BETTER BEGINNINGS, BETTER FUTURES STUDY: DELINQUENCY TRAJECTORIES OF AT-RISK YOUTH

RESEARCH REPORT 2011-03

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La présente publication est aussi disponible en français. Elle s'intitule : Étude *Partir d'un bon pas pour
un avenir meilleur* : trajectoires de la délinquance des jeunes à risque.

Table of Contents

Executive summary

Many studies of juvenile delinquency over the past two decades have focused on older, serious, and violent juvenile offenders. Younger delinquents have been ignored partly because their number is relatively small and their threat is often not as immediate. Understanding the trajectories of delinquency at a young age and the risk and protective factors associated with those developmental trajectories can inform the development of early risk assessments and the development of targeted prevention and intervention programs. The objectives of the research were to identify early trajectories of delinquency for both boys and girls from age 8 (Grade 3), age 11 (Grade 6), and age 14 (Grade 9) in a longitudinal sample of at-risk youth from a multi-informant perspective, assess risk and protective factors that may influence the likelihood that youth will engage in criminal behaviour in adolescence, and examine whether youth in the identified delinquency trajectories differ substantially in terms of delinquency, involvement with the criminal justice system, emotional and behavioural problems, experience of abuse, academic/school functioning, and health/health risk behaviours. Additionally, this study aimed at estimating the costs associated with each delinquency trajectory on utilization of government resources in the criminal justice system, remedial education, health care and social services, and social assistance.

In order to examine these research questions, analyses were conducted using the *Better Beginnings, Better Futures* data. These data followed 842 children living in five disadvantaged communities in Ontario. The same children were assessed when they were in Grades 3, 6, and 9 with measures largely based on the National Longitudinal Survey of Children and Youth (NLSCY). Three key informant sources were used to assess children's delinquency (parents, teachers and self-report youth ratings). In Grade 3, children's levels of delinquency were assessed by teachers. In Grade 6, the children were assessed by parents, teachers and the youth, while in Grade 9, they were assessed by parents and the youth. In addition to the above, 31 risk factors and 17 protective factors for delinquency were examined when the children were in Grade 3. When the children were in Grade 9, 41 outcome measures were examined in the following domains: emotional and behavioural problems, delinquency problems, abuse, involvement with the criminal justice system, functioning in school, and health and health risk activities. Finally, monetary costs associated with the criminal justice system, remedial education, health care and social services, and social assistance were estimated for each participant.

The literature on delinquent trajectories identifies three main delinquency groups among children and youth: a low delinquency group, a high delinquency group, and a desisting delinquency group. The trajectory analyses of the current research indicated that there were six delinquency trajectory groups. Children in two of the trajectories had very low ratings of delinquency across time (*lowest delinquency* group and the *second lowest* delinquency group). Two other trajectories showed a similar pattern of delinquency ratings that was decreasing over time. In the *moderate desisters* group, children had moderate levels of delinquency at Grade 3 followed by low levels of delinquency at Grades 6 and 9. In the *highest desisters* group children had the highest level of reported delinquency behaviours at Grade 3, followed by a marked decrease in reported delinquency at Grades 6 and 9. The fifth trajectory group, named *escalators*, had very low levels of reported delinquency at Grade 3 and increased markedly in their reported delinquency over time. By Grade 9, children in this trajectory group had the second highest delinquency scores. The final group, *high delinquency*, started with moderate levels of reported delinquency at Grade 3, marked by the highest reported levels of delinquency at Grades 6 and 9 of any of the trajectory groups.

Children at risk for delinquency (i.e., those in the *high delinquency*, *escalators*, and the two *desisters* trajectory groups) scored significantly higher on 17 of the 31 individual, family, peer, and neighbourhood risk factors. For example, children from these four trajectory groups experienced more hyperactive, oppositional-defiant, and physically aggressive behaviours; family risk factors included single parenthood, less parental education, public housing, and hostile-ineffective parenting. These results highlight the need to further develop and refine assessment tools to include these risk factors associated with delinquency. By Grade 9, the *high delinquency* and *escalators* groups also had significantly more problems than the

other groups; they exhibited more emotional/behavioural, health, criminal, and school functioning problems. Early identification at school and involvement in special education programs early may have significantly reduced these negative outcomes in Grade 9.

Finally, the economic analyses identified that youth in the *high delinquency, escalators*, and the two *desisters* trajectory groups cost a significant amount of money; for example, approximately 80% of the estimated costs to society (e.g., on utilization of government resources in the criminal justice system, remedial education, health care and social services, and social assistance) were from these four trajectory groups which represent 18% of the sample. Furthermore, 80% of the estimated criminal justice costs were due to the youth in the *high delinquency* and *escalators* groups.

The findings of the current study highlight some key conclusions. First, there are early indicators to the developmental pathways to delinquency. The risk factors associated with delinquency involvement (e.g., inattention/hyperactivity problems, oppositional defiant problems, low family functioning, having a teenage mother) can be identified as early as Grade 3 and can inform the implementation of an assessment and/or screening tool for children and youth at-risk of delinquency. Second, delinquency involvement does not just emerge, it develops over time, and without intervention, the problems accumulate and may become serious and significant by as early as Grade 9. Third, investment in prevention, such as educational support, can reduce criminal justice costs and delinquency involvement. The most at risk groups (*high delinquency* and *escalators* groups) for delinquency involvement accounted for the majority of the estimated reactive costs (e.g., criminal justice, health care and social services, social assistance) and not the preventative costs (e.g., remedial education). Specifically, the *high delinquency* and *escalators* groups accounted for 46% of the reactive costs compared to 32% for the two desisters groups and 22% for the two *low delinquency* groups; for the preventative costs, *high delinquency* and *escalators* groups accounted for 38% of the costs compared to 44% for the two desister groups and 18% for the two *low delinquency* groups.

Although more research is needed to understand the delinquency trajectories of girls, those at-risk of delinquency appear to require more support. Although our high risk group of girls was limited, there are some preliminary indications from this research that they are at a heightened risk for problems (e.g., emotional problems, having delinquent friends, police involvement) and the estimated costs associated with their problems may be higher than for boys because they appear not only through the criminal justice system, but also through the health care system.

Introduction

Delinquency is one of the most prevalent problem behaviours engaged in by Canadian youth. Statistics Canada (Savoie, 2006) indicates that over one-third of youth have been involved in some form of delinquency by the age of fourteen and that childhood delinquency tends to predict violent behaviours throughout the course of a lifetime. Although delinquency covers a wide range of behaviours, many of which do not go reported to the police, about 5% of Canadian youth have been charged with federal offences (Savoie, 2006). Engaging in early delinquent behaviour (i.e., before age ten) has been linked to negative psychological, emotional, health, social, academic, employment, and later criminal outcomes (Boyd et al., 2005; Lacourse, Nagin, Tremblay, Vitaro, & Claes, 2003). Nonetheless, not all early starters go on to become serious delinquents. The growing body of knowledge that forms developmental prevention science allows for the identification of risk factors associated with delinquency; the development of screening procedures to identify children at risk of delinquency; and the implementation of preventive intervention for changing the risk factors associated with delinquency and reducing children's probability of engaging in antisocial behaviour. In this paper, we examine the developmental trajectories of delinquency, and the associated individual, family, peer, and school correlates and outcomes in order to inform the prevention of delinquency. We also provide an economic analysis of the costs associated with early pathways associated with delinquent behaviours.

Development of Delinquent Behaviours

Several studies have used trajectory analysis to distinguish individual patterns of delinquent behaviour from childhood to adolescence (e.g., Hoeve, Blokland, Dubas, Loeber, Gerris, & Van Der Lann, 2008; Schonberg & Shaw, 2007; Wiesner & Windle, 2006). A review of these studies highlights several important themes. First, on average, between three and six groups of delinquent behaviours tend to be identified by the trajectory methodology. There are three consistent trajectories (although differentially labelled) across these studies: a low delinquency group (representing the majority of youth who rarely engage in delinquent behaviour), a high delinquency group (representing a small minority of youth with an early stage of high level of delinquent behaviour and increase over time), and a desisting delinquency group (representing a minority of youth who start with a high level of delinquent behaviour and decrease with time). In studies where more than three trajectories have been found, the three consistent groups are usually subdivided into other groups. For example, Lacourse, Côté, Nagin, Vitaro, Brendgen, and Tremblay (2002) found six trajectories that included the three above as well as a low rising, a low decline, and a medium decline of involvement in crime. The second important consistency across studies is that by the end of adolescence, most trajectory groups are on the decline with respect to delinquent behaviour.

Methodological differences may account for some of the discrepancies in these studies' results. First, while all the studies included self-report measures, some also included court records (Hoeve et al., 2008) and teachers' and parents' ratings (Lacourse et al., 2002). Second, the studies varied with the geographical region, for example some studies have participants from urban United States (Hoeve et al., 2008) or urban French-speaking Canadians (Lacourse et al., 2002). Third, the studies varied with respect to the age of the participants and have primarily focused on older students. Fourth, with a few exceptions, the studies included only boys. Although fewer girls than boys engage in high levels of problem behaviours, those girls who do start early and persist in antisocial behaviours experience mental health problems at levels equal to their antisocial male counterparts (Odgers et al., 2008). Thus, there are limited data available on the trajectories of delinquency in girls. Fifth, some of the studies conceptualized delinquency broadly and examined externalizing behaviours (i.e., conduct problems, physical aggression, oppositional behaviour, hyperactivity) as opposed to delinquency (defined by violations of the *Criminal Code*). Sixth, studies varied with respect to the number of assessments and the timing of assessments used to derive the trajectories. Thus, the differences in the shape and the number of the trajectories may in part be influenced by the operationalizing of delinquency and the study design. Despite these methodological differences across studies, the consistent finding of at least three similar trajectories on different populations and cultures provides strong test re-test reliability for the existence of the three main delinquent trajectories.

Risk and Protective Factors

Identifying the trajectories of delinquency provides an understanding of how this behaviour changes with age, gender and other risk factors. There are two types of risk factors that are typically defined as static and dynamic. Static risk factors refer to historical variables that are resistant to change such as age at first offence, prior criminal history whereas dynamic risk factors are changeable (Andrews & Bonta, 1998). The most useful risk factors to identify from a prevention and intervention perspective are dynamic, because these factors are amenable to change. Identification of the individual, family, peer, and community risk and protective correlates of each of the trajectory groups can provide specific direction for the development of prevention and intervention programs.

The development of delinquent behaviour is influenced by risk and protective factors residing both within individuals and their environments. Risk factors are those that lead directly to problem behaviour whereas protective factors operate to buffer risk. Protective factors generally refer to influences that modify, ameliorate, or alter a person's response to some risky environmental conditions that may result in maladaptive behaviour. Rutter (1986) points out that: (1) protective factors do not necessarily mean positive experiences; (2) protective factors are detectable only for high-risk individuals; and, (3) protective factors can be non-environmental and part of the biological make-up of the individual. Protective factors should not be considered to be merely flip sides of risk factors. Protective factors operate under conditions of risk. That is to say, protective factors operate to prevent delinquency under high-risk conditions or among high-risk individuals.

There is a cumulative effect of risk and protective factors both within and across time. At a given point in time, children are at greater risk for juvenile delinquency if they experience multiple risk factors (Lerner, 1996). Over time, there is a progressive accumulation of the consequences of individual factors (cumulative continuity) and the responses they elicit during social interactions (interactional continuity). Within this developmental framework, life phases and transitions are particularly important in understanding behaviour because they present either crises or challenges, engendering stress that can undermine development or revealing resources and opportunities (Lerner, 1996). A developmental perspective considers both stability and transformations in behaviour in their developmental context. The challenge is to explain the emergence and the change in form and frequency of antisocial and delinquent behaviours over the course of development.

The correlates of juvenile delinquency are similar in males and females. It remains unclear, however, the extent to which the outcomes of early externalizing problems are the same for both genders. The developmental trajectories of aggressive girls may involve similar processes to those of boys but result in different outcomes. For example, girls' trajectories to delinquency indicate there is strong comorbidity with depression and suicidal ideation, as well a physical and sexual victimization (Moffitt, Caspi, Rutter, & Silva, 2001). The developmental trajectories of aggressive girls exemplify the joint processes of cumulative and interactional continuity. They are maintained by individual characteristics of the girls themselves and by their interactions within the family, school, peer, and marital systems. There is emerging evidence that the risks experienced by aggressive girls may be transferred to the next generation through their ineffective parenting practices as well as their genes (Serbin et al., 2004). In summary, many risk and protective factors have been identified by researchers. However, there exist limited data on girls' involvement in delinquency and whether there are specific or nonspecific risk and protective factors for girls.

Estimated Costs Associated with Delinquency

There are significant individual, justice, health and social services, and societal costs associated with delinquency. These high intra-personal, interpersonal, and societal costs highlight the need to increase our understanding of delinquency behaviour, before it emerges. Despite the well documented individual, physical, psychological and mental health, social, and criminal outcomes of engaging in delinquent behaviours, there are limited data available in Canada on the costs associated with it. There is limited research on the costs of delinquency beyond costs savings of early prevention programs on future delinquency, and the costs to the criminal justice system. Antisocial youth tend to be multiple offenders and Cohen (1998) found that the average delinquent commits 68-80 crimes over their delinquency time period and costs society between $1.3-$1.5 million (U.S. dollars). Early intervention programs have the potential to reduce the long term costs of delinquency. Cohen and Piquero (2009) estimated that a beneficial prevention program of diverting a 14-year-old high risk juvenile from a life of crime could save from $2.6 million to $5.3 million (U.S. dollars).

