ADOLESCENT VICTIMIZATION AND INCOME DEFICITS IN ADULTHOOD: RETHINKING THE COSTS OF CRIMINAL VIOLENCE FROM A LIFE-COURSE PERSPECTIVE*

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Estimating the financial costs of criminal violence to victims is important for assessing both the impact of crime on individuals and evaluating the feasibility and utility of various crime prevention, crime control, and criminal justice policies. Traditionally, such estimates focus on short-term costs: costs connected to the victimization event itself and costs incurred during the immediate aftermath. Although the possibility of more long-term costs is acknowledged, research has yet to articulate how and to what extent criminal violence impacts socioeconomic fortunes. In this article, I propose a life-course model for estimating the long-term costs of violent victimization. Using prospective, longitudinal data from a national sample of American adolescents, and retrospective data from a national sample of Canadians, I use this conceptual model to estimate income losses over the life cycle associated with violent victimization. Three significant results are reported. First, income losses from violent victimization are age-graded, with the greatest costs occurring for victimization experienced in adolescence. Second, criminal violence experienced in adolescence appears to influence later earnings by disrupting processes of educational and occupational attainment. Third, the total costs of criminal violence over the life course for adolescents are considerable in comparison to estimates provided in previous research. The policy implications of these findings are discussed.

Estimating the monetary costs of criminal violence to victims serves many purposes. At a basic level, such estimates provide evidence on the burden of crime for individuals and society. Victims often lose property or have it damaged and sustain substantial physical injury (Miller et al., 1996; Moore et al., 1994). Criminal violence is also associated with considerable psychological trauma (American Psychological Association Task Force,

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1984; Kilpatrick et al., 1987). As these consequences of criminal violence are diverse and varied, estimates of monetary costs provide a common, easily interpretable metric for understanding the impact of crime on individuals and society.

Estimates of monetary costs also have important policy implications (Cohen et al., 1994; Miller et al., 1996). They facilitate comparisons with the costs of other social ills, which provides an indication of the relative importance of criminal violence as a social problem and gives guidance for the general allocation of resources. Such estimates also facilitate comparisons of the relative harm for specific types of crime. This helps identify what types of crime are most costly to specify where policies and resources are best directed. Finally, accurate estimates of the costs of criminal violence are important for making cost-benefit assessments of different policy options. Such estimates allow for assessments of the savings that might accrue from particular crime prevention strategies. These savings can then be compared with the costs of implementing particular strategies to assess the overall benefit of different policy options. Ultimately, accurate estimates of the costs of crime are central to understanding crime as a social problem and to the formulation and implementation of crime-related social policy.

This paper extends previous work on the costs of criminal violence to victims by proposing a life-course model that links victimization in adolescence to income losses in later life and then estimating lifetime losses in earnings associated with adolescent victimization. From a life-course perspective, these long-term costs should be age-graded, with the most significant costs occurring for victimization during adolescence. Victimization at this stage of the life cycle has the potential to disrupt processes of educational and occupational attainment that are key determinants of income in later life. Although still having considerable costs in terms of out-of-pocket expenses, lost productivity, and diminished quality of life, victimization at other ages should have minimal impact on socioeconomic fortunes. Using a life-course model as a framework, this research proceeds in two stages. First, I estimate income deficits attributable to adolescent victimization using prospective, longitudinal data from a national sample of American adolescents. Second, I replicate and extend these analyses by estimating the effects of adolescent victimization on later earnings and assessing age differentiation in the long-term costs of criminal violence with retrospective data from a national sample of Canadians.

ESTIMATING THE PERSONAL COSTS OF CRIME

Traditionally, models for estimating the costs of crime are based on the economic notion of "social costs." This term refers to any "resource-using

activity which reduces aggregate well being" (Gray, 1979:21). The range of costs considered include those caused directly by the offender, those incurred by individuals and society in an effort to deter or prevent criminal victimization, those incurred by the offender, and those associated with society's desire to punish unacceptable behavior (Cohen et al., 1994:72–73). Although costs associated with the social, cultural, and organizational responses to criminal offending are important avenues of investigation, the present research focuses specifically on financial losses directly attributable to victimization experiences. These losses can be considered the personal costs of crime.

The personal costs of criminal violence to victims fall into four categories (Cohen et al., 1994; Miller et al., 1996). First, out-of-pocket expenses exist. These expenses include property damage and loss and the cost of medical care. Data from the 1993 National Crime Survey (NCS) indicate that approximately 36% of all violent crimes result in some property loss or damage, with the average violent crime resulting in a loss of approximately $137 (Perkins et al., 1996:Tables 81 and 82). Although insurance often covers partial or full restitution for such costs, victims can still be required to pay insurance deductibles and often face higher premiums when renewing their insurance.

Particularly in the case of violent crimes, victimization often results in physical injury (Kilpatrick et al., 1987; Moore et al., 1994). Some data indicate that almost one-quarter of all victims of violent crime sustain some physical injury, of which almost 7% incurred some form of medical expense and almost 5% received hospital care (Perkins et al., 1996:Tables 75, 77, and 79). Contributing to these expenses, almost one-third of these victims had no health care insurance (Perkins et al., 1996:Table 78). Miller et al. (1996:Table 2) estimate that the medical and ambulatory costs of sexual assault, assault, and robbery are approximately $500, $425, and $370, respectively.

A second type of cost stems from lost wages and productivity. Approximately 12% of all victims of criminal violence experience some loss of time from work (Perkins et al., 1996:87). Of this group, more than 50% lose between 1 and 5 days, and almost 15% lose 11 days or more (Perkins et al., 1996:Table 89). Miller et al. (1996:Table 2) estimate that lost productivity costs victims of sexual assault approximately $2,200 and costs victims of assault and robbery approximately $950.

A third category of costs is associated with psychological trauma. Posttraumatic stress disorder (PTSD) and its symptoms are well recognized as consequences of criminal violence. Kilpatrick et al. (1987) found that one-quarter of all crime victims experienced a related PTSD, including nervous breakdowns, suicide ideation, and suicide attempts. Furthermore, recent research indicates that almost 50% of all victims of sexual assault and

approximately 5% of victims of assault and robbery incur costs for mental health services (Miller et al., 1996:Table 3). Cohen et al. (1994:Table 4) estimate the mental health costs of rape to be $3,886, of robbery to be $887, and of assault to be $361.

The final category of costs to victims of crime is less tangible, stemming from pain, suffering, and reduced quality of life. Unlike the previously mentioned types of costs, no established market value for intangible costs exists and estimation is more complicated. The most common strategy for estimating intangible costs is to base estimates on jury awards to crime and burn victims (Cohen, 1988; Cohen et al., 1994; Miller et al., 1996). Typically, these estimates are based on the portion of the jury verdict designed to compensate the victim for pain, suffering, and diminished quality of life. Miller et al. (1996), for example, estimate that diminished quality of life costs victims of sexual assault approximately $81,000 and victims of assault and robbery approximately $8,000. As a proportion, intangible costs of criminal violence typically contribute the largest component, often between 70% and 90%, to the overall costs of crime.

The range of consequences that inform prior estimates of the costs of criminal violence provides an important framework for estimating the personal costs of crime. Miller et al. (1996:Table 9) estimate that the personal costs of sexual assault total approximately $87,000. In comparison, the costs of assault and robbery total approximately $15,000 and $13,000, respectively. Cohen et al.'s (1994) report for the National Academy of Science provides similar estimates: Sexual assault costs approximately $68,800, and assault and robbery cost approximately $21,100 and $24,400, respectively (see also Cohen, 1988; Phillips and Votey, 1981). Clearly, the personal costs of criminal violence are substantial.

