Pathways of Crime and Delinquency: A life-course analysis of informal social control of antisocial behaviour

by
Joanna C. Jacob

A thesis
presented to the University of Waterloo
in fulfillment of the
thesis requirement for the degree of
Doctor of Philosophy
in
Sociology

Waterloo, Ontario, Canada, 2010

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand this may be made electronically available to the public.

Joanna C. Jacob

Abstract

The aim of this dissertation is to provide a comprehensive examination of crime and delinquency over the early life-course through an informal social control perspective. Specifically, the dissertation examines how sources of informal social control (including family, school, work, peers, and community) influence the development of, and continuity and change in antisocial propensity and behaviour. Using a three-wave panel model with lagged and synchronous effects, estimated by a series of structural equation models, I follow a nationally representative birth cohort (born 1984-1985) from the age of 10 to the age of 19, through the first five cycles of the National Longitudinal Survey of Children and Youth (NLSCY). The analyses are done in three life-stages: childhood, adolescence and emerging adulthood. This study represents the first national-level examination of the influences of informal social control on the development of, and continuity and change in, crime and delinquency in Canada.

Under the Youth Criminal Justice Act, criminal responsibility begins at age twelve. Considerable evidence shows that prior to this age, children exhibit signs of aggressive and antisocial behaviour which may lead to teenage delinquency and crime in adulthood. The theoretical foundation of my dissertation integrates age-graded informal social control theory, collective efficacy, and social disorganization theory. Traditionally, social control theories of crime such as Gottfredson and Hirschi's (1990) general theory of crime have assumed that deviance is stable over the life-course. During childhood, social bonds to institutions such as the family and school teach children to internalize the norms and values of society. Deviance arises when these social bonds are weak and remains stable over the life-course. Age-graded theory of informal social control by Sampson and Laub (1993) challenges the assumption of stability. This theory argues that deviant behaviour has elements of both stability (continuity) and change (discontinuity) over time. Under this life-course perspective, social bonds are relevant at all life stages. Individuals may modify antisocial trajectories during adolescence or young adulthood with new age-appropriate social bonds such as a positive relationship with school or with nondelinquent peers.

The results of the research confirm that antisocial propensity and behaviour are characterized by stability and change over the life-course. Social bonds are the primary mechanism through which antisocial behaviours are developed or regulated, in childhood. Informal social control further mediates effects of community disorganization characteristics and family background characteristics on antisocial behaviour in childhood. There is stability in antisocial behaviour from childhood to adolescence to early adulthood, suggesting continuity in an underlying propensity. At the same time, there are changes in antisocial behaviour at each life-stage. The importance of social bonding extends beyond childhood into adolescence, as age-graded sources of informal social control contribute to changes in antisocial and delinquent behaviour. Furthermore, individuals are subject to varying levels and sources of informal social controls as they age: during childhood, informal social controls from families and school have the greatest influence on the development of antisocial behaviour, but during adolescence, school bonds and peer associations account for most of the variation in antisocial behaviour. Finally, emerging adults do not appear to be as subject to the effects of social control as children or adolescents. In emerging adulthood, changes in antisocial behaviour may be the result of a process of maturation. The results suggest that social bonds are dynamic and different sources of informal control are more or less important during different stages of the life-course.

Acknowledgements

This dissertation was possible due to the tremendous support and contributions of many people.

I am deeply grateful to my advisor, Dr. Peter Carrington. Dr. Carrington's passion for producing high calibre research, combined with his enduring dedication to students, unquestionably made this a better dissertation. His exceptional commitment to my Doctoral studies – through constructive, thoughtful, and rigorous feedback – facilitated my intellectual growth and inspired me to advance academically and as an individual. Dr. Carrington continues to be my mentor, role model, supporter, and trusted friend. I look forward to continued collaborations together.

I also wish to thank my committee members: Dr. Martin Cooke and Dr. John Goyder. Dr. Goyder's sound methodological guidance has provided an integral contribution to this dissertation. Dr. Cooke's focus and meticulous attention to detail significantly improved the precision and readability of this work.

I gratefully acknowledge the contributions of my external committee member, Dr. Ronald-Frans Melchers and my internal-external committee member, Dr. Maureen Drysdale. Their enthusiasm for the policy implications of this study encouraged me to broaden the way I think and strive to uncover applications for my research. I would also like to acknowledge the most helpful comments of Dr. Robin Fitzgerald and Dr. Jane Sprott on earlier drafts of this dissertation. Sincere appreciation as well to Dr. G. Keith Warriner for his guidance throughout the entirety of my graduate studies.

I am grateful to Dr. Pat Newcombe-Welch and the South-Western Ontario Research Data Centre for providing the resources that allowed me to complete this dissertation. I am indebted to Statistics Canada and Human Resources and Social Development Canada for the rich data collected through the National Longitudinal Survey of Children and Youth. This dissertation would not have been possible without these organizations' investment in, and dedication to, Canadian social research. I also acknowledge the generous support of the Social Sciences and Humanities Research Council, which helped provide the means to pursue my academic endeavors.

I am grateful to many others at the University of Waterloo, including Ilona Kosa and Luanne McGinley, who both have helped to navigate, co-ordinate and facilitate the program requirements of my academic career. I am truly fortunate to have shared this journey with many close friends in the Department of Sociology, including Shane, Kristyn, Jessica, Sara, and Elin. Special thanks to the late Professor Jim Curtis, whose passion for sociology and friendship will be with me always.

I would like to thank my devoted family, who comprised my personal cheer-leading squad every step of the way. My parents, Elizabeth and Dr. Jared Fein, my sister Alison, my in-laws, Bracha and Michael Jacob, and my life-long my best friends, Kelly and Shannon Crowe, all showered me with love and encouragement to complete my studies. I cherish the enduring love of my late grandparents, Emily and Irwin Roberts, who took so much pride in my achievements, and whose memory I will always hold near to my heart.

My husband and my son have my deepest gratitude for giving me the gift of pursuing my dream. Aaron patiently sacrificed so much to support me through my studies. His friendship, advice, love and devotion gave me the courage to complete this dissertation. My son Nathan has brought me immeasurable joy, during a time I needed it most. He gave me strength and renewed my conviction to complete this journey.

Dedication

This is dedicated to my husband and best friend, Aaron Jacob: You inspired me when I needed motivation and encouraged me when I struggled to find confidence. I achieved my dream because you believed in me.

Table of Contents

List of Tables

List of Figures

Chapter One: Introduction

This dissertation provides a comprehensive examination of crime and delinquency over the life-course from an informal social control perspective. Age-graded informal social control theory and empirical research provide the foundation of the framework for this dissertation. Under the Youth Criminal Justice Act, criminal responsibility begins at age twelve. Considerable evidence shows that prior to this age, children exhibit signs of aggressive and antisocial behaviour which leads to teenage delinquency and crime in adulthood (Sampson and Laub 1995; McCord 1994, 1997; Sprott and Doob 2000; Brannigan et al. 2002). Using an integrated approach, this dissertation will examine how informal social processes, embodied in relationships with family, peers, school, work and community are related to onset, continuity and change in crime and delinquency over the life-course.

Traditionally, social control theories of crime such as Gottfredson and Hirschi's (1990) general theory of crime have assumed that deviance is stable over the life-course. During childhood, social bonds to institutions such as the family and school teach children to internalize the norms and values of society. Deviance arises when these social bonds are weak. From this perspective, social bonds at later stages in life are unimportant because once deviant behaviours are established in childhood deviance remains stable over the life-course. Age-graded informal social control theory (Sampson and Laub 1993) challenges this assumption of stability. This theory argues that deviant behaviour has elements of both stability (continuity) and change (discontinuity) over time. From this life-course perspective, social bonds are relevant at all life stages. Individuals may

modify antisocial trajectories during adolescence or young adulthood with new age-appropriate social bonds such as marriage or children. This life-course perspective has been difficult to assess because it requires a longitudinal research design with several years of data collection. To the author's knowledge, this dissertation represents the first national-level examination of how sources of informal social control (including family, school, work, peers, and community) influence the development, continuity and change in antisocial propensity and behaviour over time in Canada.

The four general questions that guide this dissertation are: (1) what is the role that social bonds play in the development, continuity and change of antisocial propensity and behaviour over the life-course? (2) Do social bonds mediate the impact of broader community conditions, and early family characteristics on pathways of antisocial and delinquent behaviour? (3) How do different social bonds (e.g. from community, family, school and peers) work together to directly and indirectly regulate antisocial behaviour over time? (4) Does the importance of informal social control from various social bonds change over time? This dissertation examines how various sources of informal social control relate to development, continuity and change in crime and delinquency over the life-course by integrating age-graded informal social control theory, social capital theory, collective efficacy, and social disorganization theory. This dissertation includes nine chapters. The following paragraphs briefly summarize the focus of the following chapters.

In the second chapter, the relevant literature and theoretical framework is reviewed. The emphasis in this chapter is on developmental and life-course theories of crime. The framework of this dissertation is based on the age-graded theory of informal social control of crime by Sampson and Laub (1993). This research is further situated within a community context, specifically social disorganization and collective efficacy theories. This chapter concludes with the general research questions for the dissertation and a conceptual theoretical model (Figure 2.2) that guide the dissertation.

The third chapter presents the data sources and sampling. This includes a detailed discussion of the National Longitudinal Survey of Children and Youth (NLSCY) and the methods used to construct the database. The data include five cycles of the NLSCY collected by Statistics Canada and Human Recourses and Social Development Canada. This chapter also details the sampling design of the NLSCY, the individuals included in the analysis, and factors affecting the analysis, including partial nonresponse of items and attrition over time. Finally, the chapter concludes with a review of relevant studies that have used the NLSCY for analysis.

Chapter four specifies the definitions of concepts and how they are measured. These include definitions for childhood community and family background characteristics, informal social control processes (social bonds) at each life stage, and antisocial behaviour in childhood, adolescence, and emerging adulthood. This chapter also examines descriptive statistics of the indicators and addresses reliability of scales.

The focus of Chapter five is on the specific hypotheses guiding this analysis. Figure 5.1 summarizes the empirical hypotheses for the dissertation. Following the hypotheses is a discussion of the strategies of analysis that are used to evaluate the hypotheses. The chapter concludes with the specification of the empirical models.

The analysis chapters are divided according to three life stages: childhood (Chapter six), adolescence (Chapter seven), and emerging adulthood (Chapter eight). Each of the analysis chapters begin with an evaluation of the statistical model and then discuss the results of the model. The focus of Chapter six is on the development (or regulation) of antisocial behaviour during childhood. The results are discussed with respect to (1) the role of childhood community and family background characteristics in the development or control of antisocial behaviour; and (2) the direct and mediating roles of childhood informal bonds (community, family, school, peers) on childhood antisocial behaviour. The main hypothesis of this chapter is that informal social controls are the central process involved in the regulation or development of antisocial behaviour in childhood.

Chapter seven explores antisocial and delinquent behaviour during adolescence. The chapter is centred around two major themes: continuity and change in antisocial propensity and behaviour. The first theme explores continuity in antisocial propensity from childhood into adolescence, as well as: (1) the extent to which childhood background characteristics contribute to stability in antisocial behaviour over time; (2)

the role childhood social bonds play in adolescent antisocial behaviour; and (3) the effect of antisocial propensity developed in childhood on social bonding in adolescence. The second part of this chapter examines how experiences and social bonds during adolescence affect delinquent and antisocial behaviour regardless of prior antisocial propensity. It also examines whether the importance of social bonds from different sources (such as family, peers or school) changes from childhood to adolescence. The central hypothesis for this chapter is that childhood antisocial propensity may be modified over time by adolescent social bonds.

Chapter eight focuses on continuity and change during the transition to early adulthood. First, the indirect effects of childhood background community and family characteristics and of childhood social bonds on antisocial behaviour in the transition to young adulthood are considered. Next whether adolescent sources of informal social control continue to shape emerging adulthood crime and deviance, or whether their effects are mediated by adolescent antisocial propensity is investigated. The cumulative effects of prior antisocial propensity are again examined with respect to social bonds to institutions in emerging adulthood. Finally, this chapter examines continuity and change in antisocial behaviour in the transition to young adulthood. As individuals enter adulthood, they may gain new sources of informal social control from family and work. This chapter examines how these new, age-relevant social controls may lead to changes in antisocial and criminal behaviour in early adulthood, regardless of antisocial propensity.

Finally, Chapter nine summarizes the key theoretical and empirical findings. The chapter begins with a summary of the theoretical framework and research objectives. Then the major findings from childhood, adolescence and emerging adulthood are discussed as they relate to the hypotheses specified in Chapter five. This chapter also considers the study's limitations and future research directions.

Chapter Two: Theoretical Framework and Literature Review

The following section reviews social theories of crime, beginning with social disorganization theory and then bridges disorganization research with social capital and collective efficacy. Following this is a review of the criminal careers and developmental and life-course literature, with an emphasis on age-graded informal social control theory.

2.1 Social Disorganization Theory

The major question for disorganization theories is: *Why do community crime rates differ?* A disorganization approach suggests that community crime rates differ depending on the ability of the community to informally regulate itself (i.e., ability to come together to enforce a shared value of freedom from crime). This ability to regulate itself is mediated by structural characteristics which bar effective communication between residents. Although community can be conceptualized in many ways, Bursik and Grasmick (1993:15) conceptualize a community as one where "the residents… share a common goal of living in an area relatively free from the threat of crime. Thus social control represents the efforts of the neighbourhood to achieve this specific goal."

Shaw and McKay (1969) studied delinquency rates of boys aged 10-16 years old who were "petitioned to the court" in Chicago over three time periods (1900-1906, 1917-1923, 1927-1933). Shaw and McKay's research was influenced by Burgess' concentric zone theory. Burgess identified a process of growth in urban areas that begins from the centre and sprawls outwards. Over time, the urban centre tends to be developed with central business and industry. Beyond the centre, a circular transitional zone houses attracting

newcomers and low cost housing, the next three zones include those people who stay in the city, but have the resources to move out of the transitional zone. Shaw and McKay used this model of zones to identify structural characteristics of the inner zone that may contribute to "socially disorganized" communities. After repeated studies in Chicago generated consistent results, Shaw and McKay (1969) concluded that the physical condition of houses, income levels, demographic stability, and ethnicity, accounted for differences in delinquency rates. Delinquency rates decreased as one moved from Zone I (centre of the city) to Zone V (outskirts of the city). They argued that areas of Chicago with low rates of delinquency are characterized more or less by "uniformity, conformity, and universality of conventional values and attitudes with respect to child care, conformity to law and related matters; whereas in the high-rate areas, systems of competing and conflicting morals have developed" (88). Based on their findings, Shaw and McKay (1969) developed social disorganization theory, suggesting that in the absence of cohesive communities with formal and informal controls, criminality may arise. Also, low socioeconomic status and high youth crime areas are characterized by a divergence in norms and values. The social processes involved in developing cohesion within a community, contribute to the deviance or conformity of youths.

Five community characteristics based on early and current social disorganization studies are thought to impede the ability of residents to form the social networks necessary for social organization: inequalities in socioeconomic status, residential instability, racial and ethnic heterogeneity, urbanization, and supervision (Jacob 2006; 2007; Schulenberg 2003; Hartnagel 1997; Bursik and Grasmick 1993; Hartnagel and Lee 1990; Sampson

and Groves 1989; Shaw and McKay 1969; Wirth 1938). Findings concerning the impact of these community characteristics on crime rates are quite diverse and in some cases, contradictory (Jacob 2006).

2.2 Social Capital and Collective Efficacy

New directions in social disorganization research focus on the *processes involved in the development of social cohesion*. The process involves social capital and collective efficacy. In this section, social capital is discussed at the individual level. Then collective efficacy will be examined, showing how social capital processes occur at the community level.

2.2.1 Social Capital

Although the term has not been used officially in social disorganization research, Hagan and McCarthy (1997) argue social capital theory offers theoretical development by integrating elements of delinquency theories in ways previously not considered in order to understand youth crime. Social capital is a resource that is realized through social relationships. The definition and use of social capital has varied (see Bourdieu 1985; Loury 1977; Coleman 1988, 1990; Baker 1990; Burt 1992; Schiff 1992) however, Portes argues the definition that best demonstrates the current consensus is: "the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (1998:6). Social capital benefits for individuals and communities operate via several mechanisms. Social capital allows communities to solve collective concerns easily (Putnam 2000). James Coleman (1990) argues that social capital focuses on the less

tangible social relations between actors that "inhere in family relations and community organization and that are useful for the cognitive or social development of a child or young person" (Coleman 1990: 300). Thus social relations embodied in family, neighbours, community, and other social institutions are potentially important sources of capital for prosocial development in young people. Coleman (1988: 1990) reasons if A does something for B and trusts that B will reciprocate the kindness, A has an expectation of B and B has an obligation to A. A is now the holder of a credit slip, or social capital. Trust and being trustworthy are also features of social capital that allow communities to move forward without problems. If in a business, ties and trust do not exist among actors "elaborate and expensive bonding and insurance devices would be necessary – otherwise transactions would not take place" (Coleman 1988: S99). Thirdly, social capital leads to an understanding of social connectedness. People who have strong social networks tend to "develop or maintain character traits that are good for the rest of society" (Putnam 2000: 288) by creating more tolerance, and empathy for others.

Social capital is often examined in studies that identify characteristics associated with successful childhood development in areas such as education or community involvement, but has yet to be developed in crime research. As a resource, social capital draws upon social networks within the neighbourhood and thus it is important to study how having social capital may be related to lower delinquency. Hagan and McCarthy (1997) argue social capital theory offers theoretical development by integrating elements of delinquency theories in ways previously not considered in order to understand youth

crime. Social capital represents characteristics beyond class to a "variety of institutional sources- including work, family, school, neighbourhood and community- that contribute to the understanding of crime and delinquency" (Hagan and McCarthy, 1997:235). By broadening the understanding of delinquency through social capital theory, researchers are encouraged to examine how "social capital accumulates and is conserved or is diminished over the life-course" (Hagan and McCarthy, 1997:236).

Family Capital

Coleman (1990) argues "that parental investments in time and effort, the affective bonds they create and maintain, and the prosocial guidance they offer, alter the likelihood the well-supported youth will engage in or acquire antisocial peers" (Wright et al. 2001:3). According to Putnam (1995:72) "the most fundamental form of social capital is the family, and the massive evidence of the loosening of bonds within the family (both extended and nuclear) is well known." The main concepts for investment in children are (a) Parental Investment, (b) Family Social Support and (c) Family Socialization. Parental investment measures the intensity of parent-child relations with the expectation that increased time and effort into a child will positively effect to the child's social and intellectual development (Coleman 1990; Wright et al. 2001). Family social support includes the establishment and maintenance of strong emotional bonds between parent(s) and children. Effective socialization (conformity to accepted values and norms) is thought to occur through emotional bonds (Wright et al. 2001). Finally family socialization focuses on the content of socialization. Wright et al. (2001: 3) argue strong moral values are important to guard against actions that might threaten future relationships. Parents "build into the youth moral inhibitions against imprudent

behaviour by communicating clear rules proscribing actions that they clearly view as potentially harmful" (Wright et al. 2001: 3). Thus consistent parenting and fairness of consequences to undesirable behaviour are important components of building conformity to social norms and values. Those who gain social capital through conventional sources such as school, family and friends, have a greater resource base from which to draw support and more sources of guidance on prosocial behaviour.

Community and Neighbourhood Involvement

As discussed with disorganization research, community characteristics are thought to influence the behaviours and decisions individuals make. As a source of social capital, parents who are involved in the community (through volunteer work, participating in parent associations and so on) are more apt to build a large resource base through stronger social networks. Social capital allows communities to solve collective concerns easily (Putnam 2000). Trusting and being trustworthy are features of social capital that allow communities to move forward without problems. If trust is not an issue, economic resources do not need to be allocated to ensuring others will follow through on arrangements. People who have strong social networks tend to "develop or maintain character traits that are good for the rest of society" (Putnam 2000: 288) by creating more tolerance, and empathy for others.

2.2.2 Collective Efficacy

Social capital is embodied in relationships between actors and is productive because individuals or groups who hold social capital (such as trust and trustworthiness) are more likely to achieve goals easily and smoothly than those without social capital (Putnam,

2000). Collective efficacy theorists examine community ties rather than individual ties, and they argue that weak ties to the community are sufficient for achieving common goals. *Collective efficacy* is defined as "social cohesion among neighbours combined with their willingness to intervene on behalf of the common good" (Sampson et al. 1997:918) to reduce crime. The theory focuses on mechanisms of how residents regulate themselves using informal social control. Sampson et al. (1997: 277) argue that neighbourhoods differentially "activate" informal social control. Collective efficacy attempts to specify the process by which social cohesion occurs and in turn how informal control manifests in the context of the neighbourhood: a process that is vague in social disorganization theory. Influences on collective efficacy include traditional social disorganization exogenous concepts (socioeconomic status, ethnic heterogeneity, residential instability, urbanization, supervision).

Robert J. Sampson (2003; 2006) criticizes the use of social capital (conceived as occurring through strong ties) for understanding reduced crime at the community level because (1) strong ties might impede social control, (2) networks may be antisocial rather than prosocial, and (3) prosocial action can be fostered through weak ties. Collective efficacy focuses on a linkage between trust and cohesion and willingness to take action on behalf of others. Barbara D. Warner (2007) examines how social cohesion and trust function as a form of informal social control within a social disorganization framework. Warner (2007: 122) found that social cohesion and trust among residents significantly reduces the probability that residents will address problems by using *formal* authorities,

though she does not find evidence that cohesion and trust foster informal action on the part of residents.

After a discussion on the merits of weak ties over strong ties, Sampson proposes to "focus on the mechanisms that facilitate social control without requiring strong ties or associations" (2003: S58; see also Sampson 2006; Carr 2003, Morenoff et al. 2001; Sampson et al. 1991; Sampson et al. 1997). Instead of strong ties, ties based on working trust and shared expectations for actions of residents for the common good are sufficient.

> Collective efficacy signifies an emphasis on shared beliefs in a neighborhood's conjoint capability of action to achieve an intended effect…efficacy is captured in expectations of control, elevating the 'agentic' aspect of social life over a perspective centered on the accumulation of 'stock' of social resources (social capital). This conception of collective efficacy refines social capital by emphasizing the expectations for action within a collectivity (Sampson 2003: S59).

Note the key differences from social capital are (1) action rather than potential (2) weak ties are sufficient rather than strong ties.

Robert J. Sampson, Jeffrey D. Morenoff and Felton Earls (1999) extend Coleman's (1990) notion of social capital to

> explicate what constitutes and sustains collective efficacy for children. Structural level sources of neighbourhood variation in intergenerational closure (parents know other parents and their children), reciprocal exchange (interacting with/helping/ providing favours for neighbours) and shared expectations for child social control. The first two factors represent social capital (resource potential of ties) and the third represents collective efficacy (task-specific process of changing social ties into action based on ties (Sampson et al. 1999: 635).

In their study, Sampson et al. (1999) integrate census data with a survey of 8500 residents in 342 neighbourhoods in Chicago and includes structural antecedents using

Hierarchical Linear Modeling (to test between and within community differences) to support their hypotheses.

2.3 Criminal Careers, Developmental Theories, and Life-Course Theories of Crime

There are several approaches to understanding crime as individuals age: the criminal careers paradigm; developmental theories of crime; and life-course theories of crime. These perspectives share many common questions and assumptions (Farrington 2003a). Some of these questions include: *When do individuals begin offending? Do they continue to offend and when do they desist? Does their offending increase in seriousness? Do individuals tend to specialize in their offending?* Some shared assumptions include: (1) Crime is an individual level phenomenon, and therefore research should focus on within individual differences, (2) Crime can be studied over the life-course, (3) Criminality may be static for some individuals or dynamic for other individuals over the life-course. Despite these commonalities, each perspective focuses on different elements of crime. Variations exist regarding the role of theory, psychological risk factors, and community and social characteristics.

2.3.1 Criminal Careers Research

Criminal careers research follows individual criminal careers driven by policy concerns rather than theoretical concerns (Sampson and Laub 2005: 306). In these studies, key concepts include onset, continuity and desistence. These studies tend to focus on official

delinquency data, such as arrests or appearances in court. Many of these studies ask among others, four key questions: (1) When is the onset of delinquency? (2) Is delinquency persistent or when does it desist? (3) What is the level of seriousness (harm) of delinquency? (4) Over time (with age), does delinquency increase or decrease in seriousness? Based on research, there is some agreement on the answers to these questions. First, it will be helpful to review some of the key studies in this area.

Marvin E. Wolfgang, Robert M. Figlio, and Thorsten Sellin (1972) followed all boys who were born in 1945 and who lived in Philadelphia between 10 and 18 years of age. Of the 9,945 boys, 3,475 had at least one recorded police contact. The data were gathered from school and police records and data records checked against the selective service registration. This study was followed up by Paul E. Tracy, Marvin E. Wolfgang, and Robert M. Figlio (1990) where they replicated the research by Wolfgang et al. (1972) following a 1958 cohort, and then compared the two birth cohorts. Drawing on containment theory, Tracy et al. (1990) anticipated that the second cohort (1958) would experience different "pushes toward" or "pulls away from" delinquency than the 1945 cohort. The 1958 cohort "experienced a delinquency risk period from 1968 through 1975" (Tracy et al. 1990: 2). The authors assumed that the 1945 cohort (born post WWII) experienced peaceful teenage years, while the 1958 cohort grew up during a time of war (Vietnam) and of social change (rise in drug abuse, social protest). Tracy et al. (1990) also reasoned that these cohorts were comparable because there was consistency in justice policy and procedures throughout both cohorts. The sample for this study included

the 1958 birth cohort living in Philadelphia from ten until eighteen years old (N=13,160 boys). The data source was the same as the study for the 1945 cohort..

While the two studies found many similarities, there were two major variations. The first prominent difference between the cohorts was based on the role of structural disadvantage (being non-white and of a low socio-economic status). Structural differences between delinquents and non delinquents were more pronounced in the 1945 cohort than in the 1958 cohort. Thus in the 1945 cohort, the majority of offenders with multiple offences were non-white and living in low socioeconomic status conditions. Furthermore, in the 1945 cohort non-whites were more likely than whites to be formally arrested, regardless of previous offence status, type of offence, or seriousness of offence. The 1958 cohort saw a more even split in racial composition, of approximately 47% white, and 53% non-white. Also a higher percentage of non-white boys fell into the high SES category in 1958 than 1945. The second were distinct cohort difference was distinctly higher proportion of violent offences in the 1958 cohort over the 1945 cohort.

Tracy and Kempf-Leonard (1996) collected data on the 1958 cohort to the age of 26 and found that career continuity was more common than discontinuity. Thus those who were nondelinquent as adolescents were more likely to remain that way while delinquents were more likely to be involved in crime as adults (Tracy and Kempf-Leonard 1996: 206). Furthermore, they found that the key predictor in adult criminal activities was early onset and multiple delinquent acts during the teenage years. They found some evidence in support of early probation as a method of intervention; boys (but not girls) who were

given probation at an early age had a lower likelihood of engaging in crime as adults (Tracy and Kempf-Leonard 1996: 141). According to their data, incarceration was an ineffective tool for reducing recidivism (Tracy and Kempf-Leonard 1996: 133). The authors pointed out though that there may be a bias in this finding as less serious crimes are more likely to be given probation and more serious offences likely to be given incarceration.

In Canada, only a few studies have been done on criminal careers. First, a landmark study of court careers was done by Peter J. Carrington, Anthony Matarazzo and Paul deSouza (2005). The authors examined the court careers of a Canadian birth cohort from the age of twelve up to their twenty second birthday. The profile of criminal careers was developed from official court records (Youth Court Survey and Adult Criminal Court Survey) from the 1979/1980 birth cohort of six provinces representing 78% of the Canadian population (Carrington et al. 2005).

A second groundbreaking study of criminal careers in Canada was based on police reports by Carrington (2007) and is a companion study to the court careers study. Carrington examined two birth cohorts (1987 and 1991). The criminal careers for the two birth cohorts are based on data from the Incident-Based Uniform Crime Reporting Survey (or UCR2), which collects detailed information about each incident recorded by participating police services in Canada. Data were available from the 8th birthday to the 18th birthday for the 1987 birth cohort and from the 5th to the 15th birthday of the 1990

birth cohort (Carrington 2007: 61). Data collected from 1995 to 2005 represented approximately 52% of the population in Canada (Carrington 2007: 60).

Carrington et al. (2005) and Carrington (2007) report findings consistent with those of the Philadelphia birth cohort regarding: (1) one time offenders; (2) repeat offenders (those with 2-3 incidents); and (3) chronic offenders (those with more than three alleged incidents). Carrington reported that for the 1987 birth cohort, almost two thirds (63%) of offenders had only one incident recorded by police, while a few chronic offenders (with 5 or more recorded offences), who accounted for only 10% of the birth cohort, were responsible for nearly half (46%) of the crime committed by the birth cohort over the 10-year period (2007: 40). The trend was similar among the court careers data. Just over half (55%) of offenders were alleged to have only one court record, while 28% were repeat offenders and 16% were chronic offenders. The chronic offenders represented 58% of all the court records by this cohort (Carrington et al. 2005: 17).

Contrary to expectations, both the court career study (Carrington et al.) and the police-recorded career study (Carrington 2007) found that early onset offenders were not necessarily the most active offenders. Carrington et al. (2005: 23) found no real evidence to show that persistent offenders began their court careers earlier in their adolescence. Similarly, Carrington found that even those with recorded police incidents from a young age (5 to 7 years old) were no more likely to become active offenders in the 10-year observation period than those whose recorded incidents began around 8 to 10 years old (2007:44).

According to Carrington, age-of -onset, measured as the first recorded incident by police, increased each year of age to the age of fifteen for the 1987 birth cohort and then began to decrease (2007: 30-31). The 1990 birth cohort showed very few individuals have police recorded incidents between the ages of 5 to 11 years old (less than 1% each year), and rises each year to the age of 14, the last year data were available for this cohort (Carrington 2007: 31). For the court careers, age –of –onset, measured as initial referral to court increased from age 12 to age 16, before declining each year, and then peaked again at age 18 (Carrington et al. 2005: 14). The Canadian court data showed a unique trend relative to studies from other countries where onset occurs in young adulthood (late onset). Carrington et al. (2005: 16) found that approximately *forty percent of first referrals* to court for alleged offences occur after the age of eighteen. The authors suggested that this "may reflect a tendency on the part of police, prosecutors, and other screening agencies, to deal with alleged offenders younger than 15 by means other than court process" (Carrington et al. 2005: 16).

In terms of specialization of offending, Carrington (2007:49) reported that of repeat offenders (those with at least two recorded offences), about 35% of the 1990 birth cohort, and 43% of the 1990 birth cohort showed specialized careers. While 65% of the 1987 birth cohort and 57% of the 1991 birth cohort with multiple reported incidents had versatile offending patterns (Carrington 2007: 50). Carrington et al. (2005: 30) explain that "versatility and specialization in offending are not so much an expression of tendencies on the part of the offenders, but simply a result of the volume of criminal

activity: the more incidents, the less likely that they will be limited to one type." Persistent offenders are more likely to have: (1) offences against the person as their most serious type of offence and (2) include both the least serious and most serious offences in their criminal careers (Carrington et al. 2005: 37).

In Canada, no pronounced pattern of escalation (increase in seriousness of referred incidents), stabilization, or de-escalation, was shown for court careers (Carrington et al. 2005: 33). For police recorded incidents, the pattern was similar. For the 1987 birth cohort, about 30% had escalating careers, and 32% had de-escalating careers, while 39% had stable careers (Carrington 2007: 55). The pattern was similar for the 1990 birth cohort, but stability in seriousness of incidents was more pronounced, accounting for about 46% of police recorded careers (Carrington 2007: 55).

The following is a summary of key findings that have gained support in criminal careers research according to Farrington (2003a: 223-224).

1. Peak onset is generally between the ages 8 to 15.
2. Prevalence of offending peaks in late teenage years around 15-19 years old.
3. High proportions (approximately 40-55 percent) of offenders desist following the first offence.
4. There is stability in offending and antisocial behaviour from childhood through adolescence and into adulthood between individuals.
5. A small proportion of offenders are chronic offenders and they commit a large proportion of all crimes. Generally chronic offenders are early onset individuals.
6. Early onset increases the risk of a long criminal career and the commission of relatively large number of offences.
7. Offending is versatile rather than specialized.
8. Up to late teenage years, the majority of offences are committed with others, but from the age of 20, most are committed alone.

9. The likelihood of committing serious offences increases if the same offence is repeated, but it does not necessarily increase with a rise in the number of offences.
10. Types of crimes have a tendency to be first committed at distinct ages. For example, shoplifting before burglary and burglary before robbery. Generally, diversity of crimes increases to age 20 and includes new and old crimes. From the age of 20 specialization increases.

Criminal careers research is recognized for its valuable contribution to understanding the careers of criminals. This research is especially helpful in understanding onset of criminal behaviour, peak offending, what is likely to occur in offending patterns following the first, second, third or more offences. This research is very useful for informing criminal justice policies. For example, it has policy implications for interventions at the individual level to reduce recidivism. Tracy et al., (1990) suggest that the juvenile justice system must impose sanctions (such as probation) on youths because failing to do so might encourage further offences. The question to be answered is, at what point to intervene? Of boys who had recorded offences, almost half were been shown to desist after the first offence and another 35% desisted after the second offence (Tracey et al. 1990). Thus at what point would intervention be the most useful? Criminal careers research focuses on documenting what is happening, rather than why it is happening. These are questions that may be answered more fully through developmental or life-course theories.

2.3.2 Developmental Theories of Crime

Developmental theories expand upon the criminal careers research (onset, continuation, and desistance) by adding risk factors and life events to theories of crime. Developmental theories of crime are concerned with explaining why changes in patterns of offending change "within" individuals. Developmental theories of crime are based on

psychological theories of delinquency, rather than social theories; however elements of between individual differences are recognized in this perspective. This creates some conflict for the theories because the focus is on within individual changes, but peer influences for example better explain between individual changes (Farrington 2003a: 226).

Developmental theories of crime focus on linear pathways of development over time. Many of the theories address a broad range of antisocial behaviours that persist throughout individuals' lives. Although specific behaviours may change over time, it is often theorized that underlying antisocial tendencies will manifest in different ways throughout the life-course. Some theories allow for the possibility of desistance as explained by normative (ontogenetic) expected changes over time, and / or by cognitive changes that lead to behavioural changes (Laub and Sampson 2003: 27-30). Thus, teenage or adulthood change in criminal behaviour is mainly due to biology and changes in psychological factors, such as maturation, physical strength and well-being (Laub and Sampson 2003: 29).

A) Adolescence-Limited and Life-Course-Persistent Antisocial Behaviour

Arguably the most influential developmental theory of crime is Terrie E. Moffitt's theory of adolescence-limited and life-course-persistent antisocial behaviour. This theory is one of continuity *or* change throughout the life-course. According to Moffitt's theory (1993) there are two distinct types of antisocial individuals: 1) life -course-persistent (LCP) and 2) adolescence-limited (AL). Individuals engage in criminal acts either because they (1)

have neuropsychological deficits (LCP), or (2) are motivated by an inconsistency between biological development and social expectations (AL).

Life-course-persistent antisocial behaviour refers to behaviour that is characterized by continuity in antisocial behaviour. These individuals comprise only a small percentage of antisocial persons (Moffitt 1993). Their behaviour is *heterotypic* in nature; that is the antisocial behaviours manifest in a variety of ways over the life-course (Moffitt 1993). LCP individuals can be identified early in life because they have "neuropsychological deficits, including hyperactivity, impulsivity, low self-control and difficult temperament" (Farrington 2003a: 241; see also Moffitt 1993: 680-683) from childhood. This perspective, based in biological and psychological development traces the disruption of normal brain development (exposure to drugs, poor nutrition) during the pre-natal period or exposure to toxins as child psychological deficits linked to later misconduct. These individuals fail to learn prosocial behaviour and reactions to their behaviour from family and peers is negative. Over time the consequences of offending produce labeling effects that lead to persistent antisocial behaviour. The "underlying disposition remains the same [for life-course-persistent behaviours] but its expression changes form as new social opportunities arise at different points in development" (Moffitt 1993: 697). Thus this theory asserts that a life-course-persistent antisocial individual is a product of the interaction between individual biological traits and the social environment.

Adolescence-limited antisocial behaviour refers to behaviour by individuals who suffer from a maturity gap between social expectations and biological development. This

mismatch produces motivation for delinquency. Adolescents will seek out other delinquent adolescents as models for behaviour in what Moffitt labels "social mimicry" (Moffitt 1993:687-688). Moffitt (1993) argues these individuals, who represent the majority of delinquent adolescents, may use antisocial behaviour as an effective means to distance themselves from their parents. Antisocial behaviour produces negative consequences from parents, pushing the adolescent away, and thereby reinforcing the antisocial behaviour. Moffitt (1993: 688-689) posits that "every curfew violated, car stolen, drug taken, and baby conceived is a statement of personal independence and thus a reinforcer for delinquent involvement."

Once they enter adulthood with legitimate roles, means of achieving their goals legitimately, they can "easily stop because they have no neuropsychological deficits" (Farrington 2003a: 242). Thus adolescence-limited antisocial delinquency "is not psychopathy" and is characterized by discontinuity (Moffitt 1993: 693). A third type of person does not have antisocial behaviours. These individuals are either too introverted, too immature, or do not have opportunities to engage in antisocial behaviour (Farrington 2003a).

This theory is very focused on "either/or" scenarios of criminality. Either offenders have neuropsychological deficits or they are immature. These states are on opposite extremes of each other. This theory offers no explanation regarding the role of larger external influences such as race, SES, composition of communities, or schools. Persistent offending appears to be an individual –psychological problem arising from congenital

deficiencies and poor parenting, regardless of other social characteristics. Learning is emphasized as social mimicking for adolescence-limited offending. It is unclear how life-course –persistent offenders become involved in crimes or learn to commit crimes.

B) Generic Control Theory

A second influential developmental theory is the *generic control theory.* LeBlanc and Loeber (1998) applied a developmental approach to address how an individual's offending changes or remains stable over the life-course. Generic control theory is a multi-layered theory which combines elements of several theories: social disorganization, social control, and personality development. Very briefly, the main argument is that environmental factors influence social bonding while psychological factors (cognitive factors) influence personality development. Bonding and personality development influence modeling (prosocial or antisocial) and constraints (internal and external controls), which are related to offending. LeBlanc and Loeber's research elaborates on many of the key concepts introduced in earlier studies by Wolfgang and colleagues, such as onset, continuity and desistence. LeBlanc and Loeber (1998) suggest that these concepts can be made more dynamic. Desistence can occur when new prosocial bonds are made and the individual becomes less self-centred. Continuity exists because many individuals' control systems remain stable throughout life (Farrington 1993a: 242-243). The authors suggest there are three central concepts: *Activation*, when criminal offending begins; *Aggravation*, referring to the developmental sequence of offending, and; *Desistence*, the process of reducing or ending the frequency of offending. Each of these concepts is composed of several processes (LeBlanc and Loeber 1998: 121-124).

LeBlanc and Loeber (1998:143-146) presented evidence that there is a developmental sequence (*aggravation*) that can be studied: specifically they argued that more serious delinquency is preceded by antisocial behaviours (such as disobedience, stealing, fighting), and that this sequence is non-random. They point to the Montreal study by Fréchette and Loeber in 1989 (LeBlanc and Loeber 1998: 146) which was based on official and self-report data that followed a sample of boys through the 1970's and 1980's. The Montreal study identified 5 stages of development of offending: emergence (ages 8-10: not serious, similar offences); exploration (ages 10-12: increase in diversity in offending); explosion (ages 13 and on: increase in variety and seriousness); conflagration (ages 15 and on: increased diversity and seriousness); outburst (adulthood: offending becomes astute or more violent). While they identified each of the stages, ordered by age, they added that only about 3% of offenders actually go through all of these stages. Most (approximately 74%) only make it though stages 1 and/ or 2.

LeBlanc and Loeber (1998) suggested that early onset (*activation*) increases the risk of acceleration, stability (continuity), and diversity of offending. They also found evidence that (1) some antisocial children will become delinquent youths, (2) some youthful offenders will continue to offend into adulthood, but they also noted that "about half of at-risk children do not reach the serious outcomes of the chronic offender, sociopath, or drug abuser (LeBlanc and Loeber 1998: 131).