Few studies of early childhood prevention programs for children have included an economic analysis (e.g., Barnett & Masse, 2007; Karoly, Kilburn, & Cannon, 2005; Mrazek & Brown, 2002; Nores, Belfield, Barnett, & Schweinhart, 2005; Peters et al., 2010; Reynolds, Temple, Robertson, & Mann, 2002; Waddell, Hua, Garland, Peters, & McEwan, 2007). All these early childhood intervention studies have reported economic analyses based on follow-up data for children, and in some cases their parents, to the child's age of 15, 21, and/or 40. Economic analyses results from these studies provide the rationale to policy makers for investing in early childhood interventions. For most economic analyses of early childhood education programs, economic benefits are typically divided into three categories: benefits to program participants (e.g., increased income from improved education), benefits to non-program participants (e.g., reduced costs to crime victims), and benefits to government/taxpayers (e.g., decreased remedial education costs, decreased costs to the justice system). The Canadian study of early intervention, discussed in this paper, is on *Better Beginnings, Better Futures* (BBBF; Peters et al., 2010). The costing perspective of the Canadian BBBF economic analysis was the government / taxpayers; Karoly et al. (1998) refer to this analysis as *cost-savings analysis* to differentiate it from the more traditional cost-benefit analysis. In this paper, we examine the social, health, educational and juvenile justice costs for each of our trajectories of delinquency.

Objectives of the study

The current study used data drawn from a longitudinal research study, *Better Beginnings, Better Futures* (Peters, Petrunka, & Arnold, 2003), which examined the long-term impacts of an early childhood prevention program. More specifically, the research project used a longitudinal sample of 842 at-risk youth from a multi-informant perspective (i.e., parents, teachers, self-reported youth ratings) to: (1) identify early trajectories of delinquency for both boys and girls at age 8 (Grade 3), age 11 (Grade 6), and age 14 (Grade 9); (2) examine risk and protective factors at the individual, family, peer, school, and community levels that may influence the likelihood that youth will engage in criminal behaviour in adolescence; (3) examine whether youth in the identified delinquency trajectories differ substantially in Grade 9 on emotional and behavioural problems, delinquency, experience of abuse, involvement with the criminal justice system, academic/school functioning, and health/health risk behaviours; and (4) estimate the costs to government associated with each delinquency trajectory on utilization of government resources in the criminal justice system, remedial education, health care and social services, and social assistance.

The BBBF data are the only existing Canadian data that include a large number of male and female youth living in neighbourhoods characterized by poverty. The dataset is also diverse in terms of ethnicity and other family demographic variables. The results are further instructive given this is the first early childhood prevention project in Canada to include an economic analysis of the estimated costs and savings to government. Thus, this research has the potential to provide empirically-based information for communities in Canada regarding identifying children and youth at risk of involvement in antisocial and delinquent behaviours, as well as for designing prevention and intervention programs that are community-based and that target empirically-based risk and protective factors associated with delinquency among children and youth.

Method

Participants

In the BBBF sample, the longitudinal research cohort was comprised of a *focal* cohort and a *following* cohort. Children in the focal *cohort* (n = 721) were born in 1989 and were recruited to the longitudinal study between Junior Kindergarten (JK) and Grade 3, mostly through the school system. Children in the following cohort (n = 238) were born in 1990, and were recruited to the longitudinal study when they were in Grade 3. For this study, there were 842 participants (396 girls and 446 boys), representing 88% of the original sample. These participants represent the longitudinal follow-up of the BBBF study and had data at ages 8 (Grade 3), 11 (Grade 6), and 14 (Grade 9).

Attrition was mainly due to two factors: (1) families relocated and the researchers were unable to contact them; and (2) families declined to be interviewed. As a test for attrition bias, we employed logistic regression to examine sociodemographic differences in children and families who dropped out of the research cohort between Grade 3 and 6 and between Grade 6 and 9, and families who completed all years of data collection. These analyses indicated no significant differences in sociodemographic variables between the retained and lost cases.

Approximately 30% of the households were headed by single parents, 34% of parents did not complete high school, 59% of families were living below Statistics Canada Low Income Cut Off line, and 19% were living in public housing. There were no significant gender differences on any of the demographic variables. Appendix A provides more information on the family demographics when the children were in Grade 3.

Measures Delinquency

Child delinquency measures were created using items from the National Longitudinal Survey of Children and Youth (NLSCY; Statistics Canada, 1995). Three different measures were created, one for parents, one for teachers, and one for the youth themselves. Ratings in Grade 3 were provided by teachers only, while ratings in Grade 6 were provided by parents, teachers and youth, and ratings in Grade 9 by parents and youth. Items for the parents and teacher versions and the Grade 6 youth version were rated on a three-point scale: 0 = *never or not true*, 1 = *sometimes or somewhat true*, and 2 = *often or very true* (e.g. "vandalizes", "steals", "destroys things", and "tells lies or cheats"). At Grade 9, the youth indicated whether or not in the past 12 months, they were part of a gang (0 = *no*, 1 = *yes*) and the remaining nine items were rated 0 = *never*, 1 = *once or twice*, 2 = *three or four times*, or 3 = *five or more times* (e.g., "stayed out all night without permission", "stolen something," "sold drugs", and "intentionally destroyed/damaged things"). Using principal component factor analyses, delinquency items from teachers, parents, and youth were combined separately at each of the three grades to create Grades 3, 6, and 9 delinquency scales: the Grade 3 delinquency scale was created by combining three teacher rated items; the Grade 6 measure had 13 items (6 parents, 5 teachers, and 2 youth); and the Grade 9 measure of delinquency included 16 items (6 parents and 10 youth). All three scales had high reliability.

Risk and Protective Factors

Risk and protective factors information about children, their families, and neighbourhoods was obtained by parent and child interviews, teacher questionnaires, and Canadian Education Quality and Accountability Office (EQAO) academic achievement test results when the children were in Grade 3. The specific details can be requested directly from the authors.

At the *individual child* level, we examined children's emotional and behavioural problems (anxiety, depression, hyperactivity, oppositional-defiant, passive victimization, physical aggression), number of serious injuries, social functioning (conflict management, cooperation, outgoing, self-concept, relationship with siblings,

number of people important to child), and cognitive and academic functioning (Mathematics Performance on provincial standardized test, Achenbach Academic and Adaptive Functioning, WISC Block Design, Peabody Picture Vocabulary Test score, grade repetition, use of special education services).

At the *family* level, we examined sociodemographic factors (parent's education level, income, marital status, mobility, teenage parent), family functioning (hostile-ineffective parenting, consistent-effective parenting), substance use (high risk drinking and drug use), and parent's emotional functioning (depression, stress, social support).

At the *peer* level, we examined how well the child got along with his/her peers. At the *school* level, we examined parents' perceptions of the school and how involved the parents were at school. Finally, at the *neighbourhood* level, we asked parents to describe how satisfied they were with their home and neighbourhood, whether they lived in public housing, and how safe they felt from crime.

Grade 9 Outcomes

We examined 41 outcomes when youth were in Grade 9 along several domains obtained by parent and youth interviews, teacher questionnaires, and Canadian Education Quality and Accountability Office (EQAO) academic achievement test results at Grade 9. The specific details can be requested directly from the authors.

To assess youth *emotional and behavioural problems*, ratings were collected from parents, teachers, and youth. The rating scales include emotional-anxiety disorder, physical aggression, oppositional-defiant, hyperactivity, and depression. To assess youth *delinquency*, parents completed a "youth trouble" scale, and youth were asked if they were part of a gang and the types of delinquent activities their friends engaged in. Youths' *experiences with abuse* were also assessed; youth were asked if they had been treated unfairly because of their gender, race, skin color, or religion and if they had been bullied or physically abused. Youth *involvement with the criminal justice system* was determined through a series of questions in the youth interview (had they ever been arrested, number of arrests, number of close friends arrested, ever been to court, and time in custody or other programs).

Youths' *functioning in school* was assessed through a series of questions asked of parents, teachers, and youths. Parents were asked if the child had repeated any grades or been suspended. Teachers were asked if the student had been suspended, received special education services, and current academic achievement. Students were asked how often they left/dropped out of school and how often they skipped class. Students' results on the standardized Ontario provincial mathematics achievement test at Grade 9 were also examined.

Finally, youth were asked a series of questions about their *health and health risk activities*. Specifically, youth were asked about their use of alcohol, tobacco, and illegal drugs, and had they ever been drunk. Youth were also asked to rate their stress level, indicate how often they had been seriously injured, were they sexually active, were they having unprotected sex, and had they ever been pregnant or gotten someone pregnant. Youth and parents were also asked to rate the youth's general health, and youth's body mass index was calculated based on their self-reported height and weight.

Estimated Costs of Government Resources Associated with Delinquency

We identified 12 measures in our data set that could be monetized to reflect children's and parents' utilization of government resources in health care and social services, remedial education, the criminal justice system, and social assistance (see Table 1 for summary). These measures were collected from children and their parents beginning when the children were in Junior Kindergarten (JK) up to and including Grade 9 (more specific details for how each of the 12 outcomes was monetized can be requested from the authors).

TABLE 1. ESTIMATED COSTS OF GOVERNMENT RESOURCES

GOVERNMENT RESOURCE	ESTIMATED COSTS IN CANADIAN DOLLARS[a]
Health Care and Social Services	
Visits to a family physician	$29.44 per visit in Ontario based on 2001 dollar figures (Browne, Gafni, & Roberts, 2002)
Hospital emergency room use	$195.76 per visit in Ontario based on 2001 dollar figures (Browne et al., 2002)
Number of serious injuries	The average cost of an unintentional injury in Canada was $4,000 in 1996. (Angus et al., 1998)
Number of overnight stays in hospital	$816.35 per overnight stay in a hospital in Ontario based on 2001 dollar figures. (Browne et al., 2002)
Visits with a nurse practitioner	$19 per visit in Ontario based on 2001 dollar figures (Browne et al., 2002)
Family involvement with Children's Aid Society	$60 per visit in Ontario based on 2001 dollar figures (Browne et al., 2002)
Remedial Education	
Grade repetition	$6,151 per year in Ontario based on 2002/03 school year dollar figures.
Use of special education services	$6,794 average cost per child receiving special education services in Ontario based on 2001/02 school year dollar figures.
Criminal Justice System	
Arrests	$500 Canadian national average cost per police investigation in 1998 (Hepworth, 2000)
Court appearances	$1,250 Canadian national average court costs (Hepworth, 2000)
Social Assistance Programs	
Social Welfare Assistance	$842 per month in Ontario based on 2003 estimated minimum value of basic social assistance for a single parent with one dependent child (National Council on Welfare, 2004)
Ontario Disability Support Program	$829 (single parent with one child) and $940 (two parents with one child) per month in Ontario based on 2003 estimated minimum payments (Ontario Ministry of Community and Social Services, 2003)

[a] A 3% discount rate was applied for all estimated cost data (e.g., Karoly et al., 1998; Karoly et al., 2005; Reynolds et al., 2002).

Statistical Analyses

For a complete description of the statistical analyses, please see Appendix B.

Results

Trajectories of Delinquency

According to the statistical tests, the six-group solution was the "best" model for the combined sample of girls and boys. Figure 1 depicts the distinct developmental trajectories of the six-class model for delinquency. Children in two of the trajectories had very low ratings of delinquency across time; we labelled these groups the *lowest delinquency* group and the *second lowest* delinquency group. Two other trajectories showed a similar pattern of delinquency ratings that was decreasing over time. In the *moderate desisters* group, children had moderate levels of delinquency at Grade 3 followed by low levels of delinquency at Grades 6 and 9. In the *highest desisters* group children had the highest level of reported delinquency behaviours at Grade 3, followed by a marked decrease in reported delinquency at Grades 6 and 9. The fifth trajectory group, labelled *escalators* had very low levels of reported delinquency at Grade 3 and increased markedly in their reported delinquency over time. By Grade 9, children in this trajectory had the second highest delinquency scores. The final group, labelled *high delinquency*, started with moderate levels of reported delinquency at Grade 3, marked by the highest reported levels of delinquency at Grades 6 and 9 of any of the trajectory groups.

