-year olds (at Cycle two). For all of the analyses that follow, we used a “weighted” sample (based on the longitudinal weights for Cycle two since that is where our sample was drawn). We divided the weight for each person by the average weight to give an “approximation” of the actual sample size. Given the sample sizes, one should be cautious in using the findings to estimate population values. We, however, are more interested in the reliability of *differences* rather than estimating the exact population values.

² All of our delinquency “outcome” measures refer to Cycle two data when the children were age 12-13.

³ There were, in fact, 26 self-report delinquency questions in total. We first developed this total scale and subsequently broke it down into sub-scales (e.g., property and violent offences). There were other questions (e.g., concerning robbery or the use of drugs). For some of these other 8 questions we did not have any particular theory about these specific crimes (e.g., drug offences) and in other cases the frequency of admitting to the offence was very low. They were, however, included in our overall “delinquency” measure which, as will be seen, was not as useful overall as the two major sub-scales.

Our dependent variables, then, are the “sum” of the responses to each of the 8 questions on violent offences and the 10 questions on non-violent offences.⁴ Both of these scales had the problem of having many zeros and very few high numbers. Thus, in order to approximate scales, we collapsed the tail of both distributions so that we had four point scales ranging from 0 to 3, which we classified as *no*, *low*, *some* and *high* involvement in the offence. Thus for the violent offences scale we had:

- 63% of 12-13 year olds with *no involvement* in violent offences (a score of zero means they have never been involved in violence)
- 17% with *low involvement* in violent offences (a score of one means they have been involved in a violent act)
- 9% with *some involvement* in violent offences (a score of two means they have been involved in one violent act a number of times, or a few violent acts once) and
- 10% with *high involvement* in violent offences (a score of three or more means they have been involved in a couple of violent acts a number of times, or a few violent acts a lot).

The non-violent, property offence scale had:

- 66% of 12-13 year olds with *no involvement* (a score of zero means they have never been involved in a non-violent offence)
- 12% with *low involvement* (a score of one means they have been in involved in a non-violent offence)
- 8% with *some involvement* (a score of two means they have been involved in one non-violent offence a number of times, or a few non-violent offences once) and
- 13% with *high involvement* (a score of three or more means they have been involved in a couple of non-violent acts a number of times, or a few non-violent acts a lot).

The four-point scales have the disadvantage of having a constrained distribution; the un-recoded scales have the disadvantage of being skewed beyond repair. In terms of assumptions underlying statistical

⁴ The eight items included in the violent offending scale are as follows: been in a fight, attacked someone, threatened to beat someone up, used a weapon in a fight, used a knife in a fight, fired a gun, attempted to sexually touch someone against their will, forced sex with someone. The ten items included in the non-violent, property offending scale are these: damaged property, stolen something from home, stolen something outside the home, stolen something from school, stolen something from a store, taken money from parents, broken into a house, used someone's credit card without permission, taken a car, driven drunk.

tests, the constrained (three-point) distribution is undoubtedly better since the division among categories is not extreme.

2.2 Environmental risk

We identified seven risk factors from Cycle one: experiencing a parental separation, being in a single parent family, being born to a teenage mother, experiencing hostility in the parent-child relationship, mother being depressed, living in a neighbourhood that had significant problems and being exposed to violence between two adults in the home.⁵ Hostile parenting, parental depression, and neighbourhood problems were all scales, and were all reported from the perspective of the person most knowledgeable about the child (the PMK). From each scale we took the top 10% and coded that as a risk (1), the other 90% was coded as no risk (0). Experiencing a divorce, being in a single parent family, experiencing violence in the home and being born to a teenage mother were coded as yes (risk = 1) or no (no risk = 0). We then added all of the risk factors together to create a scale from 0 (no risk factors) to 7 (all risk factors). We recoded the scale to run from zero to three or more risk factors. Fifty-eight percent of the sample had no risk factors, 21% of the sample had one risk factor, 13% of the sample had two risk factors and 8% of the sample had three or more risk factors.

2.3 Early aggressiveness

From Cycle one we used the PMK's report of the child's aggressiveness (conduct disorder-physical aggression scale) at age 10 or 11 and the child's own self-report of aggressiveness (conduct disorder-physical aggression scale) at age 10 or 11. We chose those children who were among the most difficult 17% according to the PMK and, by their own self-report, admitted to at least some aggressiveness at age 10-11 (top 52% on the child scale).⁶ This definition identified what might be considered to be the most aggressive 9.7% of the children which is, of course, within the estimate from Moffitt (1993) of 5-10% of a normal population.

⁵ We chose those risk factors because past research has demonstrated that they are strong risk factors for delinquency (Loeber & Farrington 1998). Unfortunately there was only one measure of neighbourhood risk that related to delinquency so we simply included it in our environmental risk measure. Including it in our measure is consistent with the theory that an accumulation of factors across family and environmental realms will place the child at higher risk for delinquency.

⁶ The choice of cut-off (top 17% and 52%) was related to the peculiar distribution of the scales.

2.4 Peer risk

Peer risk was defined in terms of children who were spending time with other children who got into trouble a lot at Cycle one. The child's account of this was used on the basis that they were more likely to know if this was the case than were their parents. This variable was based on one question that asked whether the child was "part of a group that did bad things" in the past year and was coded as "yes" or "no".⁷

2.5 School attachment

From Cycle one we identified 13 factors that measured school attachment: how much the child likes his or her school, how well the child thinks he or she is doing in school, how important the child feels it is to get good grades, how much the child likes math, how safe the child feels at school, how safe the child feels going to and from school, how often other children say mean things to him or her, how often other children bully him or her at school, how often other children bully him or her on the way to and from school, if the child feels like an outsider, if the teacher gives him or her extra help, if the teacher treats him or her fairly, and if the child finishes homework.⁸ We coded each of the items as "high attachment" (scored as 1) or "low attachment" (scored as 0) and then summed them together to create a scale that ranged from 0 (low attachment on every item) to 13 (high attachment on every item). We then recoded this 13-point scale in a two-point scale: high attachment (top 50%) and low attachment (bottom 50%).⁹ This measure had an alpha of 0.70.

⁷ Obviously, more measures would be desirable, but this was the only question that tapped into children's peers being involved in delinquency.

⁸ All of these variables were chosen because theoretically they are all likely to contribute to how attached children feel to school. If they are not doing well in school and feel that other children and their teachers don't like them, they will likely not feel attached to the school itself. Obviously other factors may relate to school attachment but these factors seemed like a reasonable starting point and they all related to one another (overall alpha for the scale was .70 with each item significantly contributing to the overall alpha).

⁹ Obviously there is likely not much difference between a child who was at 49% (therefore low attachment) and a child who was at 51% (therefore high school attachment). However in order to begin to understand differences among children who are more/less attached to school divisions in the scale must be made. Due to small numbers we decided to divide the scale simply into "high school attachment" and "low school attachment".

3. Results

3.1 Risk factors for violent and non-violent delinquency

3.1.1 Environmental risk

There is clearly a relationship between our environmental risk scale and violence.¹⁰ While not a completely linear relationship, generally the more risk factors present, the more likely it is that the child is engaging in violence (Table 1). Of those children with zero risk factors, 66% are not violent; however, of those with three or more risk factors, 51% are not violent. At the extreme, only 9% of those with no risk are heavily involved in violence but 22% of those with three or more risk factors are heavily involved in violence.