The authors presented hypotheses for desistence; specifically that desistence occurs in the opposition sequence of aggravation, but that there is not enough research to draw conclusive evidence in support of these processes (LeBlanc and Loeber 1998: 152). However, they did advocate for individual trajectories, or pathways of offending. Some trajectories are adolescence-limited, while others may be life-course delinquents. Research has not been conclusive regarding the existence of a single trajectory leading from childhood misbehaviours to delinquency or multiple trajectories from different forms of antisocial childhood behaviour to specific forms of delinquency. They did argue that examining multiple pathways might account for both specializations in delinquency as well as pathways to a variety of serious delinquent behaviours (LeBlanc and Loeber: 159).

C) Integrated Cognitive Antisocial Potential

A third developmental theory of deviance is *integrated cognitive antisocial potential* (ICAP) which addresses the question: *Why does an individual commit a crime in a given situation?* Farrington (2003a: 233) argues whether a person "commits a crime in a given situation depends on *cognitive processes*, including considering the subjective *benefits, costs and probabilities* of the different outcomes" (emphasis added). Outcomes may involve *material gains* or *social consequences* (such as parental disapproval or formal action). Therefore, ICAP is a *cognitive theory, based on rational choice theory.* That is choices may be made in the traditional economic sense (of material gain), and/or in consideration of social (environmental) factors. Farrington argues those with high antisocial potential are more likely to disregard potential consequences. *Antisocial*

Potential refers to the likelihood that an individual will take on antisocial behaviours. This is influenced by long-term and short-term anti-social motivations. Long-term antisocial motivations refer to factors that motivate an individual to engage in antisocial behaviours include strain, impulsiveness and antisocial role models. Long-term factors inhibiting offending include attachment and socialization and life-events. *Short-term antisocial motivations* refer to short term factors that encourage offending include energizing factors (boredom, anger, and frustration), opportunities and victims, and high subjective utility of offending.

This theory broadly examines antisocial behaviours, rather than criminal behaviours alone. Thus behaviour may vary greatly "depending on underlying antisocial potential, situational factors and decisions" (Farrington 2003a: 235). Although he focuses on underlying psychological factors for the potential of antisocial behaviour, Farrington (2003a) also argues that many of the key risk factors for onset and desistance, *are social* in nature (SES factors, school failure, poor supervision, neighbourhoods, criminal parents, delinquent peers). Desistance occurs as onset patterns reverse. Mainly, a reduction in long-term or short-term AP or reduced utility in offending. By 20 years of age, most have desisted. For desistance, the social factors include life-events such as marriage, job, children, less interest in male peer approval.

Evidence for ICAP has been gathered through the Cambridge Study in Delinquent Development, where self-report and official measures of offending were gathered from 411 boys mostly born in 1953 until they reached the age of 46. The study boys were

given nine face to face interviews. The boys were selected from London and represented "an overwhelmingly traditional white urban working class sample of British origin" (Farrington 2003b: 139). This research found much support for criminal careers research in terms of age at onset, duration, and chronic offenders (Farrington 2003b; Piquero, Farrington and Blumstein 2003). In terms of risk factors (measures of ICAP theory), Farrington (2003b) found some supporting evidence with the Cambridge Study data. The most important predictors of later offending from the ages 8-10 include (Farrington 2003b: 153): (1) Antisocial child behaviour (aggressiveness, dishonesty); (2) Hyperactivity-impulsivity-attention-deficit (poor concentration, risk-taking, psychomotor impulsivity); (3) Low intelligence and low school achievement; (4) Family criminality (convicted parents, delinquent older siblings, and siblings with behaviour problems); (5) Family poverty (low family income, large family size, poor housing, but not including SES as measured by occupation); and (6) Poor parenting (harsh and authoritarian discipline, poor supervision, parental conflict, and separation from parents). Farrington (2003b) found factors, such as moving away from London (usually meaning upward mobility) and marrying a non-convicted woman and staying married encouraged desistence. While Farrington makes use of some social characteristics in his theory (such as learning and strain), all reasons for committing crime are focused on individual personality issues.

Farrington (2003b: 157) offers the following explanation of the measurement of antisocial personality at age 18 including: "conviction, self-reported delinquency, self-

reported violence, antisocial group behaviour, taking a prohibited drug, heavy smoking, heavy drinking, irresponsible sex (having intercourse without using contraceptives), heavy gambling, anti-establishment attitudes, being tattooed, and self-reported impulsivity (all referring to the 15-18 age range)." This research has inspired policy changes in the United Kingdom. The UK Home Office has implemented "Antisocial Behaviour Orders." Antisocial Behaviour Orders are intended to be community-based interventions that order youths to discontinue friendships, block them from hanging around certain areas, or stopping antisocial behvaiours. The Antisocial Behaviour Orders are in place for two years. Criminal penalties are not associated with the Order however, because they are considered civil offences, a breach of an Order (for non criminal antisocial behaviours) can possibly lead to criminal records.

Although Farrington's ICAP theory allows for change in antisocial behaviours, this model and other developmental models assume there are streams that individuals must be placed in. Robert J. Sampson and John H. Laub (2003: 306) argue developmental models assume there are 'groups' or 'types' of offenders (such as long-term, or life-course persistent verses short-term or adolescence-limited). These types of individuals follow "distinct and causal pathways and probabilities of continuity and change, even if these manifestations vary by age" (Sampson and Laub 2003: 306).

2.3.3 Life-Course Theories of Crime

Life-course theories study life histories and future trajectories of individuals and groups (Elder, Kirkpatrick Johnson, and Crosnoe 2003: 3). The life-course paradigm has developed some central concepts that are used to convey the temporal natural of lives, and how social lives are socially organized. These concepts apply to life-course studies in general, and to life-course theories of crime specifically. According to Elder at al., (2003: 8), these concepts are: (1) Social pathways, (2) Trajectories, (3) Transitions, (4) Turning points, and (5) Duration. *Social pathways* refer to the trajectories people follow such as education, work, and family. These pathways are often structured around social organizations. *Trajectories,* or the sequences of roles and experiences, are shaped by transitions; or changes in state. *Transitions* are short events that are changes in state such as going to school, beginning work, entering marriage, or moving away from home. *Duration* refers to the amount of time between transitions. *Turning points* refer to major life changes that change the direction of trajectories. Examples of turning points include returning to school in middle-life, and job changes or instability (Elder et al. 2003: 8).

In addition to the key concepts, Elder et al., (2003: 10-14) argue there are five paradigmatic principles that guide the study of social change, developmental trajectories and social pathways of life-course theories. First, the *Principle of Life-Span Development*, which refers to studying changes in development beyond adolescence into early and late adulthood. Second is the *Principle of Agency* which refers to individual self-determination. Decisions and actions individuals take shape their future within the constraints of time and social context. Third, the *Principle of Time and Place* refers to the

influence of historical time and places that individuals experience over their life-course. The fourth principle, the *Principle of Timing*, refers to the understanding that the impact of transitions, events and behavioural patterns will vary for individuals depending where they are in their life-course. Finally the *Principle of Linked Lives* acknowledges that development occurs within a socially connected context of shared social relationships. New relationships can foster turning points and lead to behavioural changes. The goal of these principles is to move from age-specific or snap shot studies to promote larger social contexts, the timing of events and role changes, recognizing individual choice in shaping one's life-course (Elder et al.: 2003).

A) Age-Graded Informal Social Control

Arguably the key difference between age-graded informal social control theory and developmental theories of crime is the emphasis on social causes of stability and change in delinquent behaviour. Sampson and Laub (1993) emphasized the quality of social bonds as the main factor for understanding delinquency among individuals.

Consistent with social control theory (Hirschi 1969), Sampson and Laub aimed to explain why people do not commit crime on the assumption that "why people commit crime is unproblematic… and that offending is inhibited by strength of bond to society" (Farrington 2003a: 241). Sampson and Laub (1993) advocated for a life-course perspective on the study of crime, as opposed to traditional sociological theories of youth crime that limit explanations of crime to childhood or adolescence. Sampson and Laub (1993) challenged the emphasis psychological theories of crime place on childhood

factors for explaining later crime, without considering much about desistence, or factors that change for individuals later in life. They were further critical of traditional developmental theories for ignoring the mediating process of informal social control between structural / personality factors and crime (Sampson and Laub 1993: 6-7). Traditional developmental perspectives tend to focus on antisocial personality traits to explain continuity and change. Sampson and Laub (1993) argued that sociological concepts can explain the context in which individuals' deviance is stable or changes. The authors posited that, regardless of childhood antisocial behaviour or previous delinquency, adult institutions of informal social control (such as family, community, work) could have an influence over criminal behaviour (Sampson and Laub 1990: 611). One of the underlying concepts of this theory, that crime and deviance arise when an individual has weak bonds to society, is central to social control theory. A second major focus is that deviant behaviour has elements of both stability (continuity) and change (discontinuity) within individuals. Thus a major hypothesis of informal age-graded theory of informal social control is: structural factors, mediated by informal social control processes, affect crime and deviance over the life-course. Sources of informal social controls, such as family, school, peers, siblings, spouses, employment, may change over the life-course. Informal bonds have the power to prevent or change deviant behaviour at any point in the life span of individuals. This departs from other criminological explanations of crime that focus on childhood factors and downplay or leave out adult factors, such as the general theory of crime (Gottfredson and Hirschi 1990). Age-graded theory of informal social control is a general theory of life-course offending, seeking to explain all types of crime and offenders (Sampson and Laub 2005).

Sampson and Laub (1990; 1993) followed a life-course strategy tracing the pathways from childhood and adolescent delinquency to adulthood crime and deviance. Sampson and Laub (1993: 8-9) based their life-course perspective on work by Elder (1985). Elder (1985:17) defined the life-course as "pathways through the age differentiated life span…[age differentiation] is manifested in expectations that impinge on decision processes and in course of events that give shape to life stages, transitions, and turning points." In other words, life transitions are age graded, and embedded in social institutions and understood in historical context (Sampson and Laub 1993: 8). Sampson and Laub (1993: 8) focused on the key concepts set out by Elder (1985; see also Elder et al. 2003) included: *trajectories*, the long-term pathways of development over the life-course; *transitions* the short-term life events, such as first job, or marriage; *turning points*, transitions may produce changes in the path of trajectories. Some transitions are age-graded while others are not. Life-course analyses focus on the ordering, timing, duration of major transitions and their impact on later social outcomes. Thus there is a connection between childhood experiences and development and later adulthood outcomes; however, these patterns can change based on shorter-term turning points. For Sampson and Laub (1993), the major turning points out of criminal pathways were *informal social bonds*. Furthermore, late onset may be attributed to a loss of informal social bonds in adulthood.

The focal point of Hirschi's (1969) social control theory is the concept of the *social bond*. Social bonds are internalized during socialization to create ties to the conventions of

society. Social bonds provide protection against delinquency, regardless of personality or psychological characteristics of individuals. Sampson and Laub (1993) drew heavily on the first two types of bonds in social control theory: attachment and commitment.

Attachment refers to the internalization of norms, including laws, morals, and values, is a function of socialization. Through this process, one's ties (attachment) to society are developed. Thus, those individuals who behave delinquently do not feel bound to the conventional norms of society, and are in turn, unconcerned with the expectations of the other members of society (Hirschi 1969). For *commitment*, Hirschi (1969) draws on Howard Becker's argument that individuals make choices knowing the consequences of their actions (Hirschi 1969). Since most people have commitments, they are able to reason that committing a crime is not in their best interest, and that they could be jeopardizing their reputations or jobs.

Unlike developmental theories of crime, aged-graded informal social control theory by Sampson and Laub (1993) emphasized the role of social processes for controlling or allowing delinquency to occur. Specifically, Sampson and Laub (1993) argued that structural and individual characteristics are mediated by informal family, school, and peer controls. The authors posited that although dominant institutions of informal social control change over the life-course (for examples, during childhood, families are dominant, during adolescence peers and school are dominant, and during adulthood, marriage and employment are dominant), *social bonds are important at every life stage*. The authors examined how bonds to individuals and social institutions inhibit deviance in

childhood and adolescence, and control behaviour in later adulthood. Changes in informal social control affect social trajectories because "pathways to crime and conformity are mediated by social bonds to key institutions of social control" (Sampson and Laub 1993: 18).

Sampson and Laub (1993) conceived of a dynamic model in which adulthood can be characterized by both continuity and change. *Adult social bonds* are theorized to be the main turning points for change. Adult social bonds to institutions such as marriage and employment are thought to decrease the risk of adult involvement in criminal activities. Bonds to these adult institutions are not enough to change one's life-course; the quality of the bonds is also important (social capital). *Social capital* refers to the interrelations created between individuals. Thus having strong bonds (i.e., stable jobs, close emotional ties and strong attachment to a spouse) is thought to be able to control and change an individual's behaviour in adulthood.

While the focal point of age-graded informal control theory is the quality and strength of social bonds, Sampson and Laub (1993) and Laub and Sampson (2003) also drew upon the literature regarding deviant *peer associations* (learning theory). Laub and Sampson (2003) argued that delinquent peer associations are important at all stages of the life-course, and are not limited to adolescence (see also Warr 2002). They argued that deviant peers are particularly attractive to individuals who have difficulty securing long-term employment and relationships. This perspective is based on social learning theory. Laub and Sampson asserted that peer relations at all ages are important for "structuring

routine activities and opportunities over the life-course" (2003: 38). According to Warr (2002: 40), the number of delinquent friends a person has, is the best known predictor of criminal behaviour. This has been determined over decades of research using several sources of data including official records, and self-report data. However, there is less agreement about the direction of the relationship; whether a youth is *influenced* by delinquent peers to become delinquent, or an already-delinquent youth *selects* delinquents to associate with. Warr's (2002) longitudinal research has provided support for the theory of delinquent peer influence. Thornberry et al. (1994) suggested that the relationship is bi-directional such that a youth will be influenced by delinquent peers and then go on to acquire more delinquent friends because of his or her delinquent behaviour. Haynie (2002) examined the nature of peer delinquency using a network analysis. She (2002: 124) found that for an individual's delinquency, the proportion of delinquent to nondelinquent peers was more important than the absolute number of delinquent peers by a peer group. Despite this, debate remains about the direction of the relationship regarding peers. Generally though, it is accepted that there is a strong association between crime and delinquent peer associations.

To address the question of peer selection verses influence most recently, Baerveldt, Völker, and Van Rossem (2008) studied *selection* of delinquent friends and *influence* of delinquent friends. Selection assumes that delinquents select friends who are similar to them ("birds of a feather flock together"). Peer influence is based on social learning theories where an individual learns and participates in delinquency as a result of influence by delinquent peers (Baerveldt, Völker, and Van Rossem 2008: 576-577).

Baerveldt, Völker, and Van Rossem (2008) studied friendship networks and delinquent behaviour longitudinally in 16 schools. The authors, using nested models, found that selection was significant in four of the schools, but that it varied widely between the schools. Influence, however was significant in all the schools, with little variation between the schools (Baerveldt, Völker, and Van Rossem 2008: 573-576). This suggests that peer influence is a "general phenomenon in all networks [while] selection seems to be dependent on the network or school context" (Baerveldt, Völker, and Van Rossem 2008: 577).

As mentioned already, a key feature of age-graded informal social control is that crime and delinquency is characterized by stability and change over the life-course. The following section further explores these concepts. Sampson and Laub (2005: 174) challenged theories that group offenders into types. They give attention to Moffitt's (1993) grouping of individuals as life-course persistent offenders. Sampson and Laub (2005: 16) disagree that there are causally distinct groups that have distinct trajectories. Thus their theory (Sampson and Laub 2005; Laub and Sampson 2003) is one of continuity and change over the life-course that can be understood through a general theory of informal social control emphasizing social bonds.

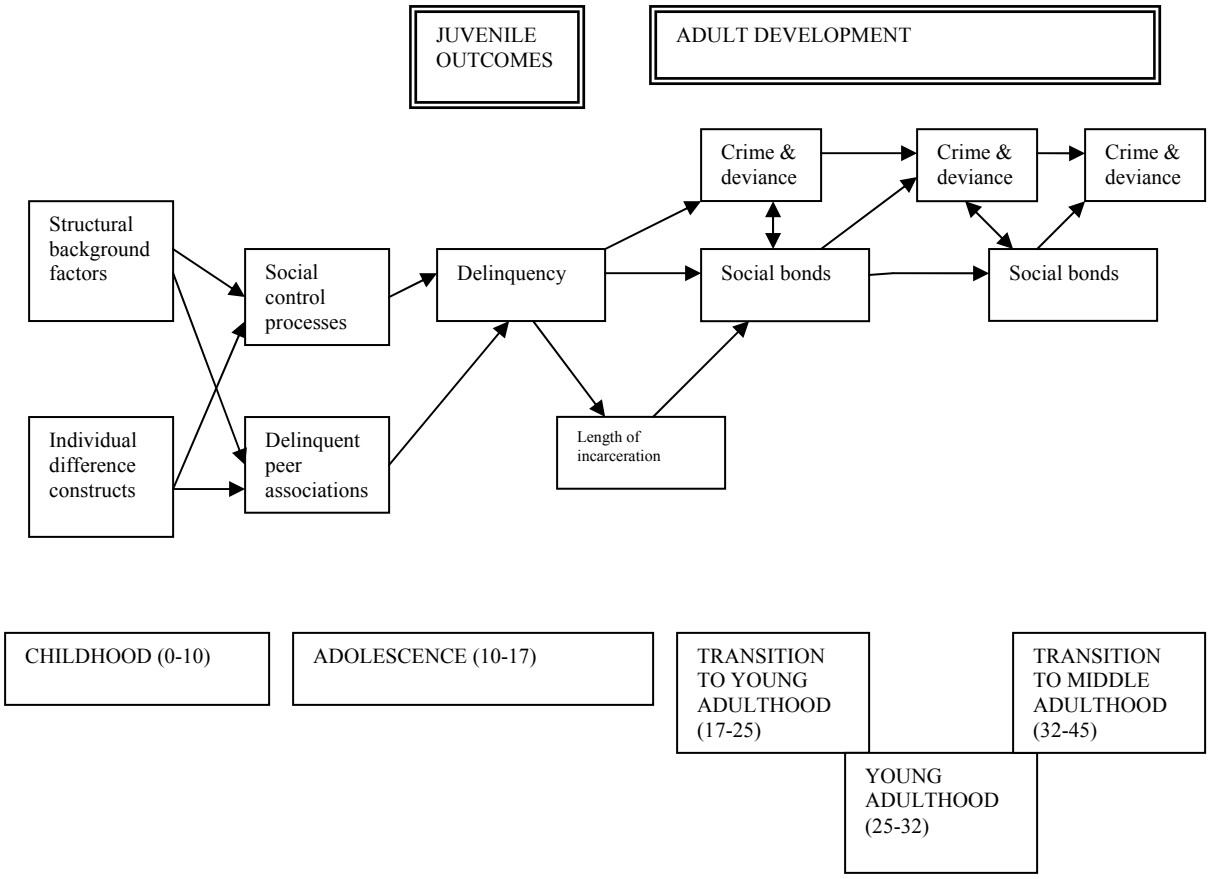
Sampson and Laub (1993) theorized there is strong *continuity* in childhood antisocial behaviour over the lifetime and that these behaviours manifest themselves in many domains. Sampson and Laub (1993) argued that behavioural stability is not the function of only the individual, but is fostered through weak social bonds. This continuity may be

homotypic (state-dependence) where behaviours exhibited in childhood are persistent and consistent into adulthood or *heterotypic* where childhood antisocial behaviours persist into adulthood but manifest themselves through several behaviours (i.e., the individual lacks a general self control such as drinking, job instability, and martial conflict). In other words, there are several antisocial behaviours that all express the same underlying antisocial propensity. This may lead to an underestimation of stability where some behaviour goes undetected. For example it may look as though one's delinquency has declined as a person moves into adulthood, but really his or her behaviour may have changed into a form that is less easily detected such as white collar crime. Continuity may be a result of ecological consistency that underlies individual level stability (Sampson and Laub 1993: 78).

The authors were also interested in explaining *discontinuities* (change) in deviant behaviour using sociological concepts. Sampson and Laub (2005) argued there are multiple pathways to desistence, all related to the process of informal social control. They point to key institutional and structural processes including marriage, work, neighbourhood change and employment in the military (Laub and Sampson 2003; Sampson and Laub 2005). All of these turning points appear to share the following characteristics: "*1) New situations that knife off the past from the present. 2) New situations that provide both supervision and monitoring as well as new opportunities of social support and growth. 3) New situations that change and structure routine activities. 4) New situations that provide the opportunity for identity transformation"* (Sampson and Laub 2005: 172, emphasis in original). Desistence is a process rather than an event and

can occur on many levels at once, including individual, situational, and community (Sampson and Laub 2005: 171). Thus, crime can be explained by examining individual trajectories, age-graded transitions and life events, within a sociological context.

Figure 2.1 Sampson and Laub's (1993: 244) Dynamic Theoretical Model of Crime, Deviance and Informal Social Control over the Life course (Adapted)



Adapted from Sampson and Laub (1993) *Crime in the Making*. London: Harvard University Press, p.244.

Empirical analysis of the theory was based upon data collected by Sheldon and Eleanor Glueck for their study *Unravelling Juvenile Delinquency* (Glueck and Glueck 1950;

1968). The data included a matched sample of 500 "persistent delinquents" and 500 nondelinquent boys from Massachusetts (Sampson and Laub 1993: 26). The sample of delinquent boys was taken from two correctional schools – the Lyman School for Boys and the Industrial School for Boys. The nondelinquents were selected from Boston public schools. All boys were white and ranged in age between 10 and 17. This is a limitation of the data because the sample is composed of all white males, yet delinquency is not limited to white males. Furthermore the sample wass assigned to groups based on non-random assignment, so there is potentially a threat to the internal validity of conclusions. Therefore tests of significance may not be reliable. Sampson and Laub argue that although the sample was non-random it appears "representative of the population of persistent official delinquents and generally nondelinquent youth in Boston at the time" (Sampson and Laub 1993: 26). Sampson and Laub (1993) used quantitative and qualitative methods in their analysis (logistic regression, structural equation models and Cox proportional hazard models and life histories including the in-depth analysis of eight unique / complete cases, and 70 reconstructed life histories) all from the Gluecks' delinquent sample.

The samples of delinquent and nondelinquent boys were matched on age, birthplace of parents, neighbourhood and household characteristics (underprivileged neighbourhood or not) and intelligence. Data were collected between 1939-1948 through interviews with the boys, their parents, schools, employers, neighbours, and criminal justice / social welfare employees. The Glueck interviews collected self-report delinquency data from the boys, their parents and school teachers. The original sample was followed up at two

points in time; when the boys were 25 years old and again when they were 32 years old. These follow-up interviews took place between 1949 and 1963. Approximately 88 percent of the delinquents and the nondelinquents were available for all three data collections (Sampson and Laub 1993: 28-31).

The authors found the largest share of variance explaining adolescent delinquency was *social process,* specifically family process -supervision, attachment, discipline (Sampson and Laub 1993: 96). Also, school attachment and peer attachment had a large direct impact on delinquency in the direction expected. Attachment to siblings was not significantly associated to delinquency. They found evidence that both structure and process contributed to delinquency when structural conditions are poor (low SES, family disruption), youths' ties to family and school also seems to be weaker, contributing to increased delinquency. Both delinquents and nondelinquents showed a great deal of both homotypic and heterotypic continuity in behaviour across several life domains such as crime, military offences, marital conflict, and economic dependence (Sampson and Laub 1993).

The authors found a great deal of consistency in offending as well as other antisocial behaviours (such as excessive drinking) from adults who had been delinquent in earlier years (as other previous research also found). Their analysis also found evidence in support of modifications to antisocial trajectories given new age-relevant social bonds. Individuals with strong commitment and attachment to a spouse and to work were likely to be nondelinquent, regardless of whether they were in the delinquent group or control

group. Thus Sampson and Laub (1990: 625) argued that quality of social bonds to adult institutions can explain variations in crime despite an antisocial childhood.

2.4 Limitations and Implications of Criminal Careers Research, Developmental and Life-Course Theories of Crime

The research design for these studies requires longitudinal studies which are costly and time consuming to collect, so there are relatively few existing data sources for this kind of research. Cross-sectional designs which are much more accessible are useful for between-individual designs; however the focus of most DLC research is within-individual development.

Within developmental theories and life-course theories of crime, there is considerable variation in the proposed risk factors for onset, continuity and desistence in offending. Some theories include motivations for offending (eg., Farrington), while motivation and opportunities are considered inconsequential by others (eg., Sampson and Laub). The role of social relationships, community characteristics, personality factors, consequences of labeling and of strain, provides further sources of variation between developmental and life-course theories. One thing these theories have in common is need to understand crime and deviance throughout the lives of individuals.

Although age-graded informal social control theory incorporates structural characteristics into the model of crime and deviance (where the effect of family socioeconomic status, and family mobility on delinquency is mediated by social control), there is a lack of

broader community context which may further enrich the theory. Elder et al. (2003) emphasized the important of context when understanding pathways and turning points. A substantial body of research in criminology has shown that ecological factors are important for understanding crime rates. Ecological factors, or community characteristics, include community socioeconomic status, community residential instability, and the heterogeneity of communities (Jacob 2006). These factors allow for a broader understanding of the conditions in which social bonds are able to develop. When a community is disorganized, that is, unable to regulate itself, it impedes the development of social ties. Thus regardless of individuals' income, or mobility, if the community is unable to support individuals or provide resources to families in a community, it may hinder the ability of other social institutions to foster social bonds.

One limitation of the Glueck data used by Sampson and Laub (1993) is the lack of variation in community characteristics. All the boys in the sample were selected from poor neighbourhoods, so there was no real opportunity to assess the impact of different communities. Sampson and Laub (1993: 64) question how boys from poor neighbourhoods sometimes become serious and persistent delinquents, while other boys from poor neighbourhoods do not become serious and persistent offenders. Collective efficacy shows that even weak ties to a community can improve informal social control. Thus examining macro-structural characteristics may shed light on the context in which micro-level social ties develop. Given the importance of this structural context, I propose including collective efficacy within an age-graded theory of informal social control.

Using a life-course perspective, I will assess how childhood social development relates to teenage and early adult offending, emphasizing the quality of social bonds throughout a person's life. Social capital, embodied in relationships within families, communities, peer groups and other institutions is a key feature of social bonds. Given weak or negative social bonds (delinquent peers); antisocial behaviours developed in childhood may persist and lead to criminal behaviour in teenage years and into adulthood. Informal social control through social bonds may mediate delinquent behaviours and allow teenagers and adults to desist from a life of crime. Furthermore, community collective efficacy and community social disorganization may be important factors in understanding the conditions under which the social bonds are developed, maintained, or broken.

2.5 Summary of Theory and Literature

Social disorganization theory, an ecological (community-level) theory, examines how a community regulates itself through informal social control. Five community characteristics are thought to impede the ability of residents to work together to control youth crime informally: socioeconomic status, residential instability, ethnic heterogeneity, urbanization, and supervision (Jacob 2006; Sampson and Groves 1989; Shaw and McKay 1969). New directions in disorganization research focus on the processes involved in the development of social cohesion: social capital and collective efficacy (community level). *Social capital* is a resource that is realized through social relationships (Portes 1998). *Collective efficacy* refers to social ties "among neighbours combined with their willingness to intervene on behalf of the common good" (Sampson et al. 1997:918). Sampson (2006: 49) suggests that neighbourhood conditions exert their

main influence on stressors in childhood, and in turn, these influence later adolescent and adult outcomes.

Life-course theories of crime (Elder 1985) study issues of crime over time such as, onset, continuity, and desistence in offending. Sampson and Laub (1993) proposed a theory of *age-graded informal social control and criminal behaviour*, emphasizing the quality of social bonds throughout a person's life. Pathways into and out of delinquency are shaped by turning points (social bonds). Social capital, embodied in relationships within families, communities, peer groups, and other institutions is a key feature of social bonds. When bonds are weak, crime may arise. Deviant behaviour is characterized by both *stability* (continuity) and *change* (discontinuity) within individuals, because social bonds may change over time. Support for this theory was gained by Sampson and Laub (1993) with longitudinal data collected by Sheldon and Eleanor Glueck in 1939 -1948 and followed up between 1949- 1963 (Glueck and Glueck 1950; 1968).

The present study applies a sociogenic approach to understanding antisocial behaviour over the life-course. This is a life-course analysis of informal social control of crime and delinquency, with attention to family and community background characteristics. Specifically, I draw on Sampson and Laub's (1993) theory of integrated age-graded informal control to the study of crime and delinquency. I focus on: (1) the direct and mediating role of informal social control at various life stages through institutions including family, school, work, peers, and community; (2) the impact of early community social disorganization and background family characteristics on informal social control

and antisocial behaviour over time. This approach entails the development and change of antisocial behaviour given informal social control over the life-course, set in a context of family and community. I examine how various forms of informal social control relate to continuity and change in crime and delinquency over the life-course by integrating age-graded informal social control theory, social capital theory, collective efficacy, and social disorganization theory.

2.6 General Research Questions

The general hypothesis of this dissertation is that antisocial behaviour has elements of both stability (continuity) and change (discontinuity) over time. My investigation focuses on *four main questions* related to understanding development, continuity and change in antisocial behaviour based on age-graded informal control theory (Sampson and Laub 1993).

First, what is the role that institutions of informal social control play in the development, continuity and change in antisocial behaviour over the life-course? *Second*, how do these institutions of informal social control mediate the impact of broader community conditions, and early family characteristics on pathways of antisocial and delinquent behaviour? *Third*, how do institutions of informal control work together to directly and indirectly regulate antisocial behaviour? *Fourth*, does the importance of informal social control from various sources change over time?

The following section includes a list of general research questions by life stage followed by a diagram (Figure 2.2) showing the general conceptual model for this dissertation. The emphasis is on the relationship between informal social controls and antisocial behaviour over time.

I. Influences on Childhood Antisocial Behaviour

1. Are childhood informal controls the primary mechanism in the regulation or development of childhood antisocial behaviour?
2. Do sources of informal control mediate the relationship between background characteristics (of the community and family) and childhood antisocial behaviour?
3. Are some sources of informal control more important than others for regulating childhood antisocial behaviour?
4. How are childhood sources of informal control interconnected? For example, is the informal control exerted by school bonds stronger when ties to the family are strong?

II. Continuity and Change in Antisocial and Delinquent Behaviour during Adolescence

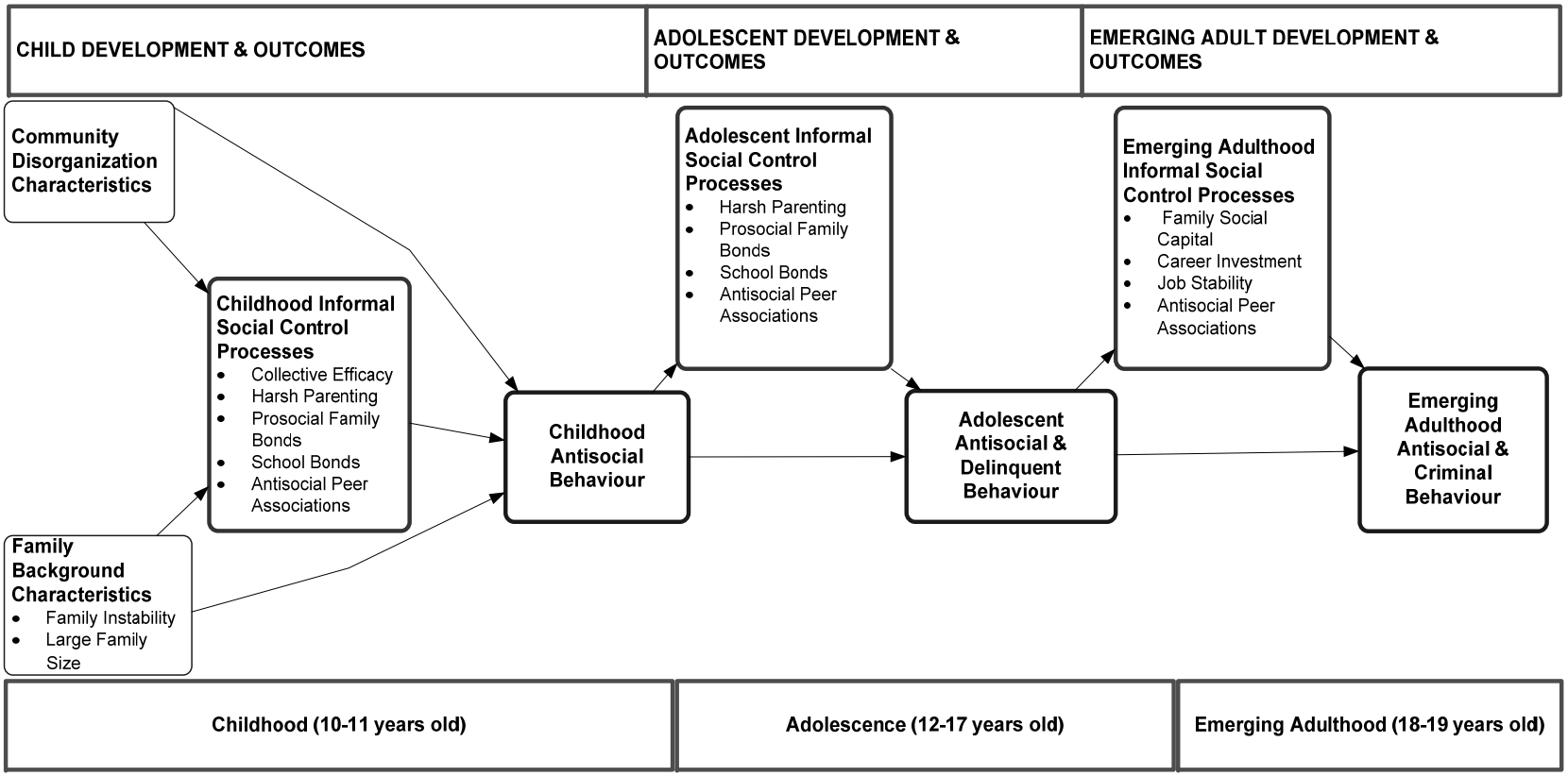
5. Is there continuity in antisocial behaviour from childhood to adolescence?
6. Does childhood antisocial behaviour mediate relationships between childhood informal controls and childhood background characteristics, and adolescent delinquent and antisocial behaviour?
7. Regardless of antisocial propensity, can adolescent sources of informal control account for changes in antisocial behaviour during adolescence?

8. As individuals age, does the importance of various sources of control (family, school, peers) change?
9. Do some adolescent sources of informal social control partially mediate the effects other sources of informal control on adolescent antisocial behaviour?

III. Continuity and Change in Antisocial Behaviour during Emerging Adulthood

10. Is there continuity in antisocial behaviour from childhood and adolescence into adulthood?
11. Does adolescent antisocial behaviour mediate the relationships between childhood background characteristics and prior informal controls, and emerging adulthood criminal and antisocial behaviour?
12. Regardless of antisocial propensity, can adult social bonds account for changes in antisocial behaviour during the transition to young adulthood?
13. Do some adult social bonds partially mediate the effects of other adult sources of informal control on antisocial behaviour in the transition to young adulthood?

Figure 2.2 General Conceptual Model. Pathways of Antisocial, Delinquent and Criminal Behaviour: A life-course model of informal social control



Chapter Three: Data Source and Sampling

3.1 Purpose

In this chapter the data for the analysis are discussed in detail. This study examines social processes (social bonds, social capital, and collective efficacy) as they relate to childhood, teenage and emerging adult antisocial behaviour. Specifically this dissertation examines how social bonds (embodied in relationships within families, communities, peer groups and other institutions) lead to stability (continuity) and change (discontinuity) in antisocial behaviour over time. The analysis is based on self-report panel data from the National Longitudinal Survey of Children and Youth (NLSCY) following Canadian children aged 10-11 (cycle 1, 1994-1995) through to emerging adulthood (aged 18-19, cycle 5).

3.2 Data Sources

This study includes microdata from the National Longitudinal Survey of Children and Youth (NLSCY). Statistics Canada and Human Resources Development Canada (HRSDC) developed the NLSCY to monitor biological, social, and economic characteristics of children and youths. Participants are asked a range of questions relating to family, social and community resources as well as childhood misconduct and aggressive behaviour. HRSDC and Statistics Canada began data collection in 1994 (Cycle 1) and intend to collect information on the *same* children on a bi-yearly basis until they reach the age of 25.

The target population of this analysis is a nationally-representative sample representing a birth cohort (born in 1984-1985) and are 10 to 11 years-old in the first cycle of the NLSCY (1994-1995), and who are 18-19 years old in Cycle 5 (2002-2003). These youths filled out the self report-surveys for each of the five cycles. In Cycle 5 there is a youth questionnaire for young adults aged eighteen and over.

At the time of the analysis, six cycles of the NLSCY had been released. The raw, unsuppressed data of all Cycles are not available for public use for reasons of confidentiality. These data are however available for Statistics Canada approved research projects within Research Data Centres (RDC), one of which is located in the University of Waterloo (the South-Western Ontario RDC). Only the data available within the RDC are adequate to support the complex longitudinal analysis required to investigate my research propositions. The microdata files are important not only for access to the longitudinal files, but also for access to complex survey design information, important for improved ability to estimate variance (e.g., funnel weights, bootstrap weights). Although six cycles are available, the antisocial, crime and delinquency questions are only included to Cycle 5 (18-19 years old), and therefore this study does not include Cycle 6.

The Five Cycles included in this analysis are:

- Cycle 1: December 1994 – April 1995 (Available in Public Use[1] and Research Data Centre, RDC[2])

[1] Although Available for Public Use, several variables are suppressed

- Cycle 2: December 1996 – April 1997 (Available in Public Use and RDC)
- Cycle 3: December 1998 – April 1999 (Available in Public Use and RDC)
- Cycle 4: December 2000 – April 2001 (Available in RDC only)
- Cycle 5: December 2002 – April 2003 (Available in RDC only)

The NLSCY data being used for this dissertation are a longitudinal panel design. The 1984-1985 birth cohort is followed from 10 to 19 years old. Additional information is linked to the NLSCY from the Canadian Census. The Census of Canadian population is taken on a quinquennial basis, enumerating all people living in the country. Information on the population, such as education, income, residence, employment and family status are collected.

3.2.1 Construction of the Database

For this analysis, the first five cycles of the NLSCY were merged by matching the child identification number at each cycle. The data within each cycle originated from multiple sources. For example, in Cycle one, from the age of 10, children answer a separate questionnaire and their answers are contained in one file. The Person Most Knowledgeable (PMK), from whom the data concerning family background and community information are contained in a main NLSCY file. A third file contained the 1991 Canadian Census information. The relevant data were integrated into a single

---

[2] Variables are not suppressed in RDC

dataset. The file structures varied across each cycle, but in each case, data from more than one file were integrated.

3.3 Sampling

3.3.1 NLSCY Sample Selection and Collection

The sampling design (Statistics Canada 1995a) for the NLSCY is the Labour Force Survey (LFS). The total sample selected was 1994 is 22,831 children; 2,343 of these children were aged 10 to 11. The sampling technique is a random multistage cluster sample, with households as its sampling unit. All individuals within the units, who are eligible, are part of the LFS sample. The primary strata are provinces; secondary are combinations of LFS strata (outside Northwest Territories). In order to ensure a sufficient sample size (to produce reliable estimates) over-sampling of the smaller provinces was done to include all ten provinces. Thus the sample size is not proportional to stratum size within provinces. In addition, measures were taken to ensure that large enough samples were taken for each of the seven age groups: 0 to 11 months, 1, 2 to 3, 4 to 5, 6 to 7, 8 to 9, and 10 to 11 years. 0 -1 year-olds were over sampled as per survey objectives. Greater detail on the sampling technique and the related implications for the analysis is given in Appendix A.