FIGURE 1. DELINQUENCY TRAJECTORIES OF AT-RISK YOUTH

6-Group Solution

Trajectories of Delinquency Scale

Lowest Delinquency — 2nd Lowest Delinquency — Moderate Desisters — Highest Desisters — Escalators — High Delinquency

Solid line = observed
dashed line = predicted

Scale Range: 0-2
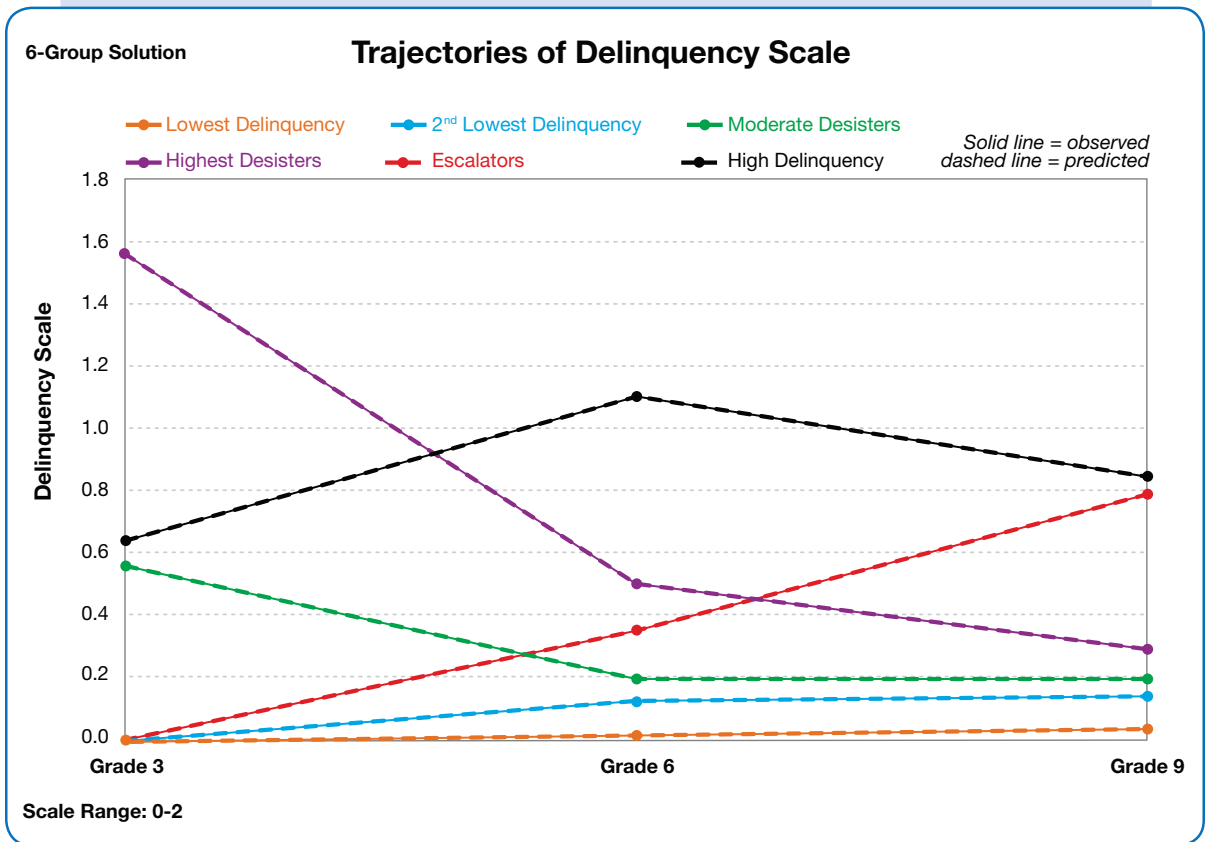
Table 2 depicts the percentages of children in each of the groups. Chi-squares tested for gender differences in the group membership of each trajectory group; a significant group by gender effect was found, that is there was a significant difference in the proportion of males compared to the proportion of females (p <.003). We then compared whether the proportion of males versus females differed for each of the six trajectory groups separately. There were significantly more females than males in the two *low delinquency* trajectory groups, p <.05 for both analyses. There were more males than females in the four remaining trajectory groups, but only the differences for the trajectory groups showing marked decreases in delinquency over time (the *moderate and highest desisters*) were significant (p <.05 for both analyses).

TABLE 2. PERCENTAGE OF BOYS *VS.* GIRLS IN EACH TRAJECTORY

Trajectory Group	Males % (n)	Females % (n)
Lowest Delinquency*	6.7% (30)	10.6% (42)
Second Lowest Delinquency*	70.4% (314)	76.5% (303)
Moderate Desisters*	13.5% (60)	8.1% (32)
Highest Desisters*	3.4% (15)	1.0% (4)
Escalators	4.0% (18)	2.8% (11)
High Delinquency	2.0% (9)	1.0% (4)

* p <.05

Grade 3 Risk and Protective Factors by Trajectories of Delinquency

We examined 31 risk factors and 17 protective factors at the individual, family, peer, school, and neighbourhood levels that may influence youth delinquent behaviours. Since Grade 3 is the earliest data point used to determining the trajectory groups, we selected Grade 3 risk and protective factors for this analysis to address whether these factors were associated with the different developmental trajectories of delinquency, and whether these factors were differentially associated for girls and boys.[1]

Of the 31 risk factors, 17 were found to be statistically significant at p <.001 with the full sample: 8 of the 10 *individual child* risk factors; 5 of the 12 *family* risk factors; 2 of the 6 *school* risk factors; the one *peer* risk factor; and 1 of the 2 *neighbourhood* risk factors (see Appendix C for more details). By Grade 3, there was evidence that children in the *high delinquency, escalators*, and the two *desisters* trajectory groups were experiencing many risk factors at the individual, family, school, and peer levels. For example, compared to the low delinquency groups, children from these four trajectory groups experienced more hyperactive, oppositional-defiant, and physically aggressive behaviours; family risk factors included single parenthood, less parental education, public housing, and hostile-ineffective parenting.

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[1] Each Grade 3 outcome variable was examined through two sets of analysis, one for the full sample (males and females combined) and the other for males only (due to the low numbers of females in our *high delinquency* and *highest desisters* groups). Gender of child was used consistently as a control variable for all full sample analyses, but the analyses for the "male only" sample looked at the bivariate relationship between male children and trajectory groups. We employed a combination of analysis of variance (ANOVA) and logistic regression depending on the type of outcome variable in question (i.e., ANOVA for continuous variables, and logistic regression for binary variables) to compare the means or proportions of variance of the variable. Omnibus F or chi-square tests were reported to indicate the significance of overall relationship, and Bonferroni tests were carried out to examine pairwise comparisons.

When examining *pairwise* comparisons for the 17 significant risk factors, the *highest desisters* group had the most frequent number of significant pairwise comparisons; in other words, this group of children experienced more risk than children in the other 5 trajectory groups. Specifically, they scored higher than the *lowest delinquency* group on all parent and teacher rating of child behaviour problems, their mothers had a lower education level, and they had poor sibling and peer relationships (see Table 3 for more details). That is, these children were experiencing more individual, family and peer problems.

The *high delinquency* group and the *moderate desisters* group also exhibited high levels of risk, especially when compared to the two lowest delinquency groups. For example, the *high delinquency* group was characterized by both parents and teachers as scoring high on hyperactivity, oppositional defiance, and physical aggression. They were more likely to come from a single family, live in public housing, experience hostile ineffective parenting, and have poor sibling and peer relationships than the *lowest delinquency* group. The *high delinquency* group had 11 significant risk factors in Grade 3, the *escalator* group had six, while the *lowest delinquency* group had none. Specifically, according to parents, the *escalator* group scored higher than the *lowest delinquency* group on hyperactivity, oppositional defiant behaviours and physical aggression. Compared to the *lowest delinquency* group, they were more likely to have a teenage mother, live in public housing and have poor sibling relationships. Thus, parents had identified these children as experiencing more problems, and they had many family risk factors.

TABLE 3. SUMMARY OF SIGNIFICANT GRADE 3 RISK FACTORS BY TRAJECTORY GROUP

	High Delinquency (1)	Escalators (2)	Desisters — Highest (3)	Desisters — Moderate (4)	Low Delinquency — 2nd lowest (5)	Low Delinquency — Lowest (6)
CHILD						
Parent Ratings of Child:						
Hyperactivity	1>5,6[a]	2>6	3>6	4>6	5>6	
Oppositional-Defiant	1>4,5,6	2>5,6	3>5,6			
Physical Aggression	1>5,6	2>6	3>4,5,6	4>5,6		
Teacher Ratings of Child:						
Hyperactivity	1>5,6		3>2,5,6	4>5,6		
Depression			3>2,5,6	4>5,6		
Oppositional-Defiant	1>2,5,6		3>1,2,4,5,6	4>2,5,6		
Passive Victimization			3>6	4>5,6		
Physical Aggression	1>2,5,6		3>1,2,4,5,6	4>2,5,6		
FAMILY						
Mother's Education			3<6	4<5,6		
Single Parent (% yes)	1>5,6			4>6		
Teenage Mother (% yes)		2>5,6		4>6		
Living in Public Housing (% yes)	1>6	2>6				
Hostile-Ineffective Parenting	1>5,6			4>6		
Poor Sibling Relationships	1>6	2>4,5,6	3>4,5,6			
SCHOOL						
Peabody Picture Vocabulary Test Scores				4<6		
Received Special Education Services (% yes)				4>5,6		
PEERS						
Poor Peer Relationships (parent rated)	1>6		3>4,5,6			

[a] This indicates that children in the *high delinquency* trajectory group received statistically significant higher ratings of hyperactivity than children in the two *lowest delinquency* groups.

Note: only statistically pairwise comparisons at *p* <.01 are shown.

Of the 17 protective factors, 7 were found to be significant at p <.001 with the full sample (see Appendix C), all in the *individual child* protective domain. The two *lowest delinquency* groups showed significantly higher levels of social skills (e.g., conflict management, helping/cooperation, outgoing/assertive) and adaptive functioning than children in the two *desisters* groups (see Table 4). Teachers also rated the *high delinquency* and *escalators* groups as showing more conflict management skills than the *highest* desisters group.

TABLE 4. SUMMARY OF SIGNIFICANT GRADE 3 PROTECTIVE FACTORS BY TRAJECTORY GROUP

	High Delinquency (1)	Escalators (2)	Desisters Highest (3)	Desisters Moderate (4)	Low Delinquency 2nd lowest (5)	Low Delinquency Lowest (6)
CHILD						
Parent Ratings of Child:						
Conflict Management					5>1,3,4[a]	6>1,2,3,4
Helping/Cooperation					5>1	6>1
Teacher Ratings of Child:						
Low Anxiety					5<3,4	6<3,4
Conflict Management	1>3	2>3,4		4>3	5>3,4	6>3,4
Helping/Cooperation		2>3			5>3,4	6>3,4
Outgoing/Assertive					5>3,4	6>3,4
SCHOOL						
Adaptive Functioning					5>3,4	6>1,2,3,4,5

[a] This indicates that children in the *second lowest delinquency* trajectory group received statistically significant higher ratings of conflict management than children in the *high delinquency* and the two *desisters* trajectory groups.

Note: only statistically pairwise comparisons at p <.01 are shown.

When examining gender differences on the 31 risk and 17 protective factors, 5 risk and 2 protective factors were found to be significant at p <.001 (see Appendix C for full details). Specifically, we found that teachers rated girls as showing fewer hyperactive, depressive, oppositional-defiant, and physically aggressive behaviours. Teachers also rated girls as showing more conflict management and helping/cooperative behaviours. Parents rated girls as showing fewer hyperactive behaviours.

Grade 9 Outcomes by Trajectories of Delinquency

We examined the relationships between Grade 9 outcome variables and delinquency trajectories in a similar manner as we did for the Grade 3 risk and protective variables.[2] However, given the small sample sizes for some trajectory groups, we reclassified the 6 groups of trajectories into 4 groups by combining *moderate desisters* and *highest desisters* (and calling it *desisters*) and by combining the *lowest* and *second lowest* trajectories (calling it *low delinquency*); the other two groups, *escalators* and *high delinquency*, remained the same as before. For continuous variables, adjusted group means are reported and for dichotomous variables, odds ratios are reported.

Of the 41 Grade 9 outcomes examined, 31 were found to be significant at $p <.001$ with the full sample (see Appendix D for more details). To briefly summarize: in the *Emotional and Behavioural Problems* domain 7 of 10 outcomes were significant; in the *Delinquency Problems* domain all 3 independent measures of delinquent outcomes were significant; in the *Experience of Abuse* domain 1 of 3 outcomes was significant; in the *Involvement with Criminal Justice System* domain all 5 outcomes were significant; in the *School Functioning* domain 5 of 7 outcomes were significant; and in the *Health and Health Risk Behaviours* domain 10 of 13 outcomes were significant. These results indicate, as would be expected that by Grade 9, the *high delinquency* group and the *escalators* were already exhibiting significantly more problems than the youth in the other trajectory groups in all areas of their functioning (emotional and behavioural problems, criminal involvement, and engaging in unhealthy behaviours).

We then examined differences among our 4 trajectory groups on these 31 significant outcomes (see Table 5 for summary). The *escalators* and *high delinquency* groups differed significantly from the *desisters* and *low delinquency* groups on 26 of the 31 outcome measures. That is, the *escalators* and *high delinquency* groups exhibited more emotional and behavioural problems, engaged in more delinquent behaviours, were more likely to be involved in the criminal justice system, had poorer school functioning, and were more likely to be engaged in health risk behaviours compared to the other two trajectory groups. Some specific results merit emphasis. Compared to the youth in the *low delinquency* group, the youth in the *high delinquency* group were 25 times more likely to be part of gang in the past year, 33 times more likely to have ever been arrested, 91 times more likely to have ever gone to court, 13 times more likely to have been suspended from school in the past 3 years, 37 times more likely to have done hard drugs in the past year, and 20 times more likely to have had unprotected sex in their most recent sexual encounter. Additionally, compared to youth in the *low delinquency* group, the youth in the *escalators* group were 44 times more likely to be part of gang, 20 times more likely to have been arrested, 37 times more likely to have gone to court, 11 times more likely to have been suspended from school, 26 times more likely to have done hard drugs, and 15 times more likely to have had unprotected sex. The importance of these results is that they are separate indicators of involvement in crime than the items used to create the delinquent trajectories. Thus, using both self report and official data sources, there is converging evidence that these high risk youth are indeed high risk and engaging in high risk behaviours with significant consequences.