Table 1 **Relationship between environmental risk (age 10-11) and involvement in violent offences at age 12-13**

	Involvement in violent offences				
	None	Low	Some	High	Total
Zero risk factors	65.9%	18.5%	6.9%	8.6%	100% (1,010)
One risk factor	59.8%	15.2%	13.6%	11.4%	100% (368)
Two risk factors	62.1%	18.8%	11.6%	7.6%	100% (224)
Three or more risk factors	51.4%	18.8%	8.0%	21.7%	100% (138)

Note: Chi-square=44.73, df=9, p<.001

The relationship between our environmental risk scale and non-violent, property offences is not as pronounced as the relationship between risk and violence. Of those children with zero risk factors in their lives, 67% are not involved in property offences and of those at highest risk (3 or more risk factors) 60% are not involved in property offences (Table 2). Anywhere between 11% to 17% of children, across all risk groups, are heavily involved in property offences. The relationship between risk and property offences does not appear to be linear in nature (linear-by-linear association = 1.10, df=1, p=.29).

¹⁰ Generally, there were not many significant gender differences in the relationships we found. Therefore, we present the findings for the whole sample, unless there was a gender difference, in which case we present the findings separately for boys and girls.

Table 2 Relationship between environmental risk (age 10-11) and involvement in non-violent, property offences at age 12-13

	Involvement in property offences				
	None	Low	Some	High	Total
Zero risk factors	66.7%	12.4%	8.7%	12.2%	100% (1,009)
One risk factor	60.2%	15.3%	8.4%	16.1%	100% (367)
Two risk factors	73.3%	8.4%	7.6%	10.7%	100% (225)
Three or more risk factors	60.1%	10.9%	11.6%	17.4%	100% (138)

Note: Chi-square=17.69, df=9, p<.05

One would expect “risk” to be more relevant to violent offending than to property offending because “risk” (or experiences before adolescence more generally), according to Moffitt’s analysis, is relevant for the early onset youth, but not for the “adolescent limited” youth who, for the most part, are likely to focus on non-violent property offences.

3.1.2 Early aggressiveness

Looking next at the relationship between early aggressiveness (a sign of the possible life-course persistent offender) and violence, it is clear that those children who were very aggressive at age 10 or 11 are now, two years later at age 12 or 13, more likely to be involved in violence (Table 3). Of those children who were “not early aggressive”, 67% were not involved in violence while only 30% of the early aggressive children were not involved in violence. At the extreme, only 9% of the not early aggressive children were heavily involved in violent whereas 25% of the early aggressive children were heavily involved in violence.

Table 3 Relationship between early aggressiveness (age 10-11) and involvement in violent offences at age 12-13

	Involvement in violent offences				
	None	Low	Some	High	Total
Not early aggressive	66.5%	16.5%	8.3%	8.8%	100.0% (1,767)
Early aggressive	29.6%	26.5%	18.5%	25.4%	100.0% (189)

Note: Chi-square=111.52, df=3, p<.001

There is also a relationship between early aggressiveness and involvement in non-violent, property offences. Those children who were highly aggressive early in life are more likely to be involved in property offences than are the children who were not identified as early aggressive (Table 4). At the extremes, only 13% of the not early aggressive children are heavily involved in property offences while 21% of the early aggressive children are heavily involved in property offences.

Table 4 Relationship between early aggressiveness (age 10-11) and involvement in non-violent, property offences at age 12-13

	Involvement in property offences				
	None	Low	Some	High	Total
Not early aggressive	67.9%	11.7%	7.5%	13.0%	100.0% (1,768)
Early aggressive	49.2%	15.9%	14.3%	20.6%	100.0% (189)

Note: Chi-square=28.58, df=3, p<.001

3.1.3 Peer group delinquency

Finally, being involved with delinquent peers appears to be related to involvement in violence (Table 5). Of those children who reported (at Cycle one) that they were not part of a group that did bad things, 10% were heavily involved in violence. However, of those who reported being part of group that did bad things, 24% reported being involved in violence.

Table 5 Relationship between having delinquent peers (age 10-11) and being involved in violence at age 12-13

	Involvement in violent offences				
	None	Low	Some	High	Total
Was not involved in a group that did bad things	63.8%	17.4%	9.1%	9.7%	100% (1,519)
Was involved in a group that did bad things	49.3%	21.0%	5.8%	23.9%	100% (138)

Note: Chi-square=30.32, df=3, p<.001

Looking next at property offences, there is again a relationship between being involved with a delinquent peer group and involvement in non-violent property offences (Table 6). Of those children who reported that they were not part of a peer group that did bad things, 13% were heavily involved in property offences. However, of those who reported that they were part of a bad group, 26% were heavily involved in property offences.

Table 6 Relationship between having delinquent peers (age 10-11) and being involved in non-violent, property offences at age 12-13

	Involvement in property offences				
	None	Low	Some	High	Total
Was not involved in a group that did bad things	67.5%	12.2%	7.7%	12.5%	100% (1,519)
Was involved in a group that did bad things	39.9%	12.3%	21.7%	26.1%	100% (138)

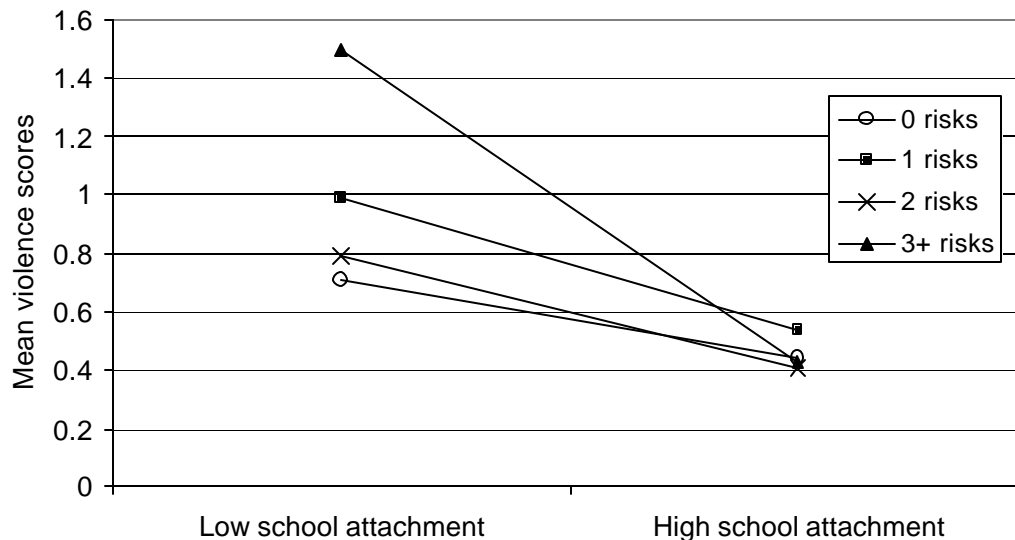
Note: Chi-square=60.07, df=3, p<.001

3.2 Protective effects of school attachment on violent and non-violent delinquency

3.2.1 Environmental risk

We next examine the protective effect that school attachment has on children at high risk for violent and non-violent delinquency. Looking first at violence, we see a main effect of risk and school attachment: those children with more risk factors, or those with low school attachment are committing more violent offences (Figure 1). In addition, however, there is an interaction between risk and school attachment. The highest risk group (those with three or more risk factors) has the largest decrease in violence when they are highly attached to school. The other groups (zero, one and two risk factors) show decreases in violence if they are highly attached to school – but they do not have as much of a decrease as the highest risk group.