Still, this previous work may significantly underestimate the personal costs of crime. For the most part, previous estimates are based on relatively short-term costs. Particularly in assessing tangible costs, the focus is on costs that are incurred during the victimization event itself or during the short time after the crime. Although incorporating intangible costs may tap some long-term costs, previous estimates have yet to fully consider long-term socioeconomic detriments stemming from violent victimization. Although this possibility is acknowledged (Cohen et al., 1994; Miller et al., 1996), previous work has yet to articulate fully the mechanisms by which criminal victimization has long-term monetary costs and has yet to incorporate such considerations in estimates of the overall costs of criminal violence. Equally important, a lack of appropriate longitudinal data has hampered the identification and estimation of long-term costs (Cohen et al., 1994; Miller et al., 1996). Consequently, long-term costs that may contribute greatly to estimates of the costs of violence to victims have not been incorporated in prior work.

In an effort to address these limitations, this research articulates a theoretical model that links violent victimization to income attainment over the life cycle. Drawing on status attainment perspectives in the social sciences, I propose a life-course model that describes an age-graded process by which violent victimization influences processes of income attainment. Using data from two national samples, one American and one Canadian, I use this model to estimate the long-term costs of criminal violence by examining income differences attributable to violent victimization in a series of regression models.

A LIFE-COURSE APPROACH FOR ESTIMATING THE MONETARY COSTS OF CRIMINAL VIOLENCE

The life course can be defined as pathways through the age-differentiated life span that involve distinct patterns in timing, duration, spacing, and order of events (Elder, 1994). In studying the life course, research explicitly examines the behaviors and experiences that influence the shape and character of individual life courses. Of particular concern is the timing of events and experiences within individual life courses. The significance of particular behaviors and experiences for social development is determined by their occurrence at particular stages of the life course. Their timing in the life cycle gives experiences unique social meaning and thus unique consequences. From a life-course perspective, the key to identifying long-term monetary costs of criminal violence is articulating (1) the psychological consequences of criminal violence for individual victims and (2) the sequence or chain of behaviors or experiences that link violent victimization to later income attainment.

THE MEANING AND CONSEQUENCES OF CRIMINAL VIOLENCE

Most generally, criminal victimization involves a power relationship in which one party dominates another (Hagan, 1989). Victimization inherently involves a lack of agency on the part of victims because victims of crime were unable to prevent themselves from being assaulted, attacked, threatened, or robbed. For individuals, such experiences demonstrate vulnerability to harm that is outside of individual control and can have implications for self-concepts, including perceptions of agency and self-efficacy. These consequences are clearly demonstrated in Fischer's in-depth study of crime victims (1984). She reports (p.166–167)

> Being criminally victimized is a disruption of daily routine. It is a disruption that compels one, despite personal resistance, to face one's fellow as predator and oneself as prey, even though all the while anticipating consequences, planning, acting, and looking to others for

> assistance. . . . As life goes on, the victim finds him/herself pervasively attuned to the possibility of victimization—through a sense of reduced agency, of the other as predatory, and of community as inadequately supportive. . . . Safety, freedom, sanctity, future are all thrown into question. Existence stands out as uncertain and problematic. . . .

At least in the short-term, criminal victimization challenges people's views of themselves as purposive beings, as people able to produce positive outcomes in their lives and limit negative ones. In essence, criminal victimization undermines conceptions of agency and self-efficacy (see also Janoff-Bulman and Frieze, 1983; LeJeune and Alex, 1973).

This conception of criminal victimization may account for the myriad consequences of victimization, such as fear, depression, anxiety, and avoidance, demonstrated in previous work (Kilpatrick et al., 1987; Lurigio, 1987; Skogan and Maxfield, 1981). All of these consequences may reflect the relatively homogeneous phenomenological experience of the disruption of an individual's sense of him/herself as an active agent. Yet, perceptions of agency and self-efficacy can manifest themselves in a wide variety of ways, which suggests possible links to other areas of social life that have not been considered in previous work, including processes of socioeconomic attainment. Thus, the second aspect of a life-course model for estimating long-term costs of criminal violence is articulating the sequence of behaviors and experiences that link violent victimization to later income attainment.

VIOLENT VICTIMIZATION AND INCOME ATTAINMENT IN LATER ADULTHOOD

Both classic (Sewell and Hauser, 1975) and contemporary research (Cancio et al., 1996) examines income attainment as a life-course phenomenon that is influenced by both ascriptive and achieved characteristics. Although early status attainment research emphasized the intergenerational transmission of the socioeconomic status and the key role of education in this process (Blau and Duncan, 1967), later refinements incorporated dimensions of human agency and self-efficacy in processes of income attainment by introducing various social and psychological variables. In particular, the *Wisconsin Model* included variables such as educational aspirations and educational performance as key determinants of later educational, occupational, and income attainment that mediate the effects of background factors (Sewell and Hauser, 1975). This model provides a framework for estimating the long-term costs of criminal violence, specifically costs stemming from diminished income attainment in later life.

With status attainment perspectives as a backdrop, the long-term costs of criminal violence stem from "strand" or "chain" effects in the life course (Rutter, 1989). Rather than produce long-term psychological changes in an individual (although this can happen), particular experiences set in motion a sequence of events or experiences that give shape to the life course. Laub and Sampson (1995) describe this process as sociogenic: Particular experiences or behaviors influence the character and content of later behaviors and experiences, such that an accrual of generally negative or positive experience occurs over the life course.

From this perspective, the most immediate consequence of violent victimization is diminished investments in education. Such investments include educational aspirations, the amount of education that one hopes to attain, and the time and energy devoted to schoolwork. As these investments are explicitly purposive and future-oriented (Clausen, 1991), diminished perceptions of agency and self-efficacy stemming from criminal victimization should limit educational investments. From lower educational investments, school performance should be hampered. As such investments are important determinants of educational performance (Alexander et al., 1994), lower investments stemming from violent victimization should result in lower grades and lower overall attainment. Furthermore, as educational attainment is a key determinant of occupational status (Sewell and Hauser, 1975), victimization should indirectly diminish occupational status. Finally, the diminished human capital stemming from criminal victimization should ultimately produce lower earnings in later adulthood. Overall, this model describes a chain of behaviors and experiences linking criminal victimization early in the life course to income attainment later in the life course and provides a conceptual framework for both anticipating and estimating the long-term costs of criminal violence.

DATA AND MEASURES

I draw on this conceptual model to estimate the long-term costs of criminal violence in two data sets. The first data set is the National Youth Survey (NYS). The NYS is a prospective, longitudinal survey of a random sample of American adolescents that contains several measures of violent victimization and a number of control variables. These data are used to estimate income losses attributable to violent victimization in adolescence. The second set of data is the 1993 Canadian General Social Survey (CGSS-93). This is a cross-sectional survey of a random sample of the Canadian population. These data have retrospective measures of adolescent victimization and are used to replicate the NYS estimates of income losses associated with violent victimization in adolescence and to assess

age differentiation in the costs of criminal violence. Together, these data are complementary in assessing the personal cost of criminal violence.