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[2] That is we employed a combination of analysis of variance (ANOVA) and logistic regression depending on the type of outcome variable in question (i.e., ANOVA for continuous variables, and logistic regression for binary variables) to compare the trajectory groups on each of the Grade 9 outcome variables. Omnibus F or chi-square tests were reported to indicate the significance of overall relationship, and Bonferroni tests were carried out to examine pairwise comparisons.

TABLE 5. SUMMARY OF SIGNIFICANT GRADE 9 OUTCOMES BY TRAJECTORY GROUP

	Escalators (1)	High Delinquency (2)	Desisters (3)	Low Delinquency (4)
YOUTH EMOTIONAL AND BEHAVIOURAL PROBLEMS				
Parent-Rated:				
Emotional-Anxiety Disorder	1>3,4 [b]	2>3,4		
Physical Aggression Scale	1>3,4	2>3,4		
Hyperactivity/Inattention Scale	1>3,4	2>3,4		
Oppositional-Defiant Scale	1>3,4	2>3,4		
Depression		2>1,3,4		
Youth-Rated:				
Physical Aggression Scale	1>3,4	2>3,4		
Hyperactivity/Inattention Scale	1>4			
Stress Index	1>3,4	2>3,4		
DELINQUENCY PROBLEMS				
Youth Getting Into Trouble Scale (*Parent-Rated*)	1>3,4	2>1,3,4		
Delinquent Friends Scale (*Youth-Rated*)	1>3,4	2>3,4		
Gang Membership (*Youth-Rated*)	43.59 OR [c]	25.46 OR	5.38 OR	
EXPERIENCE OF ABUSE				
Physical abuse (*Youth-Rated*)	7.29 OR	3.40 OR		
INVOLVEMENT WITH CRIMINAL JUSTICE SYSTEM				
Youth-Rated:				
Ever arrested/ taken to police station	19.67 OR	33.38 OR	3.65 OR	
Number of arrests	1>3,4	2>1,3,4		
Friends arrested or taken to police station	1>3,4	2>3,4		
Court Appearances	36.75 OR	90.76 OR	7.63 OR	
Incarceration	14.21 OR	49.24 OR		

	Escalators (1)	High Delinquency (2)	Desisters (3)	Low Delinquency (4)
SCHOOL FUNCTIONING				
Suspension From School	10.90 OR	13.25 OR	3.28 OR	
Dropped Out of School	1>3,4	2>3,4		
Skipped Classes	1>3,4	2>3,4		
Academic Achievement[a]				4>3
Received Special Education Services	3.41 OR	6.04 OR	2.77 OR	
HEALTH AND HEALTH RISK BEHAVIOURS				
Youth-Rated:				
General Health[a]				4>1,2
Body Mass Index		2>1,3,4		
Alcohol Consumption	1>3,4	2>4		
Ever Drunk	10.91 OR	7.9 OR		
Tobacco Use	1>3,4	2>3,4	3>4	
Marijuana Use	1>3,4	2>3,4		
Hard Drug Use	26.46 OR	37.14 OR		
Consensual Sex	12.56 OR	20.23 OR		
Unprotected Sex	14.54 OR	19.58 OR		

[a] Variable is reverse-coded (i.e., higher scores reflects a more positive outcome).

[b] This indicates that youth in the *escalators* trajectory group received statistically significant higher ratings of emotional-anxiety disorder than youth in the *desisters* and *low delinquency* trajectory groups.

[c] OR refers to Odds Ratio. Odds Ratios are reported for dichotomous variables where *low delinquency* is used as the reference category. For example, youth in the escalators trajectory group were 43 times more likely to be part of a gang than youth in the *low delinquency* trajectory group.

Note: only statistically pairwise comparisons at $p < .01$ are shown.

Estimated Costs Associated with Delinquency Trajectories

Most studies of juvenile delinquency over the past two decades have focused on older, serious and violent juvenile offenders. Younger delinquents have been ignored partly because their number is relatively small and their threat is not as immediate. However, whereas the number of very young offenders is small compared with older juveniles, child delinquents present unique challenges that need to be addressed. Intervening before minor offences become more serious and before the occasional offender becomes a chronic offender is important. Understanding the trajectories of delinquency at a young age and the risk and protective factors associated with those developmental trajectories can inform the development of early risk assessments and the development of prevention and intervention programs.

For each of the 6 trajectories of delinquency, we estimated an average cost/child/trajectory for each of the 12 monetizable government resources described in Table 1. For each child, we estimated the costs of utilizing the government resource by multiplying the unit cost available from a secondary source (e.g., $29.44 for an appointment with a family physician) by the occurrence of the event. All dollar figures that we report were discounted at a rate of 3 %. This discount rate falls within the range of rates commonly used and recommended in public-policy analysis (e.g., Karoly et al., 1998; Karoly et al., 2005; Reynolds et al., 2002). For a complete description of the statistical analyses, please see Appendix B.

Detailed results for each of the 12 indicators of government resource utilization by trajectory group by gender can be found in Appendix E. Table 6 provides a summary of the government expenditures by general domain by trajectory group. To briefly summarize the results, government expenditures were highest in the *Remedial Education* domain (64% of costs), followed by *Health Care and Social Services* (29%), *Social Assistance* (6%), and *Criminal Justice System* (1%). The two *lowest delinquency* trajectories (82% of the sample) accounted for only 19.4% of the estimated government costs. In other words, approximately 80% of the estimated costs to government were from 18% of the sample. Specifically, we found that youth from the two *desisters* trajectory groups (13% of the sample) accounted for 40% of the estimated costs to government; and youth from the two most at-risk trajectories (*escalators* and *high delinquency*, 5% of the sample) accounted for 40.6% of the estimated costs to government. It is interesting to note that 80% of the estimated *Criminal Justice* costs were due to the *high delinquency* and *escalators* trajectory groups.

We also found that antisocial or delinquent girls cost society more money than antisocial or delinquent boys in all domains, with the exception of the *Social Assistance* domain. Specifically, summing across all 6 trajectory groups from ages 4 to 14, we estimated that girls cost $244,056 while boys cost $229,236. In addition, we estimated that girls' criminal justice costs were almost twice those of boys ($4,835 vs. $2,408).

TABLE 6. RESULTS OF ESTIMATED GOVERNMENT RESOURCE UTILIZATION BY DOMAIN BY TRAJECTORY GROUP

		JK – Grade 3 ($)	Grades 4 – 6 ($)	Grades 7 – 9 ($)	All Grades ($)
Health care and social services	2nd Lowest delinquency	2,802	2,061	4,978	9,841
	Escalators	2,661	3,340	10,798	16,800
	High delinquency	980	2,570	8,953	12,503
	Moderate desisters	2,392	1,209	4,804	8,405
	Lowest delinquency	1,758	1,398	2,616	5,772
	Highest desisters	5,927	2,902	4,654	13,483
	Group total	**$16,521**	**$13,480**	**$36,802**	**$66,803**
Remedial education	2nd Lowest delinquency	5,807	5,363	4,278	16,348*
	Escalators	7,285	7,651	8,101	25,008 *
	High delinquency	8,927	8,476	10,348	30,001*
	Moderate desisters	8,223	8,032	6,522	24,277 *
	Lowest delinquency	4,595	2,898	2,104	9,947*
	Highest desisters	11,700	13,908	13,430	40,584*
	Group total	**$46,537**	**$46,327**	**$44,782**	**$146,165***
Criminal justice system	2nd Lowest delinquency				71
	Escalators				900
	High delinquency				1,647
	Moderate desisters				211
	Lowest delinquency				30
	Highest desisters				334
	Group total				**$3,193**
Family social assistance	2nd Lowest delinquency				1,758
	Escalators				4,081
	High delinquency				2,142
	Moderate desisters				2,603
	Lowest delinquency				708
	Highest desisters				1,856
	Group total				**$13,147**
All domains (12 Measures)	2nd Lowest delinquency	8,609	7,424	9,255	28,018*
	Escalators	9,946	10,991	18,899	46,788*
	High delinquency	9,907	11,046	19,301	46,292*
	Moderate desisters	10,615	9,240	11,326	35,496*
	Lowest delinquency	6,352	4,296	4,720	16,457*
	Highest desisters	17,628	16,810	18,084	56,257*
	Group total	**$63,058**	**$59,807**	**$81,585**	**$229,308***

* Includes costs of grade repetition. For those children who repeated a grade, we assigned each child one total cost of repeating a grade (e.g., number of grades failed summed from kindergarten to Grade 8); therefore, it was not possible to assign this cost to one of the specific grade categories (JK-Gr2, Gr4-6, Gr7-9). Instead, we included these costs in the "All Grades" total.

Discussion

Given that over one-third of youth have been involved in some form of delinquency by the age of fourteen, and that childhood delinquency tends to predict violent behaviours throughout the course of a lifetime (Farrington, 1989), understanding the developmental pathways that lead to delinquency is a critical issue. The current study was designed to identify the delinquency trajectories of boys and girls living in disadvantaged communities in Ontario from ages 8 to 14, and examine the risk/protective factors, Grade 9 outcomes, as well as the estimated economic costs associated with each trajectory. Results indicated that children in the *escalator* group and the *high delinquency* group had significant negative outcomes by Grade 9 with respect to their behavioural, emotional, social, and risk-taking behaviour (e.g., drug use, unprotected sex), as well as high involvement in the criminal justice system. These problems also were costly to the government.

Developmental Trajectories of Delinquency

Our first objective was to examine the trajectories of delinquency in boys and girls from ages 8 (Grade 3) to 14 (Grade 9). Our results confirm the heterogeneity of the development of delinquency and are generally consistent with previous research. We found six groups of delinquency. As expected, two groups, *lowest delinquency* and *second lowest delinquency*, representing the majority of the youth (≈82% of the sample) reported consistently low levels of delinquency over time. Two other trajectories (*highest desisters* and *moderate desisters*) showed a similar pattern of delinquency ratings decreasing over time, representing the desisters (≈13% of the sample). Another group, the *escalators* (≈3.5% of the sample), had very low levels of reported delinquency at Grade 3 and increased over time. Finally, the *high delinquency* group started with moderate levels of reported delinquency at Grade 3 and had the highest reported levels of delinquency at Grades 6 and 9 of any of the trajectory groups. The *high delinquency* group represented approximately 1.5% of the sample. It may be that the low percentage of youth in the *high delinquency* group reflects the fact that we only have data up until the youth are in Grade 9, or approximately 14 years old. Thus, many youth may just be beginning to engage in delinquent acts. We hypothesize that with more longitudinal data points, the proportion of youth in the *high delinquency* group would increase and likely more closely resemble other research findings.

This study supported the trajectories of delinquency reported in other studies, but also identified some key differences. Similarities included: 1) that the majority of youth were involved in no or limited delinquent activities; 2) females were more likely than males to be uninvolved in delinquency (i.e., there were more females in the *low delinquency and second lowest delinquency* trajectory groups); 3) there was a group of individuals who desisted from involvement in delinquency; and 4) there was a trajectory of consistently high engagement in delinquent behaviour. The key differences from previous literature was the number of groups that had low levels of delinquency (i.e., there were two low and second lowest groups that engaged in minimal delinquent behaviours). Second, the shape of the *high delinquency* trajectory group was surprising, as there was a peak in delinquency in Grade 6. We expected that the peak would not be present, and if we had extended longitudinal data we would have expected to see it at around age 18. There are several possible interpretations to this early peak. First, no other study on delinquent trajectories has been conducted starting at such a young age. Second, the current study included girls which no other study of delinquent trajectories has done. Third, this study was based on community sampling, that is it was conducted in high risk, low socioeconomic status neighbourhoods. Lastly, it is possible that there are unique sample characteristics in the participants and the results may reflect this sampling. Nonetheless, more longitudinal research is required that begins as early as this research to validate findings.

Third, when we examined differences in the distributions of boys and girls within the diverse trajectory groups, we found that the *escalators* and *high delinquency* groups had equal proportional representativeness of males and females. That is, we found no gender differences in the distribution of boys and girls in the

high delinquency group (2% of males and 1% of females), or in the escalators group (4% of males and 3% of females). Typically research reports that males are more likely to engage in delinquent behaviour than females, thus we expected to have more males than females in the high delinquency group. Notably, this pattern is inconsistent with the general developmental trend reported by Silverthorn and Frick (1999) who found that girls tend to experience a later onset of delinquency than boys, and the general finding that boys are more likely to be involved in high delinquent behaviour than girls. The discrepancy may arise because we have used a multi-informant approach, and have taken a person-oriented approach (as opposed to a group oriented approach), allowing us to examine heterogeneity within the development of delinquency. The small minority of at-risk girls in our sample demonstrated these problems as early as boys. Consistent with other research, we found that girls were overrepresented in the two low delinquency groups. However, we found there were significantly more males in the two desisters groups.

Risk and Protective Factors Associated with Delinquency Trajectories

Trajectories increase our understanding of delinquency development and identify behavioural patterns that emerge in individuals on a specific trajectory. Once these trajectories are identified, specific factors pertaining to the individual, peers, family, and community in general can be explored to determine which factors heighten the risk of delinquency (i.e., the chronic or increasing trajectories) or act as a protective factor against the involvement in delinquency (i.e., low, non-involved, or declining trajectories).

In this research we examined 31 risk factors and 17 protective factors at the individual, family, peer, school, and community level when the children were in Grade 3 (age 8) that may influence the likelihood that youth will engage in criminal behaviour in adolescence. Children at risk for delinquency (i.e., those in the high delinquency, escalators, and desisters trajectory groups) scored significantly higher on 17 of the 31 individual, family, peer, and neighbourhood risk factors. For example, children from these four trajectory groups experienced more hyperactive, oppositional-defiant, and physically aggressive behaviours; family risk factors included single parenthood, less parental education, public housing, and hostile-ineffective parenting. The most at-risk groups were experiencing problems in multiple domains, noted by multiple informants and assessments, yet they received limited interventions or support to address these problems. Thus, with comprehensive early assessments, early identification of at-risk children can occur early at school allowing the provision of extra services to prevent continuation of problematic and costly behaviours through adolescence.