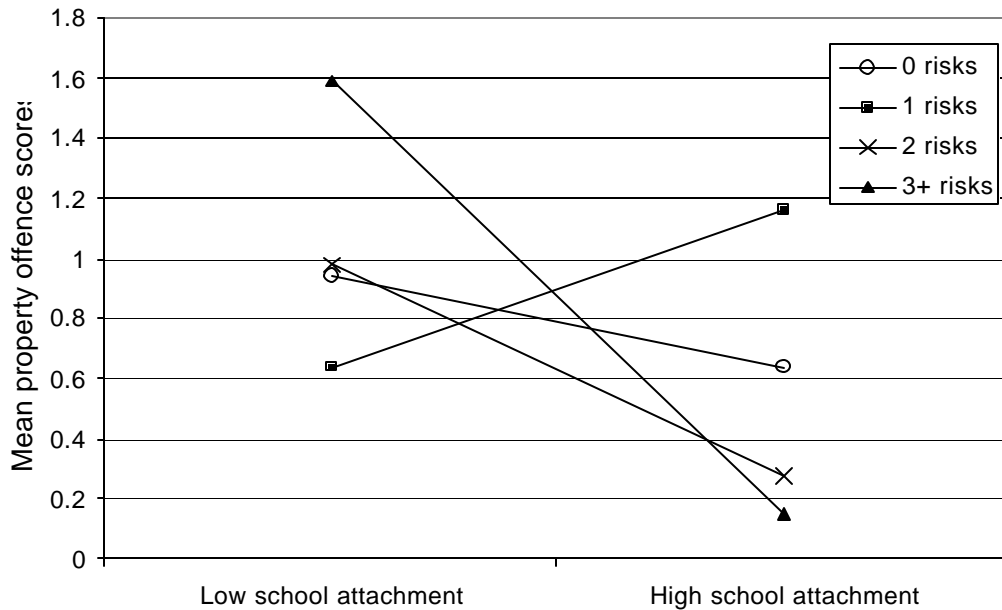
Figure 1 **Mean violence scores (Cycle 2) as a function of environmental risk and school attachment (Cycle 1)**



- Notes: 1. Main effect of environmental risk: $F(3, 1363)=3.65, p<.01$
 2. Main effect of school attachment: $F(1, 1363)=10.40, p<.001$
 3. Interaction: $F(3, 1363)=11.23, p<.001$

Looking next at non-violent, property offences, there was a significant 3-way interaction involving risk, school attachment and gender ($F(3, 1363)=3.53, p<.05$). Therefore, in order to understand the interaction between risk and school attachment, boys and girls will be shown separately. Looking at boys first, there is no main effect of environmental risk, but there is a main effect of school attachment (Figure 2). Boys who are not attached to school are committing more property offences. In addition, however, there is a rather complex interaction between school attachment and environmental risk. High school attachment appears to increase property offences for those boys with one risk factor in their lives. However, high school attachment appears to decrease property offences for those boys with zero, two or three risk factors. The boys at the highest risk (three or more risk factors) show the largest decrease in property offences when they have a high attachment to school. Thus, school attachment does appear to “protect” the highest risk group of boys from engaging in property offences.

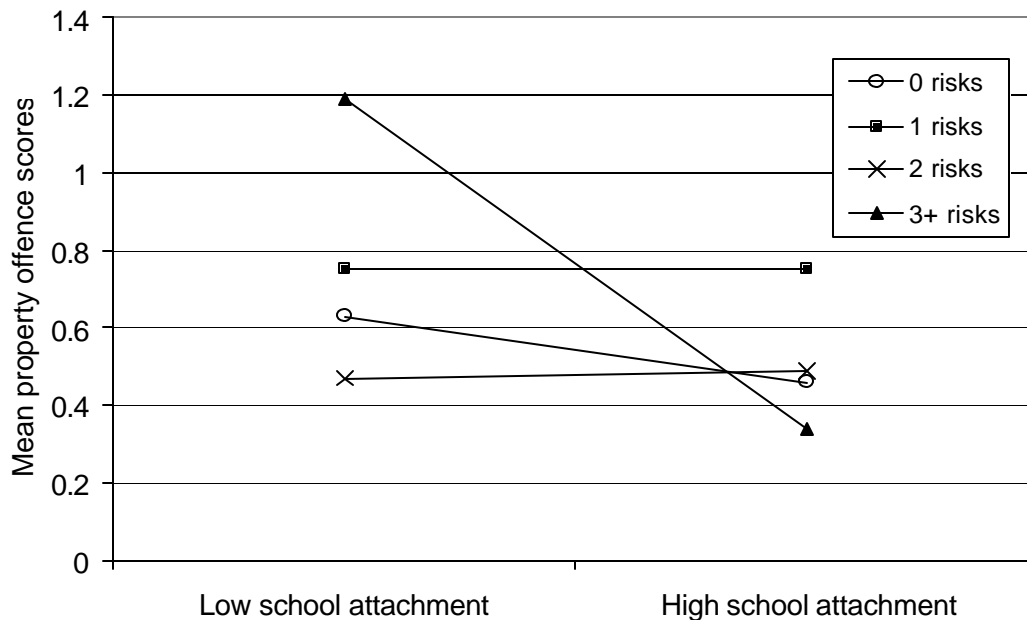
Figure 2 **Mean property offence scores (Cycle 2) as a function of environmental risk and school attachment (Boys only, Cycle 1)**



- Notes:
1. Main effect of environmental risk: $F(3,669)=1.26$, n.s.
 2. Main effect of school attachment: $F(2, 669)=5.41$, $p<.05$
 3. Interaction: $F(3, 669)=10.78$, $p<.001$

Looking at girls next, we see a main effect of risk and school attachment: girls with more risk factors and girls with low school attachment are committing more property offences (Figure 3). In addition, however, there is an interaction between risk and school attachment. The highest risk group (those with three or more risk factors) has the largest decrease in property offences when they are highly attached to school. The other groups of girls (zero, one and two risk factors) show very little change as a function of school attachment. While the patterns of protection were slightly different between boys and girls, generally high school attachment protected the highest risk groups (those with three or more risk factors) from engaging in violent or property offences.