THE NATIONAL YOUTH SURVEY, 1976–1986

The NYS is a prospective, longitudinal study of delinquent behavior and alcohol and drug use. The present analyses encompass a ten-year period from 1976 to 1986. The NYS comprises a national probability sample of households in the continental United States, based on a multistage, cluster sampling design (Elliott et al., 1989). The original sample consists of 1,725 youths between the ages of 11 and 17, with an overall response rate of 73%. Comparisons with census data show the sample to be representative of the youth population of the United States (Elliott et al., 1989). Respondent attrition over the seven waves is relatively small, with 82% of the original sample retained through 1983. Comparisons of sample composition over the seven waves show that attrition was not seriously affected by age, sex, ethnicity, class, place of residence, and reported delinquency (Elliot et al., 1989). As sample attrition appears sufficiently random in the NYS, the various analyses do not include Heckman's (1979) selection hazard.[1] In order not to bias estimates of income deficits associated with adolescent victimization, the sample for all NYS analyses purposefully excludes respondents still attending school in 1986.[2]

MEASURES OF ADOLESCENT VICTIMIZATION

Violent victimization is measured as experiences of sexual assault, being attacked with a weapon, and being beaten before the age of 18. Each wave of data contains one-year incidence measures for these types of violent victimization. For sexual assault, respondents were asked, "How many times in the last year have you been sexually assaulted?" Respondents were also asked, "How many times in the last year have you been beaten up or threatened with being beaten up by someone other than your mother or father?" Finally, a third question asked, "How many times in the last year have you been attacked with a weapon by someone other than your mother or father?" As the distributions on all victimization measures are extremely skewed, violent victimization is represented in all

1. An assessment of sample selection criteria using both probit and logit models revealed no significant predictors of sample selection. Because Stolzenberg and Relles (1990) argue that including a probit hazard can produce nonsensical results when the model used to estimate the hazard is not particularly powerful, a sample selection hazard is not included in the NYS models.

2. The findings for the total sample, including respondents still in school, are substantively similar to those found for the more restricted sample. These results are available from the author.

models as prevalence during adolescence.[3] The overall prevalence of violent victimization in adolescence in these data is 38%. Considering that this is a multiyear prevalence rate, this rate is substantively similar to those reported in previous analyses of the NYS (Lauritsen et al., 1991; Wells and Rankin, 1995).

POTENTIAL PREDETERMINING VARIABLES

All analyses also include a number of control variables, including several demographic variables, such as gender, age (during the initial interview), race, and family structure in adolescence, and urban residence. Most importantly, the models also include measures of family socioeconomic status in adolescence (indicated by the Hollingshead composite index), exposure to delinquent peers, and the respondent's involvement in delinquency. As these latter variables may influence both victimization risk and income in later life, their inclusion makes the assessment of income losses attributable to adolescent victimization more rigorous.

EDUCATIONAL ATTAINMENT, OCCUPATIONAL STATUS, AND INCOME

From a life-course perspective, the central mechanism by which violent victimization has long-term costs is through processes of educational and

3. The decision to code victimization as a dichotomy was based on theoretical and statistical considerations. First, the overall prevalence of violent victimization in the population is extremely skewed. Even measuring victimization over the entirety of adolescence and using three separate measures of victimization, almost two-thirds of the NYS sample reported no victimization experiences. Furthermore, the proportion of the sample experiencing multiple victimization grows increasingly smaller for each additional experience. At the same time, using a continuous measure of victimization in regression analysis explicitly examines whether the effects of victimization are cumulative (i.e., the differences in earnings for a person victimized twice should be double that of someone victimized once). Although this result is indeed a possibility, it is unlikely that the analyses undertaken in this research and the data used could adequately examine this issue. The robustness of the victimization effects was assessed in two ways. First, victimization was recoded as a four category variable that distinguished (1) respondents having experienced no victimization, (2) respondents having reported one to two victimization incidents, (3) respondents having reported three to four victimization incidents, and (4) respondents having reported five or more victimization incidents. Although limiting skewness, this measure examines the possible cumulative consequences of multiple victimization. In addition, the effects of victimization on later earnings were examined using a set of dummy variables indicative of multiple victimization. This process assessed the possible compounding consequences of multiple victimization. The results from both analyses were substantively similar to those found for the prevalence measure. Still, the question of whether successive victimizations have equal or compounding effects on income attainment (or any other life-course outcome) should be examined in further research.

occupational attainment. Thus, the NYS analyses include measures of educational and occupational attainment as mediating variables. Educational attainment is measured as the total years of education completed by 1986, and the respondent's occupational status is measured using the Duncan socioeconomic index (Blau and Duncan, 1967). Finally, the long-term costs of criminal violence are assessed with respect to income deficits in later adulthood. These deficits are measured by the effects of adolescent victimization on the average hourly wage reported by the respondents for 1986, ranging from $0 to over $99.[4] Descriptions, descriptive statistics, and correlations for the NYS variables are shown in Appendices 1 and 2.

THE CANADIAN GENERAL SOCIAL SURVEY, 1993

The second set of data is the CGSS-93. The target population for the CGSS-93 was all noninstitutionalized persons 15 years of age and older living in the ten Canadian provinces. The survey employed random digit dialing (RDD) and yielded a final sample of 10,385 persons.[5] The overall response rate was 81.6%. As with the NYS analyses, estimates of the personal costs of crime purposefully exclude respondents still in school.[6]

MEASURES OF VIOLENT VICTIMIZATION

Unlike measures in the NYS, long-term costs of violent victimization were estimated in the CGSS-93 data using a series of retrospective questions. First, respondents were asked about the most serious crime that had ever happened to them. Second, respondents were asked the age at which this incident occurred. These items were used to construct a series of dummy variables measuring violent victimization at different stages of the life course. Violent victimization was measured as experiences of sexual assault, robbery, and assault.

Although adequate for replicating the NYS analyses, this type of measure has some limitations. First, retrospective questions are subject to memory recall problems; respondents often forget incidents, including those of the more serious kind (Skogan, 1986). Second, respondents can

4. Because a number of respondents held more than one job, I examined the effects on these variables in two ways. First, models were estimated using prestige and income for the respondent's primary job as the dependent variable. Second, models were estimated using an average of prestige and income for all jobs that the respondent held. As the results are substantively similar, only the former results are presented.

5. Estimates indicate that persons living in households without a telephone represent less than 2% of the Canadian population. Furthermore, nonrespondents are more likely to be males and more likely to be younger (Statistics Canada, 1994).

6. Again, the findings for the total sample, including respondents still in school, are substantively similar to those found for the more restricted sample and are available from the author.

only report one victimization event, the most serious that they ever experienced. Thus, violent victimization experienced early in the life course would not be included if a respondent was victimized in adolescence and victimized by a more serious incident later in life. Ultimately, this measure may undercount violent victimization that occurred early in the life course. Although the proportion of the CGSS-93 sample (see Appendix 3) that reported any experience of violent victimization (approximately 3%) is similar to rates seen in the National Crime Victimizaton Survey (Perkins et al., 1996:Table 3), these victimization rates are somewhat smaller than rates suggested in the NYS and other national samples of adolescents (see Wells and Rankin, 1995).[7]

POTENTIAL PREDETERMINING VARIABLES

In addition to violent victimization, all analyses of the CGSS-93 data include several control variables. These include gender, age, immigration status, and first language spoken in childhood. Because no direct measures of socioeconomic status in the family of origin exist, the latter two measures serve as proxy variables. The analyses also include ecological variables, such as region of residence, to account for differences in economic conditions across Canada, and urban residence, to control for the more diverse and specialized labor markets in urban areas that may increase economic opportunities for individuals.