More specifically, youth assigned to the high delinquency group were already showing signs of problems in Grade 3. Parents and teachers rated them as higher than the low delinquency groups on hyperactivity, oppositional behaviour, and physical aggression. In addition, they were more likely to come from single parent homes, live in public housing and experience higher levels of hostile ineffective parenting and had poor quality peer and sibling relationships compared to the two low delinquency groups. Interestingly only the moderate desisters were viewed as more problematic with respect to their oppositional defiant behaviour and their physical aggression than the high delinquency group, according to teachers. With respect to school functioning, there were no differences on the PPVT test or on the likelihood that they received special educational services compared to the other groups. In fact this group had the lowest special education rates yet they had the lowest PPVT scores (although not significantly different from the other groups); they may not have been receiving the special services at school that they required.

The high delinquency group also did not score well on protective factors. They had significantly lower scores on conflict management and cooperative behaviours than the low delinquency and desisters groups, according to parents. This composition of risk and protective factors indicates that parents identified many behavioural and social problems in children in the high delinquency group. Interestingly, teachers rated the high delinquency group as showing more conflict management skills than the highest desisters group. This group was not viewed as the most problematic with respect to classroom behaviours, which may have minimized the extent of their problematic behaviours and limited the potential interventions they could have received.

Similarly, the youth in the *escalators* group were rated by their parents as showing the second worst problematic behaviours and had many family risk factors, such as more likely to live in a single parent home, lived in public housing, and had poor peer relationships. For both the *high delinquency* and the *escalators* groups, the issues at home may have played a role in their delinquent trajectories. Research has indicated that single parents may be less able to monitor their children than children living in two parent homes (Tremblay, Van Aken, & Koops, 2009). Similarly, they lived in social housing where there was a lack of monitoring and where they may have been more likely to associate with peers with similar problems, thus providing a peer group with similar problems to reinforce their aggressive and delinquent behaviour problems. Teachers did not perceive this *escalators* group as exhibiting many problematic behaviours compared to the other groups. This lack of concordance between parents and teachers may have contributed to them not being identified as having problems. It may be that the children were having fewer behavioural problems at school than at home, or it may be that the behavioural problems at school were not as extreme as those experienced at home. Furthermore, this discrepant finding between parent and teacher ratings may reflect the lack of services put into place to promote healthy behavioural and school functioning for these children, which may have inadvertently contributed to their ongoing problems. In any case, the disagreement between parents and teachers highlights the need to take parents' views into account in developing assessment and/or screening tools. Furthermore, these parents may need more services to help them address problematic behaviours early, at home. The combination of many risk and few protective factors, and little support in terms of educational assistance may have interacted and accumulated to maintain and increase their risk for delinquency over time.

The two *desisters* groups (*highest desisters* and *moderate desisters*) are an interesting contrast to the *high delinquency* and *escalators* groups. The *desisters* groups were viewed the most negatively by their teachers in Grade 3 (i.e., they had the highest score on all risk factors and the lowest overall protective scores as viewed by their teachers). Furthermore, the risk factors included both externalizing problems and internalizing problems. It may be in part this combination of depression, victimization, and externalizing problems that contributed to them being identified as such by their teachers. Parents also identified externalizing problems in these groups. Furthermore, the *moderate desisters* also have elevated risk with respect to their family environments (e.g., more likely to live in single parent homes, have a teenage mother, and a mother with lower education than the low groups). It may be that these families were receiving more social assistance due to their life circumstances than the *high delinquency* and *escalators* groups, which may have also been protective against future delinquency involvement. Furthermore, likely as a consequence of being identified by teachers as experiencing many behavioural problems and academic problems, they received the most special education services (43%) at school. These services may have acted as an effective early intervention for these students by promoting positive school functioning that in turn facilitated their desistance from delinquency and associated problematic behaviour.

There are several implications to these findings. For example, it supports the notion that developing an assessment/screening tool for risk measuring psychological, emotional, and behavioural functioning, as well as family and school functioning, can provide early identification of children who are at different levels of risk for future delinquency. In addition, providing interventions or strategies (such as special educational services) to those who are identified at-risk can prevent delinquency in the future. Among other things, the current research suggests that early investment in school services can make a measurable difference in delinquency trajectories by Grade 9. Without investment, the problematic and costly behaviours of at-risk youth are likely to continue through adolescence and potentially become more significant.

Grade 9 Outcomes Associated with Delinquency Trajectories

The third objective of this study was to examine whether youth in the identified delinquency trajectories differ substantially in Grade 9 on emotional and behavioural problems (e.g., emotional-anxiety disorder, depression, aggression, oppositional-defiant, hyperactivity-inattention), delinquency (e.g., association with delinquent friends, being part of a gang), experience of abuse (e.g., physical abuse, bullying, discrimination), involvement with the criminal justice system (e.g., arrests, court appearances, time spent in custody), academic/school functioning (e.g., achievement, use of special education services, student suspensions, grade repetition), and health/health risk behaviours (e.g., use of alcohol, tobacco, and illegal drugs, injuries, unprotected sexual activity, pregnancy). We found that early problems (i.e., emotional and behavioural, delinquency, academic) become even more significant by Grade 9. Our two most at-risk groups, the *high delinquency* and the *escalators* groups, had significantly more problems in all areas of functioning. They scored the highest on the majority of the emotional/behavioural (e.g., anxiety, hyperactivity, physical aggression); health (e.g., general health, use of tobacco/alcohol/drugs, sexual activity); criminal (e.g., arrests, court appearance, in custody), and school functioning (e.g., suspensions, special education, dropping out of school) domains.

An examination of some of the specific outcomes in Grade 9 for our two most at-risk groups (the *high delinquency* and the *escalators*) highlights that the pathway to delinquency is developmental and that early behaviours are indicative of significant problems by Grade 9. For example, even by Grade 9 these high risk groups were much more likely to be involved in gangs, to have been arrested, and to have a criminal record than the other groups. Furthermore, the *escalators* and *high delinquency* groups engaged in more risky health behaviours (e.g., consumption of hard drugs and involvement in unprotected sex behaviours). These behaviours are problematic not only in themselves but in their consequences (e.g., early pregnancy with potentially substance using parents).

Furthermore, the youth in the *high delinquency* and *escalators* groups were experiencing significant truancy, thus further limiting their long term employment and educational opportunities. In all of the domains examined, these at-risk youth were experiencing problems in Grade 9 that were much more severe than in Grade 3 and had much potentially significant longer term outcomes.

Estimated Economic Costs Associated with Delinquency Trajectories

The final objective of the present study was to estimate the costs to government associated with each delinquency trajectory on utilization of government resources in the criminal justice system, remedial education, health care and social services, and social assistance. The majority of the estimated costs associated with each of the trajectories was in the educational system – 64% of the costs were for remedial education. In contrast, the percentage of the estimated costs associated with the other domains was 29% for health care and social services, 6% for social assistance, and 1% for the criminal justice system.

As noted earlier, it was the *desisters* groups (*highest desisters* and *moderate desisters*) who received the most special educational services, and with respect to long term outcomes, this was a positive and preventative investment. A review of the specific estimated health care costs indicates that the *escalators* in particular had the highest costs associated with visiting their doctor, going to the emergency room, having serious injuries, and visiting with a nurse practitioner. These are reactionary costs (as opposed to preventative costs) in the sense that a significant event has happened. Furthermore, for girls in the *high delinquency* group, some costs were estimated as being much higher than for boys (e.g., number of serious injuries, and overnight stay in hospital. At-risk girls may be particularly vulnerable to medical problems associated with delinquency involvement compared to at-risk boys.

High risk girls were also more costly with respect to the criminal justice system. Compared to boys, the total estimated costs at age 14 (Grade 9) for girls was almost twice that for boys ($4,835 vs. $2,408). The data revealed that girls in the two high risk groups (*high delinquency* and *escalators*) were much more likely to have higher costs associated with each being arrested and court appearances. It appears that girls, once arrested, were also much more likely to enter the criminal justice system. Admittedly, our sample of girls was small and may not be representative, but it does reflect the developmental course and costs associated with a small sample of very high risk delinquent girls. The high risk boy groups also had the highest estimated costs, but not as high as those of the high risk girls. In summary, our findings suggest that girls cost the government more money than boys in all domains (except social assistance). Specifically, summing across the six trajectory groups, we estimated that, between the ages of 4 and 14, girls cost $244,056 while boys cost $229,236.

Furthermore, approximately 80% of the estimated costs to government were due to the two desisters trajectory groups (*highest desisters* and *moderate desisters*) and the youth from the two most at-risk trajectories (*escalators* and *high delinquency*) which represented 18% of the sample. Specifically, we found that youth from the two desisters trajectory groups (13% of the sample) accounted for 40% of the estimated costs to government (primarily driven by education costs, a preventative response); and youth from the two most at-risk trajectories (*escalators* and *high delinquency*; 5% of the sample) accounted for 40.6% of the estimated costs to government.

Additionally, 80% of the estimated criminal justice costs were due to the *high delinquency* and *escalators* groups. Even though the estimated Criminal Justice System costs to government were relatively low as of Grade 9 (only 1% of the overall costs), these two groups may just be getting started and the costs associated with these groups can only increase. Interestingly, the *high delinquency* and *escalators* groups accounted for 46% of the reactive costs (such as criminal justice system, health care and social services) compared to 32% for the two *desisters* groups and 22% for the two *low delinquency* groups; for the preventative costs (e.g., remedial education), the *high delinquency* and *escalator* groups accounted for 38% of the costs compared to 44% for the two *desisters* groups and 18% for the two *low delinquency* groups. The implication is that investing early in prevention costs such as remedial education may provide at-risk children and their families the opportunity to have more positive developmental outcomes and desist from delinquency involvement. As a consequence, investing in prevention can save the government money in the long run. The most at-risk groups did not receive sufficient early support and consequently the costs associated with them were reactive and costly.

Limitations

There are many strengths to the current research. The BBBF research sample comprised disadvantaged and at-risk communities; the communities were diverse (Francophone, Aboriginal, recent immigrants, and multicultural); the sample had both boys and girls; and the data allowed for economic analyses to be conducted. This is the first on a Canadian sample. Having said that, some limitations need to be noted. First, we were unable to examine the risk and outcome factors by trajectory for both boys and girls separately due to the low number of females in some of the trajectory groups. Second, some of the trajectories had a small sample size and hence the results may not be generalizable. For example, in the *high delinquency* group, the costs of delinquent behaviour in girls were high relative to boys. It may be that this is an atypical group that had many arrests, or in fact, it may be representative of an extreme group of high risk girls that to date have been neglected by research.

Conclusion

There are early indicators to the developmental pathways for delinquency. Risk and protective factors associated with more serious and escalating delinquency involvement become apparent as early as Grade 3, which could inform the implementation of an assessment/screening tool. Furthermore, the current research findings suggest that delinquency involvement does not just emerge, but develops over time, and without intervention, the problems accumulate and are serious and significant by as early as Grade 9. The increased likelihood of arrests, court appearances, and incarceration by Grade 9 for the *high delinquency* and *escalator* groups, indicate that the delinquent problems are significant and serious. Similarly, investment in prevention, such as educational support, can reduce delinquency involvement. The most at-risk groups for delinquency involvement (e.g., *escalators* and *high delinquency*) accounted for the majority of the reactive costs (e.g., criminal justice) and not the preventative costs (e.g., remedial education).

The present study also demonstrates that, although more research is needed to understand the developmental delinquency trajectories of girls, they appear to require more support than boys. Although our high risk sample of girls was limited, there are some preliminary indications from this research that they are at a heightened risk for problems, such as emotional problems, criminal activity and court system involvement, and the costs associated with their problems may be higher than for boys because they appear not only in the criminal justice system, but also in the health care system. Traditionally, we have estimated only the criminal justice costs. It may be that this venue does not reflect the full range of costs associated with female delinquency.

In summary, different developmental periods may have different risks and protective factors associated with delinquency. Thus, crime prevention needs to occur early in development and be ongoing. Our study indicates that there were more problematic externalizing behaviours in our *high delinquency* and *escalators* groups by Grade 3, as indicated by parents in particular and somewhat supported by teachers. Despite the problematic behaviours as reported by parents, teachers did not view them as displaying the most problematic externalizing behaviours in the class; instead, teachers rated the *highest desisters* group as having more oppositional-defiant and physical aggression problems than the *high delinquency* and *escalator* groups. This lack of identification may be one reason they did not receive extra support early. It may be that having problems identified early by others outside the family facilitate the identification and early intervention for children at risk for later serious delinquency. In addition to the behavioural problems, the family lives of the *escalators* and *high delinquency* group were also problematic. These children may have lacked opportunities to interact positively with other children and adults. They were living in homes characterized with higher levels of hostile and ineffective parenting and had poor peer and sibling relationships. They may have lacked a positive and supportive adult in their lives to champion them, model and reinforce positive behaviours and social relationships. Lastly, they likely lived in high risk neighbourhoods characterized by social housing and low socio-economic status that may have contributed to their delinquent trajectories. Furthermore, in these neighbourhoods, they may have had greater access to peers experiencing similar problems (as indicated by their associations with friends who were more likely to be delinquent and be arrested). Thus, there may be delinquency influence occurring within their peer groups. Therefore, crime prevention approaches need to target high risk families, living in high risk neighbourhoods, and provide family, school, and community support. This support needs to be ongoing to ensure that the behavioural problems demonstrated early in Grade 3 does not escalate and accumulate into serious delinquency and drug abuse by Grade 9.