Figure 3 **Mean property offence scores (Cycle 2) as a function of environmental risk and school attachment (Girls only, Cycle 1)**



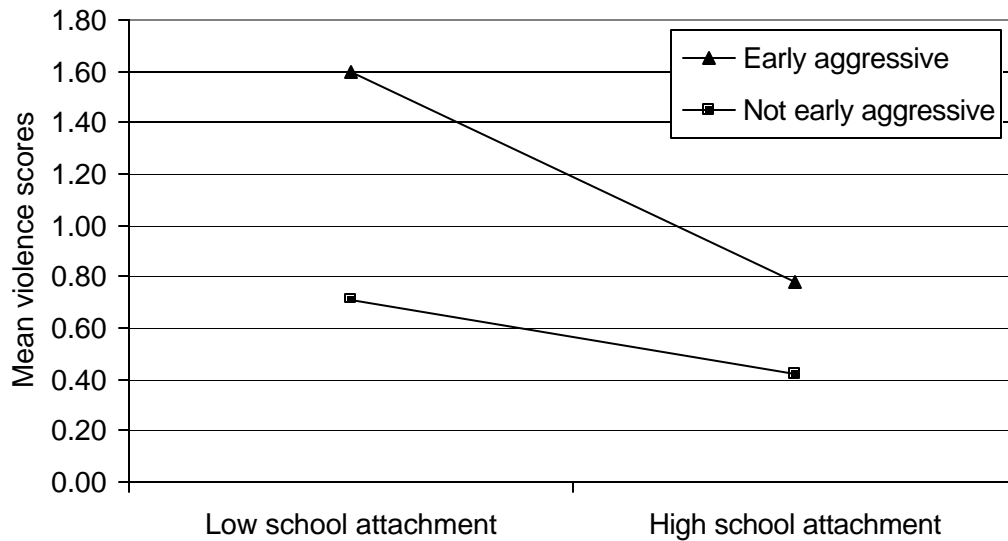
Notes: 1. Main effect of environmental risk: $F(2, 693)=3.32, p<.05$
 2. Main effect of school attachment: $F(1, 693)=5.34, p<.05$
 3. Interaction: $F(3, 693)=3.02, p<.05$

3.2.2 Early aggressiveness

We next examined the protective effect that school attachment has on early aggressive and children who are not early aggressive. The early aggressive youth also tend to be those with a higher number of risks. Though these two typologies of youth are correlated, obviously the correlation is not perfect.

Since our early aggressive group may be life-course persistent offenders, it is especially important to find protective factors for them since theory and data would suggest that they are the youth who, unless “changed” in some way, are most likely to show long-term violence sustained into adulthood. Looking at violent offences first, we see a main effect of aggressiveness and a main effect of school attachment: early aggressive children and children with low school attachment are committing more violent crimes. There is also an interaction between aggressiveness and school attachment. For the early aggressive children we see a substantial decrease when they are highly attached to school (Figure 4). The other group of children, however, is not affected as much by attachment to school.

Figure 4 **Mean violence scores (Cycle 2) as a function of aggressiveness and school attachment (Cycle 1)**

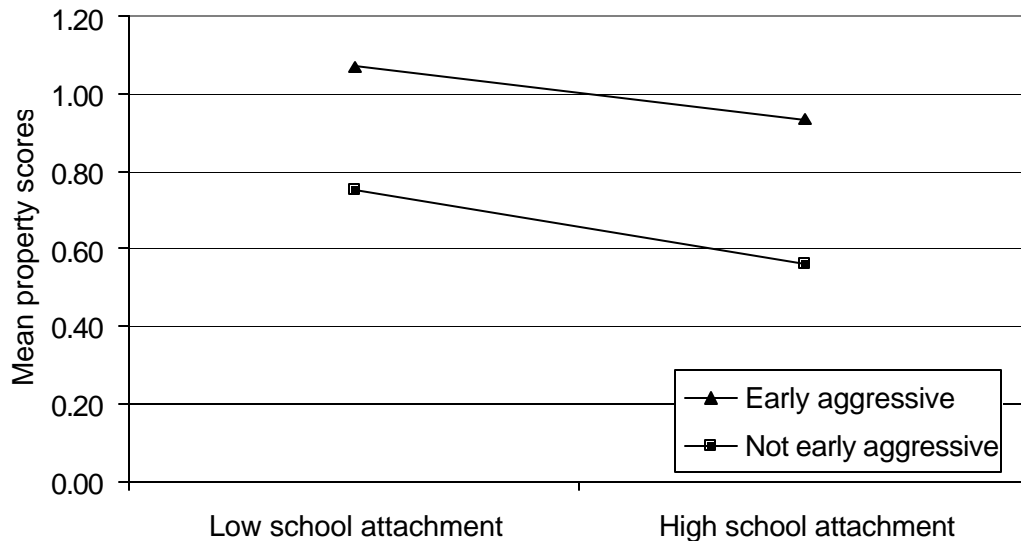


- Notes: 1. Main effect of aggressiveness: $F(1, 1442)=80.45, p<.001$
 2. Main effect of school attachment: $F(1, 1442)=40.22, p<.001$
 3. Interaction between aggressiveness and school attachment: $F(1, 1442)=10.26, p<.001$

For property offences, there is only a main effect of risk and a main effect of school attachment. There was no interaction between early aggressiveness and school attachment when the focus was on property offences. High school attachment decreased property offences equally among the early aggressive and not early aggressive children (Figure 5). Thus, it appears that school attachment only protects the early aggressive children from continuing on to commit violent offences.¹¹

¹¹ These results can be examined using a slightly different statistical technique – multiple regression. These results are shown in the Appendix. As is shown there, the findings are in all practical ways the same as shown here.

Figure 5 **Mean property offence scores (Cycle 2) as a function of aggressiveness and school attachment (Cycle 1)**

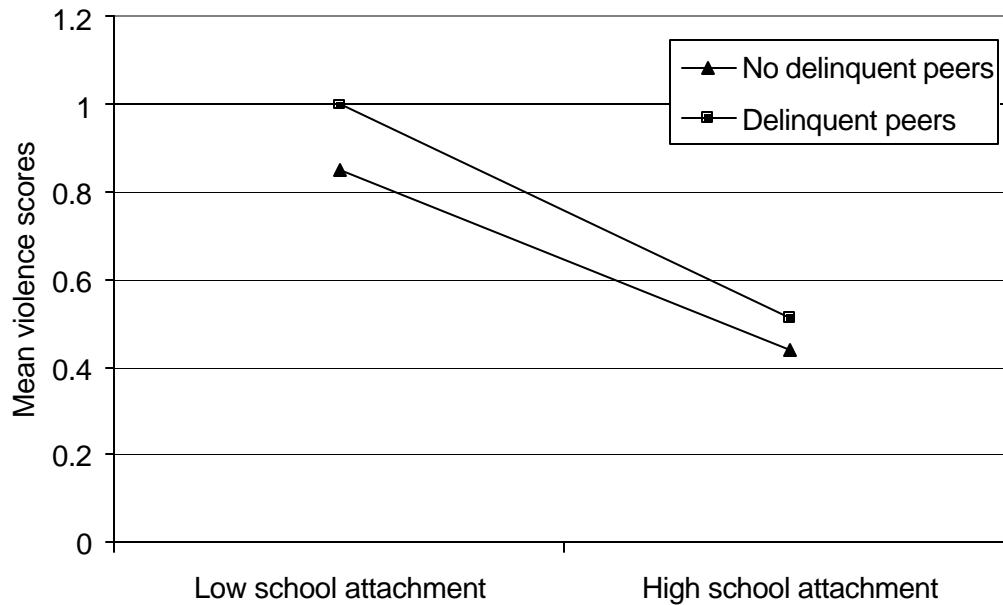


Notes: 1. Main effect of aggressiveness: $F(1, 1442)=11.77, p<.01$
 2. Main effect of school attachment: $F(1, 1442)=8.84, p<.01$
 3. Interaction between aggressiveness and school attachment: $F(1, 1442)=0.032, n.s.$

3.2.3 Peer group delinquency

We next examined the relationship of school attachment, peer group delinquency and violent and non-violent offences. Figure 6 presents the findings for violent offences. There is only a main effect of school attachment – those children who are highly attached to school are less likely to be committing violent offences. There is no main effect of having a delinquent peer group, and there is no significant interaction between peer group and school attachment. High school attachment decreases violence – for those who have delinquent peers and for those who do not have delinquent peers – by close to 50%. Equally interesting is, of course, the finding that having friends when a youth is 10 or 11 who get in trouble does not predict violence at age 12-13.