The data were collected through computer assisted interviewing, and paper and pencil questionnaires. Information included demographic characteristics of all household members. For the *child* and *adult components*, the PMK (Person most knowledgeable) was interviewed about children aged 0-11 (in Cycle 1). The PMK also answered

questions relating to the child's and family's: Education, health, medical and biological information, mother's work after the child's birth, child's development, temperament, literacy, communication, activities, behaviour, positive behaviour, sleep habits, motor and social development, relationships, parenting, custody, expectations (aspirations), socio-demographic characteristics. The *adolescent component (added in Cycle 4),* asked *16-17 year olds* about: education, labour force, income, health, activities, relationships, civic participation (volunteering). The *Self-complete Questionnaires – ages 10-11, 12-13, 14-15, and 16-17* included separate booklets for each age group. Generally including questions about themselves, their thoughts, feelings, behaviours (including delinquent activities, drugs and alcohol use), Parents, Dating and Health. The *Youth Questionnaire* is used in Cycle 5 for the youths aged *18 and older*. This questionnaire included detailed questions on employment, education, relationships (marriage), goals and aspirations, community involvement, and antisocial behaviours such as excessive drinking, drug use, and anger. Finally, there was a school section with (1) a t*eacher component* including questions about academic performance, behaviour, atmosphere in school, teaching style for children in kindergarten to 11 years old. (2) a *principal component* regarding school policies. The focus of my analysis is the social and demographic information from the PMK and the self report data from children and adolescents.

3.3.2 Unit of Analysis

The unit of analysis is individuals from the birth cohort who were 10 - 11 years old in Cycle 1 of the NLSCY. The focus of this study is the individual-level self-report data rather than official data collected by formal measures. David P. Farrington, Patrick Jolliffe, J. David Hawkins, Karl G. Hill and Rick Kosterman (2003) undertook a study

comparing self-report and official delinquency careers. The authors concluded that self-report and official data sometimes have similar conclusions regarding criminal careers. Similarities in patterns include increasing offending with age (Farrington et al. 2003:940), significant continuity in offending with both sources of data (Seattle Social Development Project, a prospective longitudinal survey and official court records), though was more prevalent with official data (Farrington et al. 2003:944-945). Interestingly, Farrington et al. (2003:946-947) found that the prevalence of chronic offenders was higher in self-report data than in court data.

Although the data were collected at the individual (child) level, a multi-level model is of theoretical interest in this study. For each individual, Census information about his or her neighbourhood was included at the Census Enumeration Area level (EA). The EA is a small area and represents roughly one or two neighbouring blocks. One strategy of analysis might have been to examine differences in antisocial behaviour between and within communities. According to research using the NLSCY in Canada by Foster et al. (2001) and Jones et al. (2002) it is possible to aggregate these enumerated areas to the neighbourhood level. Jones et al. (2002: 22) did this aggregation in a few ways. First, they aggregated the judgments of the neighbourhood by the PMK and by the interviewer to the 1996 EA based on the household postal code. Second, the authors attached 1996 Census data to the child records. To increase the reliability of their estimates, Jones et al. (2002: 25) averaged the scores of the neighbourhood questions for Cycle 1 and Cycle 3 (Cycle 2 did not include neighbourhood questions), on the assumption that little had changed in the neighbourhood ties in the four years. Aggregation was done when an

enumeration area included PMK judgments from at least six respondents. Although the number of respondents appears somewhat random, the authors chose that level arguing that six respondents is a minimum number of households for adequate reliability (Jones et al. 2002: 25). Neighbourhoods with fewer than six households were discarded from their analysis (Jones et al. 2001: 25) leaving only a subset of 200 neighbourhoods, rather than a nationally-representative sample.

After undergoing a labour-intensive process of matching households by EA for this dissertation, in order to model differences between and within communities, it became clear that multi-level modeling was impractical. A frequency table (Table 3. 1) of neighbourhoods in the sample being studied in this dissertation reveals that 98% of neighbourhoods have only one or two households, just over 1% of neighbourhoods have three households and less than 1% of neighbourhoods have four households. Overall the 1081 households in this sample are located in 959 neighbourhoods, with nearly 80% of neighbourhoods containing only one respondent household. Where there are two, three or four households located in the same neighbourhood, treating these variables at the individual level does not create an ecological fallacy because these Census variables are characteristics of the neighbourhoods that individuals live in. Furthermore, for a multi-level model to be reliable there needs to be several cases for each neighbourhood (Jones et al. 2002).

Analysis of Variance (ANOVA) models were run to examine between-neighbourhood variance on this NLSCY sample for each of the dependent variables, and the results

indicate that the between-neighbourhood variance is small and not significant. Thus, although there is some clustering of households in neighbourhoods (1081 households in 959 neighbourhoods, Table 3.1), the Census variables are examined as characteristics of neighbourhoods that individuals live in (Fitzgerald and Carrington 2008: 534). Clustering may however affect the standard error. To account for any affects of non-independence of neighbourhoods, design effect is taken into consideration in Section 3.3.4 (Weighting the Data).

Table 3. 1 Neighbourhood Clustering: Percentage of respondent households located in an Enumerated Area (EA)[a]

# of households in a neighbourhood (EA)	% of households in a neighbourhood (EA)
1	78.4%
2	19.3 %
3	1.8 %
4	0.5 %
Total number of neighbourhoods (EAs)= 959	

[a]Based on N (individuals) = 1081, standardized funnel weights

Neighbourhood context may have direct impact on antisocial behaviour because characteristics of community disorganization contribute to a stressful environment and may provide opportunities for deviance. These stressors are expected to have their main influence on childhood antisocial behaviour outcomes, in turn, indirectly affect later adolescent and adult outcomes (Sampson 2006: 49). Disorganization may further impact antisocial behaviour, indirectly by disrupting community cohesion, interactions within families, schools and peer associations (Lösel and Bender 2003).

3.3.3 Attrition and Missing Data

a) Attrition

In Cycle 1 information was collected on 22,831 children, representing an 87% response rate. Of those children, 2,425 (Table 3.1) were 10 to 11 years old in Cycle 1 (1984-1985 birth cohort). In Cycle 2 the cumulative, longitudinal response rate for households in the original cohort was 80%, but was nearly 92% for the 1984-1985 birth cohort. In Cycle 3, the cumulative, longitudinal response rate for households in the original cohort was 78% and 88% for the 1984-1985 birth cohort. In Cycle 4, the cumulative, longitudinal response rate for households in the original cohort was 69% and 77% of 1984-1985 birth cohort. In Cycle 5, the cumulative, longitudinal response rate for households in the original cohort was 67% and 68% for 1984-1985 birth cohort (Statistics Canada 2006a). The overall response rate for the 1984-1985 birth cohort that responded to every cycle was 58% (Table 3.2).

Table 3.2 Unweighted Longitudinal Response Rate for Children Selected in NLSCY, for sample aged 10 and 11 in Cycle 1

Cycle 1		Cycle 2		Cycle 3		Cycle 4		Cycle 5		All Cycles	
Age	# of Respondents	# of Respondents	% of Cycle 1	# of Respondents	% of Cycle 1	# of Respondents	% of Cycle 1	# of Respondents	% of Cycle 1	# of Respondents	% of Cycle 1
10 & 11	2,425	2,225	91.8	2,141	88.3	1,878	77.4	1,650	68	1,417	58.4

Source: Statistics Canada (2005b) *National Longitudinal Survey of Children and Youth, Cycle 5 - User Guide*, p106

b) Non-response

The NLSCY is subject to non-response, both total non-response and partial non-response. Total non-response occurs when there are no data available for a selected person in the

sample. When the respondent refuses to participate in the survey or cannot be contacted. According to Statistics Canada (2006a:170) survey weights account for these cases and correct the data. Partial non-response occurs when participants leave out some responses. Survey weights for the most part do not account for this. Thus if ignored, or mistreated, partial non-response can lead to biased estimates. There are several ways that partial non-response can be dealt with: (1) by re-weighting the data, (2) with imputation and (3) with model non-response information.

Fitzgerald (2003) used imputation to deal with partially missing data in her cross-sectional analysis of the NLSCY. Many of the study's concepts (school commitment, victimization, and delinquency) were measured as composites of several questions, and to ensure no questions were omitted as a result of only partial answers, Fitzgerald used the mean of responses in the scale that the respondent did answer and applied that mean to the other questions in the scale. This was only done for respondents who had answered at least half of the questions in a scale (Fitzgerald 2003: 7). Her analysis revealed that "imputing scores for those who answered at least 50% of the items in a scale provides a reasonable estimate of the score that would have been obtained if all items were answered. This imputation method served to decrease the non-response rate, without altering the results for models fitted in this study" (Fitzgerald 2003: 7).

Another study by Sprott et al. (2000) using the first two cycles of the NLSCY pointed to two forms of missing data: youths who did not respond to any of the delinquency questions, and youth who provided only partial responses to the delinquency questions.

To deal with this non-response, Sprott et al. (2000: 21), retained respondents that had answered at least two thirds of the delinquency question and for the questions they were missing, substituted the modal category of responses (i.e. that respondents did not engage in the delinquent behaviour).

This dissertation also employs mean substitution to address item non-response; however, this decision was made only after investigating the missing data using several techniques. First, imputing the PMK's response to antisocial behaviour items left missing by the child was considered. While this seems reasonable, there are some limitations. First, correlational analysis indicated a low correlation between Person Most Knowledgeable responses and the child self-report responses, where both PMK and child responded to items. Second, the PMK only responded to the antisocial behaviour items (and other items in the self-report measures used in this analysis) in Cycle 1, so this option was not available after 10-11 years old.

Next, mean substitution was considered, following procedures found in previous research on the self-report data from the NLSCY. This was not undertaken lightly because as Kamakura and Wedel (2000: 498) suggest, this can systematically underestimate covariances. Using factor analysis, factors among the items in antisocial behaviours (at every age) with mean substitution were tested against a factor analysis of the same items using listwise deletion. The results suggest that with listwise deletion, the correlations were artificially high and factor scores were low. In STATA, a Tobit model was run to assess the amount of non-response.

Choosing which level of response was the next step. Fitzgerald (2003) used mean substitution where an individual had responded to at least 50% of the items in a scale, while Sprott et al. (2000; 2005) used mean substitution where there was at least two thirds response. The difference in sample size for those who responded to at least 50% was compared to those who responded to at least 75% of the items in the childhood antisocial behaviour scale and found a difference of only 39 respondents. A comparison of component matrices of mean substitution and listwise deletion and suggested that they were very similar. Mean substitution of each of the 24 items in the childhood antisocial behaviour for three scenarios were run for: (1) 50% item response, (2) two-thirds item response and (3) 75% item response. Inter-correlations and factor analyses for each of these response levels were compared and the results suggest that the strength and direction of the correlations are very similar.

These variables were also run in logistic regression models to determine if there are certain types of people who were more likely not to respond. Several socio-demographic characteristics, including gender, lone-parent household, population size, family socio-economic status and family homeownership were regressed on the log-odds that a person responded to (1) 50% of antisocial behaviour items, (2) 66.67% of antisocial behaviour items, (3) 75% of antisocial behaviour items, and (4) 100% of antisocial behaviour items. The results suggest no difference between the characteristics of 50% non-responders, two-thirds responders and 75% responders. For all of these models, males, and those not

living in owned homes had a higher odds of non response. Odds of less than 100% response were higher for boys and those living in low socio-economic families.

To further test the reliability of the mean substitution, OLS regression models of antisocial behaviour scales were run (1) without mean imputation (and deleted as listwise deletion for 50%, 66.67%, 75%, 100% response levels) (2) with mean imputation (50%, 66.67%, 75% response levels). First, background community and family characteristics (gender, lone-parent household, population size, family socio-economic status and family homeownership) were regressed on antisocial behaviour scales for each partial response level, using listwise deletion, and had similar results in the strength, direction, and significance in the coefficients between the levels of response. This was repeated for models with mean substitution for 50%, 66.67%, and 75% partial response levels. The results suggest that the same characteristics were significantly related to antisocial behaviour for each of the mean substitution models. In other words, the models were almost identical for those who responded to 50%, 66.67%, and 75% of the antisocial behaviour items. Finally, the mean substation regression models were compared to a model using only people who responded to all of the items in the antisocial behaviour scale. Again, all models produced similar regression coefficients (strength, direction, and significance). These OLS regression models were run for the first four cycles of antisocial behaviour, and found similar outcomes in patterns of response between the models. These finding are consistent with Fitzgerald (2007) who used the NLSCY to examine neighbourhood contexts of parental, social support and child outcomes. Fitzgerald (2007: 60-61) found that partial responders (to at least 50% of items) did not

significantly differ from those who responded to all scale items in terms of socio-economic and demographic characteristics.

Therefore, to avoid losing respondents who responded to most, but not all questions, the mean score of the items that they did answer, was imputed for the items that they did not answer. This was only done for those who answered at least two thirds of the items in a given scale. For example, childhood antisocial behaviour is comprised of 24 items[3], so a person would have to have answered at least 16 of the 24 questions. Then the average score of the 16 (or more) questions would be applied to 8 (or fewer) items that the individual did not respond to. Imputation based on the partial response to two-thirds of items, represents a reasonable method of reducing non-response and preserving the sample size without altering the model estimates (Fitzgerald 2003: 11; 2007: 61). Given the relatively marginal difference in number of respondents, between two-thirds and 75% response, the more conservative response level of two-thirds was employed, and the response level that has been used in other research with the NLSCY (Sprott et al. 2000; 2005). The number of cases and the scales in which mean substitution was applied, are detailed in Table 3.3.

In Table 3.3, the first level of response column (100% response) shows the percentage of individuals who responded to every item in the composite scale. In all cases, at least 59% of individuals responded to 100% of the items, and in most cases at least three quarters of

[3] Complete operationalizations of concepts can be found in Chapter 4

the sample responded to 100% of the items. In the second response column (66% to 99.99%) in Table 3.3, the percentages of individuals in the sample for which mean substitution was applied is shown. In most cases, fewer than 5% of individuals had mean substitution, though for antisocial behaviour mean substitution was applied from approximately 12% to about 25% of individuals. The final column in Table 3.3 shows the percentage of the sample that was dropped from the analysis for responding to fewer than 66% of the items on a scale, and for whom, mean substitution was not applied.

Table 3.3 Mean Substitution and Missing Data

		Percentage of sample response and (action taken)		
Variables[a b]	number of items	100% response (no mean substitution required)	66% to 99.99% response (mean substitution applied)	less than 66% (and therefore excluded) (no substitution, cases dropped)
Cycle 1 N=2,343				
1. Antisocial Behaviour	24	73.7%	12.3%	14.0%
2. Harsh/Erratic Parenting	6	79.9%	3.7%	16.4%
3. Attachment to family	5	79.5%	4.8%	15.8%
4. Parent supervision	4	82.1%	2.9%	15.0%
5. School bonds	4	83.7%	3.0%	13.2%
7. Peer substance use	3	77.5%	5.1%	17.4%
Cycle 2 N=2,262				
1. Antisocial Behaviour	22	76.8%	12.6%	10.6%
2. Harsh/Erratic Parenting	6	82.2%	4.4%	13.4%
3. Attachment to family	5	59.5%	28.1%	12.4%
4. Parent supervision	4	83.7%	5.5%	10.9%
5. School bonds	4	86.2%	13.8%	9.9%
6. Peer substance use	3	74.5%	25.6%	14.3%
Cycle 3 N=2,188				
1. Antisocial Behaviour	22	59.0%	23.5%	17.5%
2. Harsh/Erratic Parenting	6	76.9%	3.4%	19.7%
3. Attachment to family	5	59.2%	21.4%	19.4%
4. Parent supervision	4	79.2%	2.0%	18.8%
5. School bonds	4	79.2%	3.8%	17.0%
6. Peer substance use	3	82.3%	0.8%	16.8%
Cycle 4 N=1,911				
1. Antisocial Behaviour	27	59.4%	15.8%	24.9%
2. Peer substance use	3	73.8%	1.3%	24.9%
Cycle 5 N=1,684				
1. Antisocial Behaviour	13	71.8%	18.2%	10.0%
2. Peer substance use	3	91.5%	2.8%	5.7%
3. Career Investment scale	10	95.0%	0.0%	5.0%

[a] All variables were summed to create scales, except peer substance use which is a binary yes or no variable
[b] All variables (concepts and indicators) are described in detail in Chapter 4.

3.3.4 Weighting the Data

Sprott et al. (2000) applied standardized (also known as normalized) longitudinal weights (person weight/average weight) to the data to approximate the actual sample size for estimation of population parameters (Sprott et al. 2000: 21). Longitudinal weights account for "unequal probabilities of sample selection including non-response due to sample attrition" (Hotton 2003: 8). In Cycle 5, there are two types of longitudinal weights: (1) longitudinal weights and (2) funnel weights. The longitudinal weights represent the original sample in Cycle 1. These weights are appropriate when a researcher wants to study individuals in Cycle 5 who were part of the Cycle 1 sample, but does not really care about Cycles 2, 3, or 4. The funnel weights represent respondents who respond to all cycles (1 through 5). These weights are appropriate when responses to all cycles are important for the analysis (Statistics Canada 2005: 185). According to the Cycle 5 User's Guide (2005: 185), the estimations based on these two weights on "some key variables…by either set are very similar." Since this dissertation uses data from all of the Cycles, the funnel weight is most appropriate. In addition, the funnel weight was standardized (person weight/average weight for sample). Standardized (or normalized) weights are rescaled survey weights that approximate the actual sample size for estimation (Sprott et al. 2000).

Design effect (DEFF) is another issue that affects the NLSCY. Design effect increases the sampling error due to the survey's complex sampling design (Singh 2007: 118). The NLSCY sample was not collected from a simple random sample, and the use of a complex sampling procedure affects the probability of selection (Singh 2007:118). The

result of the complex sampling design is that the "complex sampling design has sampling errors much larger than a simple random sample of the same size" (Singh 2007: 118). The implication of this is that the complex sample design requires a larger sample than a simple random sample in order to have roughly equal sizes of sample error. The sample for the NLSCY has already been collected, so it is not possible to increase the sample size to adjust for the increased sampling error. Instead, the sample size will be reduced to adjust for the inflated sampling error (Singh 2007). In order to explain how the adjusted sample size was arrived at, bootstrapping for variance estimation will first need to be explained. Then the calculation of the reduced sample size will be addressed.

Fortunately, one method of dealing with sampling error in a complex sample design is by applying bootstrap weights. Bootstrap weights improve the reliability of parameter estimates. Statistics Canada provides bootstrap weights for the NLSCY. Bootstrap weighting is a method of estimation that involves the re-sampling of the data to approximate a random sample. The bootstrapping technique estimates parameter values and their associated standard errors. The resulting estimation is considered a non-biased estimator (Singh 2007:109). Bootstrapping generates "subsets of the data on the basis of random sampling with replacements, which ensures that each set of data is equally represented in the randomization scheme… the original sample is compared with the reference values to get the exact p-value" (Singh 2007: 109). Due to the way that bootstrap weights estimate parameters, the technique is well suited to statistical methods such as OLS regression. The structural equation models, which are the focus of the

analysis, are estimated from a correlation matrix in LISREL, rather than the raw data that are required for the bootstrap technique in order to resample.

In order to estimate the design effect for the sample used in this analysis, two sets of OLS regressions (Table 3.4) were estimated. To determine the design effect the regressions were modeled as close to the structural equation models as possible. Specifically, three sets of regressions were estimated:

a. Childhood antisocial behaviour (dependent variable)

b. Adolescent antisocial behaviour (dependent variable)

c. Emerging adulthood antisocial behaviour (dependent variable)

All the variables used in each structural equation model as the independent variables (Table 3.4) were regressed on the dependent variables (all the variables are discussed in detail in Chapter 4). Each regression was estimated twice: once as an unweighted[4] OLS regression and once as a bootstrapped OLS regression. OLS regression was selected because the models can be run with and without bootstrap weights applied to them. OLS regression was also selected because it closely approximates the models used in the structural equation models in the analysis chapters (this will be discussed in Chapter 5). The advantage of this is that the estimates of the coefficients will be identical for the weighted OLS model as they are for the unweighted model. The ratio of difference between the models is an estimate of the design effect. The unweighted model reflects the complex sampling design with larger sampling errors. The bootstrap weighted OLS

[4] All data have normalized funnel weights (which account for sample attrition) applied. Unweighted refers to no additional weights to account for the design effect.

model reflects the adjusted sampling error accounting for the complex sampling design. The design effect is compared using a ratio "of variance estimated using a complex survey design to variance estimated using a simple random sample. Design effect is a coefficient, which reflects how the sampling design affects the variance estimation of population characteristics due to complex survey designs as compared to simple random sampling" (Singh 2007: 118).

The average design effect (DEFF) for each of the three OLS multiple regressions is shown in Table 3.4. For childhood antisocial behaviour, the average design effect for the estimates of the three OLS regression models is 1.47 (Table 3.3). This means that the complex sampling design has lower estimate precision than a simple random sampling design. This is common when cluster sampling is used (Singh 2007; Statistics Canada 2003). A DEFF of 1.0 would mean that the sampling design is equivalent to a simple random sample. Less than 1.0 would mean that the sampling design has greater precision than a simple random sample. That might occur when a stratified sampling design is used (Singh 2007; Statistics Canada 2003). The average DEFF (of the three regessions) suggests that the implication of the complex sampling design is that the sample variance is about 1.4 times as large as it would be if the sample had been selected with a simple random sample. Since the NLSCY sample was already collected, to account for this discrepancy in the variance estimation, the sample size is adjusted to reflect the complex sampling design. To estimate the sample size based on the design effects, the N (1081) is multiplied by the inverse of the design effect. Then the average adjusted sample size based on the three regressions was estimated. The resulting adjusted sample size is 735

(Tale 3.4), which represents what an approximately simple random sampling size would have been. The estimates of the standard errors for the bootstrapped OLS regressions (N=1081) and of unweighted OLS regressions run on the adjusted sample size (N=735) are now similar[5]. Therefore, the structural equation models are run with the adjusted sample size. This reduced sample size will result in more precise estimates of the standard errors[6].

[5] The design effect for the three regressions based on the adjusted N of 735 is 1.03

[6] Preliminary analysis suggests that the adjusted sample size does not affect the significance of any variables, although in some cases the level of significance is more conservative (changing from $p< 0.001$, to $p<0.01$ for example).

Table 3.4 Design Effect (DEFF). Difference in Standard Errors between Bootstrap weighted OLS regression models and Unweighted OLS Regression Models (Unadjusted N=1081)

Dependent variables -->		Antisocial behaviour (1)			Antisocial behaviour (2)			Antisocial behaviour (3)		
		OLS unweighted	OLS weighted		OLS unweighted	OLS weighted		OLS unweighted	OLS weighted	
Independent variables		standard error (s.e)	s.e	**DEFF**	s.e	s.e	**DEFF**	s.e	s.e.	**DEFF**
Social Disorganization	% lone parents	0.02	0.03	1.54	0.01	0.02	1.57	0.02	0.03	1.61
	% low income	0.01	0.01	1.34	0.01	0.01	1.28	0.01	0.01	1.35
	% unemployed	0.02	0.02	0.98	0.01	0.02	1.15	0.02	0.02	1.06
	% low education	0.01	0.01	1.53	0.01	0.01	1.74	0.01	0.01	1.52
	% government transfers	0.03	0.03	1.19	0.02	0.03	1.44	0.02	0.03	1.21
	% Rented dwellings	0.01	0.01	1.86	0.00	0.01	1.56	0.01	0.01	1.63
Family Instability	Family SES	0.11	0.17	1.56	0.08	0.13	1.62	0.10	0.15	1.45
	Lone parent family	0.22	0.32	1.50	0.16	0.24	1.48	0.20	0.29	1.42
	Residential stability	0.02	0.02	1.57	0.01	0.02	1.40	0.01	0.02	1.34
	Large Family	0.16	0.26	1.57	0.12	0.19	1.56	0.15	0.25	1.65
Childhood Social Bonds	Percieved collective efficacy	0.03	0.04	1.54	0.02	0.04	1.75	0.03	0.04	1.54
	Harsh parenting (1)	0.03	0.05	1.44	0.03	0.04	1.65	0.03	0.05	1.64
	Attachment (1)	0.00	0.01	1.65	0.00	0.00	1.42	0.00	0.01	1.43
	Supervision (1)	0.01	0.01	1.28	0.00	0.01	1.43	0.01	0.01	1.34
	School bonds (1)	0.00	0.01	1.50	0.00	0.01	1.69	0.01	0.01	1.54
	Antisocial peer associations (1)	0.17	0.25	1.50	0.13	0.21	1.64	0.16	0.24	1.51
Childhood Antisocial Behaviour	Antisocial behaviour (1)				0.02	0.04	1.68	0.03	0.05	1.65
Adolescent Social Bonds	Harsh Parenting (2)				0.03	0.05	1.78	0.04	0.06	1.63
	Attachment (2)				0.00	0.00	1.40	0.00	0.01	1.41
	Supervision (2)				0.00	0.01	1.37	0.01	0.01	1.47
	School bonds (2)				0.00	0.01	1.38	0.01	0.01	1.54
	Antisocial peer associations (2)				0.14	0.25	1.79	0.19	0.28	1.47
Adolescent Antisocial Behaviour	Antisocial behaviour (2)							0.04	0.06	1.45
Young Adulthood Social Bonds	Family social capital							0.02	0.03	1.42
	Career investment							0.00	0.01	1.27
	Job stability							0.03	0.01	0.17
	Antisocial peer associations (3)							0.21	0.27	1.27
Average Design Effect per regression				1.47			1.54			1.41

Average Design Effect	1.47
Inverse Design Effect (1/DEFF)	0.68
Adjusted Sample Size (1081*1/DEFF)	734.52

3.4 Previous Related Empirical Research based on the NLSCY

Much research has accumulated using the National Longitudinal Survey of Children and Youth. Studies have examined aggressive behaviour at all ages. For example, Raymond Baillargeon, Richard E, Tremblay, and J. Douglas Willms (1999) found that nearly four percent of Canadian children aged two to four years old exhibit physically aggressive behaviours. This is about the same percentage for boys aged five to eleven years old, but much higher than for girls aged five to eleven years old, as only 0.6% exhibit aggressive behaviours (Baillargeon et al. 1999:xi). The following section will briefly review studies that use the NLSCY to understand the social context of delinquent and / or aggressive behaviour.

The relationship between informal control by social institutions and aggressive and delinquent behaviour is explored in the context of bonds to school in research by Sprott and colleagues. Jane B. Sprott, Jennifer M. Jenkins, and Anthony N. Doob (2000) studied life-course persistent (LCP) and adolescence-limited (AL) offending in their study using the National Longitudinal Survey of Children and Youth. This study focuses on risk and protective factors for non-violent and violent delinquency of youths aged 10 to 13 years old. The first two cycles of the NLSCY (1994, 1996) were examined. Sprott, et al. (2000) distinguished between risk factors, protective factors and compensatory factors. Risk factors and compensatory factors are reserved for characteristics that produce main effects on delinquency. Compensatory factors are factors that reduce risk of delinquency for everyone. Protective factors are the result of interactions. That is, those factors that produce benefits for the population in general (compensatory factors),

but also help specific "high risk" groups (Sprott et al. 2000: 11). This distinction is important for policy implications argue Sprott et al. (2000). Main effects will have implications for broad society, while interactions (protective factors) may be best suited for targeted interactions among specific populations.

Sprott et al. (2000) examined the relationship between three risk categories (environmental, early aggressiveness, and peer delinquency) on violent and non-violent delinquency), and the protective effect of school attachment as it interacts with the risk categories on violent and non-violent delinquency. Non-violent delinquency refers to non-violent property offences, while violent delinquency was scored on a set of eight questions about involvement in violent offences. Environmental risk consisted of: parental separation, being born to a teenage mother, experiencing a hostile parent-child relationship, having a depressed mother, living in a neighbourhood that has significant problems, and witnessing violence between two adults in the home. Early aggressiveness consisted of a conduct-disorder aggression scale. Peer risk was a measure of children who were spending time with other youths who got into trouble a lot in the first cycle. School attachment consists of 13 factors that measure how much children enjoy school, think they are doing well, and attach importance to doing well in school, and so on. (Sprott et al. 2000: 22-25). The authors found that school bonds are important for protecting against violence, but not for property offending, or against the influence of delinquent peers. A 2005 study by Sprott, Jenkins and Doob with Cycles 1 and 2 of the NLSCY focused on children aged 0 to 11 (Cycle 1) and 12-13 (Cycle 2). The study found that strong bonds to school were important for reducing aggression over time, and that school bonds protected

children from violent and nonviolent offending despite the presence of environmental risk factors. Negative peer influence was also found to be reduced when children had strong bonds to school (Sprott et al. 2000: 69-72).

A cross-sectional study by Robin Fitzgerald (2003) examined sex differences in delinquency using a sample of 12-15 year olds in the third cycle of the NLSCY. Fitzgerald looked specifically at youths' commitment to school and experience with victimization as key factors associated with delinquency. Fitzgerald (2003: 11-12) finds that girls report offences much less often than boys do, and for both property-offences and violent offences, girls tend to report less serious forms of the offences than boys do. Fitzgerald (2003) also found that both boys and girls with low commitment to school and previous experience with victimization had associations with delinquency but girls were more sensitive to the risk factors. Another cross-sectional study using the NLSCY, explored the risk factors associated with adolescent (12-15) drug and alcohol use (Hotton and Haans 2004). The authors found a strong association between peer alcohol and substance use and individual use. Also associated with alcohol use, though to a lesser degree than peer influence, was parental drinking (Hotton and Haans 2004:15). Odds of drinking or using drugs also increased with age, hostile parenting, low commitment to school, and poor school bonds.

Harsh or erratic parenting has also been a focus of studies using the NLSCY. Eleanor M. Thomas (2004:17) found associations between harsh punitive parenting and child aggression. Specifically she noted that children who were parented punitively at age two

to three were aggressive at age eight to nine. Those parents who had punitive practices when the child was young, but adjusted their parenting styles to had less aggressive eight to nine year olds. Thomas (2004: 21) also showed children whose parenting had been stable but became punitive later, also scored higher on the aggression scale later. Statistics Canada (2005) also reports that punitive parenting practices for children aged two to five years old is related to aggressive behaviour by youths eight years later, regardless of a change in parenting styles or income. Change in parenting styles from punitive to non-punitive was associated with changes in child anxiety and pro-social behaviour (Statistics Canada 2005:7).

Another study by Tina Hotton (2003) explored childhood aggression and exposure to violence in the home. This study examined children aged 6-11 in the first cycle of the NLSCY. Hotton (2003: 15) found that more than two thirds of children that experience aggression in the home *do not* behave aggressively; however, among those who were more aggressive, they were more likely to experience hostile parenting. Consistent with other studies of aggression, Hotton also found that boys were more likely than girls to respond with aggression.

The following studies examine multi-level analyses using the NLSCY. Dafna E. Kohen, Jeanne Brooks-Gunn, Tamma Leventhal, and Clyde Hertzman (2002) focused on child outcomes. The authors examined the association between neighbourhood income, physical and social disorder, and child competence. The authors study was multi-level using the census, observational, and parent-reported levels. With a focus on five-year old

children, the authors found that those living in affluent neighbourhoods with higher cohesion were positively associated with verbal ability.

A few studies have used multi-level analysis to include social capital and collective efficacy. The first is a study done by Holly Foster, John Hagan, Richard E. Tremblay and Bernard Boulerice (2001) using multi-level analyses of community, family, and individual level data to examine aggressive behaviour of children to the age of eleven years old. Foster et al. (2001: 54-56) included hostile parenting and exposure to violence in the home, family characteristics (such as income, size, residential stability, home ownership, crowding, parent marital status, PMK depression), neighbourhood characteristics (incidence of low-income families, Census total population, collective efficacy, neighbourhood problems) to explain indirect and direct aggression by four to eleven year old children. This study showed that before the age of twelve, family and individual characteristics are more important than neighbourhood characteristics for determining childhood aggression (Foster et al. 2001:69).

Another study using multi-level analysis including collective efficacy is by Charles Jones, Linn Clark, Joan Grusec, Randle Hart, Gabriele Plickert and Lorne Tepperman (2002). This study examined the impact of social capital (in a national-level sample and in a sample of 200 Census enumeration neighbourhoods), family stress, parenting style, and poverty on child wellbeing (physical health and aggression, and hyperactivity). In this study, the children were followed from age four to fifteen (outcomes were based on responses about the child's aggression and health by the PMK). The study also finds

little direct impact on neighbourhood characteristics and child outcomes (Jones et al. 2002: 53-54). They found that neighbourhood social capital was a mediator and moderator of family stress and child outcomes. Foster et al. (2001) aggregate to the Census tract level (areas with populations of approximately 2,500 to 8,000), while Jones et al. (2002) aggregate to the enumeration area (EA) level (small areas approximately one or two neighbouring blocks) using postal code information. Jones et al. (2002) provide rich detail of their methods and the limitations of aggregation.

While a solid body of literature is developing using the NLSCY, I am unaware of any studies that have followed antisocial and delinquent behaviour from childhood to emerging adulthood based on these data. My dissertation draws on elements of several of these studies, particularly for methodological expertise.

3.5 Summary

The purpose of this chapter was to discuss the data source and sampling. For this study, a panel sample of the 1984-1985 birth cohort of Canadian children was selected. In total 1081 individuals from the NLSCY were followed from age 10-11 in Cycle 1 (1994-1995), age 12-13 in Cycle 2 (1995-1996), age 14-15 in Cycle 3 (1997-1998), age 16-17 in Cycle 4 (1999-2000), and age 18-19 in Cycle 5 (2001-2002). The data include self-report surveys by the birth cohort, with some additional information from the 1991 Canadian Census and the Person Most Knowledgeable (in most cases the individual's mother). For parameter estimates, the data are weighted using standardized funnel weights and bootstrap weights to account for attrition and sampling methods.

Chapter Four: Conceptual and Operational Measurement Definitions

The following chapter links theoretical concepts to measured indicators. Table 4.1 summarizes the indicators and the definitions of the indicators. Table 4.2 provides a summary of the univariate descriptives of each of the indicators. A detailed list of all items included in the analysis from the NLSCY and the Census from each cycle can be found in Appendix B.

4.1 Conceptual and Operational Measurement Definitions

The concepts to be measured are based on the conceptual model (shown at the end of Chapter 2, Figure 2.2). They are arranged under three general headings: (1) *Antisocial behaviour*, (2) *Informal social control processes;* and (3) *Structural background characteristics* (community, and family).

Table 4.1: Summary of Indicators and Definitions

Concepts/ Indicators	*Definition*
Antisocial Behaviour Outcome Variables	
Indicators of Antisocial Behaviour	
Child Antisocial Behaviour (10-11 yrs old)	Σ [24 antisocial behaviour questions (such as stealing, violence, vandalism), coded 0=Behaviour did not occur, 1=Behaviour occurred)]
Youth Antisocial & Delinquent Behaviour (12-17 yrs old)	Average of antisocial behaviour scales for Cycle 2, 3, & 4. Each scale is the Σ [antisocial behaviour questions (Cycles 2& 3=22 questions each, Cycle 4=27 questions), coded 0=Behaviour did not occur, 1=Behaviour occurred]. Each cycle scale includes items such as stealing, violence, vandalism
Emerging Adulthood Antisocial & Criminal Behaviour (18-19 yrs old)	Σ [13 antisocial behaviour questions (such as stealing, violence, drunk driving), coded 0=Behaviour did not occur, 1=Behaviour occurred)]
Informal Social Control Processes	
Indicator of Collective Efficacy (Childhood)	
Collective Efficacy	Σ [5 neighbour cohesion/trust questions(such as neighbours helping, watching neighbourhood, dealing with problems)]
Indicators of Family Social Bonds (Childhood and Adolescence)	
Prosocial Bonds (10-11)	
Attachment	Σ [5 questions relating to level of attachment between PMK & child]
Supervision	Σ [4 questions relating to level of supervision of youth by PMK]
Prosocial Bonds (12-15)	
Attachment	Average of cycles 2& 3: Σ [5 questions relating to level of attachment between PMK & child]
Supervision	Average of cycles 2& 3: Σ 4 questions relating to level of supervision of youth by PMK]
Harsh & Erratic Parenting Style (10-11)	Σ [5 parenting questions such as inconsistent rule enforcement, harsh punishments)]
Harsh & Erratic Parenting Style (12-15)	Average of cycles 2& 3: Σ [5 parenting questions such as inconsistent rule enforcement, harsh punishments)]
Indicator of School Social Bonds (Childhood and Adolescence)	
School Bonds (10-11)	Σ [4 questions relating to school bond (such as enjoyment in school, success in school, following school rules]. (*note*: variable squared to reduce skew)
School Bonds (12-15)	Average school bonds for cycles 2 & 3 (*note*: variable squared to reduce skew)
Indicators of Antisocial Peer Associations (Childhood, Adolescence, Emerging Adulthood)	
Antisocial Peer Associations (10-11)	Above average of have friends who smoke, drink, or use drugs and /or youth is part of a group who does bad things (1) or do not (0)
Antisocial Peer Associations (12-17)	Above average of Cycle 2, 3 & 4: Have friends who smoke, drink, or use drugs and /or youth is part of a group who does bad things or break the law (1) or do not (0)
Antisocial Peer Associations (18-19)	Above average of: Have friends who smoke, drink, or use drugs and /or have friends who break the law (1) or do not (0)

Table 4.1 (cont.)

Concepts /Indicators	*Definition*
Indicator of Adult Family Social Capital	
Family social capital	Derived score based on 8 questions about closeness / support of the young adult's family & friends
Indicators of Career Commitment	
Job stability	# weeks worked in the last year
Investment in Career	Σ[10 questions coded 0-1, measuring actions emerging adults have taken to pursue career goals]
Structural Background Characteristics	
Indicators of Social Disorganization (Census: 1991)	
Unemployment	% of unemployed individuals in the neighbourhood
Low educational attainment	% of residents with less than high school certificate
Government transfers	% of families receiving government transfers in the neighbourhood
Lone parent families	% of lone parent families in the neighbourhood
Low income families	% of low income families in the neighbourhood
Rented dwellings	% of rented dwellings in the neighbourhood
Population size	# of residents living in the neighbourhood
Indicators of Family and Child Characteristics (NLSCY: 1994-1995 Cycle 1)	
Family Socioeconomic Status	Derived score from (1) years of schooling from the PMK, and of the spouse; (2) occupational prestige (the pineo occupation code) of the PMK, and of the spouse; (3) and household income (in thousands of dollars).
Residential Stability	# Years family has lived at the current address, family owns home and
Lone parent family	Child living in a lone-parent family (1) or not (0)
Family Home Ownership	Family owns home (1) or family does not own home (0)
Large Family Size	Family has less than 3 children (0) or 3 or more children (1)
PMK Alcohol Abuse	PMK had 5(+) alcoholic drinks at one time at least once in the past 12 months (1=yes, 0=no)

Table 4.2 Descriptive Statistics (Valid N, Listwise= 1081, Normailzed Funnel Weight)

Concepts	*Indicators*	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Skewness*	*Kurtosis*
Antisocial Behaviour Outcome Variables								
Antisocial behaviour								
	Childhood Antisocial Behaviour (10-11 yrs old)	10	0	10	4.26	3.07	0.48	-0.97
	Adolescent Antisocial Behaviour (12-17 yrs old)	10	0	10	4.45	2.58	0.45	-0.72
	Young Adult Antisocial Behaviour (18-19 yrs old)	10	0	10	6.43	2.64	-0.19	-1.00
Informal Social Control Processes								
Collective Efficacy								
	Collective Efficacy (10-11 yrs old)	15	0	15	10.84	3.05	-0.79	1.71
Family Bonds								
	Prosocial Family Bonds (10-11 yrs old)							
	Attachment (squared)	100	0	100	83.34	23.62	-1.42	1.27
	Supervision (squared)	64	0	64	51.76	14.53	-0.95	0.09
	Prosocial Family Bonds (12-15 yrs old)							
	Attachment (squared)	100	0	100	79.96	24.62	-1.26	0.82
	Supervision (squared)	64	0	64	40.08	14.97	-0.30	-0.47
	Harsh / Erratic Parenting Style (10-11 yrs old)	10	0	10	2.83	2.47	0.48	-0.83
	Harsh / Erratic Parenting Style (12-15 yrs old)	10	0	10	2.60	2.14	0.76	-0.20
School Bonds								
	School Bonds (10-11 yrs old) (squared)	64	0	64	49.85	17.24	-1.06	0.21
	School Bonds (12-15 yrs old) (squared)	64	0	64	46.50	15.70	-0.72	-0.85
Antisocial Peer Associations								
	Antisocial Peer Associations (10-11 yrs old)	1	0	1	0.30	0.46	0.43	-1.82
	Antisocial Peer Associations (12-17 yrs old)	1	0	1	0.27	0.44	1.07	-0.85
	Antisocial Peer Associations (18-19 yrs old)	1	0	1	0.14	0.34	2.11	2.44
Adult Family Capital								
	Family Social Capital	24	0	24	19.87	3.31	-0.41	-0.52

Table 4.2 (Cont)

Concepts	*Indicators*	*Range*	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*	*Skewness*	*Kurtosis*
Career Commitment								
	Job Stability	52	0	52	33.81	18.79	-0.43	-1.38
	Investment in Career	10	1	10	6.37	2.03	-0.03	-0.50
Structural Background Characteristics								
Social Disorganization Characteristics								
	% Unemployment	71	0	71	9.91	6.02	3.04	7.18
	% Low educational attainment	92	0	91.80	37.07	12.93	0.40	-0.13
	% Government transfers	56	0	56	11.72	6.68	1.43	3.28
	% Lone parent families	56	0	55.56	11.88	5.78	1.51	3.97
	% Low income families	84	0	83.05	38.05	17.18	-0.76	3.97
	% Rented dwellings	100	0	100	26.78	19.51	1.15	0.97
	Population Size =100,000 or more (1)	1	0	1	0.58	0.49	-0.32	-1.90
Family Background Characteristics								
	Family Socioeconomic Status	5.90	-3.08	2.82	0.07	0.82	-0.15	1.25
	Residential stability	20	0	20	7.14	5.10	0.56	-0.66
	Family lone parenth status(1)	1	0	1	0.18	0.38	1.69	0.86
	Family owns home (1)	1	0	1	0.77	0.42	-1.31	-0.28
	Large family size (1)	1	0	1	0.35	0.48	0.61	-1.63
	PMK alcohol abuse (1)	1	0	1	0.26	0.44	1.09	-0.81

4.1.1 Antisocial Behaviour: Childhood, Adolescence, and Emerging Adulthood

The main outcome variable of interest is *antisocial behaviour during childhood, adolescence and emerging adulthood*. Antisocial behaviour refers to "a wide spectrum of behaviours that violate societal norms and laws. Thus it can include behaviour adjudicated as criminal in older subjects at later ages, as well as behaviour in younger children that is considered disruptive, aggressive, oppositional, or generally troublesome" (Smith and Farrington 2004:234). Studies of antisocial behaviour have developed a range of behaviours from childhood such as lying, stealing, and defiance are linked to an array of delinquent and criminal behaviours at later ages.