Although we have made a great deal of progress in understanding individual differences in antisocial behaviour and linking these to interventions, much work remains to be done. Research that continues to monitor the development of these trajectories could be informative as youth transition into early adulthood. The mental and physical health and other needs of children at-risk for delinquency involvement should not be ignored. An examination of the youth who desist from delinquency provide strong support for the value of investing early in children to prevent negative long term outcomes. Even modestly successful prevention and intervention investments, such as in education, yielded significant benefits, including decreasing future expenditure associated with delinquency, improving well-being and safety of families, children, and youth in a community, and reducing crime and delinquency.

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APPENDIX A. SOCIODEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE AT GRADE 3

Family Characteristic	Cohort at Grade 3 (n = 789[a])		P-value
	Girls	Boys	
Parent[b] place of birth, %			
Ontario	49.4	52.1	NS[c]
Elsewhere in Canada	11.4	10.0	
Outside Canada	39.2	37.9	
Parent cultural group, %			
Anglophone	24.8	30.1	NS[c]
Francophone	36.4	33.4	
Indigenous/Native	2.5	2.4	
Other	36.4	34.1	
Single parent family status, %	33.2	29.6	NS[c]
Teenage Mother, %	22.8	24.7	NS[c]
Parent level of education, %			
High school incomplete	34.5	34.1	NS[c]
High school complete	13.8	10.9	
Post-secondary, non-university	43.4	45.0	
University/professional degree	8.3	10.0	
Mother employed, %			
Full-time	43.1	47.0	NS[c]
Part-time	19.3	18.5	
Not employed; seeking work	15.7	12.8	
Not employed; not seeking work	21.8	21.6	
Father employed, %			
Full-time	74.9	76.8	NS[c]
Part-time	7.8	6.1	
Not employed; seeking work	4.1	5.1	
Not employed; not seeking work	13.2	12.1	
Mean (SD) monthly income,$CAD	2,758.05	2,926.30	NS[d]
Family Living Below Statistics Canada Low Income Cut Off, %	58.4	59.6	NS[c]
Family Living in Public Housing, %	18.9	19.7	NS[c]

[a] The longitudinal sample of 842 is based on a child having at least one data collection point at Grade 3, 6, or 9. At Grade 3, only 789 were interviewed.

[b] The term 'parent' is used because 98% of the respondents interviewed were parents.

[c] Results of chi-square test.

[d] Result of t-test; NS, not statistically significant.

APPENDIX B. DESCRIPTION OF STATISTICAL ANALYSES

To identify the trajectories of delinquency we used the semi-parametric group-based trajectory approach (Jones et al., 2001; Nagin, 1999; Nagin, 2005). In this modeling, the dependent variable was the total standardized delinquency scale score at Grades 3, 6, and 9. The censored normal distribution was used to model the trajectories to account for the censoring at the lower and upper bounds of the delinquency scale. A polynomial relationship was used to link age to delinquency behaviour. We compared models with different numbers of groups using a Bayesian information criterion (BIC) (Kass & Raftery, 1995). A large BIC value corresponds to a good model with a large log-likelihood value and not too many parameters. We tested competing models of 2, 3, 4, 5, and 6 groups of delinquency to determine the "best" model based on BIC criterion; we found that the BIC values for 2-, 3-, 4-, 5-, and 6-group models were, respectively, -886.8, -881.2, -894.4, -851.8, and -838.2. Application of the maximum BIC for model selection indicated that the six-group solution was the "best" model for the combined sample of girls and boys.

To examine trajectory group differences on the risk and protective factors, as well as the outcomes, we employed a combination of analysis of variance (ANOVA) and logistic regression depending on the type of outcome variable in question (i.e., ANOVA for continuous variables, and logistic regression for binary variables) to compare the means or proportions of variance of the variable. Omnibus F or chi-square tests were reported to indicate the significance of overall relationship, and Bonferroni tests were carried out to examine pairwise comparisons.

To estimate costs associated with each trajectory of delinquency, we estimated an average cost/ child/ trajectory for each of the 12 monetizable government resources described in Table 1. For each child, we estimated the costs of utilizing the government resource by multiplying the unit cost available from a secondary source (e.g., $29.44 for an appointment with a family physician) by the occurrence of the event. All dollar figures that we report were discounted at a rate of 3 %. This discount rate falls within the range of rates commonly used and recommended in public-policy analysis (e.g., Karoly et al., 1998; Karoly et al., 2005; Reynolds et al., 2002). All missing values, including the values of the missing grades (such as Grades 4, 5, 7 and 8 when no data collection took place), were interpolated, given that there were at least 60% data points present. Each grade specific cost figure was then combined and reclassified into three major groups, JK to Grade 3 (ages 4 to 8), Grade 4 to Grade 6 (ages 9 to 11), and Grade 7 to Grade 9 (ages 12 to 14), and presented by delinquency group trajectories and child's gender. We used the following equation to estimate the average cost for each of the 12 measures of utilization of government resources for each grade. The cost values are based on the value (v) of each outcome as outlined in Table 1 (e.g., $29.44 for a visit to a family physician), multiplied by frequency of occurrence (o) of that outcome for each child for that year.

$$\text{VO} = \sum_{i=1}^{n} v_i o_i / n \qquad (1)$$

where, VO = Average cost for an outcome measure in a grade;
      i = number of children (1, ..., n);
      n = sample size;
      v = value of outcomes ($);
      o = occurrences of the outcome.

APPENDIX C. GRADE 3 RISK AND PROTECTIVE FACTOR ANALYSES

	n	Sample[γ]	Omnibus F or χ^2	Trajectory group — MEANS						Group contrasts[Ψ]
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
Individual Child Risk Factors										
Hyperactivity: parent rated (higher scores indicate higher hyperactivity)	736	Full[ς]	F = 11.9***	8.40	6.02	6.30	5.00	3.71	2.03	1>5,6; 2>6; 3>6; 4>6; 5>6
	397	Male	F = 11.6***	10.50	7.67	7.08	5.19	4.01	1.78	1>4,5,6; 2>5,6; 3>6; 4>6
Hyperactivity: teacher rated (higher scores indicate higher hyperactivity)	678	Full[ς]	F = 44.8***	7.29	4.87	10.05	7.55	2.97	2.11	1>5,6; 2>3; 3>5,6; 4>5,6
	364	Male	F = 24.8***	8.60	5.92	10.15	8.46	3.63	3.27	3>5,6; 4>5,6
Depression: parent rated (higher scores indicate higher depression)	752	Full	F = 1.9	1.54	1.17	1.00	1.02	0.94	0.62	
	404	Male	F = 2.5*	1.88	1.60	1.15	0.86	0.93	0.64	
Depression: teacher rated (higher scores indicate higher depression)	680	Full[ς]	F = 27.8***	2.65	1.74	4.36	2.93	1.15	0.65	2>3; 3>5,6; 4>5,6
	366	Male	F = 17.7***	3.50	2.31	4.23	3.42	1.31	0.85	3>5,6; 4>5,6
Oppositional defiant: parent rated (higher scores indicate higher defiance)	751	Full	F = 13.4***	10.29	7.67	7.85	5.39	4.70	3.61	1>4,5,6; 2>5,6; 3>5,6
	403	Male	F = 11.8***	10.63	8.87	8.46	5.34	4.92	3.14	1>4,5,6; 2>4,5,6; 3>5,6

[γ] Full sample presents means or proportions adjusted for the effects of gender of child. Male sample results represent a bivariate relationship of outcome variable with trajectory group for male children only.

[Ψ] Bonferroni tests (α = 0.01) are used for multiple group comparisons.

[ς] Indicates significant differences between male and female children at $p < .001$.

* $p < 0.05$

** $p < 0.01$

*** $p < 0.001$

Trajectory group

	n	Sample[γ]	Omnibus F or χ²	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	Group contrasts[ψ]
Oppositional defiant: teacher rated (higher scores indicate higher defiance)	678	Full[ς]	F = 109.0***	11.25	2.59	17.71	10.13	2.71	1.57	1>2,3,5,6; 2>3,4; 3>4,5,6; 4>5,6
	364	Male	F = 76.3***	13.80	3.15	18.00	11.14	3.02	1.85	1>2,5,6; 2>3,4; 3>4,5,6; 4>5,6
Passive victimization: teacher rated (higher scores indicate higher victimization)	679	Full	F = 8.1***	2.55	1.79	2.39	1.85	1.02	0.69	3>6; 4>5,6
	365	Male	F = 6.3***	3.20	2.00	2.54	1.92	1.05	0.69	4>5
Physical aggression: parent rated (higher scores indicate higher aggression)	719	Full	F = 16.1***	4.01	2.14	3.91	2.06	1.24	0.38	1>5,6; 2>6; 3>4,5,6; 4>5,6
	384	Male	F = 11.7***	4.25	3.14	4.15	2.33	1.40	0.26	1>5,6; 2>6; 3>5,6; 4>6
Physical aggression: teacher rated (higher scores indicate higher aggression)	676	Full[ς]	F = 110.2***	4.16	0.82	10.13	5.36	1.22	0.62	1>2,3,5,6; 2>3,4; 3>4,5,6; 4>5,6
	362	Male	F = 63.8***	5.60	1.08	10.23	5.76	1.53	0.92	1>2,3,5,6; 2>3,4; 3>4,5,6; 4>5,6
PROPORTIONS										
Serious injuries (0 = no, 1 = yes)	752	Full	F = 1.3	0.10	0.21	0.06	0.05	0.09	0.07	
	404	Male	χ² = 11.7*	0.00	0.27	0.03	0.09	0.04	0.08	

	n	Sample[γ]	Omnibus F or χ²	Trajectory group						Group contrasts[Ψ]
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
Family Risk Factors										
Education of respondent (lower values indicate less education)	748	Full	F = 6.5***	11.92	12.96	11.91	12.41	13.40	14.34	3>6; 4>5,6
	402	Male	F = 2.4*	12.00	13.47	12.00	12.97	13.54	14.11	
Mobility (number of moves) (higher values indicate more moves)	747	Full	F = 3.7**	2.30	1.51	0.56	1.01	0.95	0.72	1>6
	401	Male	F = 2.7*	2.38	1.20	0.62	0.88	0.90	0.68	
Hostile-ineffective parenting (higher values indicate more hostility)	598	Full	F = 7.0***	19.97	17.10	17.03	16.16	14.61	13.14	1>5,6; 4>6
	316	Male	F = 5.8***	21.00	18.27	17.00	16.02	14.75	12.43	1>6; 2.6
Low family functioning (FAD) (lower values indicate lower functioning)	749	Full	F = 3.1**	22.74	22.38	23.21	22.80	23.70	24.81	4>6
	402	Male	F = 1.5	23.50	22.00	22.92	23.03	23.60	24.68	
Parent depression (higher values indicate higher depression)	750	Full	F = 2.6*	20.96	19.03	18.29	20.28	19.41	16.89	
	404	Male	F = 1.3	21.00	18.53	17.62	19.54	19.14	16.57	
Family stress (higher values indicate higher stresses)	752	Full	F = 2.8*	2.84	2.22	2.03	1.46	1.56	1.28	
	404	Male	F = 1.8	2.75	1.93	2.00	1.37	1.54	1.07	
Poor relationship with siblings: parent rated (higher values indicate poor relationship)	663	Full	F = 9.6***	3.44	3.23	3.26	2.21	2.29	1.88	1>6; 2>4,5,6; 3>4,5,6
	354	Male	F = 5.93***	3.00	3.21	3.33	2.24	2.32	1.81	2>6; 3>6

Trajectory group

	n	Sample[γ]	Omnibus F or χ^2	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	Group contrasts[ψ]
						PROPORTIONS				
Single parent (0 = no, 1 = yes)	752	Full	F = 8.2***	0.82	0.46	0.54	0.44	0.28	0.13	1>5,6; 4>6
	404	Male	χ^2 = 23.4***	0.75	0.40	0.46	0.39	0.27	0.04	
Low income (below LICO) (0 = no, 1 = yes)	738	Full	F = 3.7**	1.00	0.71	0.77	0.67	0.56	0.49	
	395	Male	χ^2 = 14.5*	1.00	0.73	0.85	0.65	0.54	0.52	
Teenage mother (<20 years) (0 = no, 1 = yes)	752	Full	F = 6.0***	0.46	0.50	0.30	0.37	0.20	0.12	2>5,6; 4>6
	404	Male	χ^2 = 8.4	0.38	0.33	0.31	0.31	0.20	0.11	
Drug use (0 = no, 1 = yes)	750	Full	F = 1.9	0.18	0.00	0.00	0.05	0.04	0.02	
	404	Male	χ^2 = 6.0	0.13	0.00	0.00	0.07	0.03	0.00	
High risk drinking (0 = no, 1 = yes)	752	Full	F = 0.8	0.00	0.13	0.00	0.07	0.07	0.04	
	404	Male	χ^2 = 2.5	0.00	0.00	0.00	0.07	0.06	0.07	