EDUCATIONAL ATTAINMENT, OCCUPATIONAL STATUS, AND INCOME

As in the NYS analyses, the CGSS-93 analyses include measures of educational attainment and occupational status as variables that should mediate the effects of adolescent victimization on later earnings. Educational attainment is measured as the total number of years of formal education

7. Although a small part of the difference in the prevalence estimates from the NYS and CGSS-93 may reflect actual differences in the prevalence of violence in Canada and the United States, it is more likely that these differences stem from the particular ways in which victimization is measured in each data set. First, estimates of prevalence in the NYS include threats, and those in the CGSS-93 do not. Second, the NYS measures violent victimization using discursive rather than legal definitions (i.e., beaten versus assault), which may increase the likelihood of measuring less serious and injurious forms of victimization [see discussions in Block and Block (1984) and Garofalo et al. (1987)]. Finally, the use of a retrospective item in the CGSS-93 makes recall more difficult (Skogan, 1986) and increases the likelihood of the inclusion of only more serious forms of victimization. Consequently, although both sets of data measure violent victimization that may have long-term socioeconomic consequences, it is likely that the CGSS-93 data are tapping more serious and severe victimization experiences that are considerably less prevalent.

(ranging from 0 to 21), and occupational status is measured by a six-category ordinal measure (Blishen et al., 1987). Finally, estimates of the long-term costs of criminal violence are derived from the regression effects of violent victimization on annual personal income in thousands of dollars. As the sample for the CGSS-93 analyses includes only full- or part-time workers not attending school, these analyses include a probit hazard (Heckman, 1979) to control for sample selection bias.[8] Descriptions, univariate statistics, and correlations for all relevant CGSS-93 variables can be found in Appendices 3 and 4.

RESEARCH RESULTS

Estimation of the long-term costs of criminal violence proceeds in two stages. The first set of analyses examines income losses attributable to violent victimization in adolescence using data from the NYS and examines the degree to which educational and occupational attainment mediates the effects of adolescent victimization on later earnings. The second set of analyses attempts to replicate and extend those of the NYS. Using the CGSS-93 data, these analyses again estimate the effects of violent victimization in adolescence on income attainment, assess whether education and occupational attainment mediate the economic costs of adolescent victimization, and explicitly examine whether the costs of victimization are age-graded. Because these latter data were collected in a different country, using a different research design, and have somewhat different measures of violent victimization, a replication of the NYS findings strengthens confidence in the validity and generalizability of the findings.

ESTIMATING THE COSTS OF VIOLENT VICTIMIZATION IN ADOLESCENCE

Analyses of the effects of violent victimization in adolescence on earnings in the NYS are shown in Table 1. These models examine the effects of overall violent victimization, as well as the effects of specific types of violence, including sexual assault, weapon attacks, and assaults. Each set of analyses includes two models. The first includes the effects of adolescent victimization, controlling for the various predetermining variables. The second set of models includes both educational attainment and occupational status to assess the degree to which diminished educational and

8. Selection of variables to estimate the selection hazard was based on previous theory and research on labor force participation. Specifically, the variables include gender, marital status, self-reported health, self-reported disability, having children, and the interaction between marital status and having children. All variables, with the exception of the interaction of marital status and having children, were statistically significant. The model chi-square is 228.760.

Table 1. Unstandardized Coefficients: Violent Victimization in Adolescence and Other Determinants of Average Hourly Wage, National Youth Survey, 1976–1987

	Average Hourly Wage (in dollars)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Predetermining Variables								
Female	−1.42**	−1.73**	−1.27**	−1.65**	−1.28**	−1.66**	−1.30**	−1.67**
	(.24)	(.23)	(.24)	(.23)	(.24)	(.23)	(.24)	(.23)
Age	.44**	.25**	.47**	.26**	.47**	.26**	.48**	.26**
	(.06)	(.06)	(.06)	(.06)	(.06)	(.06)	(.06)	(.06)
Family socioeconomic status	.04**	.00	.04**	.01	.04**	.01	.04**	.01
	(.01)	(.00)	(.01)	(.01)	(.01)	(.01)	(.01)	(.01)
Black	−1.42**	−1.22**	−1.28**	−1.14*	−1.30**	−1.15**	−1.30**	−1.16**
	(.38)	(.36)	(.38)	(.35)	(.38)	(.36)	(.38)	(.35)
Intact family	.41	.04	.49*	.07	.49*	.07	.48*	.07
	(.27)	(.25)	(.27)	(.25)	(.26)	(.25)	(.27)	(.25)
Urban resident	.81**	.62**	.74**	.58*	.78**	.60**	.81**	.62
	(.33)	(.31)	(.33)	(.31)	(.33)	(.31)	(.33)	(.31)
Suburban resident	1.07**	.86**	1.03**	.83**	1.02**	.84**	1.04**	.85**
	(.26)	(.25)	(.27)	(.25)	(.27)	(.25)	(.27)	(.25)
Delinquent peers	−.02	−.01	−.02	−.01	−.02	−.01	−.01	−.01
	(.02)	(.03)	(.02)	(.03)	(.02)	(.03)	(.03)	(.03)
Total delinquency	−.02	−.00	−.03	−.01	−.02	−.01	−.02	−.00
	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)	(.02)

Table 1. Unstandardized Coefficients: Violent Victimization in Adolescence and Other Determinants of Average Hourly Wage, National Youth Survey, 1976–1987

	Average Hourly Wage (in dollars)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Adolescent Victimization								
Total victimization	−1.03**	−.52**	—	—	—	—	—	—
	(.27)	(.26)						
Sexual assault	—	—	−.45	−.13	—	—	—	—
			(.33)	(.31)				
Weapon attack	—	—	—	—	−.69**	−.22	—	—
					(.33)	(.31)		
Assaulted	—	—	—	—	—	—	−1.13**	−.56*
							(.36)	(.34)
Mediating Variables								
Educational Attainment	—	.38**	—	.39**	—	.39**	—	.38**
		(.07)		(.07)		(.07)		(.07)
Occupational Status	—	.05**	—	.05**	—	.05**	—	.05**
		(.01)		(.01)		(.01)		(.01)
Intercept	4.89	.13	5.50	−.29	4.52	−.27	4.53	−.13
	(1.22)	(1.39)	(1.23)	(1.39)	(1.23)	(1.38)	(1.22)	(1.38)
R^2	.19	.30	.18	.29	.18	.29	.19	.30

Note: Standard errors in parentheses.
* $p < 0.05$, (one-tailed). ** $p < 0.01$, (one-tailed).

occupational attainment accounts for the effects of adolescent victimization on earnings. Two important findings are reported.

First, adolescent victimization has relatively consistent negative effects on earnings. Average hourly wages in early adulthood are more than $1 lower for respondents victimized by any form of violence in adolescence ($b = -1.03$, $p < 0.01$). Similarly, victims of weapon attacks ($b = -.69$, $p < 0.01$) and victims of assault ($b = -1.13$, $p < 0.05$) during adolescence also have significantly lower earnings. Although the effect of sexual victimization was not statistically significant ($b = -.45$, $p = .21$), the direction of the effect was similar to those of the other types of victimization.[9] Importantly, all effects are independent of the demographic and behavioral control variables, which, for the most part, have expected effects on earnings.