In order to reflect this wide spectrum of antisocial behaviours, the outcome antisocial behaviour variables are composite measures of several items representing the breadth, diversity, and extent of delinquent and antisocial activities at each life stage, childhood, adolescence and young adulthood (Sampson and Laub 1993: 51-53). The questions measuring antisocial behaviour capture age-relevant behaviours; some are consistent throughout the cycles, such as stealing, using drugs, and attacking others, while others vary according to age, such as truancy, automobile theft, driving under the influence, and carrying a weapon. Each of the antisocial indicators reflects the underlying concept of antisocial behaviour. Age-graded informal control theory is focused on explaining general antisocial behaviour over time, rather than on types of criminal behaviours such

as violent offending verses property offending. Underlying both of these types of offending, is a general antisocial propensity expressed in behaviour.

The following section will examine each of the age-graded indicators of antisocial behaviour in greater detail. Indicators of antisocial behaviour are based on unofficial delinquent and antisocial behaviours as reported by the youths.

A) Childhood Antisocial Behaviour (10-11 years old)

Childhood antisocial behaviour is a composite scale based on 24 items including (see Appendix B for a more detailed list):

- Truancy
- Bullying
- Theft
- Smoking
- Drinking alcohol
- Running away
- Stealing property
- Cruel, mean behaviours
- Lying, cheating
- Disobedience in school
- Vandalism
- Hitting, fighting, threatening, and attacking others

To create the childhood antisocial behaviour index, each item was coded 0 or 1 to indicate absence or presence of the behaviour (please refer to Tables 4.1 and 4.2). Mean substitution was applied when at least two thirds of the items included in the scale had complete responses (more detail on this is given in Chapter 3, Table 3.2). These behaviours were summed and recoded to a scale of 0 (no antisocial behaviours) to 10 or more (antisocial behaviours). The mean score was 4.3, and the distribution is not

significantly skewed (see Table 4.2). Each of the indicators in the composite scale had to correlate with at least half of the other variables in the scale (Farrington 1991). The Cronbach alpha, measured 0.819 for the 24 items in Cycle 1 indicating good internal consistency among the variables in the scale.

B) Youth Antisocial Behaviour (12- 17 years old)

The second life stage in this analysis is adolescence. Antisocial behaviour is also measured during the period of adolescence from the age of 12 to the age of 17. While there is some overlap in the kinds of questions asked of children and of adolescents, there are also age-relevant questions. This reflects the heterotypic nature of antisocial behaviour as age-graded (Lösel and Bender 2003: 144; see also Smith and Farrington 2004, Sampson and Laub 1993).

Youths were asked if in the last 12 months they participated in the following activities. These variables include (please refer to Tables 4.1 and 4.2, and Appendix B for a detailed list of all available measures):

- Truancy
- Bullying
- Theft
- Smoking
- Drinking alcohol
- Running away
- Stealing property
- automobile theft
- driving under the influence of alcohol
- using illicit drugs
- selling illicit drugs
- carrying weapons (knives, guns)

- assault
- sexual assault

For each of Cycles 2 (ages 12-13) and 3 (ages 14-15), youths responded to 22 items regarding antisocial behaviour, including delinquent activities, and alcohol and drug abuse. In Cycle 4 (ages 16-17) youths were asked to respond to 27 items on many of the same activities. However, in Cycle 4, more questions were added to the survey regarding specific delinquent activities (please refer to Appendix B for a full item lists). For each wave, the antisocial behaviour scale ranges were recoded to 0 to 10 or more (0 antisocial behaviours to 10 or more antisocial behaviours). The mean scores for each Cycle are: 5.1 (Cycle 2), 5.8 (Cycle 3), and 5.9 (Cycle 4).

To create the average antisocial behaviour scale for youths, the scales from Cycles 2, 3, and 4 were averaged for a final scale of 0 (no antisocial behaviours) to 10 (many antisocial behaviours). More specifically,

1. Each of the items in each cycle was recoded to 0-1 representing that the behaviour in question did not occur (0) or did occur (1).
2. Mean imputation was used to deal with nonresponse at each cycle (Chapter 3, Table 3).
3. Next the items at each of Cycles 2, 3, and 4, were averaged to represent overall antisocial behaviour from the ages 12 to 17, on the scale to 0 (no antisocial behaviours) to 10 (many antisocial behaviours).

According to theory, these behaviours are relatively stable over the adolescent years. Naturally, there is some fluctuation, but there is underlying consistency in over the adolescent years. Fortunately, this theory is substantiated because the data were collected at three time points during the ages 12 to 17. Statistical analysis showed that an average measure of each concept is useful given strong inter-wave correlations, particularly for adjacent cycles (see Table 4.3).

Table 4.3 Interwave correlations (N=1081) for Antisocial Behaviour Scales, Cycles 2, 3 & 4.

Antisocial Behaviour	Cycle 2 (12-13)	Cycle 3 (14-15)	Cycle 4 (16-17)
Cycle 2	1.0		
Cycle 3	0.54***	1.0	
Cycle 4	0.43***	0.56***	1.0

*** p<0.001

Furthermore, the variables in the scale had to correlate with at least half of the other variables in the scale (Farrington 1991). Although some variables were strongly correlated, none were so high as to be considered multicollinear. The Cronbach alpha, measured 0.849 in Cycle 2, 0.854 in Cycle3, and 0.866 in Cycle 4, indicating good internal consistency among the variables in the scales. The mean level of antisocial behaviour during adolescence was 4.3 (see Table 4.2).

C) Emerging Adulthood Antisocial Behaviour (18-19 years old)

The third life stage of interest in this study is emerging adulthood. During the transition to young adulthood, underlying antisocial propensity is expected to continue, but possibly be expressed in different behaviours. At the age of 18, individuals are recognized as adults under the law in Canada. Research on adolescence and young adulthood generally recognizes the period of 18 to 24 years old as a transition to young adulthood with young adulthood beginning at the age of 25 (Arnett 2010). Arnett termed this transition to young adulthood "emerging adulthood" (2007:7). Both "transition to young adulthood" and "emerging adulthood" refer to the period between 18 through 24 years old to acknowledge that the transition from adolescence to young adulthood is a process that develops over time (Arnett 2010: 7-11). Throughout this dissertation, individuals aged 18-19 years old will be referred to as emerging adults or those in transition to young adulthood, consistent with the literature (Arnett 2010; Sampson and Laub 1993).

In Cycle 5 (18-19 year-olds) of the NLSCY, both criminal and risky lifestyle questions are included as measures of antisocial behaviour. The risky lifestyle behaviours that are introduced to the NLSCY in Cycle 5 are examples of what Laub and Sampson (2003) considered heterotypic behaviour: Childhood antisocial behaviours persist but manifest themselves through several behaviours (such as anger, impulsive behaviour, drug use, and risky sexual behaviours) that underlie the same propensity to act criminally. As Smith and Farrington (2004) argue, studies on antisocial behaviour reflect an underlying antisocial propensity which is manifested in different age-relevant ways.

The NLSCY Cycle 5 includes questions about

- Theft
- Police contact
- Violence
- Driving under the influence
- Risky sexual behaviours
- Heavy alcohol consumption
- Carrying a weapon
- Illicit drug use
- Impulsive reaction to anger

There are 13 items that make up this scale of young adult antisocial behaviour (Appendix B) and the individual items are recoded 0-1 (did not engage in activity / did engage in activity). Mean imputation was applied where at least two thirds of the items had complete responses (please refer to Table 3.2 in Chapter 3 for more details). The total scale was also set to 0-10 or more occurrences of antisocial behaviours, with a mean score of 5.9 (Table 4.2) and Cronbach's Alpha of 0.747).

4.1.2 Informal Social Control Processes[7]: Childhood, Adolescence and Emerging Adulthood

This section operationalizes the main theoretical concepts of interest for the dissertation. Based on age-graded informal control theory, the major causal mechanism for continuity and change in antisocial behaviour is informal social control. Although one might be subject to informal controls over the life-course, the sources of informal control may

[7] Mean substitution was used for many of the endogenous indicators. The details regarding mean substitution for missing data are discussed in section 3.12, and Table 3.7

vary. The importance of institutions of control may also vary at different ages. Here is a summary of the sources of informal social control by age period.

Childhood informal social control processes include:

1. community collective efficacy
2. family (prosocial family bonds and harsh parenting style)
3. school bonds
4. antisocial peer associations

Adolescent informal social control processes include:

1. family (prosocial family bonds and harsh parenting style)
2. school bonds
3. antisocial peer associations

Emerging Adult informal social control processes include:

1. family social capital
2. commitment to career (job stability and career investment)
3. antisocial peer associations

The following operationalizes each institution of informal social control *in the order presented in Tables 4.1 and 4.2*: (a) Community collective efficacy; (b) Family Bonds; (c) School bonds; (d) Antisocial peer associations; (e) Family social capital; and (f) Career commitment.

A) Community Collective efficacy - Childhood (10-11)

Collective efficacy refers to sources of social control that lie within a community. Collective efficacy measures the willingness of residents to work together to reduce crime and to intervene in situations regarding crime in the community. Thus beyond individual family social control, collective efficacy refers to the informal social control

exerted by the community. This will be particularly important for the early years of offending when residents of a community may be watching for deviant youth behaviours. Community efficacy draws upon two concepts: shared *expectations of social control* and *social cohesion* (Sampson et al. 1997; Morenoff et al. 2001; See also Warner 2007) developed two Likert scale measures to capture collective efficacy.

Shared expectations for social control refers to the likelihood that community residents could be counted on to take action if deviant behaviours are occurring in their neighbourhood. Measures to capture this include the following questions asked of the child's Person Most Knowledgeable (PMK):

- If there is a problem around here, the neighbours get together to deal with it
- When I'm away from home, I know my neighbours will keep eyes open for possible trouble
- You can count on the neighbours here to watch out that kids are safe and don't get into trouble

Social Cohesion refers to the trust and ties among community residents. The children's PMKs were asked how strongly they agree with the following statements about their neighbourhood:

- There are adults in the neighbourhood that children can look up to
- People around here are willing to help their neighbours.

In Cycle 1, the NLSCY provides a composite "neighbours score" including all of the above items in a scale of 0 to 15, where 0 indicates no neighbourhood cohesion, and 15 indicates very high cohesion (Cronbach Alpha is 0.86).

For this study, the scores on the neighbourhood variables were aggregated. Aggregation revealed that the majority of sampled neighbourhoods (Enumerated Areas, or EAs) had only one or two households. Six is the minimum number of households per EA recommended by Jones et al. (2002) in a study of neighbourhoods in the NLSCY (please refer to section 3.3.2 'Unit of Analysis' for further details). As discussed earlier, aggregation for this dissertation is impractical because 98% percent of neighbourhoods in this sample of the NLSCY have only one or two households per neighbourhood. Therefore collective efficacy will need to be understood as an individual's assessment of his or her community's willingness to actively monitor their neighbourhood. Individual responses may reflect individual perceptions and may not accurately reflect the larger neighbourhood (Coulton, Korbin, and Su 1996). Furthermore, any potential clustering is accounted for by the adjusted sample size[8].

B) Family Bonds- Childhood (10-11) and Adolescence (12-15)

The family is expected to be an important institution for social control through the life-course. Parental attachment and supervision has been a consistent source of informal control of antisocial propensity in childhood (Farrington 2005). Harsh or punitive parenting practices have also been shown to be important predictors of antisocial propensity. Harsh or erratic parenting practices refer to cruel, passive or neglectful parenting, which Farrington (2005: 180-181) refers to as abusive parenting. Sampson

[8] Please refer to Chater 3, Section 3.3.4 Weighting the Data for a discussion on design effect.

and Laub (1993) identified harsh or erratic parenting practices as an impediment to social bonding between a child and his or her family, thereby increasing the risk of antisocial behaviours. Strong parental emotional attachment and supervision of the child provide positive social controls.

Family bonds are measured at two points in the life-course in the NLSCY; childhood (Cycle 1, 10-11 years old), and adolescence (Cycles 2, and 3, ages 12-15 years old). Two indicators of informal family control are included: harsh and erratic parenting style and prosocial bonds (supervision and attachment). The lists shown below describe the items from the NLSCY, measured in each of the three cycles that were included in the indicators of family bonds.

Prosocial Family bonds – attachment and supervision

First, *prosocial family bonds* include two dimensions: supervision of children by parents and close emotional attachment between parents and children. *Attachment* includes five variables, related to how parent(s) relate to their child through smiling, praising, appreciation, pride and encouragement. *Supervision* is an index based on four variables asked at Cycles 1, 2 and 3 regarding parents' knowledge of their child's activities including where and what the child is doing, encouraging a curfew, and rules for when the child can go out during the week, and ensuring homework is completed.

Each variable was recoded to 0= rarely or never 1= sometimes 2= often or always. The family attachment scale ranges from 0 (poor attachment) to 10 (strong attachment), the family supervision scale ranges from 0 (poor supervision) to 8 (strong supervision).

(a) Attachment is a composite of the following questions asked of adolescents:

- my parents smile at me
- my parents praise me
- my parents make sure I know that I'm appreciated
- my parents speak of the good things I do
- my parents seem proud of the things I do

(b) Supervision is measured through a composite of the following variables:

- my parents want to know exactly where I am and exactly what I am doing,
- my parents let me go out any evening I want to (reverse coded)
- my parents make sure I do my homework
- my parents tell me what time to be home when I go out.

As mentioned above, these variables were measured at Cycles 1, 2, & 3 of the NLSCY. According to social bond theory, the bonds to family are formed early and are stable across the life-course. Correlational analysis of these data shows consistency over the cycles for the responses to the bond questions.

First for *family attachment*, all inter-wave correlations are significant, however between childhood and adolescence, the correlations are not very strong (Cycle 1 and 2 $r=0.28$, $p<0.001$). During adolescence, the inter-wave correlation is stronger (Cycles 2 and 3, $r=0.39$, $p<0.001$). Thus the data suggest, that there may be differences in level of family attachment between ages 10 -11 and 12- 15. Cycle one (aged 10-11 years old) is used to

measure the social bonds in childhood. Cycles 2 and 3 are averaged to represent family attachment during adolescence. For *parental supervision*, again, the inter-wave correlations are all significant, but weaker between Cycle 1 and 2 ($r=0.25$, $p<0.001$), and Cycles 1 and 3 ($r=0.18$, $p<.001$), but stronger during adolescence (Cycles 2 and 3, $r=0.31$, $p<.001$). Cycles 2 and 3 are averaged to represent family supervision during adolescence.

A descriptive analysis indicated significant skew in the attachment and supervision scales for each of the cycles (see Table 4.2). For each of the scales of attachment and supervision at each cycle, the skew was approximately -2.0, and the kurtosis was approximately 5.0 or greater. In each case, a squared transformation improved the distribution of the variables. Further an exploratory factor analysis showed that family attachment and family supervision sharing an underlying similarity in prosocial family bonds (shared 69% variance in one factor). These two variables are indicators of the concept of prosocial family bonds.

Harsh or Erratic Parenting Style

Second, *harsh or erratic parenting style* is based on the style of discipline by parents. Five items measuring inconsistent enforcement of rules, punishments, and threatening of punishment were included in the scale (and reverse coded as necessary) to create indexes at each cycle. Each variable was recoded to 0= rarely or never 1= sometimes 2= often or always:

- my parents soon forget rules they made
- my parents threaten punishment more than they use it
- my parents only keep rules when it suits them

- my parents enforce a rule or don't depending on their mood
- my parents hit me or threaten to hit me.

For *harsh parenting style*, the correlations similarly show greater stability over adolescence ($r=0.34$, $p<.001$) than between childhood and adolescence ($r=0.27$, $p<.001$). Therefore, it is reasonable to compute an average score of harsh parenting style over adolescence. The harsh or erratic parenting scale ranges from 0 (consistent) to 10 (inconsistent parenting) for each of childhood and adolescence.

For each scale, a factor analysis was performed to ensure that the measures were significantly related to one underlying factor, on the basis of the analysis (and theoretical consideration), additional measures were considered but not included in the composition of the scales. As shown in Table 4.2, there is not significant skew in the harsh or erratic parenting style scales. The average level of harsh or erratic parenting is relatively low at 2.8 (out of 10) for childhood and 2.6 (out of 10) for adolescence (Table 4.2).

C) School Bonds - Childhood (10-11) and Adolescence (12-15)

School bonds capture three of the features of social bonds according to Hirschi (1969): attachment, commitment and belief. Sampson and Laub (1993: 103) argue that school bonds intervene in the relationship between social background characteristics and delinquency. They argue that school is an important institution for socialization, particularly because children and adolescents are monitored at school by teachers who are in a position to use discipline to maintain order at school. School social bonds are

measured through performance, educational aspirations, and involvement in school activities, school-related satisfaction, and ties of affection (Sampson and Laub 1993: 101). The variables selected for this analysis were included in at least the first three cycles of the NLSCY. While other measures were available in Cycle 1, they were not extended into adolescence. The variables included capture school bonds in both childhood and adolescence. This is repetition is important in order to examine stability and change in school bonds over time.

The following measures were summed to make a composite of feeling good about school (attachment), commitment to academic performance and belief in school rules, at each of cycles 1, 2 and 3:

- How do you feel about school? (Like to hate),
- How well do you think you are doing in school? (Very well to very poorly)
- How important is it to you to get good grades?
- Are you disobedient in school? (reverse coded)

School social bonds, measured over three cycles showed stability with a statistically significant correlation of $r=0.40$, ($p<0.001$) for cycles 1 & 2, and $r=0.46$($p<0.001$) over Cycles 2 & 3. Again, this is in line with the theoretical position that bonds to school are stable over time.

School bonds in childhood ranges from 0 to 8 for low to strong bonds), however, the variable is noticeably skewed (to the low end, or left) and leptokurtotic. A square of the variable improved the normality of the distributions (Table 4.2).

For adolescence school social bond is an average level of school social bond (squared to deal with significant skew; please refer to Table 4.2) over the ages 12 to 15 ($r=0.46$, $p<.001$).

D) Antisocial Peer Associations – Childhood (10-11), Adolescence (12-17), and Emerging Adulthood (18-19)

Associations with antisocial peers are theorized to be directly related to antisocial and delinquent behaviour. Despite the volume of literature showing a strong relationship between delinquent peers and delinquency, the causal priority of peers is debated (Sampson and Laub 1993: 104; Haynie 2002; Warr 2002; Baerveldt, Völker, and Van Rossem 2008). Although Sampson and Laub include a dimension on sibling delinquency, the NLSCY does not collect such information. In their research Sampson and Laub (1993) do not find a significant impact of sibling deviance and delinquency.

Some of the questions for peer antisocial associations vary from cycle to cycle to reflect changing age-appropriate behaviours, particularly for drug and illegal activities. However, all the questions measure an underlying concept of antisocial peer group behaviours. For example, in Cycle 1, when the children are aged ten and eleven the questions included about peers include whether or not they have friends who have tried smoking, drinking and sniffing glue. In later cycles there are more detailed questions regarding drug and alcohol use. Thus although the particular items may vary, the underlying concept will remain the same throughout the cycles. Interestingly, the

correlation between associations with antisocial peers childhood and adolescence is relatively moderate ($r=0.23$, $p<0.001$), but there is quite a change entering young adulthood from (1) adolescence and adulthood ($r=0.11$, $p<.001$) and, (2) childhood and adulthood ($r=0.02$, $p=0.5$).

a) Childhood antisocial peer association (10-11 years old)

Childhood antisocial peer association is measured as a dichotomous indicator for:

- Having friends who have tried smoking, drinking alcohol, and / or using drugs (1) or not (0)
- Being part of a group that does bad things (1) or not (0).

b) Adolescent antisocial peer association (12-17 years old)

Adolescent antisocial peer association is a dichotomous indicator for having (1) or not having (0) friends who

- Smoke, drink alcohol, use drugs
- Do bad things / break the law

From one cycle to the next, there appears to be relative stability for membership in a group that did bad things / broke the law with significant correlations (Cycles 2 & 3 $r=0.23$, $p<0.001$, and Cycles 3 & 4 $r=0.33$, $p<0.001$). For peer alcohol and substance use, correlations were also moderate between adjacent cycles, but particularly strong between the ages 14 and 17 (Cycles 2 & 3 $r=0.28$, $p<0.001$, and Cycles 3 & 4 $r=0.40$, $p<0.001$). *Antisocial peer association* is an average score (recoded to 0 or 1) of being part of a group that did bad things and of peer alcohol and substance abuse from the age of 12 to 17. Despite the weak correlations between antisocial behaviour in adolescence, and

adulthood, there is evidence of stability during adolescence (Table 4.4). Antisocial peer influence similarly showed significant correlations between adjacent cycles.

Table 4.4 Interwave correlations (N=1081) of antisocial peer associations, Cycles 2, 3 & 4

Antisocial Peer Associations	Cycle 2 (12-13)	Cycle 3 (14-15)	Cycle 4 (16-17)
Cycle 2	1.0		
Cycle 3	.29***	1.0	
Cycle 4	.13**	.39***	1.0

c) Young adult antisocial peer association (18-19 years old)

Respondents are asked how many of their friends:

- Smoke, drink, have tried marijuana or other drugs
- Break the law by stealing, hurting others, or damaging property

The ages of 18-19 are the last stage that emerging adults are asked about their friends' illegal activities. This variable was constructed in a similar way to the previous measures of antisocial peer influence; alcohol and substance use were coded 0 or 1 (absence or presence of activity) and having friends that break the law was also coded 0 (no) or 1 (yes). The two variables were averaged and recoded 0-1 to indicate presence (1) or absence (0) of antisocial peer influence.

Each of the above indicators for antisocial peers (childhood, adolescence, and emerging adulthood) was constructed as dichotomous indicators. To create the indicators each question was first dichotomized to reflect presence or absence of peers' behaviours (smoking, drinking or drug use, and doing bad things / breaking the law). Next the

questions at each cycle were summed, and then averaged. The average of the scores was used as the criterion for antisocial peer association. Each of the antisocial peer association variables were recoded to youth reports having (1) higher than the average antisocial peer associations; or (0) at or below the average antisocial peers. The average percentage of reported antisocial peer associations was 20% in childhood, 57.5% in adolescence, and 40.5% in emerging adulthood. Thus a score of 1 represents those individuals that report higher than the average levels of antisocial peer associations per time period.

This method of coding addresses some issues regarding the measurement of peer behaviours. First, as mentioned above, the specific wording of the questions vary over the cycles, so simplifying the construct to the absence or presence of an indicator, allows for some consistency over the cycles. Second, a coarse dichotomy accounts for the tendency for individuals to exaggerate their peers' behaviours. Recent social network research indicates that is best to collect data from both individuals and from their peers (Haynie 2002; Baerveldt, Völker, and Van Rossem 2008). This is not possible for the current dissertation, so it is perhaps better to be imprecise in the measurement of peer associations, rather than measure the precise number of friends who engage in antisocial behaviours.

D) Family Social Capital - Emerging Adulthood (18-19)

In emerging adulthood, age graded social control theory shifts from emphasizing having social bonds to having good *quality* social bonds (known as social capital) in the

regulation of antisocial behaviour. Sampson and Laub (1993: 143-144) argue that the presence of adult social bonds may not be enough to explain changes in antisocial activities, but the strength of those bonds may account for variations in adult offending, controlling for childhood delinquency. The goal of this concept is to capture the "quality, strength and interdependence of an individual's ties to important institutions of social control – family, occupation, and community" (Sampson and Laub 1993: 145).

First, having close emotional ties with family and friends beyond supervision and punishment of behaviour from childhood and adolescence is important during the transition to adulthood. As youths leave home and begin their adult lives, having people they can count on for emotional support and that they trust and can turn to if they are having problems indicates a good quality of relationships. This sense of belonging and trust involves social capital where individuals are invested in relationships and create strong social bonds. Through these strong social ties, antisocial tendencies are informally controlled.

Family social capital is expected to provide bonds for emerging adults to protect against antisocial behaviours, regardless of past behaviour. The NLSCY, Cycle 5 includes a youth social support scale based on the following items:

- If something went wrong, no one would help me (reverse coded)
- I have family and friends who help me feel safe, secure, and happy
- There is someone I trust and would turn to if I were having problems
- There is no one I am comfortable talking to about problems (reverse coded)
- I lack a feeling of closeness with another person (reverse coded)
- There are people I can count on in an emergency
- I am part of a group who shares my attitudes and values

- There is no one who shares my interests and concerns (reverse coded)

The above eight items were used to derive a factor score ranging from 0 (no social support) to 24 (strong social support). A reciprocal investment between individuals and family and friends creates social capital, and informal control by family and friends over individuals.

Attachment to spouse or partner (not included in analysis): Sampson and Laub (1993) argue that weak or strong attachment to a spouse can alter the course of antisocial behaviour. Unfortunately these data do not permit me to test this hypothesis. Although the emerging adults are asked about their marital status, only a handful of people are married, which makes this a poor indicator. This is understandable however, given that the emerging adults are under twenty years old. Cycle 5 does include a dating and length of relationship question, but data are missing for about half of the sample, so this is also unreliable.

E) Career Investment - Emerging Adulthood (18-19)

According to Sampson and Laub (1993), an additional source of adult social bonds is work. The key indicators employed by Sampson and Laub (1993: 143-144) are job stability, and commitment 17-25 and 25-35. This study is limited to emerging adulthood (18-19 years old). Sampson and Laub (1993) found that job stability was an important indicator of desistence from crime. Furthermore, commitment to work creates investments by individuals into their future. Sampson and Laub (1993) also emphasize

the investment by employers in individuals to create a reciprocal relationship; however these questions are not measured so early in the individuals' careers in the NLSCY.

The NLSCY includes a few measures of employment ties by Cycle 5, though it is not until Cycle 6 (20-21 years old) that more detailed questions about job satisfaction and commitment are included. In Cycle 6, however, the antisocial behaviour questions are largely dropped from the survey. Therefore, for this dissertation, two indicators of career investment are included: a) career commitment and b) job stability.

a) *Career commitment* is expressed through strong desire to further educational, occupational aspirations, and to better themselves (higher income, become a professional, and so on). Measures for all of these are available in Cycle 5 of the NLSCY. Specifically, the NLSCY asks about steps taken by youths to find out about future careers including:

- Talking to a guidance counselor
- Talking to a person working in their job of interest
- Completing a survey to find out areas of interest and abilities
- Reading information on the type of career they might be interested in
- Gone to an organized visit of a workplace
- Taken co-operative education
- Attended a presentation about their career interest
- Youths are asked to indicate what level of education; training and experience are needed to fulfill their aspirations.

Career commitment then, is a measure of the level of investment emerging adults have put into deciding on their career. The scale ranges from 0 (no investment) to 10 (high investment) with a mean of 6.3 and standard deviation of 2 (please refer to Table 4.2).

b) *Job stability* is measured by the number of weeks worked in the last twelve months (0 to 52). The mean number of weeks worked was 33.81, with a standard deviation of 18.32 weeks (please see Table 4.2).

4.1.3 Structural Background Characteristics

Individual, family and community characteristics are expected to have indirect effects on antisocial behaviour through informal social controls.

A) Social Disorganization Characteristics

These characteristics refer to the community characteristics identified by social disorganization theory and empirical research. In Cycle 1 of the NLSCY, the 1991 Census variables are included at the EA level (enumeration area), roughly the size of a neighbourhood block. The items included in the measurement of social disorganization of the community are the percentage of unemployed individuals, the percentage of residents with less than a high school certificate, the percentage of the households with low incomes, and the percentage of residents receiving government transfers, percentage of lone parent families in the community, and the percentage of renters in the neighbourhood, population size and ethnic heterogeneity (Fitzgerald 2007; Sampson, Sharkey, and Raudenbush 2008). The variables are measured as:

Percentage of low income households: the percentage of households that earn less than $20,000 per year. This measures the percentage of the community living within or below the poverty line (or the low income cut-off, LICO). In 1991, the average income for the

low income cut-off is approximately $25,000 for families of at least two persons (Statistics Canada 2001). The low-income cut-offs vary based on size of family (from one person up to seven or more persons) and size of population. For example, in 1991, a family of three living in (a) a population of 500,000 or more residents has a LICO of $24,792, (b) a population of 100,000 to 499,999 has a LICO of 21,265, (c) a population of 30,000 to 99,999 has a LICO of $21,117, (d) a population of 30,000 or less has a LICO of 19,649 (Statistics Canada 2001: 30).

a) Percentage of households receiving government transfers: government transfers refer to a variety of government transfer payments including Unemployment Insurance, Pension benefits, and other income from government sources (Statistics Canada 1992).

b) Percentage of unemployed persons in the neighbourhood: this is the percentage of the population (aged 15 and older) who are unemployed. Unemployment is divided by the total of (1) employed, and (2) unemployed. It does not include individuals who are not in the labour force (i.e., not employed and not looking for employment).

c) Percentage of low educational attainment: the percentage of the population (aged 15 and over) with less than a high school certificate.

d) Percentage of rented homes in the neighbourhood: The percentage of rented homes out of the total number of occupied dwellings. Ideally, the study would include a measure of the percentage of residents who moved in the last year or five years, however, this

Census variable was not included in the NLSCY. Fitzgerald (2007) includes the percentage of renters in the neighbourhood. This is a reasonable measure for the mobility of a neighbourhood (Fitzgerald 2007).

e) Percentage of lone-parent families in the neighbourhood: This is a percentage of lone parent families (single parent living with at least one dependent child) divided by the number of census families (Statistics Canada, 1997).

f) Population size: Population size of area of residence in which the child lives, according to 1991 Census counts (rural area, urban area population <30,000, urban area population 30,000 to 99,999, urban area population 100,000 to 499,999, urban area population 500,000 or over). This variable was recoded to a dichotomous variable for inclusion in the analysis, where 0 represents populations of less than 100,000 and 1 represents population size of 100,000 or more. In this sample, 58% live in areas of 100,000 of more population size (please refer to Table 4.2).

g) Ethnic heterogeneity (not included): Ethnic heterogeneity has been theorized to bar effective communication between residents and thus reduce the informal regulation of delinquency. Although the Census collects detailed information on visible minority status, these data were not included in the NLSCY file. Of the Census variables attached the NLSCY, the most appropriate measure available is the percentage of recent immigrants in a neighbourhood (Fitzgerald 2007). This variable reflects the degree of immigrant population in the community. Unfortunately, this is a relatively weak measure

of ethnic diversity, and both zero-order and multivariate regressions show that there is no significant association between immigrant population and antisocial behaviour at any stage. Furthermore, inclusion of this variable results in an additional loss of approximately 10% of the final sample due to missing data.

Studies that have measured ethnic heterogeneity in Canadian communities have not found support for the hypothesis that ethnic heterogeneity has a positive association with delinquent behaviour (Fitzgerald and Carrington 2008; Schulenberg et al. 2007; and Jacob 2006). Therefore, the decision was made to exclude this variable from the analysis.

B) Family Characteristics

Family characteristics are thought to be indirectly associated with antisocial behaviour. In their research, Sampson and Laub (1993) include the following family characteristics: (a) household crowding; (b) family disruption (such as divorce); (c) family size; (d) low family SES; (e) residential mobility; (f) mother's employment; (g) father's and /or mother's criminality / drinking. In this study, these characteristics are included, except parent criminality because the data are not available.

The NLSCY includes many characteristics of the children's families. Family background characteristics are measured in six ways: (1) family socioeconomic status (2) residential stability, (3) lone-parent status, and (4) living in a home owned by a member of the family, (5) large family size, and (6) PMK alcohol abuse.

a) Family socioeconomic status

Family socioeconomic status is a relative measure based on the access families have to resources such as economic, occupational prestige and educational achievement (Fitzgerald 2007:69). Family socioeconomic status is a derived variable in the NLSCY[9] based on the standardized means and standard deviations gathered from the following five variables: the level of education (years of schooling) from the PMK (person most knowledgeable), and of the spouse; occupational prestige (the pineo occupation code[10]) of the PMK, and of the spouse; and household income (in thousands of dollars). Adjustments were made to reflect single parent households. The range for this variable is -2.0 at the lower end and +1.75 at the upper end. The NLSCY User's Guide 8.5 gives examples of what a score might mean (Statistics Canada 1995b: 465-467).

1.5 - Both the PMK and spouse have a university degree, both employed professionals, and the household income is approximately $77,000
0.5 - The PMK has a university degree, is semi-professional and the spouse has grade 13, and is semi-skilled clerical position, with household income of approximately $57,000
0.0 - The PMK has grade 13 and is not in the labour force and the spouse grade 12, and is working semi-professional position with household income of approximately $25,000
-0.5 - The PMK and spouse have both completed grade12, are employed in semi-skilled positions with household income of approximately $16,000
-1.5 - Neither the PMK nor the spouse have completed and neither the PMK nor the spouse are in the labour force with household income is approximately $12,000
-2.0 - No spouse, PMK is not in the labor force and has not completed high school, and income is less than $10,000

---

[9] See Statistics Canada (1995b), NLSCY User's Handbook and Microdata File Guide http://www.chass.utoronto.ca/datalib/codebooks/cstdli/nlscy.htm for further details

[10] Based on a "modified version of a scale developed by Pineo, Porter and McRoberts (1977). The classification system groups occupations described in Statistics Canada's 1980 Standard Occupational Classification into 16 somewhat homogeneous categories", from Farm laborer (01) to (16) Self-employed professional (Statistics Canada 1995b:463-464),

Research by Farrington (2005: 182-183) suggests that while antisocial children disproportionately come from low SES families, SES is an inconsistent predictor of delinquency. Farrington (2005) further suggests that the link between family SES and delinquency is mediated by family socialization.

b) Residential stability

Residential stability is measured as the number of years living at the same address (in cycle 1). This variable was recoded from 0 (less than one year) through 20 (20 or more years living at the address) to reduce outliers (Table 4.2). The mean number of years living at the same address is 7.3.

c) *Lone parent status*

Lone parent status is 1= living with a single parent and 0= living in a two parent household. Including lone parent status at each cycle was considered, however the indicator was very stable over time throughout all cycles, with only five or fewer percent change to single-parent status in each cycle, and correlations ranging from 0.5 to 0.8 (all $p<0.001$). For this sample, 18% of children were living in single-parent households (please see Table 4.2).

d) Family Home Ownership

Family home ownership is measured for the child: 1= living in a family owned home, or 0=not living in a family owned home. Note for this variable though, it appears there is a

higher percentage of owned homes in this sample than are reflected in the Census (1991 and 1996). The (weighted) average homeownership in this sample 77%, (see Table 4.2) but the percentage of owned homes in Canada was approximately 66% according to the 1991 Canadian Census and 64% according to the 1996 Canadian Census. Thus, there is a nearly 13% higher rate of homeownership in this sample than is reflected in the population. This illustrates the sampling of the NLSCY as *this variable reflects the number of children living in owned homes, rather than the number of home owners in the general population*. Thus, it may be that a greater proportion of children live in owned homes.

e) Large family size

According to Farrington (2005: 183), many studies show that large family size with many siblings before the age of ten increases the risk of delinquency (Hirschi 1969; Jenkins 1997). Although it is less clear why this relationship exists, some theories suggest that parenting styles (poor supervision, disrupted families) may be the reason. Jenkins (1997) suggests that in large families, parents may have less time to devote to children, may have fewer resources for educational activities (such as educational games), and children may be more influenced by those people that do have time for them (mainly older siblings and peers). Thus, Jenkins argues that large family size weakens social bonds and increases delinquency (1997: 340). Sampson and Laub (1993) include family size as the number of children living in the household. The NLSCY collects information on the number of children in the household. Family size is a measure of the number of children

living in the household, where 0= 1 or 2 children, and 1=3 or more children. In this sample, 33% of children are living in households with three or more kids (Table 4.2).

f) PMK alcohol abuse

Having a parent who has antisocial behaviours such as criminal behaviour or alcohol abuse, may be related to having higher levels of antisocial behaviour. The NLSCY does not capture criminal behaviour of parents but it does question the volume of alcohol consumption by the Person Most Knowledgeable (PMK, usually the mother). Alcohol abuse is a measure of whether (1) or not (0) the PMK drank five or more alcohol beverages at one time at least once in the past year. PMK alcohol abuse has an average of 27% for the children in this study (Please refer to Table 4.2).