Peer Risk Factors

	n	Sample	Omnibus F or χ^2	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	Group contrasts
						MEANS				
Poor relationships with peers: parent rated (higher values indicate poor relationship)	749	Full	F = 8.7***	2.64	2.12	2.94	1.89	1.81	1.59	1>6; 3>4,5,6
	403	Male	F = 9.5***	2.63	2.53	3.00	1.88	1.81	1.39	1>6; 2>6; 3>4,5,6

	n	Sample$^\gamma$	Omnibus F or χ^2	Trajectory group						Group contrasts$^\Psi$
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	

School Risk Factors

				MEANS						
Poor perceptions of school: parent rated (higher scores mean poor perception)	740	Full	F = 0.7	9.56	9.80	9.14	9.79	9.93	10.26	
	397	Male	F = 0.7	9.75	9.40	8.92	10.15	9.87	9.85	
Low Peabody scores (lower values indicate lower scores)	728	Full	F = 4.3***	92.85	98.12	96.95	96.96	99.80	103.38	4>6
	394	Male	F = 2.4*	95.11	97.15	98.12	97.44	99.95	104.66	
Low scores on WISC – Std. Block Design (lower values indicate lower scores)	710	Full	F = 2.2	10.80	11.91	10.90	10.82	11.64	12.50	
	381	Male	F = 1.2	11.83	12.29	11.77	11.00	11.93	12.92	

				PROPORTIONS						
Low EQAO math score (0 = not low, 1 = low)	527	Full	F = 3.3**	0.84	0.73	0.88	0.82	0.70	0.50	4>6
	271	Male	χ^2 = 12.4*	0.86	0.69	0.86	0.70	0.75	0.41	
Received special ed./services (0 = no, 1 = yes)	602	Full	F = 4.8***	0.17	0.33	0.47	0.42	0.23	0.12	4>5,6
	332	Male	χ^2 = 11.9*	0.20	0.33	0.46	0.40	0.22	0.17	
Grade repetition (0 = no, 1 = yes)	656	Full	F = 0.45	0.25	0.10	0.07	0.18	0.17	0.17	
	354	Male	χ^2 = 1.9	0.17	0.08	0.08	0.19	0.16	0.13	

	n	Sample[γ]	Omnibus F or χ^2	Trajectory group						Group contrasts[ψ]
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
Neighbourhood Risk Factors										
				MEANS						
Low neighbourhood satisfaction (lower values indicate lower satisfaction)	727	Full	F = 2.3*	16.66	19.01	18.39	19.38	20.31	20.66	
	390	Male	F = 1.3	18.25	19.67	18.08	19.42	20.45	21.00	
				PROPORTIONS						
Living in public housing (0 = no, 1 = yes)	746	Full	F = 6.7***	0.60	0.46	0.41	0.22	0.18	0.08	1>6; 2>6
	402	Male	χ^2 = 15.8**	0.57	0.40	0.39	0.22	0.17	0.11	

	n	Sample[γ]	Omnibus F or χ²	Trajectory group						Group contrasts[ψ]
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
Individual Child Protective Factors				MEANS						
Low anxiety: parent rated (lower values indicate lower anxiety)	730	Full	F = 3.8**	4.73	4.09	3.53	3.03	2.64	1.95	
	392	Male	F = 3.3**	4.75	4.80	3.77	2.90	2.62	1.74	
Low anxiety: teacher rated (lower values indicate lower anxiety)	675	Full	F = 15.0****	4.34	3.53	6.76	4.62	2.42	1.30	3>5,6; 4>5,6
	362	Male	F = 11.8****	5.80	4.92	6.54	5.31	2.50	1.56	3>5,6; 4>5,6
Conflict management: parent rated (higher values indicate higher management)	744	Full	F = 13.8****	9.94	12.85	11.91	13.62	15.37	17.09	1>5,6; 2>6; 3>5,6; 4>5,6
	399	Male	F = 10.4****	9.25	11.20	11.62	13.83	14.98	17.57	1>5,6; 2>5,6; 3>6; 4>6
Conflict management: teacher rated (higher values indicate higher management)	679	Full§	F = 46.0****	7.67	9.59	3.65	6.25	9.61	9.71	1>3; 2>3,4; 3>4,5,6; 4>5,6
	366	Male	F = 35.5****	6.33	8.77	3.23	5.54	9.36	9.31	2>3,4; 3>5,6; 4>5,6
Helping/cooperation: parent rated (higher values indicate higher cooperation)	748	Full	F = 6.5***	5.46	7.34	8.59	8.00	8.94	9.39	1>5,6
	403	Male	F = 4.2***	5.00	7.13	8.23	7.97	8.63	9.57	1>5,6
Helping/cooperation: teacher rated (higher values indicate higher cooperation)	679	Full§	F = 32.1****	9.90	11.36	5.48	8.96	13.25	14.80	2>3; 3>5,6; 4>5,6
	366	Male	F = 18.4****	8.67	10.08	4.92	8.20	12.44	13.31	3>5,6; 4>5,6
Outgoing/assertive: parent rated (higher values indicate higher assertiveness)	747	Full	F = 1.3	9.16	10.55	10.56	10.14	10.30	10.93	
	400	Male	F = 1.4	9.50	10.07	10.15	10.34	10.00	11.29	

Trajectory group

	n	Sample[γ]	Omnibus F or χ^2	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	Group contrasts[ψ]
Outgoing/ assertive: teacher rated (higher values indicate higher assertiveness)	679	Full	F = 6.9***	9.87	10.46	6.95	8.60	10.29	10.84	3>5,6; 4>5,6
	366	Male	F = 4.8***	9.00	9.92	6.62	8.22	10.11	10.27	4>5
Self-concept (higher values indicate higher self-concept)	729	Full	F = 2.1	59.65	59.01	57.16	61.65	60.26	62.73	
	392	Male	F = 1.8	60.43	60.73	56.69	62.25	60.18	63.46	
Number of people important to child (higher values indicate higher number of people)	752	Full	F = 1.9	7.54	10.00	5.34	5.47	6.62	6.40	
	404	Male	F = 0.8	5.38	5.40	5.31	5.31	6.66	6.36	

Family Protective Factors

MEANS

	n	Sample	Omnibus F or χ^2	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
Consistent/ effective parenting (higher values indicate more consistent parenting)	596	Full	F = 2.4*	19.27	18.72	19.28	19.47	19.84	20.91	
	317	Male	F = 2.6*	18.67	18.25	19.40	19.79	20.05	21.55	
Social support (higher values indicate more social support)	745	Full	F = 1.1	21.30	20.76	21.45	20.52	20.79	21.37	
	401	Male	F = 0.8	21.25	20.00	21.46	20.41	20.76	21.21	

	n	Sample[γ]	Omnibus F or χ^2	High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	Group contrasts[Ψ]
				MEANS						
School Protective Factors										
Relationship with teachers/involvement in school: parent rated (higher scores indicate more positive relationship/more involvement)	714	Full	F = 1.6	22.09	22.25	19.25	22.73	22.23	23.27	
	383	Male	F = 2.5*	20.17	21.43	18.08	23.29	22.43	22.75	
Achenbach academic functioning (higher values indicate higher functioning)	154	Full	F = 1.14	9.96	9.80	8.50	9.49	10.30	12.40	
	93	Male	F = 0.6	9.33	9.83	8.67	9.71	10.62	9.75	
Achenbach adaptive functioning (higher values indicate higher functioning)	416	Full	F = 18.0***	10.04	10.80	7.22	9.89	12.44	14.86	1>6; 2>6; 3>5,6; 4>5,6; 5>6
	229	Male	F = 11.4***	9.33	10.70	6.67	9.31	12.20	13.31	3>5,6; 4>5,6

Trajectory group

	n	Sample$^\gamma$	Omnibus F or χ^2	Trajectory group						Group contrasts$^\psi$
				High Delinquency (1)	Escalators (2)	Highest Desisters (3)	Moderate Desisters (4)	2nd Lowest Delinquency (5)	Lowest Delinquency (6)	
				MEANS						
Neighbourhood Protective Factors										
Satisfaction with dwelling (higher scores indicate higher satisfaction)	751	Full	F = 1.9	6.17	7.58	7.04	7.42	7.77	8.07	
	403	Male	F = 1.8	6.63	8.20	6.54	7.41	7.79	8.14	
Safety from crime (lower values indicate higher safety)	745	Full	F = 2.5*	3.02	2.93	3.26	3.05	2.70	2.67	
	402	Male	F = 2.1	2.50	2.87	3.31	3.02	2.67	2.50	

APPENDIX D. GRADE 9 OUTCOME ANALYSES

Grade 9 Measures‡	n	Omnibus F or χ^2	Trajectory group				Group contrasts$^\Psi$	Sig. of gender
			Escalators (1)	High delinquency (2)	Desisters (3)	Low delinquency (4)		
CHILD EMOTIONAL AND BEHAVIOURAL PROBLEMS								
Parent-rated:								
1. Emotional disorder scale (+ = more)	593	$F = 16.5$***	4.64	7.39	2.28	2.64	1>3,4; 2>3,4	*
2. Physical aggression scale (+ = more)	584	$F = 19.8$***	3.04	3.41	0.76	0.95	1>3,4; 2>3,4	ns
3. Hyperactivity-inattention scale (+ = more)	598	$F = 9.7$***	5.11	6.47	2.85	2.90	1>3,4; 2>3,4	ns
4. Oppositional defiant scale (+ = more)	611	$F = 16.2$***	8.10	9.25	4.94	4.53	1>3,4; 2>3,4	ns
5. Depression scale (+ = more)	597	$F = 10.3$***	1.23	2.82	0.89	0.96	1>2; 2>3,4	ns
Teacher-rated:								
6. Emotional disorder scale (+ = more)	350	$F = 2.6$	2.74	5.09	2.26	2.03		*
7. Hyperactivity-inattention scale (+ = more)	370	$F = 2.1$	6.28	7.71	4.76	4.38		ns
Youth-rated:								
8. Emotional disorder scale (+ = more)	524	$F = 2.0$	4.39	5.15	3.89	3.52		***
9. Physical aggression scale (+ = more)	526	$F = 27.1$***	3.90	5.39	1.98	1.50	1>3,4; 2>3,4	ns
10. Hyperactivity-inattention scale (+ = more)	523	$F = 6.5$***	5.55	5.89	4.41	3.84	1>4	ns

‡ Each analysis uses gender of child and grade 3 equivalent of grade 9 outcome measure (if available) as control variables.
$^\Psi$ Bonferroni tests ($\alpha = 0.01$) are used for multiple group mean comparisons (for continuous variables); odds ratios reported for dichotomous variables where "low delinquency" is used as reference category.

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

Grade 9 Measures[‡]	n	Omnibus F or χ^2	Trajectory group				Group contrasts[ψ]	Sig. of gender
			Escalators (1)	High delinquency (2)	Desisters (3)	Low delinquency (4)		
DELINQUENCY								
11. Youth rated: delinquent friends scale (+ = more)	517	$F = 54.6^{***}$	12.79	13.92	4.81	4.17	1>3,4; 2>3,4	**
12. Youth reported: part of a gang (0 = no, 1 = yes)	527	$\chi^2 = 61.6^{***}$	43.59***	25.46***	5.38***	1.00	Odds ratios	ns
13. Youth rated: youth trouble scale (+ = more)	635	$F = 46.1^{***}$	12.76	16.46	9.58	8.60	1>2,3,4; 2>3,4	ns
ABUSE								
14. Child reported: physical abuse (0 = no, 1 = yes)	527	$\chi^2 = 25.9^{***}$	7.29***	3.40*	1.14	1.00	Odds ratios	ns
15. Child rated: victimization scale (+ = more)	499	$F = 2.1$	3.20	3.03	2.39	2.17		ns
16. Child reported: being discriminated (0 = no, 1 = yes)	527	$\chi^2 = 5.2$	2.13	0.55	1.67	1.00	Odds ratios	**
CRIME								
17. Ever arrested/taken to police station (0 = no, 1 = yes)	498	$\chi^2 = 64.1^{***}$	19.67***	33.38***	3.65***	1.00	Odds ratios	ns
18. Number of arrests (+ = more)	527	$F = 55.7^{***}$	1.30	2.47	0.37	0.12	1>2,3,4; 2>3,4	ns
19. Number of close friends arrested (+ = more)	525	$F = 26.4^{***}$	1.26	1.38	0.41	0.37	1>3,4; 2>3,4	ns
20. Ever been to court (0 = no, 1 = yes)	527	$\chi^2 = 46.8^{***}$	36.75***	90.76***	7.63**	1.00	Odds ratios	*
21. Spent time in custody/other programs (0 = no, 1 = yes)	527	$\chi^2 = 29.5^{***}$	14.21***	49.24***	2.76	1.00	Odds ratios	ns