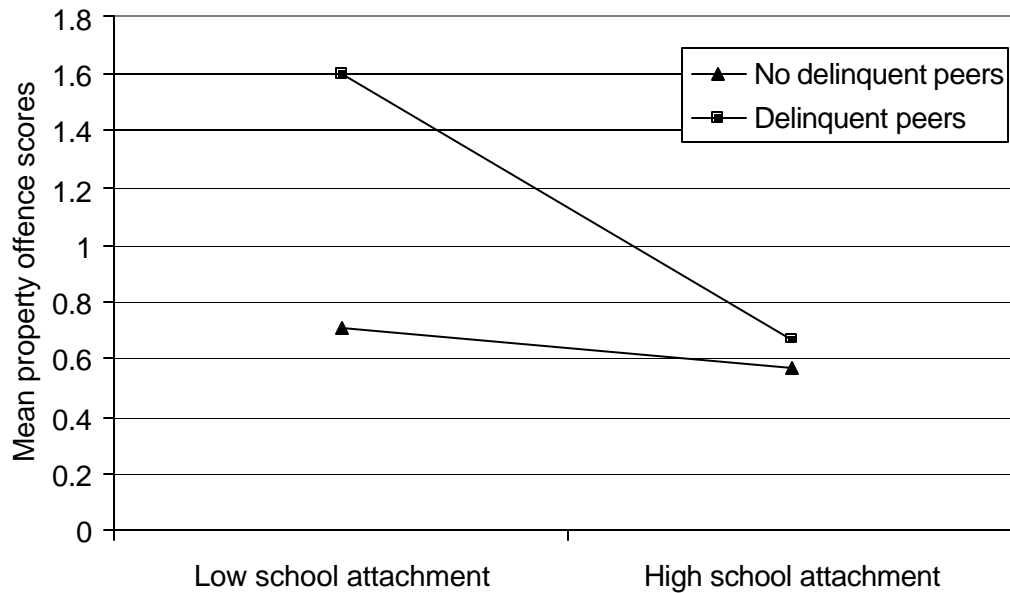
Figure 6 **Mean violence scores (Cycle 2) as a function of delinquent peer groups and school attachment (Cycle 1)**



Note: 1. Main effect of delinquent peers: $F(1, 1425)=1.91$, n.s.
 2. Main effect of school attachment: $F(1, 1425)=57.57$, $p<.001$
 3. Interaction: $F(1, 1425)=.39$, n.s.

Figure 7 presents the relationship between delinquent peers and school attachment for non-violent property offences. Here, the pattern is very different from the pattern for violent offences. There is a main effect of delinquent peer group and school attachment: those children who have a delinquent peer group, and those children who have a low attachment to school are committing more property offences. In addition, there is an interaction between peer group and school attachment. School attachment decreases property offences more for the children at highest risk – those involved in a delinquent peer group. Thus school attachment protects the highest risk children (defined in terms of hanging out with a group that does bad things when they were 10 or 11 years old).

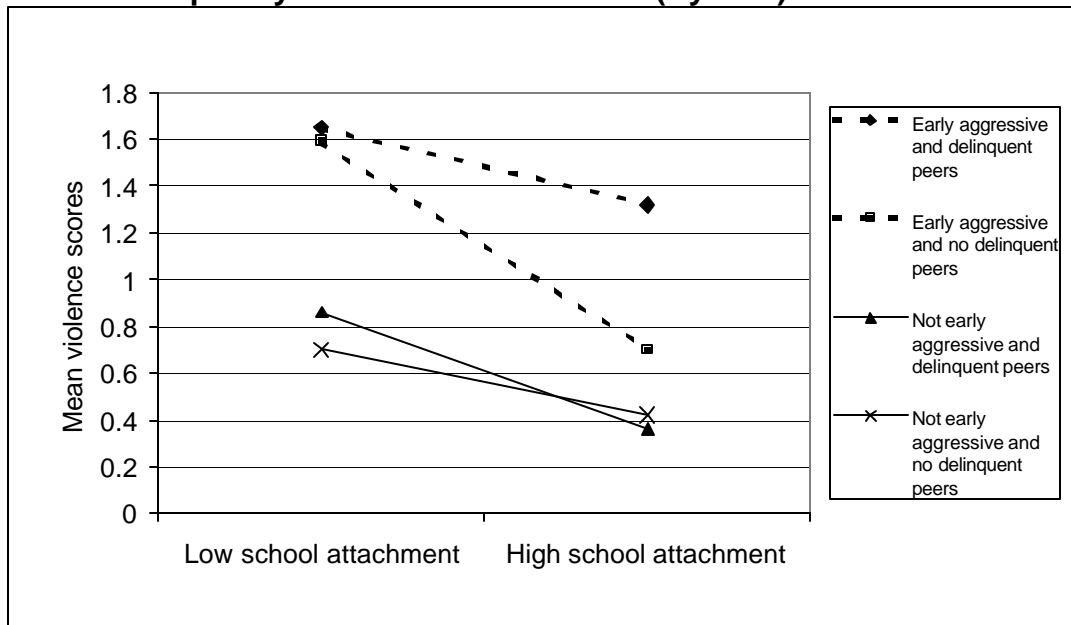
Figure 7 **Mean property offence scores (Cycle 2) as a function of delinquent peer groups and school attachment (Cycle 1)**



Notes: 1. Main effect of delinquent peers: $F(1, 1425)=38.28, p<.001$
 2. Main effect of school attachment: $F(1, 1425)=9.84, p<.01$
 3. Interaction: $F(1, 1425)=14.05, p<.001$

Next we examined the effect that school attachment has on early aggressiveness and having a delinquent peer group. Looking first at violent offences, we see that there is a main effect of early aggressiveness and a main effect of school attachment (Figure 8). The early aggressive children and the children with low school attachment are more likely to be committing violent offences. In addition, as has already been seen (Figure 4), high attachment to school reduces violence the most among the early aggressive group. There are no other interactions and no significant three-way interactions among early aggressiveness, delinquent peer group and school attachment.