4.2 Summary

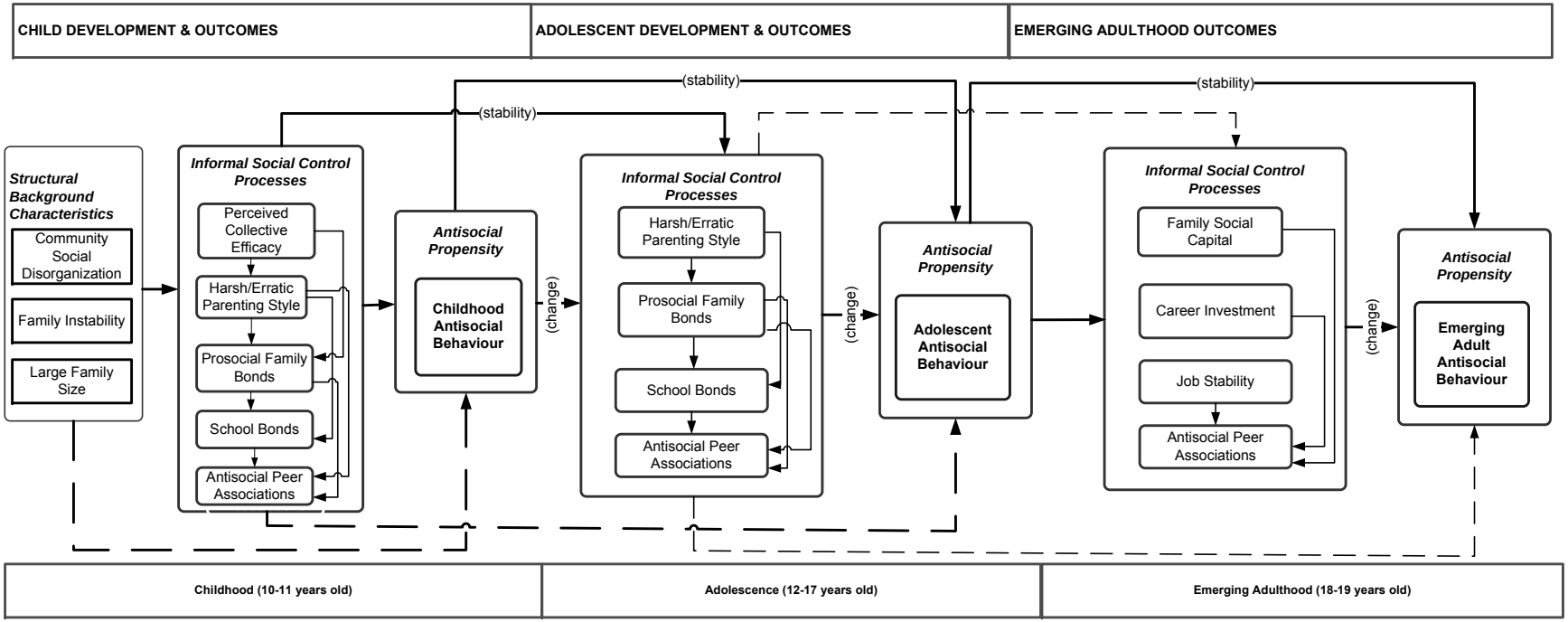
In this chapter, theoretical concepts were linked to observed indicators. Three main conceptual areas were identified based on age-graded informal social control theory: (1) *Antisocial behaviour* during childhood, adolescence, and emerging adulthood. (2) Age-graded *informal social control processes* (collective efficacy, prosocial family bonds, harsh / erratic parenting style, school bonds, antisocial peer associations, family capital, career investment, job stability). (3*) Structural background characteristics* of the community (social disorganization) and of the family (socio-economic status, residential stability, lone parent status, family home ownership, large family size, PMK alcohol abuse). The next chapter presents hypotheses specifying how these variables are related. The next chapter will also identify the strategies of analysis for testing the hypotheses.

Chapter Five: Specific Hypotheses and Strategies of Analysis

The following chapter lays out the specific hypotheses that will be tested in this dissertation. Following the hypotheses, the strategies of analysis and model specification are discussed. Figure 5.1 represents a summary representation of the hypotheses as applied to the NLSCY data Cycles 1 through 5. This is a life-course model of informal social control and antisocial behaviour. This analysis is based on age-graded informal social control theory of crime by Sampson and Laub (1993) with an emphasis on the earlier parts of the theory from childhood to emerging adulthood. This sociogenic explanation (emphasizing social influences) of antisocial behaviour explains the pathways from childhood, through adolescence to emerging adulthood antisocial behaviour.

In Figure 5.1 hypothesized relationships are represented by solid arrows. Those with broken arrows are hypothesized to have weak or indirect paths to antisocial behaviour in childhood, adolescence and emerging adulthood. Those without arrows are hypothesized to have no relationship or indirect relationships.

Figure 5.1 Conceptual Causal Model of Hypotheses. Development, continuity and change in antisocial propensity and behaviour over the life-course



5.1 Hypotheses

The hypotheses are summarized in four general themes. *First*, the major causal explanation of antisocial behaviour at each life-stage (childhood, adolescence, and emerging adulthood) is theorized to be concurrent *informal social control processes*. In childhood, antisocial behaviour is expected to be primarily regulated informally through social bonds (family, community, school, and peers). *Structural background factors* (community social disorganization, and family characteristics) are expected to have the greatest impact on antisocial behaviour through their effects on informal social control in childhood.

Stability and change in antisocial behaviour over time is the *second* theme of this theoretical model (Figure 5.1). This model explicitly links childhood antisocial behaviour with adolescent antisocial and delinquent behaviour, and adolescent antisocial behaviour with emerging adulthood antisocial and criminal behaviour. Stability in behaviour is also expected to occur indirectly through informal social control processes at each life-stage. For example childhood antisocial behaviour is expected to weaken prosocial family bonding during adolescence, which in turn increases antisocial behaviour in adolescence.

While stability in antisocial behaviour is expected to be a prominent feature over time, *change* in behaviour is also anticipated. Changes in behaviour, either from antisocial behaviour to non-antisocial behaviour or from non-antisocial behaviour to antisocial behaviour, may occur given informal social control processes. In adolescence, for example, antisocial behaviour expressed may increase or decrease given antisocial peer

associations during adolescence, regardless of prior antisocial behaviours. Therefore *stability and change are expected in levels of antisocial behaviour given informal social control processes*.

The *third* theme of this analysis is that of the *interconnection between sources of informal social control*. Although this theme is not explicitly examined in age-graded informal control theory, studies show that social bonds in some realms may affect bonding in other realms. For example, children who have weak bonds at home are more likely to have a harder time bonding to school, while children who are subject to harsh or erratic parenting styles may be more likely to have antisocial peer associations. Therefore social bonds are expected to have direct and indirect effects on levels of antisocial behaviour.

Finally, it is hypothesized that individuals are subject to varying levels of informal social control over time. *At different life-stages, the most important sources of informal social control may vary*. For example during childhood, the family and school are expected to be the strongest sources of informal social control. During adolescence, informal social control from the family is expected to weaker compared with other sources, such as antisocial peer associations.

5.1.1 Summary of Hypotheses

The following lists the hypotheses that will be tested. These are the hypotheses that are stated in the empirical causal model (Figure 5.1) by each life stage (childhood, adolescence, and emerging adulthood).

A) Pathways to Antisocial Behaviour in Childhood

1. The major causal explanation of childhood antisocial behaviour is informal social control processes (e.g. from collective efficacy, prosocial family bonds, harsh / erratic parenting style, school bonds, and antisocial peer associations).
2. Structural background characteristics (community disorganization and family characteristics) will primarily affect childhood antisocial behaviour indirectly through their effects on childhood informal social controls.
3. Institutions of informal social control are interconnected and some sources of control will also indirectly affect antisocial behaviour. For example, harsh parenting practices are expected to reduce prosocial family bonds and increase antisocial peer associations.

B) Continuity and Change in Antisocial Behaviour during Adolescence

1. The effects of childhood structural background characteristics (community social disorganization, and family characteristics) and childhood informal social controls are mediated by childhood antisocial propensity.
2. Continuity in antisocial behaviour is expected from childhood to adolescence.
3. Stability is expected in social bonds from childhood to adolescence.
4. Prior antisocial propensity is expected to create stability in antisocial behaviour by impeding social bonds during adolescence.

5. Regardless of antisocial propensity, adolescent sources of informal control (family, school, peers) will account for changes in antisocial behaviour from childhood to adolescence.
6. During adolescence, it is expected that there will be a shift in the importance in the effect of various sources of control (family, school, peers) on antisocial behaviour, as compared with childhood. Specifically, it is expected that social control from the family will be less influential during adolescence and the influence of antisocial peer associations will become a prominent indicator of adolescent antisocial behaviour.
7. Adolescent sources of informal social control are interconnected and some sources of control will mediate the effects of other sources of informal social control on youth antisocial behaviour. For example, prosocial bonds to family and school are expected to control antisocial behaviour, while weak or negative bonds (harsh parenting, antisocial peers) are expected to encourage antisocial behaviour during adolescence.

C) Continuity and Change in Antisocial Behaviour during Emerging Adulthood

1. Adolescent antisocial behaviour is expected to mediate the effects of prior informal controls and childhood background characteristics on antisocial behaviour in the transition toyoung adulthood.
2. From childhood, through adolescence and into emerging adulthood, there is expected to be continuity in general antisocial behaviour.

3. Antisocial propensity is expected to contribute to stability in antisocial behaviour by impeding social bonds during the transition to young adulthood.
4. Regardless of prior antisocial propensity, adult social bonds (family capital, job stability, career commitment and peer associations) are expected to account for changes in antisocial behaviour during emerging adulthood.
5. The development of prosocial bonds to adult institutions of informal social control (such as family, and work) indirectly impedes antisocial behaviour in adulthood by preventing associations to antisocial peers.

5.2 Strategies of Analysis

To examine these theoretical propositions, this study draws on two sources of data: Individual-level self report data of the National Longitudinal Survey of Children and Youth (NLSCY), and for community context, the 1991 Canadian Census. The focus of the study is the individual life-course as told by the 1984-1985 birth cohort in the NLSCY. In addition, the analysis is set in the context of the community in which individuals live with data from the Census. The purpose of this is to provide a wider context of socialization beyond the family. Collectively these data provide a comprehensive examination of the informal social control of crime and deviance throughout the early life-course.

This research includes several types of analysis[11] including: descriptive statistics, OLS regression, and structural equation modeling (SEM). These analyses will be estimated using appropriate survey weights. Although survival models would be very useful in terms of timing of events, the data are captured retrospectively and do not include specific dates for many events. Furthermore, the life-course theory is focused more on the order of events, rather than specific timing.

Causal models (path analysis and structural equation modeling) are useful for addressing the research questions and hypotheses of this dissertation. Causal modeling requires three basic elements: first, that the variables covary, second that time-order is established and third that spuriousness is ruled out. Given the longitudinal nature of these data, it will be possible to establish time-order, if of course there is an association for many of the hypotheses. During each life stage (childhood, adolescence, and emerging adulthood), informal bonds are also measured concurrently to antisocial behaviour measures, so time order is more difficult to establish statistically. Ruling out spurious associations is also difficult to do. The models will be controlled using statistical techniques, rather than through experimental conditions, using theoretically and empirically relevant variables identified in previous research. Although true experimental conditions are the identified method for establishing causality, it is impractical, unethical and impossible to conduct this social life-course study as an experiment on young people. Thus, although one must

[11] Although I planned to use hierarchical linear modeling to examine antisocial behaviour nested within communities, the data do not permit such an analysis. As discussed in operation definitions, too few respondents live in each area to permit a reliable aggregation.

use caution in claiming causality; this longitudinal design employs causal logic to establish the role of intervening variables. Furthermore this method is established as the accepted means for testing life-course theories (Sampson and Laub 1993; Laub and Sampson 2003).

The hypotheses call for recursive models where all the causal influences are assumed to be in a single direction. Both path analysis and structural equation models (SEM) are capable of estimating coefficients for recursive models. Path analysis is especially helpful for answering the question: is the theory consistent with the data? Path analysis goes beyond elaboration model and assesses spuriousness, suppressors, and indirect effects all at once. Path analysis is expressed as a causal diagram and each arrow connecting variables (exogenous and/or endogenous), represents a hypothesis about two variables. Exogenous variables are at the extreme left of the diagram. These are variables for which no causal explanation is sought. (i.e., there is no goal to explain the causes of their variance). A double headed curved arrow connects the exogenous variables together representing association. Endogenous variables are theorized to be affected by at least one causal variable in the model. The path diagram includes path coefficients (direct paths between two variables) which are estimated standardized partial regression coefficients. Indirect paths are calculated by multiplying path values. Through effect decomposition, path analysis reveals the total co-variation between variables. This includes total effects (direct effects + indirect effects), unanalyzed co-variation, and spurious co-variation.

Although compound paths (indirect paths) can be computed using ordinary least squares (OLS) regression to calculate coefficients, there are some limitations to the method. Calculating path coefficients through OLS multiple regressions does not allow the calculation of standard errors for compound paths, which traces the path of an exogenous variable through an endogenous variable to another endogenous variable. Another problem with OLS regression for path analysis is that error terms cannot be specified to be correlated because this would violate the regression assumption of independent disturbance terms. Thus, while OLS multiple regressions are legitimate, they are arguably not the most appropriate. Particularly because there are compound paths in this model and it would be useful to obtain standard errors for the estimates of these compound paths.

Structural equation models allow the specification of a set of equations that are simultaneously solved. The LISREL software package can be used to estimate structural equation models (SEM). Other packages that deal with these equations include SAS (proc calis), Mplus, Stata, and AMOS. Although I am familiar with both SAS and LISREL software packages, I prefer to use LISREL for structural equation modeling, as it is the package recommended by Kenneth Bollen (1989; Bollen and Curran 2005). LISREL offers a great deal of flexibility over SAS in terms of fixing and freeing factor loadings, and other parameters. LISREL estimates parameters using maximum likelihood estimation (MLE) to estimate parameters, rather than least squares. Bohnrstedt and Knobe (1994) recommend using the completely standardized solution in order to interpret both unobserved concepts and observed variables. This is important because although it

is possible to interpret each individual parameter (i.e., the amount of change in an endogenous variable given a one-unit change in an exogenous variable, holding others constant), it is difficult to compare the parameters of the whole model if they are measured on different scales. By standardizing the parameters of the both unobserved concepts and their observed indicators, it is possible to interpret them on both levels.

Another advantage of SEMs with LISREL is that the LISREL method calculates the equations simultaneously allowing the output to provide the direct and indirect paths. LISREL provides standard error of the estimates for the compound (indirect paths) which path analysis using OLS regression does not. Also the ability of LISREL to estimate alternate models makes this a powerful tool. It will illustrate the strength of having the ability to calculate model goodness of fit in ways other than R^2. Model fit can be assessed in three ways (Kelloway 1998): (1) *absolute fit* of the model which assesses the ability of the model to reproduce the covariance matrix, such as Chi Squared, root mean squared error of approximation (RMSEA), or the goodness-of-fit index (GF1); (2) *comparative fit* which compares competing models such as just-identified model (all parameters estimated) verses models with fewer parameter estimations to see which is the better fit, e.g. comparative fit index (CFI) or normalized fit index (NFI); (3) *parsimonious fit* which recognizes that the more parameters estimated, the better the fit (perfect fit is obtained in just-identified models). Parsimonious statistics, such as parsimonious goodness-of-fit (PNFI), or Akaike information criterion (AIC) assess fit on a "cost-benefit' trade-off and asks: Is the cost (loss of degree of freedom) worth an additional benefit (increased fit) of estimating more parameters?" (Kelloway 1998: 23-24). The chi-

square test can be used to assess the goodness of fit by comparing the size of the chi square. A larger chi square value suggests a poorer lack of fit. Note though, the chi-square is not being used as a test of significance, because the chi-square values are proportionate to the sample size, and thus works better as a goodness of fit statistic (Bornshtedt and Knoke 1994).

In order to account for potential bias in repeated measures, a structural equation model estimates the covariance among the error terms of the endogenous (dependent) variables in the "structural" equations (i.e., the theoretical model). In ordinary least squares regression, estimates of population parameters assume linearity, no measurement error and normally distributed error terms. These assumptions are referred to as Best Linear and Unbiased Estimate (BLUE) assumptions. The data for this analysis are panel data, meaning that variables are measured from the same individuals each time; childhood antisocial behaviour and adolescent antisocial behaviour are based on responses from the same individuals (Bohrnstedt and Knobe 1994: 285-286; 452). Thus, the error in the childhood antisocial behaviour equation cannot be assumed to be independent from the error in the adolescent antisocial behaviour equation, thus violating a BLUE assumption. OLS regression models are unable to account for correlated errors in equations because each equation is modeled separately. Structural equation models are able to handle correlated errors of equations. Essentially, structural equations simultaneously model two or more equations.

For this dissertation, the analysis of antisocial behaviour through the early life-course is estimated with a three-wave panel model with concurrent and lagged effects estimated by a series of structural equation models. Theoretically, the effects of social bonds may be lagged to some degree. On the other hand if the two-year time difference between panel observations represents too long a lag length, then synchronous effects would be more informative (Finkel 1995). For example, peer associations are known to be very fluid and the friends one has as a child may be different than the friends they have during adolescence. Therefore a lagged and synchronous effects structural equation model allows the estimation of: (1) stability (lagged) effects (stability of antisocial behaviour and social bonds); (2) cross-lagged effects (for example when early family social bonds may affect later bonds to school); and (3) synchronous effects (for example the effects of concurrent social bonds on antisocial behaviour). The correlation matrix, variable means and standard deviations can be found in Appendix C. All structural equation models are based on a weighted correlation matrix and used maximum likelihood estimation in LISREL 8.8 (Jöreskog and Sörbom 2007).

5.3 Model Specification

The final dataset emphasizes theoretically important age groupings, rather than measuring particular activities at each cycle regardless of age. The five waves of data have been divided into three relevant time frames: Childhood (Cycle 1, ages 10 to 11 years old); Adolescence (Cycles 2, 3 and 4, ages 12 to 17) and Emerging Adulthood (Cycle 5, ages 18-19). The following table (Table 5.2) presents the standardized

coefficients from zero-order OLS regressions of each of the independent variables on the three antisocial behaviour dependent variables (childhood, adolescence, and emerging adulthood).

Table 5.1 Zero-Order OLS Regressions for Antisocial Behaviour in Childhood, Adolescence, and Emerging Adulthood N=1081[a]

*Dependent variables --> **Antisocial Behaviour*** *Independent variables (below)*	***Childhood***	***Adolescence***	***Emerging Adulthood***
	β	β	β
Structural Background Characteristics			
Community Characteristics (1991 Census)			
• Lone parent Families (%)	**0.12*** **	**0.11*** **	**0.08** **
• Low income (%)	0.05	**0.09***	0.05
• Unemployment (%)	0.05	0.04	0.05
• Low education (%)	0.02	0.04	0.02
• Receive government transfers (%)	0.02	0.05	0.04
• Rented dwellings (%)	0.05	**0.10***	0.06
• Population size	0.02	-0.01	-0.07
Family Characteristics (10-11 years old)			
• Family SES	**-0.13***	**-0.11***	-0.04
• Family owns home	0.02	-0.07	-0.01
• Lone parent family	**0.12***	0.08	0.05
• Residential stability	**-0.11***	**-0.12*** **	-0.02
• Large family (3 or more kids)	**0.11***	**0.10***	0.01
• PMK Alcohol Abuse (0-1)	0.01	0.07	**0.14** **
Informal Social Control Processes			
Childhood Informal bonds (10-11 years old)			
• Community Ties	**-0.25*** **	-0.08	-0.04
• Harsh parenting	**0.39*** **	**0.13** **	0.09
• Family attachment	**-0.28*** **	**-0.13** **	-0.02
• Family supervision	**-0.16*** **	-0.08	0.00
• School bonds	**-0.51*** **	**-0.25*** **	**-0.12***
• Antisocial Peer Associations	**0.21*** **	**0.21*** **	**0.23*** **
Childhood Antisocial Behaviour (10-11 years old)			
• Childhood Antisocial behaviour		**0.44*** **	**0.23*** **
Adolescent Informal Bonds (12-17 years old)			
• Harsh Parenting (12-15)		**0.38*** **	**0.22*** **
• Family attachment (12-15)		**-0.29*** **	**-0.18*** **
• Family supervision (12-15)		**-0.21*** **	**-0.12** **
• School bonds (12-15)		**-0.57*** **	**-0.29*** **
• Antisocial Peer Associations		**0.52*** **	**0.32*** **
Adolescent Antisocial & Delinquent Behaviour (12-17 years old)			
• Adolescent Antisocial Behaviour			**0.52*** **
Young Adult Informal Bonds (18-19 years old)			
• Family Capital			**-0.17*** **
• Career Investment			0.04
• Weeks worked			0.01
• Adult Antisocial Peer associations			**0.29*** **

[a] Bootstrap weights and normalized funnel weights applied to data

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

The table above (Table 5.1) is included for the purpose of model specification. Of the community social disorganization characteristics, only percentage of lone parent families in the community has any correlation with antisocial behaviour at various ages. Similarly, of the family background characteristics, family home ownership and PMK alcohol abuse have extremely weak or no detectible significant correlations with antisocial behaviour.

This is also the finding at the multivariate level. I estimated the multivariate models in the proceeding chapters and found that three of these background variables also had extremely weak or non significant correlations with the both social bond variables and the antisocial behaviour variables. For the social disorganization characteristics, most variables had significant effects on at least some social bonds, except population size. Thus in order to simplify the models presented in the analysis chapters, the following background variables have been excluded from further examination: (1) population size (of the community), (2) family home ownership, and (3) PMK alcohol abuse.

Gender is not a focus of age-graded informal control theory (Sampson and Laub 1993) or in many other life-course theories of crime. Farrington (2005) offers this explanation: factors such as gender and ethnicity vary only between individuals and cannot be changed within individuals over time. Furthermore, "such factors have no practical implications for intervention (e.g. it is not practical to change males into females)" (178). Thus Farrington (2005) does not include gender in his analysis of antisocial behaviour on the basis of its lack of implications for intervention.

As a control variable, gender can be used to explain differences in antisocial behaviour due to differences in socialization techniques by parents, or by differences in opportunities to offend by boys and girls. Studies that have been done on gender have shown that as might be expected, boys have higher antisocial tendencies than females; however the causes of delinquency are more often similar for boys and for girls (Jacob 2006; Hotton and Haas 2004; Fitzgerald 2003).

In this dissertation, all models were run with and without gender included as a control variable. As expected, boys had a slightly higher level of antisocial behaviour than females in all three life stages (childhood, adolescence, and emerging adulthood); however, gender did not have a significant impact on the informal social control processes[12]. The models did not change much when gender was removed. Thus in the analysis chapters for both theoretical and substantive reasons, gender is not included in the analysis.

5.4 Summary

The aim of my research is to advance our understanding of the social conditions associated with early delinquent behaviours, and how these might be stable and change over the teenage years and into emerging adulthood. The central hypotheses for this dissertation include: (1) the major causal explanation of antisocial behaviour at each life-

[12] During adolescence, boys were subject to slightly higher levels of harsh or erratic parenting practices than females, but this was a very weak association.

stage (childhood, adolescence, and emerging adulthood) is concurrent informal social control processes; (2) stability and change are expected in antisocial behaviour given informal social control processes; (3) institutions of informal control are interconnected and work together to directly and indirectly regulate antisocial behaviour; and (4) at different life-stages, the most important sources of informal social control may vary. The following three analysis chapters will address these hypotheses. The chapters are divided by life stage: childhood, adolescence, and emerging adulthood.

Chapter Six: Pathways to Antisocial Behaviour in Childhood

The role of social bonds in the development, continuity and change of antisocial behaviour over the life-course is the focus of the subsequent three chapters. The analysis is broken into three life stages: childhood (10 to 11 years old); adolescence (12 to 17 years old) and emerging adulthood (18 to 19 years old). The theoretical framework for this analysis is an integrated age-graded informal control theory. During childhood, and more generally, throughout life, the guiding theoretical principle is that *risk of deviance is heightened when individuals have weak social bonds (attachment, commitment) to social institutions (such as family, school, or work).*

In this dissertation, social disorganization theory and collective efficacy theory are integrated into Sampson and Laub's (1993) informal control theory. These theories are both about the role of community in crime. The main tenet of social disorganization theory is that socially disorganized communities (characterized by socioeconomic disadvantage, residential instability) create difficult conditions for residents to work together to informally control crime. Collective efficacy is the degree to which individuals living in a community share trust, expectations for informal control, and a willingness to intervene to protect the community. Thus social disorganization impedes collective efficacy, and in turn the community is an ineffective source of informal social control. The integration of these theories contextualizes antisocial behaviour within a community context.

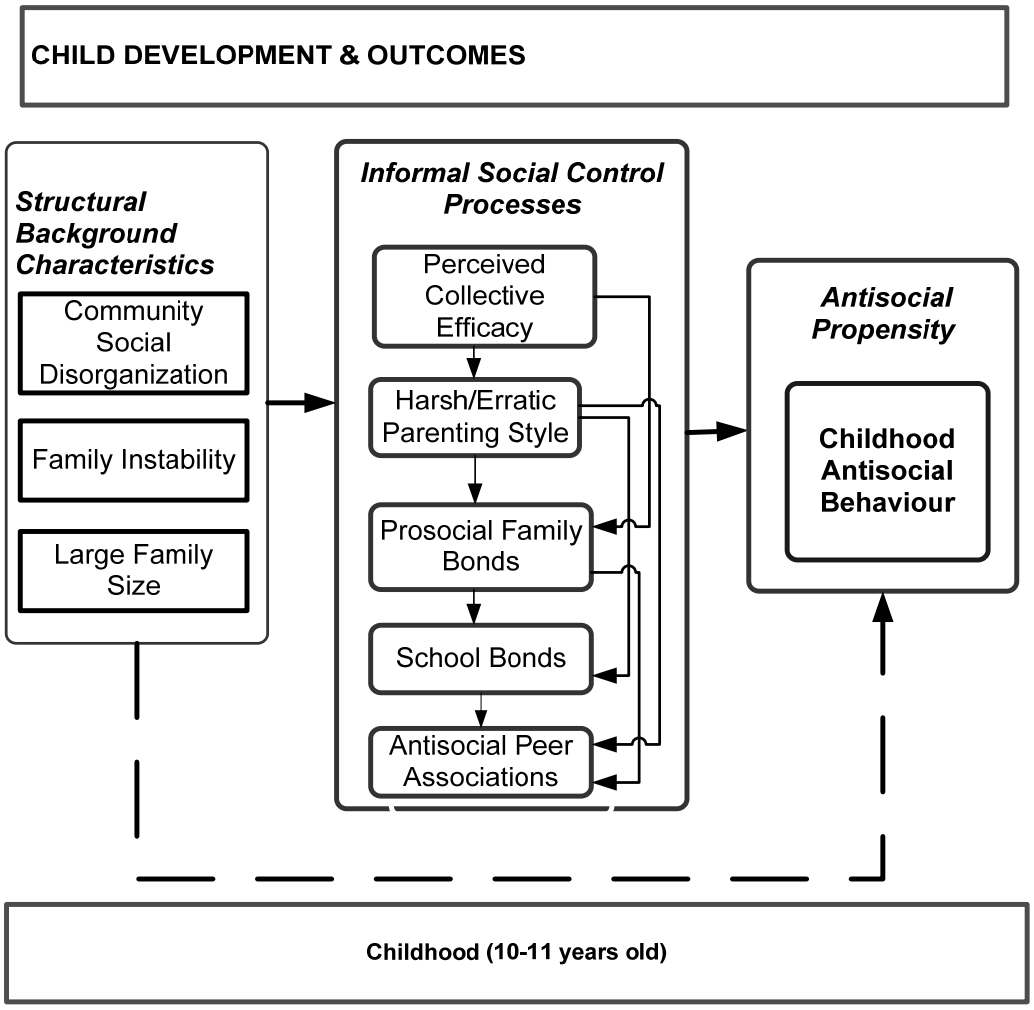
In this chapter, two major themes will be studied: (1) the role of informal social bonds (to family, school, community, and peers) in the formation and regulation of childhood antisocial behaviour, and (2) how informal social controls mediate the effect of the background characteristics of the community and of family on children's antisocial behaviour.

This chapter also sets the stage for the analyses in the two following chapters. A major theme of this dissertation is that there is both continuity and change over the life-course in an individual's antisocial propensity and its expression in antisocial behaviour. An individual's antisocial propensity is established in childhood and expressed in childhood antisocial behaviour. Antisocial propensity refers to the potential that an individual will behave in ways considered antisocial. The dependent variable in the analyses in this chapter – childhood antisocial behaviour – is intended as an indicator both of the individual's underlying antisocial propensity, and of its behavioural expression. The hypothesis of *continuity* of antisocial propensity over the life-course implies strong positive associations among the levels of childhood, adolescent and young adult antisocial behaviour. These are not interpreted primarily as the effects of behaviour at one stage of life on behaviour at the next stage, but of the behavioural expressions of continuity in an underlying propensity. The hypothesis of *change* means that the underlying antisocial propensity that was formed in childhood may be modified by changes in social bonds in adolescence and adulthood. This implies that the associations among childhood, adolescent, and adult antisocial behaviour will be less than perfect, and

that other variables in the model that measure age-graded social bonds will also have effects on adolescent and adult antisocial behaviour. Continuity and change will be addressed in the two following chapters.

Four hypotheses shown in Figure 6.1 are tested in this chapter: (1) the theoretical hypothesis that the major causal explanation of childhood antisocial behaviour is informal social control processes (collective efficacy, prosocial family bonds, harsh / erratic parenting style, school bonds, and antisocial peer associations); (2) structural background characteristics, (community social disorganization and family characteristics) will primarily affect childhood antisocial behaviour indirectly through childhood informal social control processes; (3) institutions of informal social control are interconnected and some sources of social control will mediate the effects of other sources of informal control on antisocial behaviour; (4) in childhood, family and school are expected to be the most influential sources of informal social control in the regulation (or the development) of antisocial behaviour.

Figure 6.1 Conceptual Causal Model of Hypotheses. Pathways to antisocial behaviour in childhood



6.1 Analysis and Discussion

In this section the results of a latent variable structural equation model for childhood antisocial behaviour are presented and discussed. Chapter 3 contains the descriptive information for each of the variables included in the childhood model of antisocial

behaviour. Bivariate OLS regressions in Chapter 5 show the associations between informal social controls and childhood antisocial behaviour, as well as associations between antisocial behaviour and structural background characteristics. At the bivariate level, each of the informal social controls has a strong association with antisocial behaviour. Therefore in this chapter, the analysis considers the simultaneous effects of the informal social controls on antisocial behaviour, both directly and indirectly. The results are summarized in Figure 6.2, Table 6.1 and Table 6.2 below.

Figure 6.2 Structural Equation Model. Direct and indirect paths to childhood antisocial behaviour through antisocial childhood informal controls

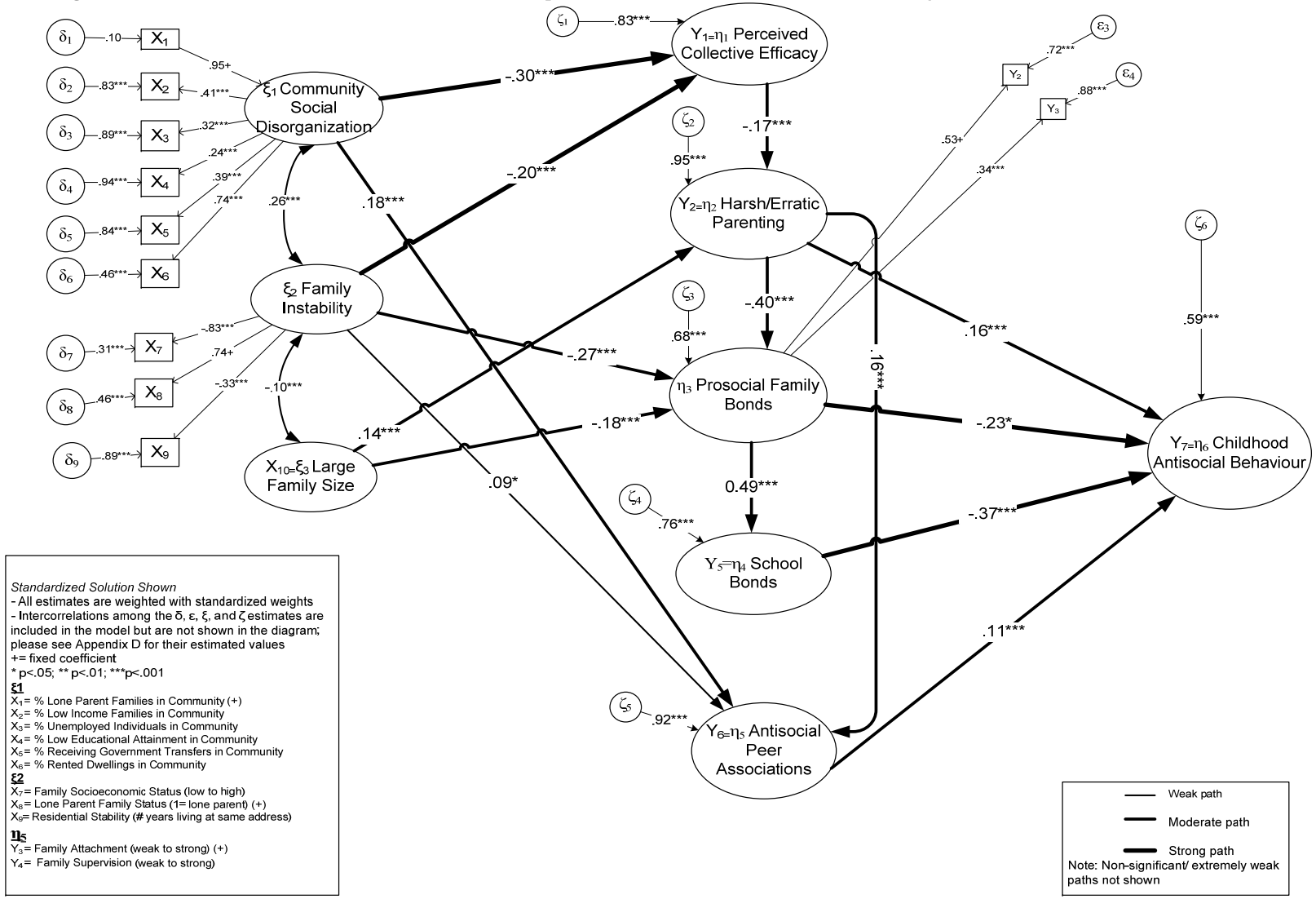


Table 6.1 Standardized Direct, Indirect and Total Effects of Structural Background Characteristics and Informal Social Control Processes on Childhood Antisocial Behaviour

Dependent Variable: Childhood antisocial behaviour (ages 10-11) (η_6)			
N=735	Standardized Path Coefficients		
Independent variables	**Direct effects (s.e.)**	**Indirect effects (s.e)**	**Total Effect (s.e)**
Structural Background Characteristics			
Community social disorganization (ξ_1)	**-**	**0.04***	**0.04***
		(0.02)	(0.02)
Family Instability (ξ_2)	**-**	**0.14*****	**0.14*****
		(0.04)	(0.04)
Large Family Size (ξ_3)	**-**	**0.12*****	**0.12*****
		(0.03)	(0.03)
Informal Social Control Processes			
Perceived Collective Efficacy (η_1)	-0.02	**-0.06*****	-0.08
	(0.05)	(0.01)	(0.05)
Harsh/Erratic parenting style (η_2)	**0.16*****	**0.18*****	**0.35*****
	(0.05)	(0.05)	(0.03)
Prosocial family bonds (η_3)	**-0.23***	**-0.18*****	**-0.41*****
	(0.12)	(0.03)	(0.11)
School bonds (η_4)	**-0.37*****	**-**	**-0.37*****
	(0.04)		(0.04)
Antisocial Peer Associations (η_5)	**0.11*****	-	**0.11*****
	(0.03)		(0.03)
R^2	$R^2_{\text{Collective Efficacy}}$= 0.17; $R^2_{\text{Harsh parenting}}$=0.05; $R^2_{\text{prosocial family bond}}$= 0.32; $R^2_{\text{School Bonds}}$=0.24 $R^2_{\text{childhood antisocial peer associations}}$=0.08 $R^2_{\text{childhood Antisocial behaviour}}$= 0.41		
Fit	χ^2=116.14 (81), p=0.006; GFI= 0.98, AGFI=0.97; RMSEA=0.02; NFI=0.98; CFI =0.99; PNFI=0.58		

[a] Normalized Funnel Weights, N adjusted to account for design effect

* p<.05 **p<.01 ***p<.001

Table 6.2 Estimates for the final structural model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

N=735	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	ζ
Childhood									
Collective efficacy (η_1)	-0.30*** (-7.23)	-0.20*** (-3.39)	- -						0.83*** (18.67)
Harsh parenting (η_2)	- -	- -	0.14*** (3.97)	-0.17*** (-4.70)					0.95*** (19.22)
Prosocial family bonds (η_3)	- -	-0.27*** (-3.46)	- 0.18** (-3.39)	- -	-0.40*** (-6.71)				0.68*** (3.47)
School bonds (η_4)	- -	- -	- -	- -	- -	0.49*** (7.90)			0.76*** (13.02)
Antisocial Peer Associations (η_5)	0.18*** (4.56)	0.09* (2.02)	- -	- -	0.16*** (4.73)	- -			0.92*** (19.18)
Childhood antisocial behaviour (η_6)	- -	- -	- -	-0.02 (-0.49)	0.16*** (3.30)	-0.23* (-2.02)	-0.37*** (-8.79)	0.11*** (3.63)	0.59*** (15.80)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model; Normalized Funnel Weights; N adjusted to account for design effect

Notes:
Cells contain standardized parameter estimates, with t-value in parentheses
Exogenous variables are denoted by ξ_i; endogenous variables by η_i
In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}.
Appendix D, Tables A6.1a, A6.1b, A6.1c, and A6.1d provide detailed information for additional matrices

6.1.1 Model Fit

Overall, the fit of this model is adequate to good according to the fit statistics. Two types of fit statistics are used to evaluate this model. (1) Absolute fit indices are functions of discrepancies between the model and the data, the sample size and degrees of freedom (McDonald and Ho 2002: 72). (2) Relative indices "compare a function of the discrepancies from the fitted model to a function of the discrepancies from a null model [which] is almost always the hypothesis that all the variables are uncorrelated" (McDonald and Ho 2002: 72). The χ^2 is a measure of absolute fit. For Figure 6.2, the χ^2 is significant (p=0.003) suggesting there is a high probability the model may not fit the data. The fit statistics suggest this model is a good fit. They offer evidence that this model is less false than an independence model. For example, the Root Mean Square Approximation (RMSEA) is 0.02. A RMSEA closer to zero, and less than 0.05 is considered to be a good fit. The Comparative Fit index (CFI=0.99, range 0-1) is also considered to be a good fit (McDonald and Ho 2002). Together with other measures of fit provided in Table 6.1, the relative fit statistics suggest that this model is a good fit.

6.1.2 Measurement Model

Multiple indicators were available for three of the concepts that were hypothesized to affect childhood antisocial behaviour. Therefore, latent variables were specified for these three concepts: community social disorganization (ξ_1), family instability (ξ_2), and prosocial family bonds (η_3). The indicators that comprise each latent variable are based on theory and empirical research discussed in Chapter 2. This section discusses the

confirmatory factor analyses (measurement model) in which the three latent variables were specified, and their reliability.

The confirmatory factor analysis of "community social disorganization characteristics" (Figure 6.2) shows that structural background characteristics of the community measure an underlying general instability of a child's community. Figure 6.2 shows the parameter estimates (factor loadings). For *community social disorganization* (ξ_1), for the percentage of the community: lone parent families (0.95), low income families (0.41), unemployed (0.32), low educational attainment (0.24) receiving government transfers (0.39), and living in rented dwellings (0.74). The item reliabilities (defined as "the proportion of an item's variance that is attributed to the unobserved cause", Bohrnstedt and Knobe 1994: 473) for social disorganization range from 0.06 (% low educational attainment, λ_{41}^2) to 0.90 (% lone parent families, λ_{11}^2).

The standardized parameter estimates for *family instability characteristics* (ξ_2) are: (a) family socio-economic status (-0.83), lone parent family status (0.74), and residential stability (-0.33). The reliabilities range from 0.11 (residential stability) to 0.64 (family socioeconomic status). When "large family size" (x_{10}, 3 or more children in a family) was included with the indicators of *family instability,* it had a small and non-significant factor loading (0.06, t=0.94). This suggests that family size is a distinct concept from family instability, which motivates its inclusion in the model as a separate single-indicator latent variable ($X_{10}= \xi 3$). Family size is a binary variable (0-1), where 0= one or two children and 1= three or more children. The unobserved factors for community social

disorganization and family instability (Φ_{12}= 0.26, p<0.001) and for family instability and large family size (Φ_{23}= -0.10, p<0.001) have significant correlations. Community social disorganization and large family size are not significantly correlated (Φ_{13}= 0.09, t=1.47).

Prosocial family bonds (η_2) is composed of family attachment and family supervision, with factors loadings of 0.53 and 0.34 respectively. The reliabilities are 0.29 for family attachment and 0.12 for family supervision.

The remaining factors are single indicator factors. These include (1) *collective efficacy* ($Y_1=\eta_1$), measured on a 15-point scale of degree of neighbour ties (trust, active supervision of neighbourhood and children); (2) *harsh / erratic parenting style* ($Y_2=\eta_2$), measured on a 10-point scale of level of inconsistency in and severity of discipline; (3) *school bonds* ($Y_5=\eta_4$), measured on an 8-point scale (squared to 0-64, to address skew) of how well the child is doing in school, enjoys school, and follows school rules; (4) *antisocial peer associations* ($Y_6=\eta_5$), is a binary variable (0-1), where 1=higher than average number of friends who use drugs, drink alcohol and / or do bad things; (5) *childhood antisocial behaviour* ($Y_7=\eta_6$), 10-point scale measuring the number of antisocial activities an individual engaged in during the last year. Activities included are stealing, lying, hitting, destroying property, and so on (please refer to Appendix B for more detail).