The second important finding concerns the assessment of the life-course model that guides this research. A key feature of a life-course perspective is the argument that long-term costs of violent victimization associated with income deficits should stem from disrupted processes of educational and occupational attainment rather than days lost from work or permanent or long-term disability. This argument is assessed in Models 2, 4, 6, and 8 of Table 1 by including measures of educational attainment and occupational status. Both variables have significant effects on earnings. Each additional year of education increases average hourly wage by approximately 40 cents ($b = .38$ or $.39$, $p < 0.01$), and each additional occupational status point increases hourly earnings by 5 cents ($b = .05$, $p < 0.01$). Importantly, the effects of all forms of adolescent victimization are significantly reduced when educational attainment and occupational status are included. Diminished educational and occupational fortunes account for between 50% and 71% of the effects of violent victimization in adolescence on earnings in early adulthood. Supporting a life-course perspective on the personal costs of violent victimization, these results suggest that the substantial earnings losses that stem from violent victimization in adolescence result from diminished educational and occupational attainment.

ESTIMATING THE COSTS OF VIOLENT VICTIMIZATION IN ADOLESCENCE: A REPLICATION AND EXTENSION

Analyses shown in Table 2 estimate income losses associated with violent victimization in adolescence using the CGSS-93 data. As in the NYS analyses, violent victimization has significant negative effects on income attainment in later life. In general, violent victimization in adolescence

9. Examining the effects of sexual victimization only among women did not significantly change the results.

Table 2. Unstandardized OLS Coefficients: Violent Victimization in Adolescence and Other Determinants of Personal Income, Canadian General Social Survey, 19937

	Annual Personal Income (in thousands of dollars)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Predetermining Variables								
Female	−13.56**	−12.59**	−13.52**	−12.55**	−13.70**	−12.65**	−13.72**	−12.65**
	(.53)	(.38)	(.53)	(.39)	(.52)	(.38)	(.53)	(.38)
Age group	.05	.76**	.03	.77**	.04	.78**	.03	.78**
	(.08)	(.07)	(.07)	(.06)	(.08)	(.06)	(.07)	(.06)
Immigrant	1.16*	−1.16**	1.17**	−1.16**	1.17*	−1.16**	1.18**	−1.16**
	(.68)	(.57)	(.68)	(.57)	(.68)	(.57)	(.68)	(.57)
First language	−4.47**	−2.53**	−4.45**	−2.52**	−4.38**	−2.48**	−4.42**	−2.50**
	(.75)	(.62)	(.75)	(.62)	(.75)	(.62)	(.75)	(.62)
Urban resident	3.09**	.99**	3.08**	.98**	3.09**	.98**	3.10**	.99**
	(.46)	(.38)	(.46)	(.38)	(.46)	(.38)	(.46)	(.38)
Region								
Atlantic	−5.95**	−4.95**	−5.91**	−4.92**	−5.94**	−4.94**	−5.96**	−4.95**
	(.73)	(.61)	(.74)	(.61)	(.73)	(.61)	(.73)	(.61)
Quebec	−5.01**	−3.25**	−5.08**	−3.24**	−5.13**	−3.26**	−5.15**	−3.28**
	(.74)	(.61)	(.74)	(.61)	(.74)	(.61)	(.74)	(.61)
Ontario	.12	.36	.13	.36	.09	.35	.10	.35
	(.71)	(.59)	(.72)	(.59)	(.71)	(.59)	(.71)	(.59)
Prairies	−2.30**	−1.27**	−2.30**	−1.26**	−2.35**	−1.29**	−2.35**	−1.29**
	(.69)	(.57)	(.70)	(.57)	(.69)	(.57)	(.69)	(.57)

Table 2. Unstandardized OLS Coefficients: Violent Victimization in Adolescence and Other Determinants of Personal Income, Canadian General Social Survey, 1993

	Annual Personal Income (in thousands of dollars)							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Adolescent Victimization								
Total victimization	–5.93**	–2.65**	—	—	—	—	—	—
	(1.27)	(1.04)						
Sexual assault	—	—	–6.04**	–3.15**	—	—	—	—
			(1.69)	(1.38)				
Robbery	—	—	—	—	–6.56	–3.44	—	—
					(4.96)	(4.11)		
Assault	—	—	—	—	—	—	–5.32**	–1.65
							(2.04)	(1.66)
Mediating Variables								
Total education	—	1.53**	—	1.53**	—	1.53**	—	1.53**
		(.07)		(.07)		(.07)		(.07)
Occupational status	—	4.23**	—	4.24**	—	4.24**	—	4.42**
		(.11)		(.11)		(.11)		(.11)
Selection Lambda	–22.22**	–5.97**	–22.49**	–6.10**	–22.05**	–5.85*	–22.04**	–5.88**
	(4.23)	(3.20)	(4.26)	(3.20)	(4.22)	(3.20)	(4.22)	(3.20)
Intercept	39.61	3.91	39.41	3.81	39.27	3.68	39.40	3.73
	(1.07)	(1.22)	(1.07)	(1.22)	(1.06)	(1.22)	(1.06)	(1.22)
Model R^2	.18	.43	.18	.43	.17	.43	.17	.43

Note: Standard errors are in parentheses.
* $p < 0.05$, (one-tailed). ** $p < 0.01$, (one-tailed).

diminishes annual income by almost \$6,000 ($b = -5.93$, $p < 0.01$). Furthermore, victims of sexual assault have personal incomes approximately \$6,000 less ($b = -6.04$, $p < 0.01$), and victims of robbery have incomes approximately \$6,500 less than nonvictims ($b = -6.56$, *not significant*).[10] Similarly, assault victimization reduces annual incomes by more than \$5,300 ($b = 5.32$, $p < 0.01$). These effects are again independent of several control variables that are also determinants of income attainment. These variables include gender, age, first language spoken, urban residence, immigration status, and region of residence. The selection hazard also had significant effects.

I again assess whether educational and occupational attainment mediates the effects of adolescent victimization on earnings (see Models 2, 4, 6, and 8 in Table 2). Consistent with previous research and findings from the NYS analyses, educational attainment and occupational status are strong predictors of personal income. Each additional year of education increases income by approximately \$1,500 ($b = 1.53$, $p < 0.01$), and each increase in occupational status increases personal income by approximately \$4,200 (statistically significant b-coefficients range from 4.23 to 4.42, depending on the model). More importantly, all effects of adolescent victimization are substantially reduced when these variables are included in the model. Diminished educational attainment and occupational status accounts for between 48 and 69% of the effect of violent victimization in adolescence on personal income. As in the NYS analyses, data from the CGSS-93 show significant income deficits associated with adolescent victimization.

As a final issue, the CGSS-93 data are used to assess whether age contextualizes the effects of criminal violence on annual personal income. Although a life-course model would anticipate significant income deficits from adolescent victimization, it would also suggest that victimization at other stages of the life course should have minimal, if any, effect on earnings. In contrast, if the most significant effects of victimization on income stem from days lost from work, decreased productivity, or injury (cf., Cohen et al., 1994; Miller et al., 1996), the effects of victimization should not be age-graded.

This issue is examined by including five dummy variables indicating violent victimization that occurred (1) in adolescence, (2) at ages 18 and 19, (3) between the ages of 20 and 24, (4) between the ages of 25 and 29, and (5) at age 30 and older. The reference category is all persons not reporting any violent victimization. This model also includes all predetermining

10. Again, examining the effects of sexual victimization only among women did not significantly change the results.

variables, although only the coefficients for the victimization measures are shown to conserve space.