Figure 8 **Mean violence scores (Cycle 2) as a function of aggressiveness, peer delinquency and school attachment (Cycle 1)**

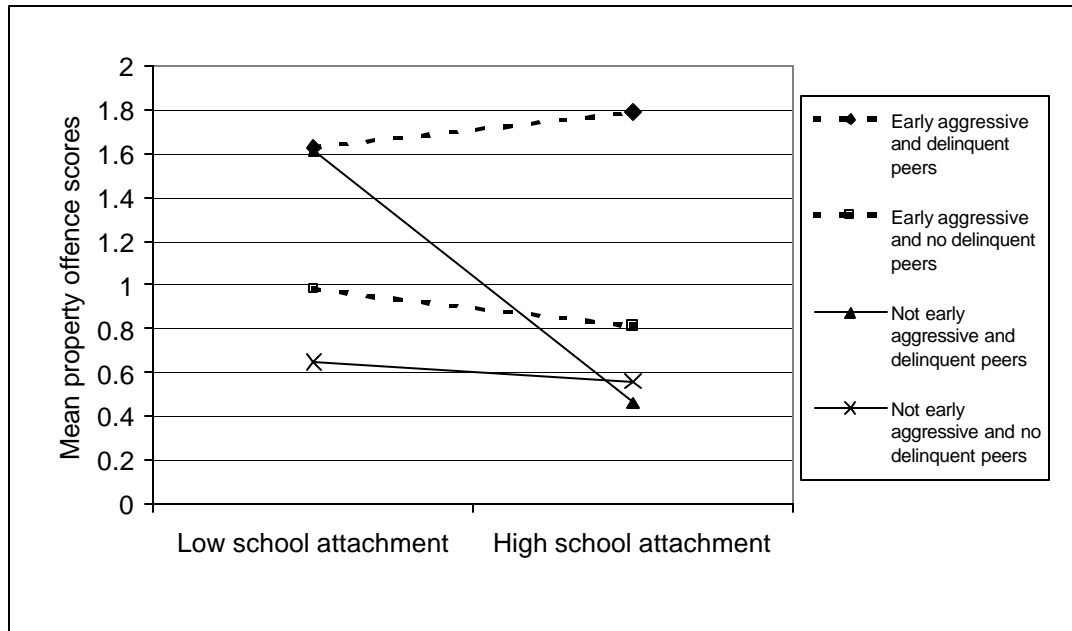


- Notes:
1. Main effect of early aggressiveness: $F(1, 1425)=89.00, p<.001$
 2. Main effect of delinquent peers: $F(1, 1425)=1.21, n.s.$
 3. Main effect of school attachment: $F(1, 1425)=42.41, p<.001$
 4. Interaction between early aggressiveness and school attachment: $F(1, 1425)=8.66, p<.01$
 5. Interaction between early aggressiveness and delinquent peers: $F(1, 1425)=0.15, n.s.$
 6. Interaction between delinquent peers and school attachment: $F(1, 1425)=0.25, n.s.$
 7. Interaction between early aggressiveness and delinquent peers and school attachment: $F(1, 1425)=1.08, n.s.$

Finally we examine the combined effect of school attachment, early aggressiveness and having a delinquent peer group on property offences. Figure 9 illustrates a main effect of early aggressiveness, a main effect of delinquent peers and a main effect of school attachment. Early aggressive children and children with delinquent peers are committing more property offences than the non-aggressive children and the children with no delinquent peers. Moreover, high school attachment decreases property offences among all groups of children.

In addition, however, there is an interesting, though somewhat unexpected, three-way interaction. For the not early aggressive children, high attachment to school significantly decreases property offences for the children who have delinquent peers. Among the not early aggressive group, those with delinquent peers are as involved in property offences as those with no delinquent peers when highly attached to school. Among the early aggressive children, with or without delinquent peers, there is no significant reduction in property offences when attachment to school is high.

Figure 9 **Mean property offence scores (Cycle 2) as a function of aggressiveness, peer delinquency and school attachment (Cycle 1)**



- Notes:
1. Main effect of early aggressiveness: $F(1, 1425)=12.07, p<.01$
 2. Main effect of delinquent peers: $F(1, 1425)=37.19, p<.001$
 3. Main effect of school attachment: $F(1, 1425)=7.91, p<.01$
 4. Interaction between early aggressiveness and school attachment: $F(1, 1425)=0.19, n.s$
 5. Interaction between early aggressiveness and delinquent peers: $F(1, 1425)=0.03, n.s.$
 6. Interaction between delinquent peers and school attachment: $F(1, 1425)=14.11, p<.001$
 7. Interaction between early aggressiveness and delinquent peers and school attachment: $F(1, 1425)=5.39, p<.05$

4. Conclusion

4.1 Policy implications

The distinctions we suggested at the outset – between violent and property offending, between early aggressive children and those not aggressive, and between those with many “risks” and those with few risks – are clearly important in terms of understanding factors that relate to both violent and non-violent delinquency in early adolescence (age 12-13). Similarly, it is clear that the protective influence of school attachment is not simple: it interacts with the other influences on the youth. From a policy perspective, however, the findings can be seen as quite encouraging.

In the first place, the idea that “early aggressiveness” cannot be altered is challenged by the findings that school attachment can have a protective influence on the level of aggressiveness exhibited by “early aggressive” or “at risk” children. The fact that the influence of school attachment as a protective factor in property offending is different from its impact on violence makes sense in terms of what we know about the background and activities of “early onset” vs. “adolescent limited” delinquents. That is, school attachment protected early aggressive children from engaging in violence, but not property offences (see Figures 4 and 5). We would expect this because property crime is probably beginning to be dominated by the “adolescent limited” offenders. These “adolescent limited” offenders are engaging in relatively normal adolescent behaviours; therefore, the protective effect was seen for the early aggressive group on violence, but not for groups dominated by the “normal” adolescents (not early aggressive and property offending).

From a policy perspective, the fact that high levels of “school attachment” had positive influences on property offending (Figure 5) and the fact that high levels of school attachment protected both boys (Figure 2) and girls (Figure 3) with large numbers of “risks” from property offending also reminds us of the potential impact of schools. More specifically, these findings suggest that zero-tolerance policies that exclude “problem” children through suspensions or expulsions would be counterproductive. We should not be surprised by the influence of the school experience on young people. Children who go to school regularly spend approximately 20% of their waking hours each year in school. In terms of total time, therefore, it would be surprising if schools did not have a large influence.

Peers also can have important influences on children, though, predictably, these influences are not always simple. Moffitt (1993) suggests that much of the violence committed by “life-course persistent” youth is solitary. Hence it is not surprising that whether or not a youth had delinquent peers at age 10-11 (“In the past year were you part of a group that did bad things”) had no simple impact on how violent the youth was at age 12-13 (Figure 6). However, the “protective factor” of high levels of school attachment on violence committed by early aggressive children is, to some extent “offset” by the presence of delinquent peers (Figure 8). Those early aggressive children who have delinquent friends do not show the protective impact of school attachment that is shown by those without delinquent friends.