6.1.3 Causal Model

Overall, the results provide support for the main hypothesis of age-graded informal control theory (Figure 6.1): during childhood, informal social control processes are a central mechanism in the regulation of antisocial behaviour. The R^2 for childhood antisocial behaviour is 0.41 (Table 6.1). This suggests that this model accounts for a great deal of the variance in a child's antisocial behaviour.

The analysis will first discuss the structural background characteristics (shown at the far left of Figures 6.1 and 6.2) as they relate to childhood antisocial behaviour. Next, each of the informal social control processes will be discussed: collective efficacy, family social bonds (prosocial family bonds and harsh and erratic parenting), school bonds, and antisocial peer associations.

A) Structural Background Characteristics: Community Social Disorganization and Family Background Characteristics

The impact of community social disorganization, family instability and large family size were tested in a structural equation model of childhood antisocial behaviour. The SEM analysis showed no significant direct paths from these background characteristics to childhood antisocial behaviour. The estimated standardized direct paths (not shown) to childhood antisocial behaviour were: community social disorganization (γ_{61}=-0.03 t=-0.76); family instability (γ_{62}=0.02 t=0.41); and large family size (γ_{63}=0.01 t=0.34).

According to social disorganization theory, disorganization in the community indirectly affects the rate of crime. Individuals living in communities characterized by social disorganization are unable to work cohesively to address neighbourhood problems such as crime. A disorganized community will have difficulty monitoring behaviour and acting to protect the community from delinquent behaviour. A community with social ties among neighbours will be more willing to supervise the activities in the neighbourhood. Community social disorganization does appear to have indirect effects on childhood antisocial behaviour through its effects on perceived collective efficacy and antisocial peer associations. In support of social disorganization theory, a disorganized community has a negative impact on the perceived collective efficacy (γ_{11}=-0.30, $p<0.001$). This suggests that living in a community with greater social disorganization reduces perceived levels of trust and willingness of neighbours to intervene for the good of the community. Community social disorganization is also associated with antisocial peer associations (γ_{51}=0.18, $p<0.001$). Where a community has greater social disorganization, conditions appear to be favourable for greater antisocial peer associations. The overall effect of living in a socially disorganized community on antisocial behaviour though is weak (0.04 $p<.05$).

The relationship between family background characteristics (family instability and large family), and childhood antisocial behaviour is also mediated by social bonds. Family instability (family socioeconomic status, lone parent family status, and residential

stability) indirectly increases childhood antisocial behaviour through its effects on collective efficacy, prosocial family bonds and antisocial peer associations. The overall effect of family instability on childhood antisocial behaviour (Table 6.1) is indirect (0.14, $p<0.001$). Being in a large family (3 or more children) has an indirect positive effect (0.12, $p<.001$) on childhood antisocial behaviour through children's prosocial family bonds. These results support the hypothesis that the impact of family background characteristics on antisocial behaviour is mediated by informal social control processes.

B) Perceived Collective Efficacy

Turning now to the impact of informal social control on childhood antisocial behaviour, this section examines the direct and mediating roles of key institutions of informal social control: community, family, school, and peers. The analysis first examines the community as a source of informal social control through perceived collective efficacy.

Collective efficacy refers to how well community members work together, share a sense of trust, and willingness to intervene in situations for the good of the community (Sampson et al. 1997:918). It was expected that higher perceived collective efficacy would have a negative impact on antisocial behaviour. As expected, the analysis showed that social disorganization lowers perceived collective efficacy, but perceived collective efficacy did not have a significant direct impact on antisocial behaviour (β_{61}= -0.02, t=-0.49, Table 6.2). Part of the reason for this weak result may be the weakness of the measurement of community collective efficacy. The NLSCY does not provide a community-level "objective" indicator of collective efficacy. Therefore, this study relies

on an estimate of "perceived" collective efficacy based on the perceptions of the PMK (person most knowledgeable about the child – usually the mother). This basis for the measurement of collective efficacy also explains the strong negative relationship between family instability and collective efficacy (γ_{12}= -0.20, p<0.001, Table 6.2). Presumably the family's circumstances negatively colour the PMK's perception of the community's collective efficacy. Even with these two explanatory factors, the R^2 value for collective efficacy is only 0.17, suggesting that other unmeasured factors may play a role in explaining the variance in perceived collective efficacy.

C) Family Social Processes – Prosocial Family Bonds and Harsh and Erratic Parenting

According to social bond theory (Hirschi 1969), and coercion theory (Patterson 1982; Larzelere and Patterson 1990) in childhood, the family is a main source of informal control. Essentially, social control theory argues that a strong emotional attachment to parents inhibits antisocial behaviour. Coercion theory emphasizes management (supervision, consistency in rule enforcement) of parents for control of antisocial behaviour (Sampson and Laub 1993). In age-graded informal control theory, Sampson and Laub (1993) identify the following parenting styles and attachment issues as impediments to the development of social bonds between children and their parents: (a) inconsistent parenting – if discipline is harsh or erratic or threatening, the risk of delinquency increases; (b) supervision– weak supervision increases the risk of delinquency; and (c) attachment – low emotional attachment between child and parent(s) or parental rejection of the child will increase the risk of delinquency. The NLSCY captures "prosocial family bonds" where children are well supervised and have strong

attachment to their parents, and "harsh or erratic parenting" where discipline practices are threatening, aggressive, and / or inconsistent in rule enforcement and punishments.

The results of the structural equation model are consistent with studies that show children whose parents know where their children are, who they are with and what activities they are doing, express fewer antisocial behaviours (Farrington and Welsh 2007). The results (Table 6.2) also support the hypothesis that inappropriate methods of discipline; parental rejection, unnecessarily harsh and inconsistent parenting disrupts the development of informal social control because children do not internalize consequences for particular behaviours consistently. Harsh parenting style has a positive impact on antisocial behaviour in childhood ($\beta_{62} = 0.16$, $p<0.001$). A child with stronger prosocial family bonds has lower antisocial behaviour ($\beta_{63} = -0.23$, $p<0.05$). The informal social control exerted by the family through close emotional ties and supervision has a strong impact on childhood antisocial behaviour even before examining indirect effects.

Second, Sampson and Laub's theory on family social control includes the mediating role family control plays between antisocial behaviour and family background characteristics (community social disorganization, family instability, and large family size). Sampson and Laub posit that the background characteristics of the family will have only weak direct effects on antisocial behaviour, and that family social control will largely mediate this relationship (1993: 69). The structural equation model of the NLSCY data provides some support for this hypothesis (Table 6.2). A child who lives in a large family has an increased risk of being subject to increased harsh or erratic parenting styles (γ_{23}=0.14,

$p<0.001$) and weaker prosocial family bonds (γ_{33}=-0.18, $p<0.01$). Furthermore, family instability (low family socio-economic status, lone parent family status, residential instability), has a negative impact on the development of prosocial family bonds (γ_{32}=-0.27, $p<0.001$). Despite the association with prosocial bonds, family instability is not significantly associated with harsh and erratic parenting. Thus family instability is a moderate indicator of childhood antisocial behaviour through prosocial family bonds. This suggests that family instability may impact the ability of parents to supervise their children, thereby disrupting the development of prosocial bonds (Farrington and Welsh 2007:79). Living in a family characterized by instability weakens opportunities for bonding.

D) School Bonds

The school is an important institution for social control, particularly during childhood. Teachers are in a position to monitor the behaviour of children and to discipline disruptive behaviour. Research has shown an inverse relationship between school attachment and delinquency (Lockhart Burrell and Roosa 2009; Sprott et al. 2005; Sprott et al. 2000: Sampson and Laub 1993; Kercher 1988; Hirschi 1969). School bonds include enjoyment of school, achievement in school, and a willingness to follow school rules. The structural equation model of the NLSCY provides support for the hypothesis that bonds to school reduces antisocial behaviour (β_{64} =-0.37, $p<0.001$, Table 6.2). Interestingly, of all of the institutions of informal social control, bonds to school appear to be the strongest direct protective factor against antisocial behaviour in childhood. This

is not entirely unexpected based on the results of zero-order OLS regressions (Table 5.1, Chapter five).

Childhood school bonds partially mediate the relationship between family informal social control and childhood antisocial behaviour. Children who report stronger prosocial family bonds have stronger bonds to school (β_{43} =0.49, p<0.001), and this in turn reduces antisocial behaviour. School bonds do not appear to mediate the effects of background characteristics (community social disorganization, family instability, and large family size) on antisocial behaviour in childhood. The overall effect of school bonds on childhood antisocial behaviour is the second strongest (next to the overall effect of prosocial family bonds) of the institutions of informal social control (Table 6.1). The R^2 for school bonds indicates that approximately 24% of the variance is explained by this model (largely accounted for prosocial family bonds).

E) Antisocial Peer Associations

The association between delinquent peers and a youth's own delinquency is one of the most consistent findings in research on the subject, though the causal priority of peers is debated (Sampson and Laub 1993: 104; Haynie 2002; Warr 2002; Baerveldt, Völker, and Van Rossem 2008). Although establishing the order between peer selection and peer influence may be difficult, some research suggests that peer influence is stronger (Baerveldt, Völker, and Van Rossem 2008). Thus there is an expectation that during

childhood there will be a positive association between antisocial peer influence and a child's antisocial propensity.

Social learning from peer associations is a moderate and direct indicator of childhood antisocial behaviour. During childhood kids (in the NLSCY) are asked questions about their peers: whether or not they have friends who have tried smoking, drinking and sniffing glue, and whether their friends do bad things. The results from the structural equation model (Figure 6.2) provide some support for this, though they are rather surprising. Having higher than average antisocial peer associations, does increase a child's antisocial behaviour (β_{65}=0.11, p<0.001, Table 6.2); however based on empirical research during adolescence, this relationship was expected to be much stronger. This structural equation model has shown that during childhood, the family and school are very important instructions of informal social control, so perhaps social control from peers' increases in importance during teenage years.

Of the institutions of informal social control, only harsh and erratic parenting style has a significant impact on antisocial peer associations (β_{52}=0.16, p<0.001). Other sources of informal social control did not have significant effects on antisocial peer associations (not shown): perceived efficacy (β_{51}=0.01, t=0.30), prosocial family bonds (β_{53}=-0.03, t=-0.24), and school bonds (β_{54}=-0.04, t=-0.72). Despite the significant paths to antisocial peer associations from social disorganization, family instability and harsh parenting style, the R^2 value of 0.08, suggests that there are other factors that lead to

making friends with peers who engage in activities such as alcohol abuse, illicit drug use, and other bad things.

F) Interconnections among Sources of Informal Social Control

The results of the structural equation model (Figure 6.2) support the hypothesis that sources of informal social control are interconnected. The effects of perceived collective efficacy on childhood antisocial behaviour are mediated by harsh parenting practices. The results show an inverse relationship between the PMK's perceived level of collective efficacy and use of harsh or erratic parenting practices (β_{21}= -0.17, $p<0.001$). Perceived collective efficacy is not mediated by other sources of informal social control. The overall effect of perceived collective efficacy on childhood antisocial behaviour is not statistically significant (-0.08, t=1.63, Table 6.1).

The analysis of the NLSCY (Tables 6.1 and 6.2, and Figure 6.2) indicates support for the hypothesis that the effects of family informal social control on childhood antisocial behaviour are partially mediated by other sources of informal social control. First, there is an expectation that children who are subject to harsh or erratic parenting styles will be less likely to feel an emotional attachment to their parents. The results from the structural equation model of the NLSCY provide support for the direction of this impact[13] (β_{32}= -0.40, $p<0.001$). The results also show that harsh and inconsistent parenting style

[13] The direction of the relationship between harsh parenting style and prosocial family bonds was tested in a nonrecursive structural equation model. The nonrecursive model showed that when both reciprocal paths from parenting style to prosocial family bonds and from prosocial family bonds to parenting style are included, neither path is significant. In a recursive structural equation model, the path from harsh parenting style to prosocial family bonds is strong and significant. Modification indices show that freeing the path from prosocial bonds to harsh parenting style would be very weak (and non significant) and add very little (if anything) to the model.

significantly increases antisocial peer associations (β_{52}=0.16, p<0.001), which in turn increases childhood antisocial behaviour (β_{65}=0.11, p<0.001). This is consistent with recent research (Boislard et al. 2009; Lockhart Burrell and Roosa 2009; Svensson 2003). Boislard et al.'s (2009) and Lockhart Burrell and Roosa's (2009) studies used structural equation modeling techniques to examine the pathways to problem behaviours from negative parenting practices through deviant peer associations. Both studies showed inconsistent parenting practices had a positive impact on deviant peers associations and in turn a positive impact on problem behaviours. Unexpectedly, the structural equation model with the NLSCY data showed that prosocial family bonds are not significantly associated with changes in antisocial peer associations. Overall, harsh parenting style has a strong positive impact on childhood antisocial behaviour (0.35, p<0.001), both directly and indirectly (total indirect effect =0.18, p<0.001). Harsh parenting style indirectly affects antisocial behaviour through prosocial bonds (0.09 of the indirect effect), school bonds (0.07) and antisocial peer associations (0.02). This suggests that parents who treat their children harshly and inconsistently have less control over their children's choice of friends, school bonds and have weaker family attachments. This is not unexpected as Sampson and Laub argue that informal controls from family are "presumed causally prior to the formation of peer attachments" (1993:122).

The path between prosocial family bonds and childhood antisocial behaviour is also partially mediated. The structural equation model (Figure 6.2) also shows that having close emotional ties with parents and being closely monitored by parents (prosocial family bonds) has a strong positive impact on bonds to school (β_{43} =0.49, p<0.001), and

this in turn lowers antisocial behaviour (β_{64}=-0.37, p<0.001). Again this is consistent with findings from Lockhart Burrell and Roosa (2009:525). Overall, the indirect effect on childhood antisocial behaviour by prosocial family bonds through school bonds is -0.18 (p<0.001). Parental attachment and monitoring appears to increase children's bonds to school. The overall impact of prosocial family bonds (including direct and indirect effects) is strong at -0.41 (p<0.001). This is the strongest overall impact of all of the variables in the model. This suggests that prosocial family bonds during childhood are very important to the informal control of antisocial behaviour; both directly and indirectly.

6.2 Summary of Findings

The purpose of this chapter was to test four hypotheses relating to the role of informal social control of antisocial behaviour in childhood. The hypotheses centre around two major themes. First, according to age-graded informal social control theory, informal social control is the primary mechanism in the regulation or development of antisocial behaviour. Second, the influence of structural background characteristics on childhood antisocial behaviour is mediated by sources of informal social control. Antisocial behaviour in childhood include such behaviours as: truancy, bullying, threatening, hitting and other aggressive behaviours, lying, cheating, stealing, damaging property, disobedience at school, and drinking alcohol. The following section reviews the findings for the four specific hypotheses (please refer to Figure 6.1).

Overall, the analysis finds support for the hypotheses that sources of informal control are the primary mechanisms through which antisocial behaviour is regulated (*hypothesis 1*). The first social control process considered in this analysis was perceived collective efficacy. This measures the degree to which the person most knowledgeable (PMK, usually the child's mother) feels that the neighbours in the community share ties, trust, and a willingness to monitor the community. It was expected that living in a community where residents are willing to take action to protect the community, and where neighbours are trusted would act to informally regulate deviant activities in the community. The structural equation model did not provide support for this hypothesis. The reason for this may be with the measurement of collective efficacy as a perception from the Person Most Knowledgeable, rather than as an objective indicator from other individuals in the community.

Next sources of informal control from the family were considered. Based on previous research and theory, there was an expectation that the family would be a very important source of informal control during childhood. Two dimensions of family bonds were studied: Harsh or erratic parenting style and prosocial family bonds (emotional attachment to parents and parental supervision of children's activities). The structural equation modeling with the NLSCY data provided support for this hypothesis. Inconsistency in parenting style has a positive impact on childhood antisocial behaviour. A child who has a strong emotional attachment to parent(s), and whose parents actively supervise his or her activities express less antisocial behaviour.

Based on previous research, there was an expectation that during childhood bonds to school would informally control antisocial behaviour. The results provide support for this hypothesis: having stronger bonds to school decreased antisocial behaviours such as being aggressive, being cruel, stealing, being disobedient, lying and cheating, and being truant. Bonds to school had the strongest direct effect on preventing antisocial behaviour, relative to other sources of informal social control.

Finally, in childhood, antisocial peer associations have a positive impact on a child's own antisocial behaviour. The relationship is not as strong as the literature suggests it might be though. It is possible that peer associations become a stronger source of influence during adolescence.

Overall the analyses indicate that for Canadian children, the impact of background community and family characteristics on antisocial behaviour is mediated by informal social control processes (*hypothesis 2*). According to social disorganization theory, a community characterized by instability, and socio-economic disadvantage, has greater difficulty bringing residents together to maintain informal control. The effects of living in a socially disorganized community were mediated by perceived community efficacy and antisocial peer associations. The effects of family instability and large family size on antisocial behaviour were also mediated by informal social controls. Family instability indirectly increased antisocial behaviour through weaker collective efficacy, weaker

prosocial family bonds and increased antisocial peer influence. Large family size (3 or more children), was related to weaker prosocial family bonds and increased harsh or erratic parenting styles (Hirschi 1991; Coleman 1990). This is consistent with Sampson and Laub who found that family bond variables "mediated approximately 75% of structural background on delinquency" (1993:96), and have almost no direct effect on delinquency beyond the family process variables.

The analysis also provides support for the hypothesis that informal social control processes are interconnected (*hypothesis 3*). The effects of perceived collective efficacy on childhood antisocial behaviour are completely mediated by harsh and erratic parenting styles. This is consistent with other research on the relationship between community ties and parenting styles (Fitzgerald 2007; Simons et al. 2005). The effects of harsh and erratic parenting style on childhood antisocial behaviour are partially mediated by antisocial peer associations, prosocial family bonds and school bonds. The overall effects of prosocial family bonds on childhood antisocial behaviour are strong and nearly half of the effect is partially mediated by school bonds.

Support was found for the hypothesis that some sources of informal social control are more effective at informally controlling antisocial behaviour than others (*hypothesis 4)*. The results show that school bonds have the strongest direct impact on a child's antisocial behaviour. Prosocial family bonds have the largest overall impact on regulating antisocial behaviour (combing direct and indirect paths). Harsh parenting practices also have a

strong overall effect on increasing antisocial behaviour. The strength of informal social controls from school and family is consistent with findings from Sampson and Laub (1993: 119). Antisocial peer influence had a smaller than expected impact on childhood antisocial behaviour. This suggests that during childhood, antisocial peers do influence antisocial behaviour, but the influence is less than the positive effects of family and school bonds.

Therefore, these results provide support for almost all of the hypotheses shown in Figure 6.1. A central tenet of the informal social control theory is that antisocial behaviour arises when social bonds (that bind individuals to societal norms) are weakened. Informal social control exerted through family, school and peer bonds were found to significantly impact antisocial behaviour in childhood. Prosocial family bonds, school bonds and harsh or erratic parenting practices were found to have the greatest informal social control effects on antisocial behaviour. Antisocial peer associations had a weaker than expected impact on antisocial behaviour in childhood. Perceived community collective efficacy was the only informal social control that did not have a direct impact on antisocial behaviour. Furthermore, informal social controls were found to mediate the impact of background characteristics from socially disorganized communities, family instability, and large family size. Finally, the results also provide support for the hypothesis that sources of informal social control are interconnected.

According to age-graded informal control theory, individuals are subject to varying forms of informal control over the life course. Some forms of social control may become more or less important as individuals age. In this chapter, the analyses showed that in Canada, childhood antisocial behaviour is better understood as being regulated by informal social controls from institutions including the family, school, and peers, than by family and community characteristics alone. The next chapter will explore whether there is continuity in antisocial propensity and behaviour developed in childhood. It will also assess whether social bonds in adolescence contribute to change in the underlying antisocial propensity over the teenage years.

Chapter Seven: Continuity and Change in Antisocial Behaviour during Adolescence

The theme of this chapter is continuity and change in antisocial propensity and behaviour from childhood to adolescence. Antisocial propensity, expressed through antisocial behaviours may have strong continuity over time. This continuity may be homotypic, where the same or similar behaviours are repeated over time, or it may be heterotypic, where physically different behaviours manifest in underlying consistency over time. For example, specific behaviours in childhood, considered to be antisocial, may be different than behaviours considered antisocial in adulthood, but there may be a strong association between them. At both life stages, there is an underlying antisocial propensity that manifests itself in different ways over time (Sampson and Laub 1993:123). The focus of the following chapter is to address the questions of stability and change in antisocial propensity and its expression in behaviour. The central hypothesis for this chapter is that *childhood pathways of antisocial propensity and behaviour may be modified over time by adolescent social bonds*.

Various definitions of the term propensity have been used to describe antisocial potential. Hirschi and Gottfredson for example define propensity in terms of low self-control. They argue that crimes are "short-term, circumscribed events" (1990:137) in which a certain set of circumstances, such as opportunity must be present to occur. Underlying these crimes is low self-control and low self-control is generally stable. The stability to which Gottfredson and Hirshi (1990) refer is relative stability between individuals over time, as opposed to within individual stability. Propensity for crime remains stable between

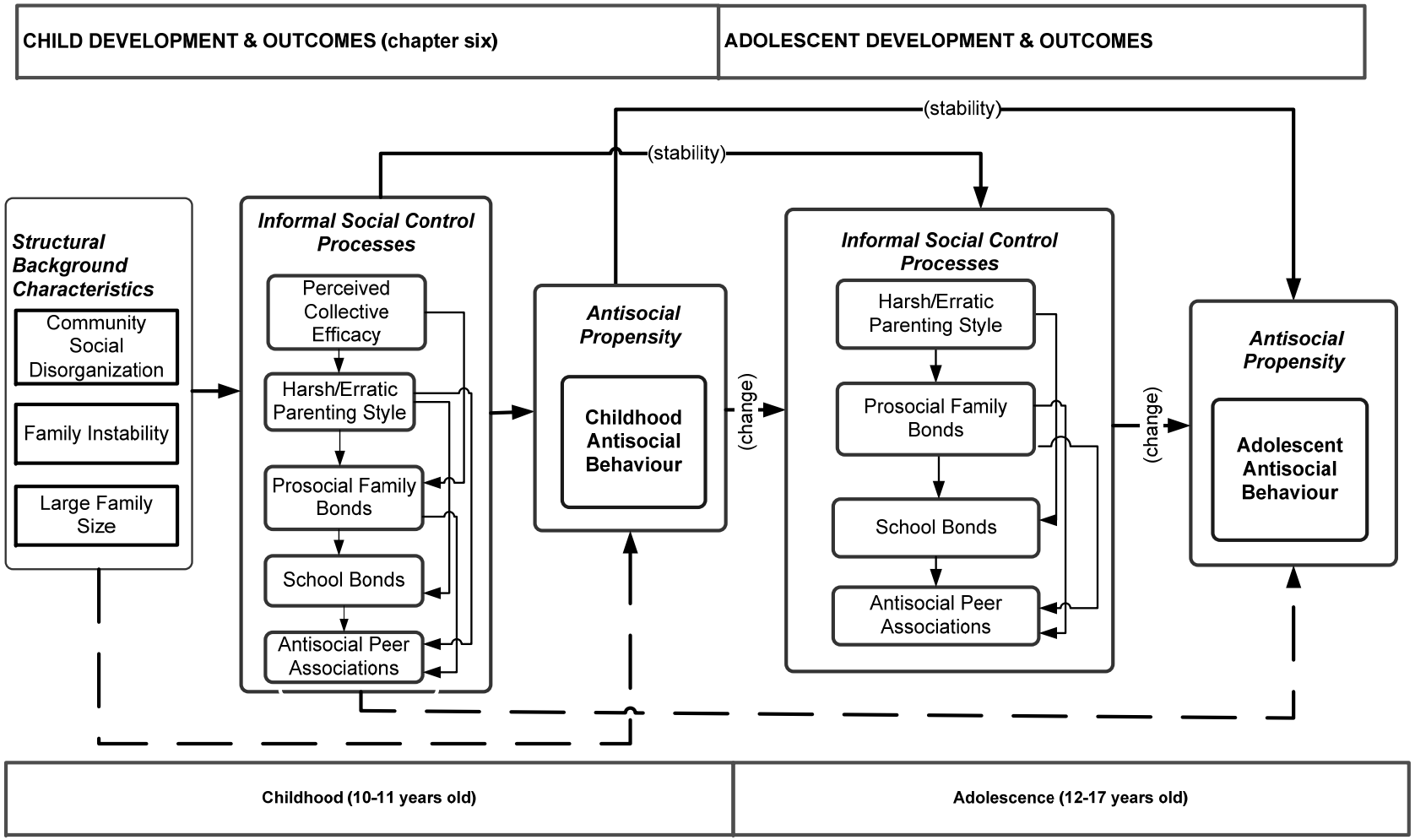
individuals over time (Gottfredson and Hirschi 1990). Similarly to Gottfredson and Hirschi, in this dissertation, it is assumed that antisocial propensity is established in childhood, primarily as a result of socialization and remains relatively stable throughout the life course. Sampson and Laub agree with the definition of low self-control set forth by Gottfredson and Hirschi and find that "regardless of which measure of delinquency or antisocial behavior in childhood is used, childhood misbehavior has a powerful relationship with adult crime and deviance (1993: 129). Sampson and Laub add to this definition the possibility of modification to propensity. They argue that adult behaviour is influenced not only by early socialization and self-control, but by "modifying events and socialization in adulthood" (1993: 17). Thus propensity refers to an underlying antisocial potential that manifests itself in deviant behaviours throughout individuals' lives and is subject to modification. Antisocial behaviour may vary depending on underlying antisocial propensity and informal social control. A main difference to the expression of antisocial propensity in Sampson and Laub's theory from Gottfredson and Hirschi's (1990) general theory is the possibility of stability *and change* over the life course.

The specific hypotheses that are tested in this chapter (Figure 7.1) include: (1) childhood informal social controls and background characteristics will have indirect effects on adolescent antisocial behaviour through their effects on childhood antisocial behaviour and adolescent informal social control processes; (2) childhood antisocial behaviour impacts the quality of social bonds in adolescence, regardless of childhood social bonds; (3) the propensity towards antisocial behaviour will persist from childhood to adolescence; (4) the major causal explanation for change in adolescent antisocial

behaviour is concurrent sources of informal control, regardless of antisocial propensity; (5) during adolescence, informal social control processes are interconnected; and (6) the most influential sources of informal social control are expected to change in adolescence, compared to childhood. For example, the influence of antisocial peer associations on antisocial behaviour is expected to increase.

The analysis of continuity and change is estimated with a two-wave lagged effects and synchronous effects structural equation model (Finkel 1995). Figure 7.1 represents the conceptual hypotheses for this chapter. Solid lines in Figure 7.1 represent direct paths and broken lines indicate indirect paths. Results of the structural equation model are presented in Table 7.1, Table 7.2 and Figure 7.2.

Figure 7.1 Conceptual Causal Model of Hypotheses. Continuity and change in antisocial propensity and behaviour in adolescence



7.1 Analysis

The structural equation model (Figure 7.2) shows the statistically significant pathways to adolescent antisocial behaviour from childhood. In Figure 7.2, all significant paths leading to adolescent antisocial behaviour are emphasized with larger font and path sizes. The other paths that lead to childhood informal social controls and childhood antisocial behaviour are discussed in Figure 6.2, Chapter 6, and so those paths are deemphasized in Figure 7.2 with reduced font and path sizes (all estimates can be read clearly in Table 7.2). The details of the measurement model are discussed in section 7.1.2. Table 7.1 contains the standardized direct and indirect effects of all childhood and adolescent factors on adolescent antisocial behaviour. Table 7.2 includes the standardized estimates of the structural model. Additional matrices of estimates can be found in Appendix E.

Figure 7.2 Structural Equation Model: Direct and indirect paths of continuity and change in antisocial propensity and behaviour in adolescence

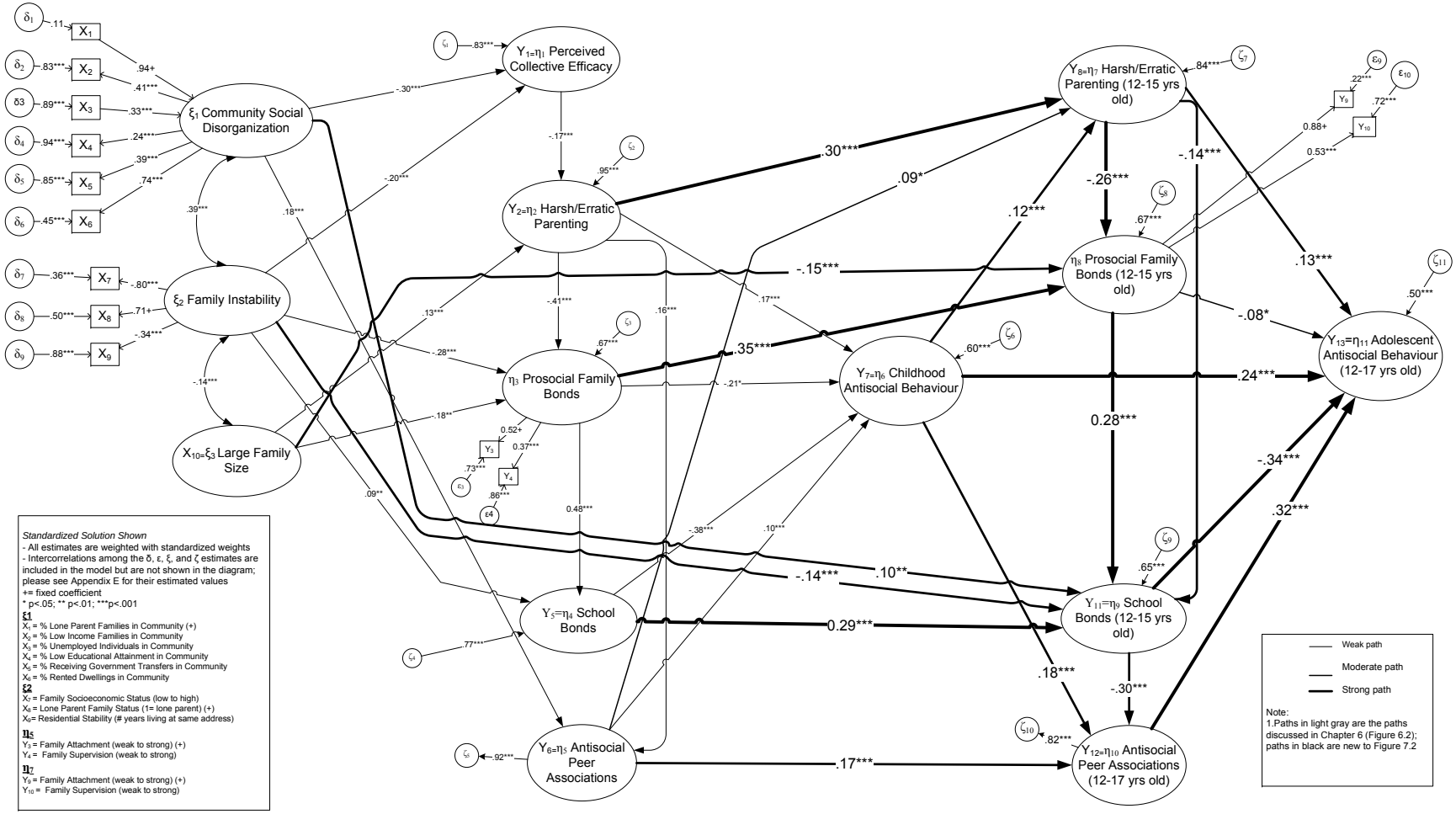


Table 7.1 Standardized Effects of Childhood & Adolescent Factors on Adolescent Antisocial Behaviour

Dependent Variable: Adolescent antisocial behaviour (ages 12-17) (η_{11})			
N=735	Standardized Path Coefficients		
Independent variables	**Direct effects**	**Indirect effects**	**Total Effect**
Structural Background Characteristics			
Community social disorganization (ξ_1)	-	0.01	0.01
s.e.		0.02	0.02
Family Instability (ξ_2)	-	**0.15*** **	**0.15** **
s.e.		0.03	0.03
Large Family Size (ξ_3)	-	**0.11*** **	**0.11*** **
s.e.		0.02	0.02
Childhood Informal Social Control Processes (10-11)			
Perceived Collective Efficacy (η_1)	-	**-0.06*** **	**-0.06*** **
s.e.		0.02	0.02
Harsh/Erratic parenting style (η_2)	-	**0.26*** **	**0.26*** **
s.e.		0.02	0.02
Prosocial family bonds (η_3)	-	**-0.26*** **	**-0.26*** **
s.e.		0.05	0.05
School bonds (η_4)	-	**-0.25*** **	**-0.25*** **
s.e.		0.03	0.03
Antisocial Peer Associations (η_5)	-	**0.11*** **	**0.11*** **
s.e.		0.02	0.02
Childhood Antisocial Behaviour (10-11)			
Childhood Antisocial Behaviour (η_6)	**0.24** **	**0.10*** **	**0.34*** **
s.e.	0.04	0.03	0.04
Adolescent Informal Social Control Processes (12-17)			
Harsh Parenting Style (12-15) (η_7)	**0.13*** **	**0.11*** **	**0.24*** **
s.e	0.03	0.02	0.03
Prosocial family bonds (12-15) (η_8)	**-0.08***	**-0.12*** **	**-0.20*** **
s.e	0.04	0.02	0.05
School bonds (12-15) (η_9)	**-0.34*** **	**-0.10*** **	**-0.44*** **
s.e	0.03	0.01	0.03
Antisocial Peer Associations (12-17) (η_{10})	**0.32*** **	-	**0.32*** **
s.e	0.03		0.03
R^2	$R^2_{\text{Collective Efficacy}}$= 0.17; $R^{2c}_{\text{Harsh parenting1}}$=0.05; $R^2_{\text{prosocial family bond1}}$= 0.33; $R^2_{\text{School bonds.1}}$=0.23 $R^2_{\text{childhood antisocial peer associations1}}$=0.08 $R^2_{\text{childhood antisocial behaviour}}$= 0.40; $R^2_{\text{Harsh parenting2}}$=0.16; $R^2_{\text{prosocial family bond2}}$= 0.35; $R^2_{\text{School bonds.2}}$=0.31 $R^2_{\text{adolescent antisocial peer associations2}}$=0.18 $R^2_{\text{adolescent antisocial behaviour}}$= 0.50		
Fit	χ^2=239.27 (164), p<0.001; GFI= 0.97, AGFI=0.95; RMSEA=0.025; NFI=0.97; CFI =0.99; PNFI=0.63		

[a] Normalized Funnel Weights * p<.05 **p<.01 ***p<.001; N adjusted to account for design effect

Table 7.2 Estimates for the final structural model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ).

N=735[a]	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	ζ
Childhood														
Collective efficacy (η_1)	-0.30*** (-7.31)	-0.20*** (-3.61)	--	--										0.83*** (18.67)
Harsh parenting (η_2)	--	--	0.13*** (3.97)	-0.17*** (-4.84)										0.95*** (19.28)
Prosocial family bonds (η_3)	--	-0.28*** (-3.69)	- 0.18** (-3.39)	--	-0.41*** (-6.98)									0.67*** (3.58)
School bonds (η_4)	--	--	--	--	--	0.48*** (8.30)								0.77*** (14.61)
Antisocial Peer Associations (η_5)	0.18*** (4.43)	0.09** (2.11)	--	--	0.16*** (4.73)	--	--							0.92*** (19.18)
Childhood antisocial behaviour (η_6)	--	--	--	-0.03 (-0.77)	0.17*** (3.30)	-0.21* (-2.07)	-0.38*** (-10.99)	0.10*** (4.17)						0.60*** (16.52)
Adolescence														
Harsh parenting (η_7)	--	--	--	--	0.30*** (8.28)	--	--	0.09* (2.49)	0.12*** (3.38)					0.84*** (19.21)
Prosocial family bonds (η_8)	--	--	-0.15*** (-4.11)	--	--	0.35*** (4.61)	--	--	0.03 (0.43)	-0.26*** (-6.67)				0.67*** (5.79)
School bonds (η_9)	0.10** (2.99)	-0.14*** (-3.02)	--	--	--	--	0.29*** (9.30)	--	-0.05 (-1.29)	-0.14*** (-4.12)	0.28*** (5.73)			0.65*** (18.43)
Antisocial Peer Associations (η_{10})	--	--	--	--	--	--	--	0.17*** (4.89)	0.18*** (4.89)	--	--	-0.30*** (-8.35)		0.82*** (19.17)
Adolescent antisocial behaviour (η_{11})	--	--	--	--	--	--	--	--	0.24*** (6.28)	0.13*** (4.40)	-0.08* (-2.07)	-0.34*** (-10.77)	0.32*** (11.29)	0.50*** (18.78)

* p<.05; ** p<.01; ***p<.001 -- parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model;

Notes:

[a]Normalized Funnel Weights; N adjusted to account for design effect

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}.

Appendix E, Tables A7.4a, A7.4b, A7.4c, and A7.4d provide detailed information for additional matrices

7.1.1 Model Fit

Overall, the fit of this model is adequate to good according to the fit statistics. Two types of fit statistics are used to evaluate this model: absolute fit and relative fit. The χ^2 (absolute fit index) is significant ($p<0.001$) suggesting there is a high probability that the model may not fit the data. The relative fit statistics suggest this model is a good fit. The Root Mean Square Approximation (RMSEA) is 0.03 and the comparative Fit index (CFI) is 0.99. Together with other measures of fit provided in Table 7.1, the relative fit statistics suggest that this model is a good fit (McDonald and Ho 2002).

7.1.2 Alternative Models

The hypotheses for this section are based on previous theory and empirical research. In order to test the hypotheses, some alternative models were specified. These structural equation models can be found in Appendix E for Chapter 7 (Tables A7.1a, A7.2a, and A7.3a). Alternative models were necessary for model identification. Specifically, to test the hypotheses that (1) background community and family characteristics have primarily an indirect effect on antisocial behaviour in adolescence, and (2) that childhood informal social controls have primarily an indirect effect on antisocial behaviour during adolescence required including all direct and indirect paths in a model. A model including all parameters to test these two hypotheses was under-identified and no solution could be estimated. Therefore the first model (Table A7.1a, Appendix E) fixed cross-lagged endogenous paths (e.g. $\beta_{92,}$ $\beta_{93,}$ β_{95}) and direct paths from childhood informal social controls to adolescent antisocial behaviour (e.g. $\beta_{11.1,}$ $\beta_{11.2,}$ $\beta_{11.3}$) to zero. The

purpose of this was to estimate the significance and strength of direct effects of background characteristics on antisocial behaviour during adolescence. Theory and empirical research suggest that these characteristics primarily have indirect effects only. The caution in interpreting this model is that misspecification may be problematic because many potentially significant paths have been fixed to zero. This model did however suggest that the background characteristics (i.e. ξ_1 to ξ_3) have limited effects on bonding during adolescence (i.e., significant paths to η_8 and η_9) but no direct effect on antisocial behaviour during adolescence (η_{11}). The implications of these results are discussed further in section 7.1.4 (below).

The second alternative model (Table A7.2a, Appendix E) examined the effect of childhood informal social controls (i.e. $\eta_{1\ to}\ \eta_5$) on adolescent informal social controls ($\eta_{7\ to}\ \eta_{10}$) ("lagged" and "cross-lagged" effects) and adolescent antisocial behaviour (η_{11}). Non significant paths from exogenous background characteristics identified in the first structural equation model (Table A7.1a, Appendix E), were fixed to zero. Again this was done for model identification. Based on theory and empirical research, it was expected that childhood informal social controls would have only an indirect effect on antisocial behaviour in adolescence. The parameter estimates of this model suggested that childhood informal social controls contribute to the development (or control of) of antisocial behaviour in childhood (i.e. significant direct paths to η_6 from $\eta_{2\ to}\ \eta_5$) and then stability of social bonds during adolescence (i.e. some significant direct paths to η_7 - η_{10} from $\eta_{1\ to}\ \eta_5$). They do not however appear to have direct effects on later antisocial

behaviour beyond their indirect effects: i.e. the parameter estimates in Appendix E Table A7.2a for the effects of $\eta_{1 \text{ to }} \eta_5$ on η_{11} are all non-significant. The implications of these results are discussed further in section 7.1.4 (below).