Grade 9 Measures[‡]	n	Omnibus F or χ^2	Escalators (1)	High delinquency (2)	Desisters (3)	Low delinquency (4)	Group contrasts[ψ]	Sig. of gender
SCHOOL FUNCTIONING								
22. Parent reported: child repeated a grade (0 = no, 1 = yes)	651	$\chi^2 = 8.1^*$	3.45**	1.72	1.26	1.00	Odds ratios	ns
23. Parent/teacher: child suspended (0 = no, 1 = yes)	662	$\chi^2 = 58.4^{***}$	10.90***	13.25***	3.28***	1.00	Odds ratios	**
24. Child reported: # of times left/dropped out of school (+ = more)	524	$F = 37.3^{***}$	1.46	1.54	0.21	0.16	1>3,4; 2>3,4	ns
25. Child reported: # of times skipped class (+ = more)	517	$F = 33.7^{***}$	3.91	3.67	1.37	1.08	1>3,4; 2>3,4	ns
26. Eqao math (0 = not low, 1 = low)	153	$\chi^2 = 1.4$	1.55	1.97	0.42	0.87	Odds ratios	ns
27. Teacher reported: child's current academic achievement (+ = less)	432	$F = 7.4^{***}$	3.74	3.92	3.65	2.92	3>4	*
28. Teacher reported: special ed./services (+ = more)	448	$\chi^2 = 19.7^{***}$	3.41**	6.04*	2.77**	1.00	Odds ratios	ns
HEALTH AND HEALTH RISK BEHAVIOUR								
29. General health rating: parent rated (+ = less)	609	$F = 2.0$	2.08	1.95	1.84	1.73		ns
30. General health rating: child rated (+ = less)	522	$F = 7.7^{***}$	2.87	3.13	2.33	2.20	1>4; 2>4	**
31. Child reported: alcohol consumption (+ = more)	521	$F = 20.2^{***}$	5.21	4.75	2.91	2.37	1>3,4; 2>4	***
32. Child reported: smoking experience (+ = more)	521	$F = 47.6^{***}$	5.28	5.38	2.48	1.68	1>3,4; 2>3,4; 3>4	***
33. Child reported: ever drunk (0 = no, 1 = yes)	527	$\chi^2 = 38.2^{***}$	10.91***	7.90**	1.71	1.00	Odds ratios	*
34. Child reported: marijuana experience (+ = more)	521	$F = 54.9^{***}$	2.80	3.48	0.45	0.41	1>3,4; 2>3,4	ns
35. Child reported: other hard drugs (0 = no, 1 = yes)	527	$\chi^2 = 68.9^{***}$	26.46***	37.14***	1.28	1.00	Odds ratios	*

Grade 9 Measures[‡]	n	Omnibus F or χ^2	Trajectory group				Group contrasts[Ψ]	Sig. of gender
			Escalators (1)	High delinquency (2)	Desisters (3)	Low delinquency (4)		
36. Child reported: stress index (+ = more)	527	$F = 10.1$***	2.81	3.46	1.74	1.74	1>3,4; 2>3,4	***
37. Child reported: # of times injured (+ = more)	509	$F = 6.0$**	1.40	1.19	0.65	0.59	1>4	ns
38. Child body mass index (+ = more)	264	$F = 9.7$***	23.77	32.72	23.08	22.35	1>2; 2>3,4	ns
39. Had consensual sex (0 = no, 1 = yes)	501	$\chi^2 = 49.2$***	12.56***	20.23***	1.34	1.00	Odds ratios	ns
40. Had unprotected sex (0 = no, 1 = yes)	501	$\chi^2 = 43.4$***	14.54***	19.58***	2.35	1.00	Odds ratios	**
41. Ever pregnant (0 = no, 1 = yes)	527	$\chi^2 = 6.5$	5.12	4.34	0.00	1.00	Odds ratios	ns

Health Care and Social Services

		JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
		Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Visits to a family physician	2nd Lowest delinquency	110	103	107	58	54	56	52	48	50	220	205	212
	Escalators	125	150	134	67	59	64	54	44	50	246	253	249
	High delinquency	108	156	128	51	57	53	51	45	49	209	259	230
	Moderate desisters	116	107	113	56	54	56	55	52	54	227	213	222
	Lowest delinquency	110	107	109	51	47	49	32	39	36	192	193	193
	Highest desisters	93	45	82	61	60	61	64	46	60	218	151	203
	Group total	662	668	673	344	331	338	307	274	299	1,313	1,273	1,310
Hospital emergency room use	2nd Lowest delinquency	261	237	250	107	99	103	97	92	95	465	428	447
	Escalators	370	448	384	164	196	175	139	138	138	673	782	698
	High delinquency	474	78	355	215	8	167	172	3	125	861	89	647
	Moderate desisters	203	123	184	62	65	63	66	74	69	331	261	317
	Lowest delinquency	176	210	194	71	61	65	60	28	41	307	300	301
	Highest desisters	440	78	380	166	128	158	119	62	108	725	268	646
	Group total	1,923	1,174	1,748	785	557	732	653	397	576	3,362	2,128	3,056
Number of serious injuries	2nd Lowest delinquency	2,328	1,659	2,009	2,087	1,405	1,759	4,890	4,363	4,637	9,305	7,427	8,405
	Escalators	2,476	987	1,904	3,595	1,756	2,903	8,932	11,055	9,714	15,004	13,799	14,521
	High delinquency	30	1,499	427	1,628	4,783	2,299	6,188	17,343	8,410	7,846	23,625	11,136
	Moderate desisters	1,130	1,382	1,195	882	890	885	5,092	3,609	4,556	7,104	5,882	6,636
	Lowest delinquency	718	1,125	889	774	1,299	1,073	3,478	1,468	2,326	4,971	3,893	4,288
	Highest desisters	1,542	1,086	1,507	1,906	969	1,740	3,976	6,327	4,271	7,424	8,382	7,518
	Group total	8,223	7,738	7,930	10,873	11,103	10,659	32,558	44,167	33,915	51,654	63,008	52,504

		JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
		Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Number of overnight stays in hospital	2nd Lowest delinquency	348	482	414	92	172	131	144	226	184	584	881	728
	Escalators	160	234	190	245	26	163	1,062	448	834	1,467	709	1,187
	High delinquency	0	5	1	0	51	10	0	1,480	296	0	1,536	307
	Moderate desisters	1,098	255	874	206	134	188	134	66	110	1,437	455	1,172
	Lowest delinquency	893	210	547	378	64	206	475	8	208	1,746	283	962
	Highest desisters	4,586	761	3,928	848	1,046	892	143	305	177	5,577	2,112	4,998
	Group total	7,085	1,947	5,955	1,769	1,494	1,590	1,957	2,534	1,810	10,811	5,975	9,355
Visits with a nurse practitioner	2nd Lowest delinquency	12	15	13	4	5	5	3	6	4	19	25	22
	Escalators	14	11	13	6	9	7	9	7	8	29	27	28
	High delinquency	13	1	8	1	19	4	0	27	8	14	47	20
	Moderate desisters	10	4	8	3	5	3	2	5	3	14	14	15
	Lowest delinquency	9	8	9	4	5	4	3	5	4	16	18	17
	Highest desisters	3	18	7	4	1	3	5	12	6	11	31	16
	Group total	61	56	57	21	43	27	21	63	34	103	162	118
Visited by a children's aid worker	2nd Lowest delinquency	10	10	10	7	7	7	7	8	8	25	26	25
	Escalators	7	93	36	20	39	27	39	76	53	66	208	117
	High delinquency	23	108	61	41	13	37	64	59	64	128	179	163
	Moderate desisters	18	16	18	13	14	13	11	15	12	42	45	43
	Lowest delinquency	13	7	10	1	0	1	0	0	0	14	8	11
	Highest desisters	10	57	22	50	41	48	34	20	31	94	119	102
	Group total	81	291	158	133	115	134	156	179	169	370	585	461

	JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Remedial Education												
Grade repetition (Historical repetition data from JK to Grade 9)												
2nd Lowest delinquency										932	869	900
Escalators										2,024	1,864	1,971
High delinquency										1,660	3,429	2,250
Moderate desisters										1,559	1,385	1,501
Lowest delinquency										578	185	351
Highest desisters										1,259	2,597	1,546
Group total										8,012	10,328	8,519
Use of special education services (from Grade 1 to Grade 9)												
2nd Lowest delinquency	5,813	5,777	5,807	5,606	5,067	5,363	4,496	4,027	4,278	15,915	14,871	15,447
Escalators	8,557	5,297	7,285	8,373	6,294	7,651	7,571	9,184	8,101	24,501	20,775	23,037
High delinquency	9,405	6,642	8,927	8,606	7,994	8,476	8,180	15,830	10,348	26,191	30,466	27,751
Moderate desisters	8,037	8,643	8,223	7,227	9,381	8,032	6,225	7,006	6,522	21,490	25,031	22,776
Lowest delinquency	5,586	3,647	4,595	3,920	2,092	2,898	3,248	1,090	2,104	12,754	6,830	9,596
Highest desisters	10,701	14,482	11,700	13,956	13,673	13,908	12,654	17,341	13,430	37,311	45,496	39,038
Group total	48,099	44,489	46,537	47,688	44,502	46,327	42,375	54,477	44,782	138,162	143,468	137,646
Criminal Justice System												
Number of arrests (Grade 9 only)												
2nd Lowest delinquency										43	63	53
Escalators										335	949	555
High delinquency										755	1,869	1,059
Moderate desisters										189	72	147
Lowest delinquency										72	0	30
Highest desisters										180	0	154
Group total										1,573	2,953	1,997

	JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Court appearances (Grade 9 only)												
2nd Lowest delinquency										12	26	19
Escalators										135	719	345
High delinquency										404	1,078	588
Moderate desisters										67	60	65
Lowest delinquency										0	0	0
Highest desisters										216	0	180
Group total										834	1,883	1,196
Family Social Assistance												
Social welfare (Grade 9 only)												
2nd Lowest delinquency										1,093	1,054	1,074
Escalators										2,320	4,210	3,037
High delinquency										3,093	0	2,142
Moderate desisters										1,326	2,738	1,811
Lowest delinquency										600	0	250
Highest desisters										2,320	0	1,856
Group total										10,752	8,001	10,169
Ontario disability (Grade 9 only)												
2nd Lowest delinquency										709	660	685
Escalators										0	2,753	1,044
High delinquency										0	0	0
Moderate desisters										904	577	792
Lowest delinquency										675	302	458
Highest desisters										0	0	0
Group total										2,288	4,292	2,978

Domain Total and Grand Total

Domain	Group	JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
		Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Health care and social services	2nd Lowest delinquency	3,070	2,505	2,802	2,354	1,743	2,061	5,194	4,743	4,978	10,618	8,990	9,841
	Escalators	3,152	1,923	2,661	4,098	2,085	3,340	10,235	11,769	10,798	17,484	15,778	16,800
	High delinquency	647	1,846	980	1,936	4,931	2,570	6,476	18,957	8,953	9,058	25,734	12,503
	Moderate desisters	2,575	1,887	2,392	1,222	1,161	1,209	5,359	3,822	4,804	9,156	6,870	8,405
	Lowest delinquency	1,919	1,669	1,758	1,280	1,477	1,398	4,048	1,548	2,616	7,246	4,694	5,772
	Highest desisters	6,674	2,044	5,927	3,035	2,246	2,902	4,340	6,774	4,654	14,050	11,064	13,483
	Group total	18,036	11,875	16,521	13,925	13,643	13,480	35,652	47,613	36,802	67,613	73,130	66,803
Remedial education	2nd Lowest delinquency	5,813	5,777	5,807	5,606	5,067	5,363	4,496	4,027	4,278	16,847	15,739	16,348
	Escalators	8,557	5,297	7,285	8,373	6,294	7,651	7,571	9,184	8,101	26,525	22,639	25,008
	High delinquency	9,405	6,642	8,927	8,606	7,994	8,476	8,180	15,830	10,348	27,851	33,895	30,001
	Moderate desisters	8,037	8,643	8,223	7,227	9,381	8,032	6,225	7,006	6,522	23,049	26,416	24,277
	Lowest delinquency	5,586	3,647	4,595	3,920	2,092	2,898	3,248	1,090	2,104	13,332	7,014	9,947
	Highest desisters	10,701	14,482	11,700	13,956	13,673	13,908	12,654	17,341	13,430	38,571	48,094	40,584
	Group total	48,099	44,489	46,537	47,688	44,502	46,327	42,375	54,477	44,782	146,175	153,797	146,165
Criminal justice system	2nd Lowest delinquency										55	89	71
	Escalators										470	1,668	900
	High delinquency										1,159	2,947	1,647
	Moderate desisters										256	132	211
	Lowest delinquency										72	0	30
	Highest desisters										395	0	334
	Group total										2,408	4,835	3,193

	JK – Grade 3 ($)			Grade 4 – Grade 6 ($)			Grade 7 – Grade 9 ($)			All Grades ($)		
	Male	Female	All	Male	Female	All	Male	Female	All	Male	Female	All
Family social assistance												
2nd Lowest delinquency										1,802	1,714	1,758
Escalators										2,320	6,963	4,081
High delinquency										3,093	0	2,142
Moderate desisters										2,230	3,315	2,603
Lowest delinquency										1,275	302	708
Highest desisters										2,320	0	1,856
Group total										13,041	12,293	13,147
All domains (12 measures)												
2nd Lowest delinquency	8,882	8,282	8,609	7,960	6,809	7,424	9,690	8,769	9,255	29,323	26,532	28,018
Escalators	11,709	7,220	9,946	12,471	8,380	10,991	17,806	20,953	18,899	46,800	47,047	46,788
High delinquency	10,053	8,488	9,907	10,542	12,925	11,046	14,655	34,786	19,301	41,162	62,576	46,292
Moderate desisters	10,612	10,530	10,615	8,449	10,543	9,240	11,585	10,828	11,326	34,691	36,733	35,496
Lowest delinquency	7,504	5,316	6,352	5,200	3,569	4,296	7,296	2,639	4,720	21,925	12,010	16,457
Highest desisters	17,375	16,527	17,628	16,991	15,919	16,810	16,995	24,115	18,084	55,336	59,158	56,257
Group total	66,135	56,364	63,058	61,613	58,145	59,807	78,027	102,091	81,585	229,236	244,056	229,308