The results shown in Table 3 clearly indicate that the age at which one is victimized determines the effects of violent victimization on earnings. For respondents victimized in adolescence, victimization reduces annual income by almost $6,000 ($b = -5,870$, $p < 0.01$). Respondents victimized between the ages of 18 and 19 also experience significantly lower income ($b = -3,700$, $p < 0.01$), although to a lesser extent than those victimized in adolescence. Violent victimization is most costly when it occurs in adolescence, the formative stage of the socioeconomic life course. At the same time, victimization experienced in later adulthood has no significant effects on earnings. These results support a life-course model by showing the key role of age in contextualizing the effects of violent victimization on earnings.

Table 3. Unstandardized OLS Coefficients: Effects of Adolescent and Adulthood Violent Victimization on Annual Personal Income, Canadian General Social Survey, 1993

	Annual Personal Income (In thousands of dollars)
Age of Victimization	
Adolescent victimization	-5.87**
	(1.23)
Victimization, Ages 18–19	-3.70*
	(1.72)
Victimization, Ages 20–24	1.24
	(1.37)
Victimization, Ages 25–29	1.07
	(1.48)
Victimization, Ages 30 and older	1.49
	(.99)
Intercept	39.55
	(1.07)
R^2	.18
Number of cases	7,792

Note: Standard errors are in parentheses. All models control for age, sex, immigration, first language spoken, urban residence, and region.
* $p < 0.05$, (one-tailed). ** $p < 0.01$ (one-tailed).

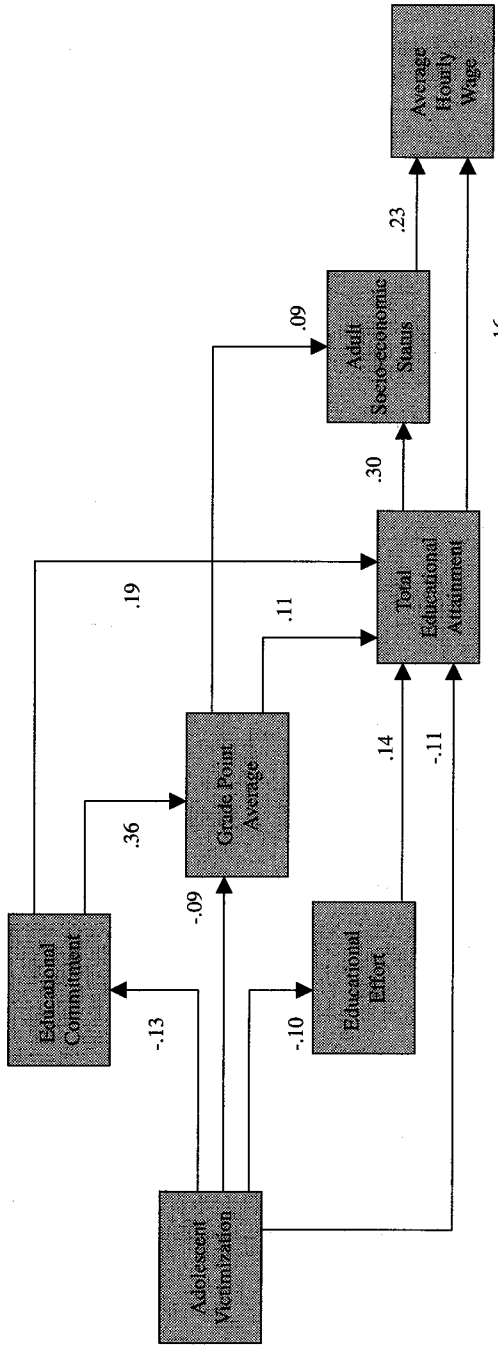
DISCUSSION AND CONCLUSION

Estimating the monetary costs of criminal violence is central to understanding both the impact of crime on individuals and society and making rational assessments regarding crime prevention, crime control, and criminal justice policies. Although early studies of the costs of crime to victims focused predominantly on out-of-pocket expenses, more recent work has attempted to incorporate less tangible costs, such as pain, suffering, and fear of injury (Cohen, 1988; Cohen et al., 1994; Miller et al., 1996). This paper complements earlier work by estimating long-term costs of criminal violence associated with diminished socioeconomic attainment.

Although the potential for such long-term costs has been acknowledged in previous work, some speculation exists that, because the average number of school days lost is relatively small, these costs should contribute relatively little to the overall costs of criminal violence (Miller et al., 1996). Taking a different approach, the life-course model developed in this research argues that long-term costs of criminal victimization stem from the psychological consequences of victimization that disrupt processes of educational and occupational attainment, ultimately resulting in diminished income in later life. Situating criminal violence within socioeconomic trajectories demonstrates the complex relationship between violent victimization and income attainment and further illuminates the social processes that influence the costs of criminal violence.

To further understand the life-course sequence that links adolescent victimization to diminished earnings in later life, Figure 1 shows a causal model estimating the psychological and socioeconomic consequences of adolescent victimization using the NYS data. The most immediate consequences of adolescent victimization are diminished investments in education; adolescent victimization decreases both commitment to education ($\beta = -.13$) and effort put into schoolwork ($\beta = -.10$). Victimization has further direct ($\beta = -.09$) and indirect effects on educational performance (i.e., grade point average). Diminished educational investments and performance ultimately undermine overall educational attainment. Furthermore, through diminished educational attainment, adolescent victims have lower occupational status in early adulthood. Finally, through both diminished educational attainment and occupational status, adolescent victims have lower personal incomes in early adulthood. Importantly, the long-term costs of adolescent victimization are entirely indirect, resulting from disrupted trajectories of educational and occupational attainment. In all, this model shows the life-course connections, both psychological and behavioral, that link adolescent victimization to diminished income in later adulthood.

Figure 1: Causal Model of the Effects of Violent Victimization in Adolescence on Income Attainment in Early Adulthood, NYS, 1976–1986.



Note: Coefficients shown are standardized regression coefficients. All models also contained controls for sex, age, family socioeconomic status, race, family structure, urban/suburban residence, delinquent peers, and total delinquency.

The implications of this research can be understood by reexamining the issues that opened this paper: the impact of crime on victims and the significance of crime as a social problem. First, the estimates of the costs of criminal violence for individuals victimized in adolescence are considerable in comparison to estimates from previous research. Recall that previous work suggests that the average sexual assault costs between $68,000 and $87,000, and estimates of the personal costs of assault or robbery range between $13,000 and $24,400 (Miller et al., 1996:Table 9). Beginning with the effects shown in Table 1, one could estimate the lifetime earning losses attributable to violent victimization in adolescence. By assuming an 8-hour work day, a 5-day work week, a 50-week work year, and an average or expected time in the labor force of 40 years, the expected lifetime income loss for any violent victimization in adolescence is $82,400 (1.03 x 8 x 5 x 50 x 40). Using the same formula, the average lifetime loss for sexual victimization in adolescence is $36,000, $55,200 dollars for assaults with weapons, and $90,400 for having been beaten.[11]

Similar, albeit larger, estimates emerge from the CGSS-93 analyses. For example, using the general victimization effect from Table 3, one could estimate that the total loss in income from violent victimization in adolescence is a startling $237,200 ($5,930 x 40). Using this same approach, the expected lifetime income loss from sexual assault is $241,600, from robbery is $262,400, and from assault is $212,800. The larger estimates of long-term costs of violent victimization in the CGSS-93 may reflect a combination of factors. These factors include differences in the wages in Canada and the United States, differences in the measurement of victimization (i.e., that the CGSS-93 may have measured more serious types of victimization), and differences in model specification (i.e., not controlling for family socioeconomic status and involvement in delinquency in the CGSS-93). Regardless, these admittedly basic estimates still demonstrate that the personal costs of crime are substantively similar in the CGSS-93 and the NYS data and are potentially much greater than suggested in earlier work.