Finally a third alternative model was specified to include correlated residual terms between repeated measures for both the causal model and the measurement model (Appendix E, Table A7.3a). First, nonrandom error is a possibility in the measurement model when the same measure is taken from the same individual at multiple points in time. Nonrandom error refers to error between variables "that is related in some systematic way" (Maruyama 1997:87). Ignoring nonrandom error may result in an inaccurate estimation of the relationship between two variables. Structural equation modeling allows for the estimation of the effects of nonrandom error by estimating residual covariances among the measured variables. For example, school bonds measured at time 1 and school bonds measured at time 2 may be related, but they may also share systematic error. This structural equation model (Table A7.3a, Appendix E) accounted for residual error covariances among repeated measures (please refer to Appendix E , Table A7.3c for the detailed estimates). The results of this structural equation model suggest that correlated residual terms between repeated measures may be present for family attachment ($\theta_{\varepsilon\ 93} = 0.09$, $p<0.05$) and for family supervision ($\theta_{\varepsilon\ 10.4} = 0.19$, $p<0.001$).

Secondly, Best Linear Unbiased Estimator (BLUE) assumptions of linear regression models are that error terms of the latent η (dependent) variables are uncorrelated (Borhnstedt and Knoke 1994: 452). This assumption is tested here because the indicators of informal social family, school and peer bonds, as well as, antisocial behaviour are estimated at two points in time from a panel sample. It is possible that the variances from the error terms could be correlated. Table A7.3e (Appendix E) shows the estimates of the error covariances. The covariances (ψ) among the error terms (ζ) of the causal model are non significant between antisocial behaviour (time 1 and time 2), harsh parenting styles (time 1 and time 2), school bonds, (time 1 and time 2), and antisocial peer associations (time 1 and time 2). However, in this structural equation model error covariance is significant for prosocial family bonds (ψ_{83}=0.24, $p<0.01$).

The final structural equation model (Table 7.1, Table 7.2, and Figure 7.2) is specified based on the theoretical and empirical research in order to test the hypotheses for this chapter. The model includes significant error covariances of the measurement and causal models as estimated in the previous model (Tables A7.3c and A7.3e, Appendix E). It also includes indirect paths from background community characteristics and childhood informal social controls. The final structural equation model (Figure 7.2, Table 7.2) is discussed in detail in the remainder of this chapter.

7.1.3 Measurement Model

This model includes two life stages: childhood and adolescence. The factors included in the model from these life stages are: (1) background characteristics (community and

family), (2) childhood informal social bonds, (3) childhood antisocial behaviour, (4) adolescent informal social bonds, and (5) adolescent antisocial behaviour. The measures are discussed in detail in Chapter 4 (Table 4.1) and are reviewed here.

The first three factors from childhood are the focus of Chapter 6 and are presented in Figure 6.2. They are reviewed here. First, background characteristics of the community and family include three concepts; two of which have multiple indicators: community social disorganization (ξ_1), family instability (ξ_2), and large family size (3 or more children) (ξ_3). The confirmatory factor analysis of "community social disorganization characteristics" (Figure 7.2) shows that structural background characteristics of the community measure an underlying general instability of a child's community. Factor loadings for *community social disorganization* (ξ_1) are for the percentage of the community that is: lone parent families (0.94), low income families (0.41), unemployed (0.33), low educational attainment (0.24) receiving government transfers (0.39), and living in rented dwellings (0.74).

The standardized parameter estimates for *family instability characteristics* (ξ_2) are (please refer to Figure 7.2): (a) family socio-economic status (-0.80), lone parent family status (0.71), and residential stability (-0.34). *Large family size* (ξ_3) is a single indicator factor based on the number of children living in a household. This is a binary variable (0=one or two children; 1= three or more children). The unobserved factors for community social disorganization and family instability (Φ_{12}= 0.39, $p<0.001$) and for family instability and

large family size (Φ_{23}= -0.14, p<0.001) have significant correlations. Community social disorganization and large family size are not significantly correlated (Φ_{13}= 0.07, t=1.16).

Childhood informal social controls include several factors. *Childhood prosocial family bonds* (η_2) is composed of family attachment (Y_3) and family supervision (Y_4), measured at ages 10 to 11 years old, with factors loadings of 0.52 and 0.37 respectively. The remaining factors are single indicator factors. These include (1) *perceived collective efficacy* ($Y_1=\eta_1$), measured on a 15-point scale of degree of neighbour ties (trust, active supervision of neighbourhood and children); (2) *harsh / erratic parenting style* ($Y_2=\eta_2$), measured on a 10-point scale of level of inconsistency in and severity of discipline (10-11 years old); (3) *school bonds* ($Y_5=\eta_4$), measured on an 8-point scale (squared to 0-64, to address skew) of how well the child is doing in school, enjoys school, and follows school rules (10-11 years old); (4) *antisocial peer associations*($Y_6=\eta_5$), is a binary variable (0-1), where 1=higher than average number of friends who use drugs, drink alcohol and / or do bad things (10-11 years old).

Third, *childhood antisocial behaviour* ($Y_7=\eta_6$), is measured through a 10-point scale assessing the number of antisocial activities an individual engaged in during the last year (10-11 years old). Activities included are stealing, lying, hitting, destroying property, and so on (please refer to Appendix B for more detail).

Fourth, adolescent informal social controls include both single-indicator and multiple-indicator concepts. *Adolescent prosocial family bonds* (η_8) is composed of

family attachment (Y_9) and family supervision (Y_{10}), with factors loadings of 0.88 and 0.53 respectively. These indicators are the average level of attachment and supervision over the ages 12 to 15 years old (Cycle 2 and 3 of the NLSCY). The other factors are single-indicator concepts: (1) *harsh / erratic parenting style* ($Y_8=\eta_7$), measured on a 10-point scale of level of inconsistency in and severity of discipline, averaged over the ages 12 through 15; (2) *school bonds* ($Y_{11}=\eta_9$), measured on an 8-point scale (squared to 0-64, to address skew) of how well the adolescent is doing in school, enjoys school and follows school rules (averaged from the ages 12 through 15); and (3) *antisocial peer associations* ($Y_{12}=\eta_{10}$),is a binary variable (0-1), where 1=higher than average number of friends who use drugs, drink alcohol and / or break the law, averaged over the ages 12 through 17.

Finally, *adolescent antisocial behaviour* ($Y_{13}=\eta_{11}$), is measured on a 10-point scale based on the number of antisocial activities an individual engaged in during the last year (averaged over ages 12 through 17). Activities included are stealing, lying, hitting, destroying property, being questioned by police and/or security guards; breaking into properties with the intent to steal; stealing purses, wallets, from stores, schools; selling stolen goods; fighting leading to minor and / or serious injuries; carrying/using weapons (knives, guns) for the purpose of fighting; purposely setting fires and so on.

7.1.4 Causal Model

A) Indirect Effects of Background Characteristics and Childhood Informal Social Controls on Adolescent Antisocial Behaviour

In this section, each of the six hypotheses specified at the beginning of Chapter 7 and summarized in Figure 7.1 is addressed. The first hypothesis is that the effects of childhood informal social controls and background characteristics on adolescent antisocial behaviour are indirect. To test this hypothesis, two alternative structural equation models were estimated[14]. One structural equation model[15] estimated the direct and indirect effects of community family background characteristics on adolescent antisocial behaviour. In this structural equation model, none of the background characteristics had a significant direct effect on adolescent antisocial behaviour: community social disorganization ($\gamma_{11.1}$ = 0.06, t=1.58); family instability ($\gamma_{11.2}$ = -0.02, t=-0.43); and large family size ($\gamma_{11.3}$ = 0.03, t=0.88).

The second structural equation model[16] tested the direct and indirect effects of childhood informal social controls on level of adolescent antisocial behaviour. This model showed that the effects of childhood informal social controls on adolescent antisocial behaviour are completely mediated by childhood antisocial behaviour and adolescent informal social controls: collective efficacy ($\beta_{11.1}$ = -0.02, t=-0.31); harsh parenting style ($\beta_{11.2}$ =

[14] Please refer to section 7.1.2 for explanation.
[15] Please refer to section 7.1.2 and see Table A7.1a in Appendix E for detailed estimates
[16] Please refer to section 7.1.2 and see Table A7.2a in Appendix E for detailed estimates

-0.06, t=-1.57); prosocial family bonds ($\beta_{11.3}$ = 0.24, t=1.48); and school bonds ($\beta_{11.4}$ = 0.00, t=0.04), and childhood antisocial peer associations ($\beta_{11.5}$ = 0.02, t=0.79).

The final structural equation model (Figure 7.2, Table 7.1 and Table 7.2[17]) shows that background characteristics and childhood informal social controls have significant indirect effects on later antisocial behaviour. Their effects are mediated by childhood antisocial behaviour and adolescent informal social controls.

The indirect effects of family instability on adolescent antisocial behaviour are largely through adolescent school bonds (0.07 of the 0.15 total effect). Family instability in childhood appears to have negative consequences for school bonds in adolescence (γ_{92} = -0.14, p<0.01). Other indirect paths to youth antisocial behaviour from family instability are via childhood antisocial behaviour (0.03) and adolescent antisocial peer associations (0.04). This suggests that the effect of childhood family instability is rather complex.

The overall effect of large family size on adolescent antisocial behaviour is indirect (0.11, p<0.001). A larger family size (with more than two children) weakens prosocial family bonds (γ_{83} = -0.15, p<0.001). Despite this direct effect, more than half of the indirect effect of family size on adolescent antisocial behaviour is through childhood antisocial behaviour (0.03) and school bonds (0.04), while the effect through prosocial family bonds is only (0.02). Although community social disorganization appears to have a

[17] For detailed estimates of additional parameters, please refer to Tables A7.4a, A7.4b, A7.4c, and A7.4d in Appendix E

positive effect on school bonds (0.10, $p<0.01$), the overall effect of community social disorganization on adolescent antisocial behaviour is not significant (0.01, $t=0.50$).

Most of the childhood informal social controls have significant indirect effects on adolescent antisocial behaviour through their effects on childhood antisocial behaviour and adolescent antisocial informal social controls (Table 7.1). Community efficacy has significant indirect, effect on adolescent antisocial behaviour (-0.06, $p<0.001$), mainly through childhood antisocial behaviour (-0.02), harsh parenting (-0.01), school bonds (0.01), and antisocial peer associations (0.01). Childhood harsh parenting has a strong overall effect on adolescent antisocial behaviour (0.26, $p<0.001$).

The main indirect effect of childhood harsh parenting is through childhood antisocial behaviour (0.08 of the 0.26, $p<0.001$ total effect). Childhood harsh parenting is also partially mediated by adolescent social bonds, particularly school bonds (0.06), harsh parenting (0.05) and antisocial peer associations (0.05). Prosocial bonds and school bonds have strong negative indirect effects (-0.26, $p<0.001$ and -0.25 $p<0.001$, respectively). The effects of prosocial family bonds are partially mediated by childhood antisocial behaviour (-0.09) and adolescent school bonds (-0.09). Similarly, the indirect effect of childhood school bonds is via adolescent school bonds (-0.11) and childhood antisocial behaviour (-0.09). The effects of childhood antisocial peer associations (0.11, $p<0.001$) are largely mediated by adolescent antisocial peer associations (0.06) and to a lesser extent by childhood antisocial behaviour (0.02).

Sampson and Laub (1993: 134) found that once childhood delinquency was accounted for, childhood family bonds and other characteristics did not directly explain later antisocial behaviours. The results of this structural equation model provide support for the hypothesis that childhood bonds and characteristics have only indirect effects on later antisocial behaviour. It also shows that the indirect paths from childhood bonds to adolescent antisocial behaviour are complex and not fully accounted for by childhood antisocial behaviour.

B) Cumulative Continuity: The Consequences of Prior Antisocial Behaviour

The theme of age-graded informal control theory is continuity *and* change in antisocial propensity; the concepts are not mutually exclusive. The antisocial propensities individuals develop early in life may be persistent, but changes in circumstances can modify antisocial trajectories. Age-graded theory argues that changes in deviance may be structured by social transitions.

Cumulative continuity extends the consequences of early antisocial propensity to other realms of social life. In this section the hypothesis (#2, Figure 7.1) is that prior antisocial behaviour will have negative consequences for prosocial social bonding during adolescence, regardless of childhood social bonds. It is expected that there will be strong continuity in social bonding from childhood through adolescence. The lagged-effects structural equation model accounts for stability in social bonds, in order to capture the change in bonding caused by early antisocial propensity.

The stability effects[18] for social bonds are: (1) harsh and erratic parenting style (β_{72}=0.30, p<0.001); (2) prosocial family bonds (β_{83}=0.35, p<0.001); (3) school bonds (β_{94}=0.29, p<0.001); and (4) antisocial peer associations ($\beta_{10.5}$=0.17, p<0.001). These stability effects suggest that there is a great deal of continuity in social bonding from childhood through adolescence. A traditional social control perspective focuses on that stability without considering how antisocial propensity may affect social bonds in later life.

Age-graded informal social control theory argues that, in addition to the delinquent outcomes during adolescence, childhood antisocial propensity has consequences for a variety of domains. Specifically, prior antisocial behaviour may interfere with successful social relationships later. Sampson and Laub argue that cumulative continuity may occur where "delinquent behaviour has a systematic attenuating effect on the social and institutional bonds linking adults to society" (1993:138). The structural equation model provides some support for this hypothesis.

Prosocial bonds developed in childhood appear to have strong protective qualities against antisocial behaviour (Table 7.2). Prior antisocial behaviour does not have a significant impact on prosocial family bonds beyond the stability of childhood prosocial family bonds (β_{86} =0.03, t=0.43). This means that stability in prosocial family bonds, developed during childhood, are strong enough to withstand the effects of childhood antisocial behaviour. Prior antisocial behaviour does not have a significant impact on later school

[18] Standardized stability coefficients measure "between-individual" stability

bonds, when stability in school bonds is controlled for (β_{96} = -0.05, t= -1.29). Prior school bonds continue to have strong protective qualities against antisocial propensity into adolescence.

Weak social bonds, in contrast, are worsened by the effects of early antisocial propensity (Figure 7.2, Table 7.2). Harsh parenting practices may increase beyond childhood with childhood antisocial behaviour (β_{76} =0.12, $p<0.001$). Prior antisocial behaviour also has an impact on choice of peer associations in adolescence, beyond the stability effect of antisocial peer associations. Childhood antisocial behaviour increases associations with peers who use drugs or do illegal things in adolescence ($\beta_{10.6}$ = 0.18, $p<0.001$), regardless of childhood peer associations. The overall indirect effect of childhood antisocial behaviour on adolescent antisocial behaviour is mainly via adolescent antisocial peer associations (0.06 out of the 0.10, $p<0.001$ total indirect effect),

Overall these results support the hypothesis that childhood antisocial behaviours impact social bonding during adolescence. Cumulative continuity extends the consequences of antisocial propensity to other social realms. Specifically, antisocial propensity developed in childhood further strains individuals' weak ties to conventional society at later stages (Sampson and Laub 1993; Zara and Farrington 2009; Sampson and Laub 2005; Kornhauser 1978 and Janowitz 1975).

C) Continuity and Change in Antisocial Propensity and Behaviour

Informal control through social bonding has traditionally focused on bonding during childhood. During childhood individuals are expected to learn and internalize accepted societal norms. A general theory of crime (Gottfredson and Hirschi 1990) argues that the effects of these bonds (or lack thereof) have a direct lasting effect on behaviour. Sampson and Laub's thesis is that "childhood pathways to crime *and* conformity are significantly modified over the life course by adult social bonds" (1993:139 emphasis in original).

The hypothesis of this section of the dissertation is that *pathways to antisocial and delinquent behaviour may be modified from childhood to adolescence by adolescent social bonds*. Thus it is expected that bonds in adolescence will be able to account for variations in antisocial behaviour, regardless of previous antisocial propensity. Although what happens in childhood may have lasting effects on behaviour; it is possible to build new social bonds at different stages in life, thereby modifying antisocial propensity over time.

Antisocial propensity is formed during childhood and the potential for antisocial behaviour persists over time. The stability coefficient of antisocial behaviour in childhood is strong ($\beta_{11.6} = 0.24$, $p<0.001$; Figure 7.2, Table 7.2). However, the tendency towards antisocial behaviour is subject to modification when there is a change in circumstances. Concurrent informal social controls are hypothesized to be the primary mechanism for change in antisocial propensity. Regardless of prior antisocial behaviours, concurrent bonds may increase or decrease individuals' antisocial behaviour

during adolescence. Social environments are variable and subject to the effects of early antisocial behaviour (left side of diagram, Figure 7.2). Furthermore, empirical research has shown most antisocial children do not become antisocial adults (Sampson and Laub 1993: 12; Werner 2004; Lösel and Bender 2003; Werner and Smith 2001; Moffitt et al. 1996; McCord 1994; Loeber and Leblanc 1990; Cline 1980).

i) Family Social Processes –Harsh and erratic parenting and prosocial family bonds

In childhood, it was established that informal social control through prosocial family bonds effectively protects against antisocial behaviour. It is less clear however, whether the family can change antisocial behaviour during adolescence. The analysis includes two aspects of family relationships: first, the effect of weak or broken bonds when parenting is harsh or inconsistent and second, the role of prosocial bonds in protecting against antisocial behaviour in adolescence.

First, harsh or erratic parenting practices during adolescence has a positive affect on antisocial behaviour, regardless of prior antisocial behaviour ($\beta_{11.7}$=0.13, p<0.001; Table 7.2, Figure 7.2). Harsh parenting during adolescence further affects prosocial family bonding (β_{87}=-0.26, p<0.001) and school bonds (β_{97}=-0.14, p<0.001). During adolescence, the effect of harsh parenting on antisocial behaviour is much weaker than it was during childhood. Being subject to harsh parenting is not significantly related to having antisocial peer associations during adolescence, as it was in childhood ($\beta_{10.7}$=0.01, t=0.27, Table A7.2a in Appendix E). Another difference from childhood is that during adolescence, harsh parenting has a negative impact on school bonds. The estimate of the

overall effect of harsh parenting practices during adolescence on adolescent antisocial behaviour is 0.24, ($p<0.001$, Table 7.1). Concurrent harsh parenting style in adolescence may modify antisocial behaviour regardless of antisocial propensity developed in childhood.

During adolescence, prosocial family bonds are just barely a strong enough source of informal control to directly reduce antisocial behaviour in adolescence, above the effect of prior antisocial behaviour ($\beta_{11.8}$= -0.08, t=-2.07, Table 7.2). Although prosocial family bonds only have a weak direct effect on adolescent antisocial behaviour, they do indirectly impact adolescent antisocial behaviour through stronger bonds to school (β_{98}=0.28, $p<0.001$). The estimate of the overall (mainly indirect) effect of prosocial family bonds in adolescence is -0.20 ($p<0.001$, Table 7.1).

The results support the hypothesis that informal social control from the family is important beyond childhood; however, it also suggests that the role of prosocial family informal controls on adolescent antisocial behaviour is less important during adolescence, at least directly (compare Tables 6.1 and 7.1). Recent research by Beaver and Wright (2007) found that family risk (parent supervision and economic disadvantage) had no significant effect on antisocial lifestyle using data from the Cambridge Study in Delinquent Development. Chung and Steinberg (2006:326) also found that parenting practices during adolescence do not have a direct effect on individual offending. Even as an indirect source of informal social control, the impact of prosocial family bonds on antisocial behaviour is much weaker than it was during childhood. Prosocial family

bonds were the strongest overall source of informal control during childhood. In adolescence, they are the weakest source of informal control in regulating antisocial behaviour. Harsh and erratic parenting may impact antisocial behaviour, directly and indirectly, regardless of prior propensity. The results also indicate that family has a diminishing amount of influence as harsh parenting style is less influential than school bonds or antisocial peer associations on antisocial behaviour during the teenage years.

ii) School Bonds in Adolescence

In childhood, school is an important institution of informal social control. In adolescence, school bonds are still expected to be important to controlling adolescent behaviour. If individuals are committed to doing well in school, they have more to lose by engaging in antisocial and delinquent behaviours.

The results show that during adolescence school bonds continue to be an important protective factor against antisocial behaviour. The informal control exerted by school bonds, remain very strong during adolescence regardless of childhood antisocial behaviour. Previous antisocial behaviour is not significantly associated with later changes in bonds to school, controlling for stability in school bonds. However, committing to success in school during adolescence protects against antisocial behaviour regardless of prior antisocial behaviour ($\beta_{11.9}$=-0.34, $p<0.001$), regardless of previous antisocial propensity. Thus, bonds to school during adolescence appear to have an effect beyond childhood school bonds and antisocial behaviour in childhood. The overall impact of school bonds (directly and through its inhibiting effect on antisocial peer associations) is

the strongest of all of the sources of informal social control (-0.44, $p<0.001$, Table 7.1). These results suggest that school bonds are important during adolescence and may modify antisocial propensities.

iii) Antisocial Peer Associations in Adolescence

Empirical research overwhelmingly suggests a strong relationship between antisocial peer associations and adolescent deviance. It is expected that concurrent antisocial peer associations will have a very strong impact on antisocial behaviour in adolescence. The results show that concurrent timing of peer associations is more important for understanding individuals' behaviours as compared to earlier peer associations. Childhood antisocial behaviour affects later antisocial peer associations ($\beta_{10.6}=0.18$, $p<0.001$), which in turn has a strong impact on antisocial behaviour in adolescence ($\beta_{11.10}= 0.32$, $p<0.001$). This result is supported by Richard E. Tremblay, Louise C. Mâsse, Frank Vitaro and Patricia L. Dobkin (1995) who showed that earlier friendship associations are less able to explain later behaviour than concurrent friendship associations. They argue that friends tend to share similar characteristics to individuals during the same time period (Tremblay et al. 1995: 649). Regardless of individuals' antisocial propensity developed in childhood, concurrent antisocial peer associations are the second strongest factor for change in individuals' antisocial propensity during adolescence.

There is a risk of overestimating the relationship between antisocial behaviour of individuals and that of their friends because research has shown that "people tend to

exaggerate the similarity in behaviour between themselves and their friends" (Baervelt et al. 2008: 561). This is a potential problem for this dissertation. To minimize any overestimation, a less precise measure of peer associations was used: capturing those who reported association with delinquent peers more than the sample average, and those who reported the average or lower of delinquent peer associations. Despite the potential of overestimation, the results from the NLSCY suggest a similar pattern in adolescent delinquent behaviour among Canadian youths as other studies in Canada and around the world: that during adolescence, levels of delinquent and antisocial behaviour are closely associated with delinquent peer associations (Baervelt et al. 2008; Özbay and Özcan 2008, Warr 2002; Gardner and Shoemaker 1989).

D) Interconnections among Sources of Informal Social Control

The results of the structural equation model (Figure 7.2) support the hypothesis that sources of informal social control are interconnected (hypothesis 5). As discussed throughout the analysis, concurrent harsh parenting has negative consequences for prosocial family bonding and for school bonds. The total indirect effect of harsh parenting on antisocial behaviour is 0.11($p<0.001$). Of this, the majority of the indirect influence of harsh parenting is mediated by school bonds (0.07). The remainder of the indirect effect is through prosocial family bonds (0.02) and antisocial peer associations (0.02).

Concurrent prosocial family bonds continue to improve bonds to school beyond childhood. The analysis suggests that the indirect path from prosocial family bonds in

adolescence to antisocial behaviour mediated by school bonds (-0.10 of the -0.12 total indirect effect). The indirect effect of adolescent prosocial family bonds on adolescent antisocial behaviour, is larger than the direct effect of prosocial family bonds on antisocial behaviour ($\beta_{11.8} = -0.08$, $p<0.05$). School bonds have a protective quality against antisocial peer associations during adolescence (0.10, $p<0.001$ indirect effect).

One possible way that informal social controls are interconnected is over time. Early social bonds may contribute to (a) stability in the same types of bonds over time (lagged-effects), and (b) different types of social bonds at a later life stage (cross-lagged effects). For example strong prosocial family bonds in childhood may lead to strong school bonds in adolescence. An alternative structural equation model (Section 7.1.2, Table A7.2a in Appendix E) included all cross-lagged effects from childhood informal social controls to adolescent informal social controls. In order to identify the final structural equation model, non-significant paths were fixed at zero (Table 7.2, and Figure 7.2[19]). This is useful for assessing direction of influence. When factors are measured on two or more occasions, it is possible to examine (1) stability in a factor and (2) direction of cause (Finkel 1996; Engel et al. 2007). The cross-lagged paths between informal social controls (harsh parenting, prosocial family bonds, school bonds and antisocial peer associations) are not the focus for this study, but were included in a structural equation model (Table A7.2a, Appendix E) to examine the direction of specified paths between informal social

[19] Only two cross-lagged paths were included in the final structural equation model. They are not shown in Figure 7.2 because they are very weak. The estimates can be found in Table 7.2. All other paths are non-significant (Table 7.2a, Appendix E) and were removed from the final model (Table 7.2).

controls. It is possible to estimate this when stability in a factor is controlled for (using repeated measures), because this "ensures that cross-lagged paths do not reflect co-variation between stable components of the two products" (Engel at al. 2007: 230). According to Engel at al. the cross-lagged coefficients are compared and if it can be demonstrated that one of the "coefficients is larger in magnitude that the other, then there is evidence of direction" (2007: 230). In this model, however, nearly all of the cross-lagged effects were non-significant, and the two significant paths are weak (Table 7.2 and Table A7.2a, Appendix E). These results do not provide much support for or against the direction of causation.

Overall, the structural equation model supports the hypothesis that pathways to continuity and change in antisocial propensity and behaviour through informal social controls may be direct and indirect. Although prosocial family bonds do not have much of a direct impact on antisocial behaviour in adolescence, close family bonds play a role in informal social control exerted by other social institutions. Thus it is useful to understand how institutions of informal control work together to bind individuals to social norms and expectations.

E) Relative Influence of Informal Social Control Processes during Adolescence

Although there is evidence of strong stability of social bonding from childhood to adolescence, the relative impact of each appears to shift during adolescence (hypothesis 6). During childhood, informal social controls from school and from prosocial family bonds have the greatest protective qualities against the development of antisocial

behaviour. While harsh and erratic parenting had strong consequences for developing antisocial behaviour. Antisocial peer associations in childhood had only a weak influence on antisocial behaviour.

During adolescence, potential modifications in antisocial trajectories are most influenced by school bonds and by peer associations. School bonds appear to maintain a strong protective influence on antisocial behaviour regardless of prior social bonds or antisocial propensity. The influence of antisocial peer associations emerges during adolescence as a strong influence in potential changes to individuals' antisocial behaviour. Regardless of prior bonds or early propensity, associations with antisocial friends, represents the largest risk for increased antisocial behaviour during adolescence. Concurrent harsh parenting continues to have detrimental consequences for antisocial behaviour. The influence from prosocial family bonds is largely indirect through its effects on other sources of informal social control.

Overall, this model accounts for approximately 50% of the variance in adolescent delinquent and antisocial behaviour. Change in antisocial behaviour in adolescence is possible given weak or strong bonds to institutions of informal social control during adolescence, regardless of antisocial propensity. However, childhood antisocial behaviour has a strong continuity affect on later adolescent antisocial behaviour. Early antisocial propensities also further attenuate weak bonds to families through harsh parenting and increase risk of antisocial peer associations in adolescence.

7.2 Summary of findings

The results overall provide support for most of the hypotheses tested in this chapter. As expected, the analysis supports the hypothesis that childhood informal social controls and background characteristics will have indirect effects on adolescent antisocial behaviour through their effects on childhood antisocial behaviour and adolescent informal social control processes (*hypothesis 1*, Figure 7.1). Thus, childhood informal social controls do not have a direct effect on later expressions of antisocial behaviour. They do however have an important indirect effect on antisocial propensity over time based on their role in informally controlling the development of antisocial behaviour during childhood.

Not only is there evidence of continuity in behaviour, but as Moffitt (1993) posits, antisocial propensity has a negative effect on later bonds with institutions such as the family. The results of the structural equation model support the hypothesis that childhood antisocial propensity has negative consequences for social bonds in adolescence (*hypothesis 2*, Figure 7.1). Moffitt (1993) argues antisocial individuals may use antisocial behaviour as a means of distancing themselves from their parents. Evidence from this model (Figure 7.2) suggests that early antisocial behaviour creates harsh and erratic parenting responses and increases associations with antisocial peers. Thus, antisocial behaviour in childhood further weakens ties to parents in adolescence and increases the influence of antisocial peers.

The results provide strong support for behavioural stability in antisocial propensity (*hypothesis 3*, Figures 7.1). Furthermore the results provide support for Sampson and

Laub's (1993) assertion that antisocial propensity will manifest in a variety of behaviours over time (heterotypic continuity). The continuity in antisocial behaviour from childhood to adolescence demonstrates the heterotypic nature of antisocial behaviour over time. From childhood, behaviours include hitting, threatening, bullying, destroying property, stealing, lying, cheating and other aggressive behaviours. In adolescence, many of those same behaviours from childhood are continued, but many other behaviours, specifically delinquent behaviours are added: being questioned by police and/or security guards; breaking into properties with the intent to steal; stealing purses, wallets, from stores, schools; selling stolen goods; fighting leading to minor and / or serious injuries; carrying/using weapons (knives, guns) for the purpose of fighting; purposely setting fires and so on. Clearly many of the behaviours included during adolescence are far more serious in nature than those in childhood, and yet the results suggest that there is stability in an underlying antisocial propensity over time. These antisocial behaviours persist over time independent of adolescent social ties. Antisocial propensity and behaviour from childhood show remarkable stability into adolescence.

The structural equation model also supports the hypothesis that the major causal explanation for adolescent antisocial behaviour is concurrent sources of informal control, regardless of previous antisocial behaviour (*hypothesis 4*, Figure 7.2). All of the concurrent informal social control processes had a direct impact on antisocial behaviour beyond, childhood bonds and early antisocial behaviour, though for family prosocial bonds, the impact was weak. The results provide further evidence that antisocial and delinquent behaviour is more likely to occur when social ties to concurrent social

institutions are weak. Weak or strong ties in a variety of settings may lead to modifications in antisocial behaviour during adolescence: Strong bonds to school during adolescence provide protection against antisocial behaviour. In contrast inconsistent and harsh parenting directly increases antisocial behaviours. Furthermore, associations with antisocial peers during adolescence potentially increase antisocial behaviour during adolescence. Thus, antisocial behaviour may be modified in adolescence when concurrent ties to conventional sources of informal control are weak.

During adolescence, it seems that institutions of informal social control are interconnected (*hypothesis 5,* Figure 7.2). Harsh and erratic parenting has negative consequences for prosocial family bonds and for school bonds. Prosocial family bonds strengthen bonds to school. School bonds in turn protect against associations with antisocial peers. Institutions of informal social control do not work in isolation. The cumulative effect of concurrent positive bonds is to increase the overall protective value of prosocial bonds against antisocial behaviour. The cumulative effect of concurrent weak or broken bonds is to increase antisocial behaviour.

The results also provide support for the hypothesis that the most influential sources of informal social control change in adolescence, compared to childhood (*hypothesis 6*). Interestingly school bonds continue to have the greatest protective qualities against antisocial behaviour in adolescence. Prosocial family bonds however have the overall weakest impact on antisocial behaviour during adolescence. The effect of adolescent prosocial family bonds on antisocial behaviour is largely mediated by other sources of

informal social control. Negative influences of harsh and erratic parenting continue to create weak ties to conventional norms and consequently may increase antisocial behaviour. Parenting style is a much weaker informal control during adolescence as compared with childhood. As expected, having antisocial peers has a strong impact on adolescent antisocial behaviour. The literature (Sampson and Laub 1993: 104; Haynie 2002; Warr 2002; Baerveldt, Völker, and Van Rossem 2008) shows support for this finding.

The results suggest that it is insufficient to consider social bonds only in childhood; social bonds must be understood during each life stage. Individuals are subjected to different levels of informal social control over the life course, and these may contribute to modified antisocial propensities at later stages. What happens to individuals as children is important but so is what happens to individuals throughout life.

In this chapter, the focus was on stability and change in antisocial propensity and behaviour during adolescence. As expected, stability in antisocial behaviour was a key finding in this chapter. The findings suggest an underlying consistency in the antisocial propensity, expressed through a variety of behaviours. Concurrent informal social controls were found to be the primary mechanism through which change in antisocial behaviour occurs.

The next chapter examines the transition to young adulthood. As individuals move into adulthood, age-graded informal control theory suggests that informal social controls will

operate through social capital that emphasizes quality of relationships (as opposed to monitoring and supervision). When individuals are invested in relationships within the family and work, they may modify antisocial behaviour in order to avoid jeopardizing their relationships. The focus of Chapter 8 then, is stability and change in antisocial propensity and behaviour given social relationships during the transition to young adulthood.

Chapter Eight: Continuity and Change in Antisocial Behaviour during Emerging Adulthood

During the transition to young adulthood, young people have the opportunity to create new social bonds in areas such as work and marriage. During this period, the emphasis in social bonding involves the development of social capital. Social capital is the process whereby an individual builds reciprocal ties with others (such as family and employers). Individuals create social bonds characterized by quality of reciprocal ties between individuals. This can be contrasted with childhood social bonds where supervision by parents and feeling an emotional attachment to parents was most important to informal social control. The central hypothesis of this chapter is that *adolescent pathways of antisocial behaviour may be modified by social bonds in emerging adulthood*.

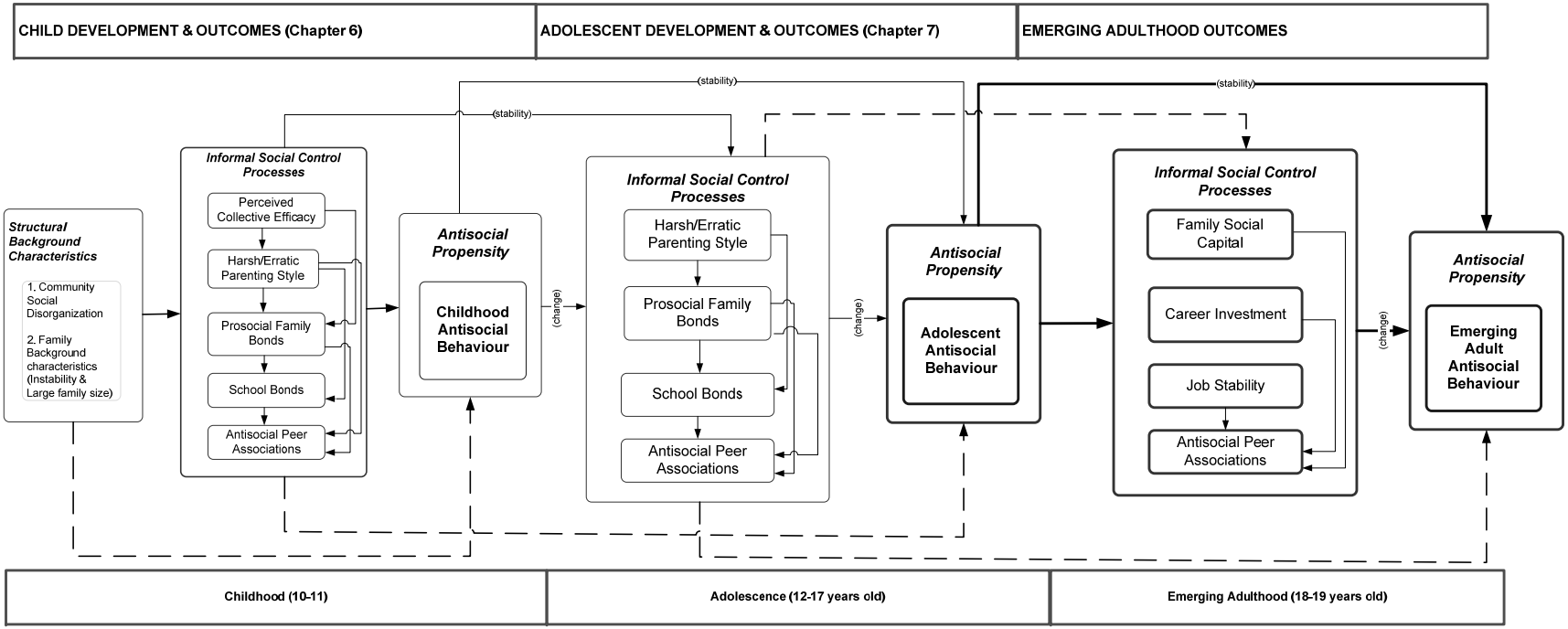
The focus of this chapter is on the hypotheses (Figure 8.1) that (1) childhood and adolescent factors (community disorganization, family instability, and informal social bonds) will indirectly affect antisocial behaviour in emerging adulthood; (2) antisocial behaviour is stable into emerging adulthood; (3) new sources of informal control in emerging adulthood account for changes in antisocial behaviour, regardless of antisocial propensity; (4) concurrent sources of informal social control indirectly affect antisocial behaviour in emerging adulthood.

In the previous chapter, the analyses suggested that among Canadian youths, there is strong stability in antisocial propensity from childhood to adolescence. Antisocial propensity is manifested in a broad range of antisocial behaviours. Childhood behaviours such as lying, stealing, hitting and bullying were linked to the same behaviours in

adolescence, along with a broader range of delinquent behaviours such as being questioned by police and/or security guards; breaking into properties with the intent to steal; stealing purses, wallets, from stores, schools; selling stolen goods; fighting leading to minor and / or serious injuries; carrying/using weapons (knives, guns) for the purpose of fighting; purposely setting fires and so on. In the transition to adulthood, many of these same behaviours are measured, along with some additional measures of antisocial behaviour including carrying a weapon, heavy alcohol consumption, illicit drug use, and contact with the police, driving under the influence of alcohol, stealing, and impulsive, violent, and risky behaviours.

The analysis of continuity and change in antisocial behaviour is tested with a three-wave lagged and synchronous effects structural equation model (Finkel 1995). Figure 8.1 represents the conceptual hypotheses for this chapter. Solid lines in Figure 8.1 represent direct paths and broken lines indicate indirect paths. Results of the structural equation model are presented in Table 8.1, Table 8.2 and Figure 8.2.

Figure 8.1 Conceptual Causal Model of Hypotheses. Continuity and change in antisocial propensity and behaviour in emerging adulthood



8.1 Analysis

The structural equation model shown in Figure 8.2 includes the statistically significant pathways to emerging adulthood antisocial behaviour. In Figure 8.2, all significant paths leading to emerging adulthood antisocial behaviour are emphasized: the paths are prominent and the font size of path estimates is larger. The other paths that lead to childhood antisocial behaviour and to adolescent antisocial behaviour are thinner and the font size of estimates is reduced. These paths are discussed in Figure 6.2, chapter 6 (childhood) and in Figure 7.2, Chapter 7 (adolescence). All estimates can be read clearly in Table 8.2. The measurement details of observed indicators are discussed in section 8.1.2. Table 8.1 contains the standardized direct and indirect paths to emerging adulthood antisocial behaviour. Table 8.2 includes the standardized estimates of the structural equation model. Additional matrices can be found in Appendix F.