“Doing bad things” in a group, typically means property offending. Thus it is not surprising that those who have friends who do bad things and who are not attached to school are more likely to be involved in property offending (Figure 7). Once again, however, school attachment can act as a protective factor against the influence of delinquent peers: those who have delinquent friends but are attached to school are no more likely to be involved in property offending than are those without delinquent friends (Figure 7). This protective effect, however, is limited to those who were not “early onset” aggressive children. High attachment to school does not seem to reduce property offending for those who are both early aggressive children and who have delinquent peers (Figure 9).

4.2 The implications for future research

It should be obvious that none of the findings that we have presented here could have been found without the longitudinal data available in the NLSCY. We would suggest that our findings demonstrate the value of these types of studies.

First of all, we have done little to test, in a Canadian context, what leads children to end up being identifiable as “early aggressive” children at age 10-11. Tibbetts and Piquero (1999) suggest that for males, but not necessarily for females, the combination of low birth weight (as a marker for possible neuropsychological disorders) and a disadvantaged childhood (low socioeconomic status, and a “weak” family structure) interact to increase the likelihood of early onset offending (within a sample of black inner-city offenders in the U.S.). Clearly we need to know more about the development of “early aggressiveness.” There are clearly certain events in a child’s life that predispose the child to develop into

an “early aggressive” child. These typically have been identified as “risks” some of which we have used in our analysis of “environmental risks” in a child’s life. What has not been examined is what events (before age 10-11) protect these “at risk” children. Tibbetts and Piquero (1999) would suggest that there are family and income effects that may be important, though this is, undoubtedly, only part of the story. As we get more longitudinal data, we should be able to understand this phenomenon much more.

Second, we have identified some variables at age 10-11 (school attachment, the absence of a delinquent peer group) that can have some influence on early offending (at age 12-13). Not all “early onset” aggressive children, therefore, can be expected to turn into aggressive adolescents (and adults). It will be important both to track these youth as they go through adolescence, but it is equally important to understand what accounts for variability in their offending behaviour.

Finally, we have not focused very much in this report on the determinants of “adolescent limited” delinquency. These offenders, Moffitt (1993) suggests, are relatively “normal” since the kinds of (largely property) offences they commit are committed by large numbers of adolescents. Nevertheless, there is known to be a large amount of variability in the amount of this behaviour exhibited by these youth. These questions – and other related questions – can only be answered with longitudinal data.

Appendix

An alternative approach

As noted in the text, there are a number of different ways to test our basic hypotheses – that school attachment acts to protect “early onset” delinquents. An alternative to the analysis of variance models used in the text is to include our predicted interaction term in a multiple regression model. The advantage of this approach is, obviously, that one can see whether the addition of the predicted interaction term does, in fact, increase the amount of variance explained by the model (i.e., whether R^2 – change is significant).

In Table 7, we present three models for predicting violence (high number indicates more self-reported violence) at age 12-13. First we entered, as a control variable, the gender of the respondent. In the second model, we entered the two main effects: early aggressiveness (0=not early, 1 = early), and school attachment (1 = low, 2 = high). In the third model we entered an interaction term (early aggressiveness by school attachment) where a score of 1 was given to the early aggressiveness, low school attachment group (predicted to be highest in violence) and a score of 0 was given to the other three groups (all predicted to be lower than the early aggressiveness, low school attachment group).

Table 8 repeats this same analysis for the property score measure (high number indicates more property offending self-reported).

**Table 7 Predicting violence at age 12-13
(Higher score = More self-reported violence)**

Predictors	Model I		Model II		Model III	
	Unstandard. coefficient	Standard. coefficient	Unstandard. coefficient	Standard. coefficient	Unstandard. coefficient	Standard. coefficient
Constant	1.26*	-	1.52*	-	1.45*	-
Sex (1=boys,2=girls)	-.399*	-.199	-.314*	-.157	-.318*	-.159
Early aggressiveness (0=no, 1=yes)	-	-	.696*	.225	.289#	.093
School attachment (1=low, 2=high)	-	-	-.317*	-.159	-.267*	-.133
Interaction (1=early aggressive,low attachment; 0=other)	-	-	-	-	.556*	.159
R	.199		.356		.364	
R-Squared change from previous model	.04 F(1,1448)=59.92*		.087 F(2,1446)=71.72*		.006 F(1,1445)=10.18*	

Notes: * $p < .01$, # $p = .053$

Table 8 **Predicting property offending at age 12-13**
(Higher score = More self-reported property offending)

Predictor	Model I		Model II		Model III	
	Unstandard. coefficient	Standard. coefficient	Unstandard. coefficient	Standard. coefficient	Unstandard. coefficient	Standard. coefficient
Constant	1.036*	-	1.193*	-	1.198*	-
Sex (1=boys,2=girls)	-.225	-.104	-.185*	-.086	-.185*	-.086
Early aggressiveness (0=no, 1=yes)	-	-	.305*	.091	.333*	.100
School attachment (1=low, 2=high)	--	-	-.170*	-.079	-.174*	-.080
Interaction (1=early aggressive, low attach; 0=other)	-	-	-	-	-.0389	-.010
R	.104		.166		.166	
R-Squared change from previous model	.011 F(1,1448) = 15.987*		.017 F(2,1446)=12.437*		0.0 F<1 (n.s.)	

Note: * p<.01

Obviously, these findings are entirely consistent with the findings presented in the main text. For violent offences, the (predicted) interaction term added to the overall predictability of the model based solely on main effects. For property offending, however, the interaction term added nothing to the “main effects” model (Model II).

The importance of differentiating between aggressiveness and property offences can be seen in two ways. First, the overall prediction of violence (from the measures of early aggressiveness and school attachment two years earlier) is considerably higher for violent offences at age 12-13 ($R = .364$) than it is for property offences ($R = .166$). This is exactly what Moffitt (1993) would have predicted: violence is determined in large part by factors in the youths early life, whereas property crime (which at age 12-13) is probably beginning to be dominated by “adolescent limited” offenders, and is therefore less predictable from these same factors. Second, and again entirely consistent with Moffitt’s (1993) prediction, off-setting factors earlier in a child’s life will affect aggressiveness but not the kind of “normal” adolescent behaviours involved in property offending.

The importance of differentiating between “types of offending” can be seen in another way. As mentioned in the text, we originally created an overall “delinquency” scale from the 26 self-report items.

Using this scale as the dependent variable, and performing the same regressions described above, we obtained models that were almost exactly the same as the “property offending” model described above. There were “main effects” of early aggressiveness and school attachment but no significant contribution came from the interaction term (and the model which included the interaction term was no more predictive over “Model II” (R-squared change = .001, not significant). The overall predication, however, was comparable to that of the model predicting violence ($R = .323$).