It is important to recognize that these estimates tap a source of costs

11. Estimates of the "real dollar" losses in earnings over the life cycle would need to take into account both wage growth and changes in inflation over time. Although the exact impact of these factors on future earnings is somewhat speculative, government policy analysts and economists typically employ a 2% discount rate. Applying this rate to the estimated lifetime losses in earnings stemming from violent victimization in adolescence would suggest that the overall loss in "real dollars" for violent victimization in general would be $36,726. Discounted estimates for sexual assault, assaults with weapons, and having been beaten are $16,045, $24,603, and $40,921, respectively. Even discounted, these estimates of the personal costs of criminal violence are considerable in comparison to those provided in previous work.

that is largely independent of costs considered in prior research. Consequently, they should be considered *in addition* to costs demonstrated by earlier research. Income losses attributable to adolescent victimization do not negate the considerable costs associated with injury, out-of-pocket expenses, lost wages, and diminished quality of life. Still, conceptual models for assessing the overall costs of crime should consider the life-course implications of victimization and examine the long-term socioeconomic disadvantage that may result.

Importantly, these costs are not born equally by all members of society. Young, inner-city, minority males, particularly those living in poor-quality neighborhoods and involved in crime and delinquency, have dramatically increased the risk of violent victimization (Block, 1986; Lauritsen et al., 1991).[12] As a result, the long-term costs of crime demonstrated in this research are most likely to affect individuals already lacking social and economic resources. Criminal violence may thus contribute to the social and economic marginalization of some groups in society. Indeed, exposure to criminal violence may play a role in the reproduction of social and economic failure among the disadvantaged (Farkas and Vicknair, 1996).

Although the long-term costs shown in this research occur only for victimization in adolescence, it is important to recognize that adolescents have a relatively high risk of victimization. Risk of violent victimization typically increases into late adolescence and then declines monotonically with increasing age (Hindelang et al., 1978; Perkins et al., 1996). In general, adolescents have victimization rates typically three to five times greater than older adults do (Wells and Rankin, 1995). Consequently, compounding effects of large long-term costs exist among the subpopulation at high risk of victimization, such that estimates of the aggregate costs of criminal violence should also be considerably greater than those shown in prior research.

The relevance of this result for contemporary policy is relatively straightforward. Most generally, these findings suggest that crime, as a social problem, is considerably more costly than previously conceived. Even without accounting for the various intangible costs associated with diminished quality of life that comprise the largest proportion of prior estimates of personal costs of crime, criminal violence has the potential to cost individual victims tens, if not hundreds, of thousands of dollars in lost earnings. With such substantial and enduring costs of crime, criminal violence may be society's most costly social problem.

12. Further analyses of the NYS data show a strong and robust effect of family socioeconomic status on victimization risk (Macmillan, 1998), which provides further support for the argument that criminal victimization may play a role in the reproduction of income inequality.

These findings also have implications for victim-related policies and programs. With increased attention directed at problems of crime in contemporary society, considerable expansion of services has occurred for victims of crime. Yet, most victim's services either focus on alleviating the physical and psychological impact of crime (i.e., crisis intervention) or on issues of reimbursement (i.e., compensation, restitution, and legal services) (Elias, 1986). Although such services are directed broadly, they largely target adult victims and focus on relatively short-term costs of crime. The findings reported in this research suggest the need for an important redirection in victim services. This research suggests that a promising intervention to limit the long-term costs of criminal violence would focus on maintaining educational investments and maintaining or improving school performance among victims of violent crime. Recall that the most immediate consequences of violent victimization are diminished commitment to education, diminished effort in schoolwork, and poorer overall school performance and that the long-term costs of crime stem largely from disrupted processes of educational and occupational attainment. From this perspective, victim services could be expanded to focus on buffering the educational detriments of violent victimization, such that long-term trajectories of educational and occupational attainment are not undermined.

Importantly, several models already exist that could accommodate such an objective. In particular, instructional programs for children and adolescents at risk of educational failure and delinquent activity provide some guidance as to the form that victim assistance programs could take. Johnson (1998) usefully summarizes 20 techniques for enhancing educational performance among at-risk learners, including such strategies as maintaining high expectations, encouraging cooperative learning, teaching self-monitoring and self-management, and facilitating parental involvement with schooling. Recently, increased use of peer tutoring has also occurred as a means of increasing academic achievement among at-risk children (Arreaga-Mayer, 1998). Such programs may be particularly beneficial in enhancing educational self-efficacy by demonstrating the larger community as responsive and helpful rather than predatory and threatening (cf., Fischer, 1984). Overall, educational enhancement strategies have the potential to go a long way in limiting the long-term costs of crime.

Finally, although the various victim services that are currently available are indeed important for buffering the impact of crime on victims, the present research indicates a need to recognize the substantial long-term costs of victimization and, therefore, to protect young people against exposure to violence. Preventing violence among adolescents and in schools may be vital in securing the long-term economic futures of today's youth (cf., Farkas and Vicknair, 1996). The costs of criminal violence should not be underestimated.

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Appendix 1. Descriptions, Means, and Standard Deviations of Variables, National Youth Survey 1976–1987

Variable	Description	Mean	S.D.
Victimization (1976–1981)	Beaten up, attacked with a weapon, or sexually assaulted before the age of 18 (Victimized = 1)	.38	.48
Sexual assault	Sexually assaulted before the age of 18 (Victimized = 1)	.16	.37
Attacked with a weapon	Attacked with a weapon before the age of 18 (Victimized = 1)	.16	.37
Beaten	Beaten before the age of 18 (Victimized = 1)	.13	.33
Predetermining Variables			
Female (1976)	Respondent's sex (Female = 1)	.47	.50
Age (1976)	Respondent's age	13.87	1.95
Family socioeconomic status (1976)	Hollingshead scale	43.92	16.55
Black (1976)	Respondent's ethnicity (Black = 1)	.15	.36
Intact family	Family structure (Both parents in household = 1)	.68	.47
Urban residence (1976)	Respondent lives in central city of SMSA or urban area with a population of 100,000 or more	.26	.44
Suburban residence (1976)	Respondent lives in part of SMSA not classified as urban or any other suburban community	.45	.50

Appendix 1. Descriptions, Means, and Standard Deviations of Variables, National Youth Survey 1976–1987

Variable	Description	Mean	S.D.
Delinquency (1976)	This variable is computed as means of rates of self-reported involvement in delinquency. Offenses include: damaged family property, damaged school property, damaged other property, stolen motor vehicle, stolen something worth more than $50, bought stolen goods, carried a hidden weapon, stolen something worth less than $5, attacked someone, been paid for sexual relations, been in gang fights, sold marijuana, hit teacher, hit parent, hit other student, sold hard drugs, begged, ran away, sexually assaulted someone, used force on students, used force on a teacher, used force on other person, stolen things worth between $5 and $50, had sexual intercourse, broken into a building to steal or look around, gone joyriding, engaged in disorderly conduct, or used marijuana or hashish. Each individual item is coded from 1 = never to 9 = 2 to 3 times a day	31.18	6.18
Delinquent peers (1976)	"How many of your friends have: (1) cheated on school tests, (2) destroyed property, (3) used marijuana, (4) stolen something worth less than $5, (5) hit someone, (6) used alcohol, (7) broken into a vehicle, (8) sold hard drugs, (9) stolen something worth more than $50, or (10) suggested you break the law?" (From 1 = none of them to 5 = all of them)	17.12	5.47
Educational Investments and Performance			
Educational commitment (1977–1981)	"How important has school work been?" (From 1 = not important at all to 5 = very important) "How important is it to go to college?" (From 1 = not important at all to 5 = very important) "How important is it to have a high grade point average?" (From 1 = not important at all to 5 = very important)	11.99	2.74