References

- Agnew, R. and Brezina, T. (1997). "Relational problems with peers, gender and delinquency." *Youth and Society*, 29(1), 84-111.
- Blumstein, A., Farrington, D. and Moitra, S. (1985). "Delinquency careers: Innocents, desisters and resisters." 187-219. In *Crime and Justice: An Annual Review of Research*, Vol. 6, Edited by M. Tonry and N. Morris. Chicago: University of Chicago Press.
- Born, M., V. Chevalier, and I. Humblet (1997). "Resilience, desistance and delinquent career of adolescent offenders." *Journal of Adolescence*, 20, 679-694.
- Elliot, D., Huizinga, D., and Ageton, S. (1985). *Explaining Delinquency and Drug Use*. Beverly Hills, CA: Sage.
- Elliot, D., Huizinga, D., and Menard, S. (1989). *Multiple Problem Youth: Delinquency, Substance Abuse and Mental Health Problems*. New York: Springer-Verlag.
- Farnworth, M., Schweinhart L., & Berrueta-Clement J. (1985). "Pre-school intervention, school success and delinquency in a high-risk sample of youth." *American Educational Research Journal*, 22, 445-464.
- Farrington, David P. (1998). "Predictors, causes, and correlates of male youth violence." In *Youth Violence (Crime and Justice: A Review of the Research, Volume 24)*. (pp. 421-475). M. Tonry and M.H. Moore (Eds.). Chicago: University of Chicago Press.
- Figueira-McDonough, J. (1983). "On the usefulness of Merton's anomie theory: Academic failure and deviance among high school students." *Youth and Society*, 14, 259-279.
- Gottfredson, Michael R. and Travis Hirschi (1990). *A General Theory of Crime*. Stanford, California: Stanford University Press.
- Healy, William and Bronner, Augusta F. (1936) *New Light on Delinquency and Its Treatment: Results of a Research Conducted for the Institute of Human Relations*, Yale University. New Haven, CT: Institute of Human Relations, Yale University Press.
- Hirschi, T. (1969). *Causes of Delinquency*. Berkley, CA: University of California Press.
- Huesman, L. R., Eron, L.D., Lefkowitz, M., and Walder, L.O. (1984). "Stability of aggression over time and generations." *Developmental Psychology*, 20, 1120-1134.
- Jang, S. (1999). "Age varying effects of family, school and peers on delinquency: A multilevel modelling test of interactional theory." *Criminology*, 37, 643-686.

- Jenkins, J. M., & Keating, D. P. (1998). *Risk and Resilience in Six and Ten-Year-Old Children* (W-98-23E). Report prepared for the Applied Research Branch, Strategic Policy, Human Resources Development Canada. Ottawa, Canada.
- Jenkins, P. (1997). "School delinquency and the school social bond." *Journal of Research in Crime and Delinquency*, 34(3), 337-367.
- Jensen, G. (1976). "Race, achievement and delinquency: A further look at delinquency in a birth cohort." *American Journal of Sociology*, 82, 379-382.
- Jessor, R., J. Van Den Bos, J. Vanderryn, F. Costa, M. Turbin (1995). "Protective factors in adolescent problem behavior: Moderator effects and developmental change." *Developmental Psychology*, 31, 923-933.
- Kercher, K. (1988). "Criminology." in *The Future of Sociology*, ed. E. Borgatta and K. Cook. Beverly Hills, CA: Sage, 294-316
- Klein, Karla, Rex Forehand, Lisa Armistead and Patricia Long (1997). "Delinquency during the transition to early adulthood: Family and parenting predictors from early adolescence." *Adolescence*, 32, 61-80.
- Krohn M. and Massy, J. (1980). "Social control and delinquent behavior: An examination of the elements of the social bond." *Sociological Quarterly*, 21, 529-543.
- LaGrange, R. and White H. (1985). "Age differences in delinquency: A test of theory." *Criminology*, 23, 19-45.
- Lane, B. (1980). "The relationship of learning disabilities to juvenile delinquency: Current status." *Journal of Learning Disabilities*, 13, 425-434.
- Landy, S. and K. Tam. (1998). *Understanding the Contribution of Multiple Risk Factors on Child Development at Various Ages*. Report prepared for the Applied Research Branch, Strategic Policy, Human Resources Development Canada. W-98-22E. Ottawa, Canada.
- LeBlanc, Marc, Évelne Vallières, and Pierre McDuff (1993). "The prediction of males' adolescent and adult offending experience." *Canadian Journal of Criminology*, 35, 459-478.
- Loeber, R. and Dishion, T. (1983). "Early predictors of male delinquency: A review." *Psychological Bulletin*, 94, 68-99.
- Loeber, Rolf and David P. Farrington. (1998). "Never too early, never too late: Risk factors and successful interventions for serious violent juvenile offenders." *Studies on Crime and Crime Prevention*, 7(1), 7-30.

- Maguin, E. and R. Loeber (1996). "Academic performance and delinquency." In M. Tonry (Ed.). *Crime and Justice: A Review of the Research*. Chicago: University of Chicago Press, 145-264.
- Meyer, A. (1957). *Psychobiology: A Science of Man*. Springfield, IL: Charles C. Thomas.
- Moffitt, T. (1993). "Adolescent-limited and life-course persistent antisocial behavior: A developmental taxonomy." *Psychological Review*, 100, 647-701.
- Olweus, D. (1979) "Stability of aggressive reaction patterns in males: A review." *Psychological Bulletin*, 86, 852-875.
- Rutter, Michael. (1983). "Statistical and personal interactions: Facets and perspectives." In D. Magnusson and V. Allen (Eds.), *Human Development: An Interactional Perspective* (pp. 295-319). New York: Academic Press Inc.
- Rosenbaum, J. and J. Lasley (1990). "School, community context and delinquency: Rethinking the gender gap." *Justice Quarterly*, 7(3), 493-513.
- Sampson, R. and Laub, J. (1993). *Crime in the Making: Pathways and Turning Points Through Life*. Cambridge, Massachusetts : Harvard University Press.
- Simpson, S. and L. Elis (1995). "Doing gender: Sorting out the caste and crime conundrum." *Criminology*, 33(1), 47-TK.
- Thornberry, T., Moore M., and Christenson, R. (1985). "The effect of dropping out of school on subsequent criminal behavior." *Criminology*, 26, 3-18.
- Thornberry, T., Lizotte, A., Krohn, M., Farnworth, M., and Jang, S. (1991). "Testing interactional theory: An examination of reciprocal causal relationships among family, school and delinquency." *Journal of Criminal Law and Criminology*, 82, 3-35.
- _____. (1994). "Delinquent peers, beliefs and delinquent behavior: A longitudinal test of interaction theory." *Criminology*, 32, 47-83.
- Thornberry, T. (1996). "Empirical support for interactional theory: A review of the literature." In J. Hawkins (Ed). *Delinquency and Crime: Current Theories*. Cambridge: Cambridge University Press, 198-235.
- Tibbetts, Stephen G. and Alex R. Piquero (1999). "The influence of gender, low birth weight, and disadvantaged environment in predicting early onset of offending: A test of Moffitt's interactional hypothesis." *Criminology*, 37, 843-877.
- Tiet, Q., H. Bird, M. Davis, C. Hoven, P. Cohen, P. Jensen, and S. Goodman. (1998). "Adverse life events and resilience." *Journal of the American Academy of Child and Adolescent Psychiatry*, 37(11), 1191-1201.

Williams, J., C. Ayer, R. Abbott, J. Hawkins and R. Catalano (1999). "Racial differences in risk factors for delinquency and substance use among adolescents." *Social Work Research*, 23(4), 209-272.

Zingraff, M. Leiter, J. Johnson, M and Myers, K. (1994). "The mediating effect of good school performance on the maltreatment-delinquency relationship." *Journal of Research in Crime and Delinquency*, 31(1), 62