Appendix 1. Descriptions, Means, and Standard Deviations of Variables, National Youth Survey 1976–1987

Variable	Description	Mean	S.D.
Educational effort (1977–1981)	"How many evenings during the school week are spent studying?" (From 0 to 5) "How many afternoons during the school week are spent studying?" (From 0 to 5) "How much time is spent studying on weekends?" (From 1 = very little to 5 = a great deal)	7.29	3.59
Grade point average (1977–1981)	Respondent's self-reported average grades during grade 12 (From 1 = mostly F's to 5 = mostly A's)	3.72	.81
Educational and Socioeconomic Attainment Measures			
Education attainment (1987)	Respondent's highest grade attained (From 6 to 18)	13.78	2.83
Occupational status (1987)	Duncan's scale	36.25	20.03
Hourly wage (1987)	Average hourly wage (From $0 to $99)	7.04	4.11

Appendix 2. Correlation Matrix, National Youth Survey, 1976–1986

Total adolescent victimization	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sexual assault	.68	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Attacked with weapon	.68	.33	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Assaulted	.58	.21	.39	1.00	.	.	.	.	.	.	.	.	.	.	.	.
Sex	−.24	−.21	−.18	−.13	1.00	.	.	.	.	.	.	.	.	.	.	.
Age	−.11	−.09	−.12	−.06	−.05	1.00	.	.	.	.	.	.	.	.	.	.
Family socioeconomic status	−.10	−.06	−.08	−.07	.04	.13	1.00	.	.	.	.	.	.	.	.	.
Race (Black)	−.03	.00	.00	.01	−.05	−.07	−.28	1.00	.	.	.	.	.	.	.	.
Intact family	−.11	−.11	−.11	−.06	−.03	.08	.19	−.28	1.00	.	.	.	.	.	.	.
Urban resident	.03	.04	.08	.05	−.01	−.02	−.03	.29	−.16	1.00	.	.	.	.	.	.
Suburban resident	.01	−.04	−.02	−.02	.04	.04	.09	−.17	.07	−.50	1.00	.	.	.	.	.
Delinquent peers	.11	.08	.10	.08	−.16	.29	−.01	−.00	−.07	.12	−.01	1.00	.	.	.	.
Total delinquency	.26	.22	.24	.16	−.23	.10	−.06	.00	−.11	.14	−.05	.53	1.00	.	.	.
Total educational attainment	−.25	−.18	−.20	−.19	.03	.29	.39	−.10	.21	−.06	.06	−.03	−.14	1.00	.	.
Occupational status	−.22	−.14	−.19	−.17	.20	.27	.33	−.18	.16	−.03	.12	−.01	−.08	.51	1.00	.
Average hourly wage	−.12	−.07	−.09	−.10	−.16	.29	.25	−.16	.13	−.04	.13	.06	.03	.40	.41	1.00

Appendix 3. Definitions, Means, and Standard Deviations of Variables, 1993 Canadian General Social Survey

Variable	Description	Mean	S.D.
Victimization Measures			
Adolescent victimization	Violent Victimization prior to age 18 (Any violent victimization = 1)	.03	.18
Sexual assault	Sexual assault victimization prior to age 18 (Sexual assault = 1)	.02	.13
Robbery	Robbery Victimization prior to age 18 (Robbery = 1)	.00	.05
Assault	Assault victimization prior to age 18 (Assault = 1)	.01	.12
Victimization, 18–19	Violent victimization at ages 18 and 19 (Any violent victimization = 1)	.01	.11
Victimization, 20–24	Violent victimization at ages 20 to 24 (Any violent victimization = 1)	.01	.11
Victimization, 25–29	Violent victimization at ages 25 to 29 (Any violent victimization = 1)	.01	.11
Victimization, 30 and older	Violent victimization at age 30 and older (Any violent victimization = 1)	.01	.11
Predetermining Variables			
Female	Respondent's Sex (Female = 1, Male = 0)	.54	.54
Age Group	Respondent's Age Group (From '15 to 17' = 1 to '80 and over' = 15)	7.18	3.61
Urban	Respondent's location of residence (Urban = 1, Other = 0)	.70	.46
Immigrant	Respondent immigrated to Canada (Yes = 1, No = 0)	.15	.35
Region	Respondent's province of residence		
Atlantic	(Atlantic province = 1, Other = 0)	.20	.40
Quebec	(Quebec = 1, Other = 0)	.19	.39
Ontario	(Ontario = 1, Other = 0)	.22	.41
Prairies	(Prairie = 1, Other = 0)	.26	.44

Appendix 3. Definitions, Means, and Standard Deviations of Variables, 1993 Canadian General Social Survey

Variable	Description	Mean	S.D.
Language	Respondent's first language spoken (Not English/French = 1, English/ French = 0)	.12	.32
Mediating and Outcome Variables			
Educational attainment	Respondent's highest level of education (Total education in years)	12.63	2.92
Occupational status	Pineo socioeconomic index for occupations (From 1 to 6)	3.11	1.73
Annual personal income	Respondent's total personal income (In thousands of dollars)	23.69	19.60

Appendix 4. Correlation Matrix, Canadian General Social Survey, 1993

Total victimization	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Sexual assault	.74	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Robbery	.24	−.00	1.00	.	.	.	.	.	.	.	.	.	.	.	.	.
Assault	.61	−.01	−.00	1.00	.	.	.	.	.	.	.	.	.	.	.	.
Sex (female)	.06	.10	−.00	−.02	1.00	.	.	.	.	.	.	.	.	.	.	.
Age	−.13	−.08	−.04	−.09	.06	1.00	.	.	.	.	.	.	.	.	.	.
Immigrant	−.03	−.03	−.01	−.01	.01	.08	1.00	.	.	.	.	.	.	.	.	.
First language	−.04	−.04	.00	−.02	−.01	.09	.53	1.00	.	.	.	.	.	.	.	.
Urban resident	.01	−.00	.01	.02	.03	−.04	.14	.07	1.00	.	.	.	.	.	.	.
Atlantic	−.02	−.00	−.01	−.02	.02	−.01	−.15	−.16	−.28	1.00	.	.	.	.	.	.
Quebec	.01	.01	.02	−.01	−.00	.01	−.11	−.11	.06	−.25	1.00	.	.	.	.	.
Ontario	.00	−.01	−.00	.01	−.00	−.01	.17	.09	.13	−.27	−.25	1.00	.	.	.	.
Prairies	.01	.01	−.00	.01	−.02	.00	.00	.11	.01	−.03	−.28	−.31	1.00	.	.	.
Total education	−.01	−.00	−.00	.00	−.03	−.27	.07	−.03	.14	−.02	−.06	.06	−.03	1.00	.	.
Occupational status	−.03	−.01	−.02	−.03	−.03	.08	.05	−.00	.08	−.03	−.00	.05	−.03	.48	1.00	.
Personal income	−.06	−.07	−.01	−.01	−.38	−.06	.02	−.03	.09	−.10	−.05	.09	.02	.41	.41	1.00