Figure 8.2 Structural Equation Model. Direct and indirect paths of continuity and change in antisocial propensity and behaviour in young adulthood

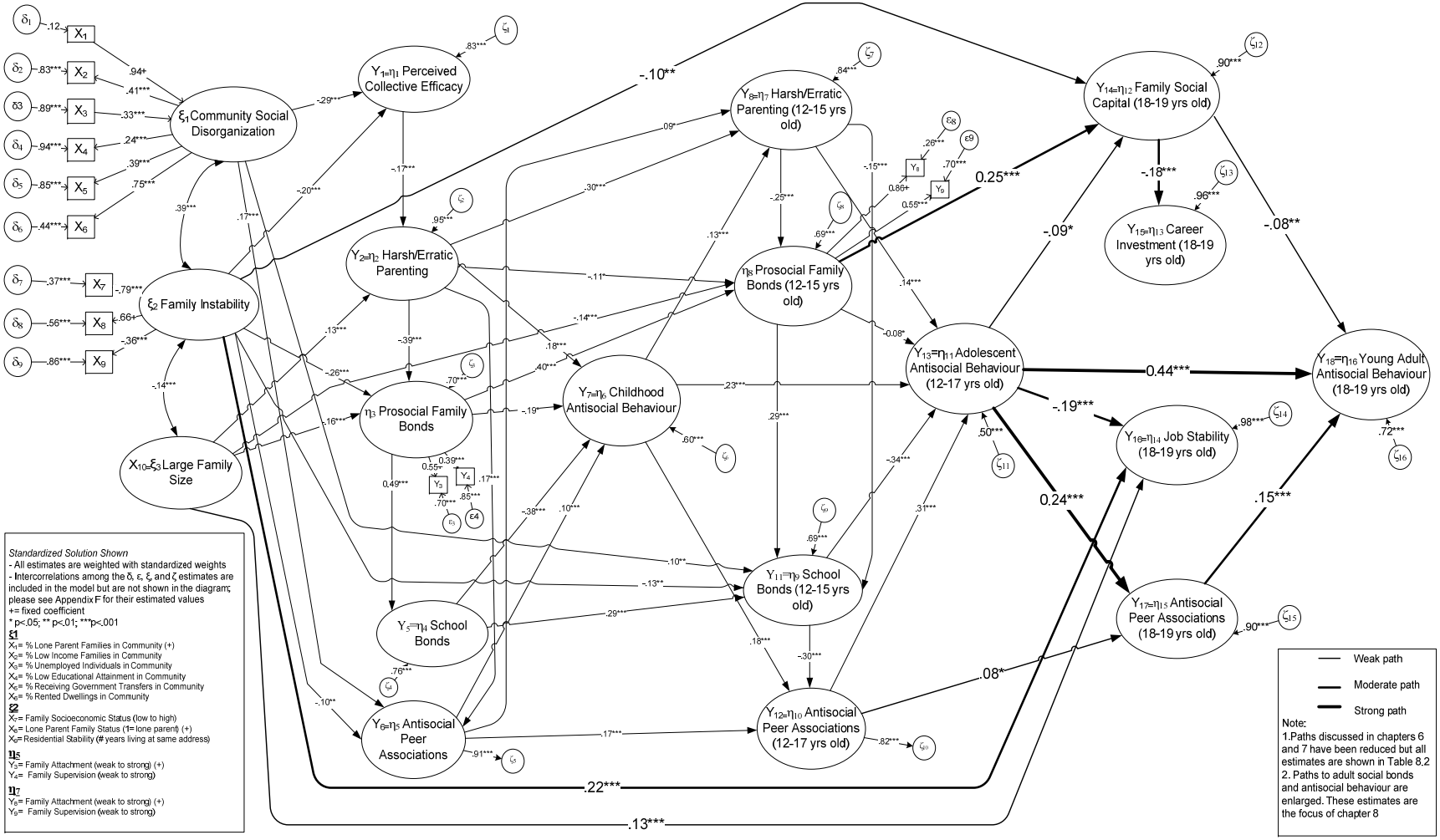


Table 8.1 Standardized Effects of Childhood, Adolescent & Emerging Adulthood Factors on Emerging Adulthood Antisocial Behaviour

Dependent Variable: Emerging adulthood antisocial behaviour (ages 18-19) (η_{16})			
N=735[a]	Standardized Path Coefficients		
Independent variables	**Direct effects**	**Indirect effects**	**Total Effect**
Structural Background Characteristics			
Community social disorganization (ξ_1)	**-**	0.00	0.00
s.e.		0.01	0.01
Family Instability (ξ_2)	**-**	**0.08*** **	**0.08*** **
s.e.		0.02	0.02
Large Family Size (ξ_3)	**-**	**0.06*** **	**0.06*** **
s.e.		0.01	0.01
Childhood Informal Social Control Processes (10-11)			
Perceived Collective Efficacy (η_1)	-	**-0.03*** **	**-0.03*** **
s.e.		0.01	0.01
Harsh/Erratic parenting style (η_2)	**-**	**0.13*** **	**0.13*** **
s.e.		0.01	0.01
Prosocial family bonds (η_3)	**-**	**-0.14*** **	**-0.14*** **
s.e.		0.02	0.02
School bonds (η_4)	**-**	**-0.12*** **	**-0.12*** **
s.e.		0.01	0.01
Antisocial Peer Associations (η_5)	**-**	**0.05*** **	**0.05*** **
s.e.		0.01	0.01
Childhood Antisocial Behaviour (10-11)			
Childhood Antisocial Behaviour (η_6)	**-**	**0.16*** **	**0.16*** **
s.e.		0.02	0.02
Adolescent Informal Social Control Processes (12-17)			
Harsh Parenting Style (12-15) (η_7)	**-**	**0.13*** **	**0.13*** **
s.e		0.02	0.02
Prosocial Family Bonds (12-15) (η_8)		**-0.12*** **	**-0.12*** **
s.e		0.01	0.01
School bonds (12-15) (η_9)	**-**	**-0.21*** **	**-0.21*** **
s.e		0.03	0.03
Antisocial Peer Associations (12-17) (η_{10})	**-**	**0.16*** **	**0.16*** **
s.e		0.03	0.03
Adolescent Antisocial Behaviour (12-17)			
Adolescent Antisocial Behaviour (η_{11})	**0.44****	**0.04*** **	**0.48*** **
s.e.	0.03	0.01	0.03
Emerging Adult Informal Social Control Processes (18-19)			
Family Social Capital (η_{12})	**-0.08****	0.00	**-0.08****
s.e	0.03	0.01	0.03
Career Investment (η_{13})	-0.05	-0.01	-0.05
s.e	0.03	0.00	0.03
Job Stability (η_{14})	0.00	0.00	0.00
s.e	0.04	0.01	0.03
Antisocial Peer Associations (η_{15})	**0.15*** **	-	**0.15*** **
s.e	0.03		0.03
R^2	$R^2_{\text{Collective Efficacy}}$= 0.17; $R^{2c}_{\text{Harsh parenting1}}$=0.05; $R^2_{\text{prosocial family bond1}}$= 0.30; $R^2_{\text{School bonds.1}}$=0.24 $R^2_{\text{childhood antisocial peer associations1}}$=0.09 $R^2_{\text{childhood AB}}$= 0.40; $R^2_{\text{Harsh parenting2}}$=0.16; $R^2_{\text{prosocial family bond2}}$= 0.31; $R^2_{\text{School bonds.2}}$=0.31 $R^2_{\text{adolescent antisocial peer associations2}}$=0.18 $R^2_{\text{adolescent AB}}$= 0.50; $R^2_{\text{Family capital}}$=0.10; R^2_{invest}= 0.04; $R^2_{\text{job stability}}$=0.02 $R^2_{\text{adult antisocial peer associations3}}$=0.10 $R^2_{\text{adult AB}}$= 0.28		
Fit	χ^2=372.9 (263), p<0.001; GFI= 0.96, AGFI=0.95; RMSEA=0.02; NFI=0.96; CFI =0.99; PNFI=0.67		

[a] Normalized Funnel Weights, sample size adjusted for design effect * p<.05 **p<.01 ***p<.001;

Table 8.2 Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

N=735[a]	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	η_{11}
Childhood														
Collective efficacy (η_1)	-0.29*** (-7.24)	-0.20*** (-3.93)	--	--										
Harsh parenting (η_2)	--	--	0.13*** (4.00)	-0.17*** (-4.96)	--	--								
Prosocial family bonds (η_3)	--	-0.26*** (-3.91)	-0.16*** (-3.28)	--	-0.39*** (-7.02)	--								
School bonds (η_4)	--	--	--	--	--	0.49*** (8.07)	--							
Antisocial Peer Associations (η_5)	0.17*** (4.43)	0.10** (2.31)	--	--	0.17*** (5.06)	--	--	--						
Childhood antisocial behaviour (η_6)	--	--	--	-0.05 (-1.19)	0.18*** (4.14)	-0.19* (-2.08)	-0.38*** (-9.38)	0.10*** (3.50)	--					
Adolescence														
Harsh parenting (η_7)	--	--	--	--	0.30*** (8.22)	--	--	0.09* (2.49)	0.13*** (3.41)					
Prosocial family bonds (η_8)	--	--	-0.14*** (-3.79)	--	–	0.40*** (5.01)	--	--	-0.01 (-0.14)	-0.25*** (-6.54)				
School bonds (η_9)	0.10** (2.89)	-0.13** (-2.97)	--	--	--	--	0.29*** (7.89)	--	-0.03 (-0.93)	-0.15*** (-4.25)	0.29*** (6.19)			
Antisocial Peer Associations (η_{10})	--	--	--	--	--	--	--	0.17*** (4.90)	0.18*** (4.89)	--	--	-0.30*** (-8.35)		
Adolescent antisocial behaviour (η_{11})	--	--	--	--	--	--	--	--	0.23*** (6.81)	0.14*** (4.59)	-0.08* (-2.17)	-0.34*** (-10.68)	0.31*** (11.27)	
Emerging Adulthood														
Family Social Capital (η_{12})	--	-0.10** (-2.42)	--	--	--	--	--	--	--	--	0.25*** (5.27)	--	--	-0.09* (-2.26)
Career Investment (η_{13})	--	--	--	--	--	--	--	--	--	--	--	--	--	0.07 (1.80)
Job Stability (η_{14})	--	0.22*** (4.20)	0.13*** (3.58)	--	--	--	--	--	--	--	--	--	--	-0.19*** (-3.41)
Antisocial Peer Associations (η_{15})	--	--	--	--	--	--	--	--	--	--	--	--	0.08* (2.02)	0.24*** (5.99)
Emerging Adult antisocial behaviour (η_{16})	--	--	--	--	--	--	--	--	--	--	--	--	--	0.44*** (13.39)

[a] Normalized Funnel Weights sample size adjusted for design effect * p<.05 **p<.01 ***p<.001; - - parameter set to zero based on empirical results (of non-significance); empty cells set to zero based on conceptual model

FIT: $\chi^2(264) = 383.5$, p<0.001; GFI=0.96; AGFI=0.95; RMSEA=0.025; CFI=0.99; NFI=0.96; PNFI=0.67

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i, endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}

Appendix F, Tables A8.4a, A8.4b, A8.4c, and A8.4d provided detailed information for additional matrices

Table 8.2 Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

(Continued)	η_{12}	η_{13}	η_{14}	η_{15}	ζ
Childhood					
Collective efficacy (η_1)					0.83*** (18.72)
Harsh parenting (η_2)					0.95*** (19.30)
Prosocial family bonds (η_3)					0.70*** (4.34)
School bonds (η_4)					0.76*** (14.55)
Antisocial Peer Associations (η_5)					0.91*** (19.17)
Childhood antisocial behaviour (η_6)					0.60*** (17.30)
Adolescence					
Harsh parenting (η_7)					0.84*** (19.22)
Prosocial family bonds (η_8)					0.69*** (7.10)
School bonds (η_9)					0.69*** (18.42)
Antisocial Peer Associations (η_{10})					0.82*** (19.18)
Adolescent antisocial behaviour (η_{11})					0.50*** (19.00)
Emerging Adulthood					
Family Social Capital (η_{12})					0.90*** (18.75)
Career Investment (η_{13})	-0.18*** (-4.86)				0.96*** (19.13)
Job Stability (η_{14})	-0.01 (-0.25)	0.00 (-0.08)			0.98*** (18.03)
Antisocial Peer Associations (η_{15})	-0.07 (-1.82)	-0.04 (-1.25)	-0.02 (-0.52)		0.90*** (19.19)
Young Adult antisocial behaviour (η_{16})	-0.08** (-2.39)	-0.05 (-1.48)	0.00 (0.08)	0.15*** (4.71)	0.72*** (19.26)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i, endogenous variables by η_i. In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Appendix F**, **Tables A8.4a, A8.4b, A8.4c, and A8.4d provided detailed information for additional matrices**

8.1.1 Model Fit

Overall, the fit of this model is adequate to good according to the fit statistics. The χ^2 (absolute fit index) is significant ($p<0.001$) suggesting that the lack of fit has a high probability of not being due to chance. The relative fit statistics suggest this model is a good fit. The Root Mean Square Approximation (RMSEA) is 0.02 and the Comparative Fit Index (CFI) is 0.99. Together with other measures of fit provided in Table 8.1, the relative fit statistics suggest that this model is a good fit (McDonald and Ho 2002).

8.1.2 Alternative Models

The hypotheses for this section are based on previous theory and empirical research. In order to test the hypotheses, three alternative models were specified. These structural equation models can be found in Appendix F for Chapter 8 (Tables A8.1a, A8.2a, and A8.3a). Alternative models were necessary for model identification: when all parameters to test all hypotheses were freed in a single model, the model was under-identified and no solution could be estimated by LISREL. Two alternative models were specified to test the hypotheses that (1) background community and family characteristics (i.e. ξ_1 to ξ_3) have primarily an indirect effect on antisocial behaviour in emerging adulthood, and (2) that childhood and adolescent informal social controls (i.e. η_1 to η_{10}) have primarily an indirect effect on antisocial behaviour during the transition to young adulthood required including all direct and indirect paths in a model.

The first model (Table A8.1a, Appendix F) estimated the significance and strength of effects of background characteristics (i.e. ξ_1 to ξ_3) on antisocial behaviour during emerging adulthood (η_{16}). Theory and empirical research suggest that background family characteristics primarily have indirect effects only. This is also expected based on the results of the previous chapters where the background community and family characteristics had no direct effects on antisocial behaviour in childhood or in adolescence. Paths to emerging adulthood informal social controls from childhood informal social controls and adolescent informal social controls (i.e. $\beta_{16.1,}$ $\beta_{16.2,}$ $\beta_{16.3,}$ $\beta_{16.4,}$ $\beta_{16.5,}$ $\beta_{16.7,}$ $\beta_{16.8,}$ $\beta_{16.9,}$ $\beta_{16.10}$) were fixed in order to have an identifiable model. The parameter estimates of this model suggest that the background characteristics (i.e. ξ_1 to ξ_3) have limited effects on bonding during emerging adulthood (i.e., significant paths to job stability [η_{13}] and family social capital [η_{12}]) but no direct effect on antisocial behaviour during emerging adulthood (η_{16}). The implications of these results are discussed further in section 8.1.4 (below).

The second alternative model (Table A8.2a, Appendix F) examined the effect of childhood informal social controls (i.e. $\eta_{1\text{ to }}\eta_5$) and adolescent informal social controls ($\eta_{7\text{ to }}\eta_{10}$) on emerging adulthood antisocial behaviour (η_{16}). Non significant paths from exogenous background characteristics identified in the first structural equation model (Table A8.1a), were fixed. Again this was done for model identification. Based on theory and empirical research, it was expected that childhood and adolescent informal social controls would have only indirect effects on antisocial behaviour in emerging adulthood. The parameter estimates of this model suggested that adolescent informal social controls contribute to the development (or control) of antisocial propensity in emerging adulthood indirectly (i.e. significant paths from prosocial

family bonds to family social capital [$\beta_{12.8}$] and from adolescent antisocial peer associations to young adult antisocial peer associations[$\beta_{15.9}$]), but did not have direct effects on later antisocial behaviour (i.e. the parameter estimates in Table A8.2a for the effects of $\eta_{7 \text{ to }} \eta_{10}$ on η_{16} are all non-significant). The implications of these results are discussed further in section 8.1.4 (below).

Finally a third alternative model (Table A8.3a, Appendix F) was specified to include correlated residual terms between repeated measures for both the causal model and the measurement model (Maruyama 1997). The covariances (ψ) between the error terms (ζ) of the causal model (Table A8.3e, Appendix F) are non-significant for antisocial behaviour ($\psi_{16.11}$=-0.45, t= -0.83) and for antisocial peer associations ($\psi_{15.10}$=0.13, t=1.21). Therefore, it does not appear that the assumption of uncorrelated errors (random error) among the etas has been violated. This structural equation model also accounted for residual error covariances between repeated measures in the measurement model (Table A8.3c). The results of this structural equation model suggest that correlated residual terms between repeated measures for antisocial behaviour (θ_{ε} $_{18.13}$= -0.03, t=-0.47) and antisocial peer associations ($\theta_{\varepsilon 17.12}$ = 0.96, t=0.81) are non significant.

The final structural equation model (Table 8.1, Table 8.2, and Figure 8.2) is specified based on the theoretical and empirical research, as well as the results from the three alternative models discussed above in order to test the hypotheses for this chapter. The model includes indirect paths from background community and family characteristics (i.e. ξ_1 to ξ_3) and informal social controls (i.e. η_1 to η_5 and η_7 to η_{10}) as identified in Tables A8.1a and A8.2a (Appendix F). It also

includes direct and indirect paths from prior antisocial behaviour (i.e. η_6 and η_{11}), and concurrent young adult informal social controls (i.e. η_{12} to η_{15}) to emerging adulthood antisocial behaviour (i.e. η_{16}). The final structural equation model is discussed in detail in the remainder of this chapter.

8.1.3 Measurement Model

The structural equation model includes three life stages: childhood, adolescence and emerging adulthood. The factors included from childhood are: (1) background characteristics (community and family), (2) childhood informal social bonds, (3) childhood antisocial behaviour. The factors included from adolescence are: (1) adolescent informal social bonds, and (2) adolescent antisocial behaviour. The factors included from emerging adulthood are: (1) emerging adulthood informal social bonds, and (2) emerging adulthood antisocial behaviour. Details of indicators can be found in Chapter 4 (Table 4.1).

The first three factors from childhood are the focus of Chapter 6 and the results are presented in Figure 6.2. Adolescent informal social controls and antisocial behaviour were the focus of Chapter 7 and the results are presented in Figure 7.2. They are reviewed here. First, background characteristics of the community and family include three concepts; two of which have multiple indicators: community social disorganization (ξ_1), family instability (ξ_2), and large family size (3 or more children) (ξ_3). The confirmatory factor analysis of "community social disorganization characteristics" (Figure 7.2) shows that structural background characteristics of the community measure an underlying general instability of a child's community. Factor loadings for

community social disorganization (ξ_1) are for the percentage of the community that is: lone parent families (0.94), low income families (0.41), unemployed (0.33), low educational attainment (0.24) receiving government transfers (0.39), and living in rented dwellings (0.75).

The standardized parameter estimates for *family instability characteristics* (ξ_2) are (please refer to Figure 8.2): (a) family socio-economic status (-0.79), lone parent family status (0.66), and residential stability (-0.36). *Large family size* (ξ_3) is a single indicator factor based on the number of children living in a household. This is a binary variable (0=one or two children; 1= three or more children). The unobserved factors (Appendix F, Table A8.4c) for community social disorganization and family instability (Φ_{12}= 0.39, p<0.001) and for family instability and large family size (Φ_{23}= -0.14, p<0.001) have significant correlations. Community social disorganization and large family size are not significantly correlated (Φ_{13}= 0.07, t=1.06).

Childhood informal social controls include several factors. *Childhood prosocial family bonds* (η_2) is composed of family attachment (Y_3) and family supervision (Y_4), measured at ages 10 to 11 years old, with factors loadings of 0.55 and 0.39 respectively. The remaining factors are single indicator factors. These include (1) *perceived collective efficacy* ($Y_1=\eta_1$), measured on a 15-point scale of degree of neighbour ties (trust, active supervision of neighbourhood and children); (2) *harsh / erratic parenting style* ($Y_2=\eta_2$), measured on a 10-point scale of level of inconsistency in and severity of discipline (10-11 years old); (3) *school bonds* ($Y_5=\eta_4$), measured on an 8-point scale (squared to 0-64, to address skew) of how well the child is doing in school, enjoys school, and follows school rules (10-11 years old); (4) *antisocial peer associations*

($Y_6=\eta_5$), is a binary variable (0-1), where 1=higher than average number of friends who use drugs, drink alcohol and / or do bad things (10-11 years old).

Childhood antisocial behaviour ($Y_7=\eta_6$), is measured through a 10-point scale assessing the number of antisocial activities an individual engaged in during the last year (10-11 years old). Activities included are stealing, lying, hitting, destroying property, and so on (please refer to Appendix B for more detail).

Adolescent informal social controls include both single-indicator and multiple-indicator concepts. *Adolescent prosocial family bonds* (η_8) is composed of family attachment (Y_9) and family supervision (Y_{10}), with factors loadings of 0.86 and 0.55 respectively. These indicators are the average level of attachment and supervision over the ages 12 to 15 years old (Cycle 2 and 3 of the NLSCY). The other factors are single-indicator concepts: (1) *harsh / erratic parenting style* ($Y_8=\eta_7$), measured on a 10-point scale of level of inconsistency in and severity of discipline over the ages 12 through 15; (2) *school bonds* ($Y_{11}=\eta_9$), measured on an 8-point scale (squared to 0-64, to address skew) of how well the adolescent is doing in school, enjoys school, and follows school rules (averaged from the ages 12 through 15); and (3) *antisocial peer associations* ($Y_{12}=\eta_{10}$), is a binary variable (0-1), where 1=higher than average number of friends who use drugs, drink alcohol and / or break the law, averaged over the ages 12 through 17.

Adolescent antisocial behaviour ($Y_{13}=\eta_{11}$), is measured on a 10-point scale based on the number of antisocial activities an individual engaged in during the last year for each of Cycles 2, 3 and 4 (averaged over ages 12 through 17). Activities included are stealing, lying, hitting, destroying

property, being questioned by police and/or security guards; breaking into properties with the intent to steal; stealing purses, wallets, from stores, schools; selling stolen goods; fighting leading to minor and / or serious injuries; carrying/using weapons (knives, guns) for the purpose of fighting; purposely setting fires and so on.

Emerging adulthood (18-19 years old) informal social bonds include four single-indicator measures that are available from the NLSCY: (1) *family social capital* ($Y_{14}=\eta_{12}$) is a derived score created by Statistics Canada based on 8 questions about closeness and support of the young adult's family and friends (ranging from 0-24). Items include having family that individuals can count on, feel safe with, share attitudes with, and share close ties with; (2) *Career investment* ($Y_{15}=\eta_{13}$) is a 10-point scale measuring steps individuals have taken to find out about their career of interest. Items include: talking to a guidance counselor, a person working in the job of interest, participating in a co-operative program or volunteering in the area of interest and so on; (3) *Job stability* ($Y_{16}=\eta_{14}$) measures the number of weeks an individual was employed in the last year (range: 0-52); and (4) *antisocial peer associations* ($Y_{17}=\eta_{15}$). This variable is measured as a binary variable (0:1) where 1=higher than average number of friends who use drugs, drink alcohol and / or break the law.

Finally, *emerging adulthood antisocial behaviour* ($Y_{18}=\eta_{16}$), is measured on a 10-point scale based on the number of antisocial activities an individual engaged in during the last year (18-19 years old). Activities included are: being questioned by police, theft, violence, selling illicit drugs, carrying a weapon; driving under the influence of alcohol, acting impulsively in anger, and so on (please refer to Appendix B for more detail).

8.1.4 Causal Model

A) Indirect Effects of Background Characteristics and Childhood Informal Social Controls on Emerging Adulthood Antisocial Behaviour

In this section, each of the hypotheses specified at the beginning of Chapter 8 and summarized in Figure 8.1 is addressed. The focus of this chapter is on continuity and change in antisocial behaviour from adolescence to emerging adulthood. The first hypothesis is that the effects of childhood informal social controls and background characteristics and adolescent informal social controls on emerging adulthood antisocial behaviour are indirect. To test this hypothesis at the multivariate level, two alternative structural equation models were estimated[20]. The first structural equation model[21] estimated the direct and indirect effects of community and family background characteristics on emerging adulthood antisocial behaviour. In this structural equation model, none of the background characteristics (ξ_1, ξ_2, and ξ_3) had a significant direct effect on adolescent antisocial behaviour: community social disorganization ($\gamma_{16.1}$ = -0.05, t=-1.38); family instability ($\gamma_{16.2}$ = -0.06, t=-1.31); and large family size ($\gamma_{16.3}$ = -0.06, t=-1.95). Furthermore, community social disorganization (ξ_1) does not have a significant indirect effect on antisocial behaviour in emerging adulthood (Table 8.1). Family instability (ξ_2) and large family size (ξ_3) do appear to have significant indirect effects on emerging adulthood antisocial behaviour.

---

[20] Please refer to section 8.1.2 for explanation.
[21] Please refer to section 8.1.2 and see Table 8.1a in Appendix F for detailed estimates

Any substantial effects of childhood family characteristics on adult antisocial behaviour are mainly through adolescent antisocial behaviour. There are some direct paths from childhood background characteristics to emerging adulthood social bonds: family instability to family social capital and job stability ($\beta_{12.2}$ = -0.10, $p<0.01$ and $\beta_{14.2}$ =0.22, $p<0.001$, respectively) and; large family size to job stability ($\beta_{14.3}$ =0.13, $p<0.001$). Despite these direct paths, the contribution of background characteristics to emerging adulthood antisocial behaviour via adult social bonds is marginal. The majority of the effect of family instability is mediated by adolescent antisocial behaviour (0.07 out of 0.08 of the total effect). Only 0.01 of the effect of family instability on emerging adulthood antisocial behaviour is through adult social bonds (specifically, family social capital). In Chapter 7, the results showed that the main indirect effect of family instability on adolescent antisocial behaviour (0.16 total indirect effect) is mediated by adolescent school bonds (0.07), adolescent antisocial peer associations (0.04) and childhood antisocial behaviour (0.03).

Similarly large family size mainly has an overall indirect effect on emerging adulthood through adolescent antisocial behaviour (0.05 out of the 0.06 total effect), and not through adult social bonds (0.01). As discussed in Chapter 7, more than half of the indirect effect of family size on adolescent antisocial behaviour is through childhood antisocial behaviour and adolescent school bonds (0.07 out of 0.11 of the total indirect effect). Thus, the analysis suggests that the effects of childhood background characteristics have complex indirect paths to emerging adulthood antisocial behaviour. While the effects are not direct; family instability and large family size have consequences for social bonding and antisocial behaviour in childhood and in adolescence.

The effect of family instability and large family size on antisocial behaviour in adulthood is largely mediated by adolescent antisocial behaviour.

The effects of childhood and adolescent informal social controls (η_1 to η_5 and η_7 to η_{10}, respectively) on emerging adulthood antisocial behaviour (η_{16}) were also estimated in an alternative model (Appendix F, Table A8.2a). None of the childhood informal controls or adolescent informal social controls had significant direct effects on antisocial behaviour in emerging adulthood (Appendix F, Table A8.2a). The results of the final structural equation model for this analysis also show that childhood social bonds have indirect effects on antisocial behaviour in emerging adulthood (Table 8.1). The indirect paths of childhood social bonds to emerging adulthood antisocial behaviour are almost entirely through adolescent antisocial behaviour: perceived collective efficacy (-0.03 of the -0.03 total indirect effect); harsh parenting (0.11 of 0.13 total indirect effect); prosocial family bonds (-0.12 of the -0.14 total indirect effect); school bonds (-0.11 of the -0.12 total indirect effect) and; antisocial peer associations (0.05 of the 0.05 total indirect effect).

The paths from childhood social bonds to adolescent antisocial behaviour are largely mediated by childhood antisocial behaviour (as discussed in Chapter 7). Childhood school bonds have large indirect effects on adolescent antisocial behaviour through childhood antisocial behaviour and through adolescent school bonds. Similarly, negative effects of childhood prosocial family on adolescent antisocial behaviour is mediated by both childhood antisocial behaviour (-0.09)

and by school bonds (-0.09). Overall, the indirect effects of these childhood social bonds remain significant into emerging adulthood. Furthermore, the direction of their effect on antisocial behaviour remains stable into emerging adulthood. Yet the effect is primarily mediated by antisocial behaviour and not by adult social bonds.

Looking at the path diagram (Figure 8.2), it appears that adolescent prosocial family bonds (η_8) and adolescent antisocial peer associations (η_{10}) have some indirect effects on emerging adulthood antisocial behaviour through adult social bonds. Individuals who have family prosocial bonds in adolescence continue to have close ties through family social capital in early adulthood ($\eta_{12.8} = 0.25$, $p<0.001$). Antisocial peer associations show weak stability between adolescence and emerging adulthood ($\eta_{15.10} = 0.08$ $p<0.05$). The structural equation model suggests that antisocial peer associations are characterized more by change during the transition from the teenage years to adulthood.

Despite these direct paths from adolescent bonds to emerging adulthood social bonds, the indirect effects of adolescent social bonds are primarily mediated by adolescent antisocial behaviour and not by adult social bonds. The effect of continuity in family bonding from adolescence to emerging adulthood, has only a small overall indirect effect on emerging adulthood antisocial behaviour (-0.02 out of the -0.12 total indirect effect). Instead, the effect of adolescent prosocial family bonds is almost entirely via young adolescent antisocial behaviour (-.09 out of the -0.12 total effect).

Similarly, the pathway of adolescent antisocial peer associations to emerging adulthood antisocial behaviour is mainly through adolescent antisocial behaviour (0.14 of the 0.16 total indirect effect), rather than through adult antisocial peer associations (0.02). Any significant indirect effects from other adolescent social bonds on emerging adulthood antisocial behaviour are also primarily through adolescent antisocial behaviour: harsh parenting (0.11 of the 0.13 total indirect effect) and school bonds (-0.19 out of -0.21 total indirect effect). Adolescent school bonds appear to have the largest indirect effect on emerging adulthood antisocial behaviour of the childhood and adolescent social bonds.

Therefore the analyses suggest support for the hypothesis that the effects of childhood background characteristics (family instability and large family size), childhood informal social controls and adolescent informal social controls on antisocial behaviour in emerging adulthood are indirect. This finding is consistent with Sampson and Laub (1993: 134-135) who found that the effects of early family factors are mainly indirect on delinquency through informal social bonds. In the transition to young adulthood, any substantial effects on antisocial behaviour from childhood and adolescence factors are through adolescent antisocial behaviour.

B) Cumulative Continuity: The Consequences of Prior Antisocial Behaviour

The consequences of prior antisocial behaviour are expected to impact future social relationships, such family ties. This refers to cumulative continuity and the notion that early antisocial propensity contributes to stability in antisocial behaviour and attenuates social relationships in a variety of domains in adulthood (Sampson and Laub 1993). For example,

stealing, drug use or violent behaviours may weaken future prospects for integration into conventional roles (employment, marriage), which leads to risks of further future antisocial behaviours.

The structural equation model provides some support for this idea during the transition from adolescence to adulthood. Adolescent antisocial behaviour has consequences for relationships in early adulthood. Adolescent antisocial behaviour decreases family social capital, controlling for prior prosocial family bonds ($\eta_{12.11} = -0.09$, $p<0.05$), though the relationship is weak. Job stability in early adulthood is also reduced by prior antisocial behaviour ($\beta_{14.11} = -0.19$, $p<0.001$); however, job stability is not significantly related to antisocial behaviour in emerging adulthood. The possibility of having antisocial peer associations in emerging adulthood is much higher given prior antisocial behaviour, controlling for stability in antisocial peer associations ($\beta_{15.11} = 0.24$, $p<0.001$). Young adult antisocial peer associations partially mediate the effects of adolescent antisocial behaviour on antisocial behaviour in emerging adulthood (accounting for all of the indirect effect). Thus the structural equation model provides support for cumulative continuity where the consequences of antisocial behaviour have wider implications for future social relationships. Antisocial propensity further attenuates the ties of individuals to conventional society (Zara and Farrington 2009, Laub and Sampson 200).

C) Continuity and Change in Antisocial Propensity and Behaviour

Stability in antisocial propensity is expected to be strong from childhood through adolescence into emerging adulthood. Although propensity for antisocial behaviour may be characterized by

continuity, it may also change over time (Laub and Sampson 2003). Sampson and Laub (1993:139) argued that "childhood pathways to crime and conformity are significantly modified over the life course by adult social bonds." Assessing change in adulthood according to age-graded informal control theory, entails examining the quality and strength of social bonds that individuals acquire as they age. Such life changes include having strong marriages, children and other family and friendship relationships where individuals are invested in, or have social capital. This investment in the relationships provides the informal control that may prevent antisocial behaviour regardless of antisocial propensity. Other areas of investment that Sampson and Laub (1993) identified include, work and military participation. Each of these institutions will be effective sources of informal social control if individuals have invested social capital with them.

Sampson and Laub limited their analysis of "change" to the effects of "adult social ties on crime and deviance" (1993:149) because it allowed a direct test of change in crime and deviance. "Prior levels of delinquency are controlled for so the resulting multivariate models permit the assessment of the independent effects of adult social ties on changes in adult criminality. We are thus able to examine variations in adult offending not directly accounted for by deviant childhood 'propensities' (Gottfresdon and Hirschi, 1990)" (Sampson and Laub 1993: 149). Thus the only variable measured prior to the transition to young adulthood included in Sampson and Laub's (1993) models was prior delinquency. In this dissertation, the structural equation model permits the inclusion of all prior variables in the model. This method also permits the assessment of change, while accounting for stability in relationships that are measured at multiple points in time. For example, the concurrent impact of emerging adulthood antisocial peer associations on antisocial behaviour is estimated taking the stability of prior antisocial peer associations into

consideration. Therefore in this analysis, concurrent and prior informal social controls are included in the structural equation model.

A limitation facing this study of change in adulthood is that many of the participants are still too young (18-19 years old) to have made some of the commitments that Sampson and Laub refer to (such as marriage, children, and careers). Although the following cycle (Cycle 6) of the NLSCY, when the respondents are 20-21 years-old, was available at the time of my study, the survey did not question the birth cohort about criminal or antisocial behaviours. Thus, this section of the dissertation examines how early adult bonds may be associated with changes in behaviour during the time of transition to young adulthood from adolescence, controlling for prior antisocial behaviour.

First, the analysis examines *stability* in antisocial behaviour and antisocial peer associations from adolescence to emerging adulthood. According to Nagin and Paternoster (2000: 118), adolescent antisocial behaviour has a twofold effect of weakening reservations against delinquent behaviour and strengthening motivations for further antisocial behaviours. The structural equation model indicates strong stability in antisocial propensity ($\beta_{16.11}$= 0.44, $p<0.001$). This provides support for the hypothesis that underlying antisocial tendencies are stable, even when measured by behaviours that change over time. Sampson and Laub (1993) define this as heterotypic continuity, where the antisocial behaviours may vary, but there is an underlying stability in antisocial propensity.

As expected from the literature on antisocial peer associations, there is little stability in the transition from adolescence to emerging adulthood ($\beta_{15.10}$= 0.08, $p<0.05$). Warr (2002: 102) shows that the amount of time spent with peers, the exposure to delinquent peers and the commitment individuals have to delinquent peers decreases from adolescence to adulthood. Though "it remains unclear *why* peer relations decline in importance as adolescents enter adulthood" (Warr 2002: 102, emphasis in original). Perhaps the transitions to adult social bonds might provide some reasons for the decline[22] (Warr 2002).

Age-graded theory of informal social control emphasizes both stability and change in antisocial propensity. The following section examines *change* in behaviour given concurrent social bonds. The importance of social bonds in adulthood goes beyond the institution as an agency of control per se (Sampson and Laub 1993). Rather, social capital is required. Social capital refers to reciprocal relationships between individuals. Informal social is exerted through these social relationships. Adult social ties are important "insofar as they create interdependent systems of obligation and restraint that impose significant costs for translating criminal propensities into action" (Sampson and Laub 1993: 141). Therefore, age-graded informal social control theory states that regardless of criminal background, adults with strong ties, where they have investments in family and work, will be less free to commit crimes in adulthood. Informal social ties in emerging adulthood are expected to contribute to change in antisocial propensity, regardless of prior antisocial behaviour.

---

[22] This will be addressed in section 8.1.4, part D (interconnections among informal of social control).

First, family social capital captures the quality of family social bonds with questions regarding whether respondents had family and close friends that they could rely on, that they could go to if they needed help. Family social capital emphasizes relationships that are embodied strong social relations; a key feature of adult social bonds. The structural equation model provides some support for this hypothesis. Family social capital accounts for a decrease in emerging adulthood antisocial behaviour regardless of prior antisocial behaviour or prosocial family bonds ($\beta_{16.12}$ = -0.08, $p<0.01$, Table 8.2, Figure 8.2), though the effect is weak.

Career investment, measured by the number of actions taken by young adults to find out about careers they are interested in pursuing, does not have a statistically significant impact on emerging adulthood antisocial behaviour ($\beta_{16.13}$=-0.05, t=-1.48, Table 8.2). Job stability (the number of weeks worked) is an indicator of social bonding to work. Although job stability is reduced by prior antisocial behaviour, it does not appear to significantly impact antisocial behaviour in emerging adulthood ($\beta_{16.14}$ =0.00, t=0.08, Table 8.2). Unfortunately, in this survey cycle of the NLSCY, questions about quality of employment were not included. This analysis does suggest that employment length is insufficient to act as informal control for antisocial behaviour.

Finally, the role of antisocial peer associations, while still significant in emerging adulthood, appears to be diminishing in adulthood as compared to adolescence. In adolescence, the relationship between antisocial peer associations and antisocial behaviour is quite strong ($\beta_{11.10}$= 0.31, $p<0.001$, Table 8.2), as compared to the relationship between antisocial peer associations

and antisocial behaviour in emerging adulthood ($\beta_{16.15}$= 0.15, p<0.001). This reflects other research that suggests the influence of delinquent peers is stronger during adolescence and has decreasing importance into adulthood (Warr 2002).

Overall, the results of the change model indicate that having family social capital may modify antisocial behaviour in emerging adulthood. Regardless of prior antisocial behaviours or antisocial peer associations, concurrent antisocial peer associations have a positive impact on antisocial behaviours during emerging adulthood. Career investment and job stability do not significantly modify antisocial pathways in emerging adulthood.

D) Interconnections among Sources of Informal Social Control

The structural equation model also tested whether there are any mediating effects among the informal controls (Table 8.2). Sampson and Laub (1993) focus their analysis of the direct effects of adult institutions of informal social control (such as marriage and work) to their outcomes on delinquency, rather than on the mediating effects between various sources of informal social control. Warr (2002:101) argues that these institutions may discourage desistence for another reason: "if marriage disrupts or dissolves relations with [associations with delinquent peers], then marriage ought to encourage desistence from crime" (2002:101). Warr is making the argument that the path to desistence between adult institutions of control and antisocial behaviour may not be direct. Warr (2002) argues that antisocial peers are the primary cause of antisocial behaviour and that the causal mechanism of change in behaviour may flow indirectly through peer

associations. Therefore, in this section, the indirect effects of concurrent institutions of informal social control are examined.

Although there are few hypotheses about the indirect paths of adult social bonds, the results are somewhat unexpected. The structural equation model shows a negative relationship between family social capital and career investment ($\beta_{13.12}$= -0.18, p<0.001, Table 8.2), suggesting that individuals with close family and friendship networks spend less effort investigating career options. Despite this relationship, the indirect effect of family social capital through investment in career is not significant (total indirect effect = 0.000, t= -0.07, Table 8.1). Given that the age of respondents is 18-19 years old, it may be too early to accurately identify the relationship (if any) between family social capital and career investment. Family social capital does not have a statistically significant impact on job stability ($\beta_{14.12}$= -0.01, t=-0.25) or on antisocial peer associations in emerging adulthood ($\beta_{15.12}$= -0.07, t=-1.82).

Investment in future career and job stability are not significantly associated[23] ($\eta_{14.13}$= 0.00, t=-0.08, Table 8.2 and Figure 8.2). Neither career investment nor job stability have significant effects on antisocial peer associations ($\eta_{15.13}$= -0.04, t=-1.25, and $\eta_{15.14}$= -0.02, t=-0.52, respectively). Thus, these results do not provide support for Warr's hypothesis that institutions of informal social control in adulthood indirectly reduce antisocial behaviour through antisocial

[23] A reversal of the paths (i.e., $\eta_{13.14}$), was also non-significant (not shown)

peer associations. This structural equation model does not provide support for inter-connections among these adult sources of informal social control.

Overall, this model accounts for approximately 28% of the variance in emerging adulthood antisocial behaviour. A large proportion of the variance is explained by prior antisocial behaviour in adolescence. This is inconsistent with the findings in the previous two chapters. During childhood social bonds account for a great deal of the overall variance in antisocial behaviour (R^2=0.41). During adolescence prior antisocial behaviour accounts for a large proportion of adolescent antisocial behaviour, but so do adolescent social bonds (R^2=0.50). Therefore, in emerging adulthood the findings do not provide much support for the key argument of age-graded informal social control theory that new adult social bonds may modify antisocial behaviour in emerging adulthood. This is especially inconsistent with findings from the previous two chapters. Possible explanations for this are explored in the following section.

8.2 Summary of Findings

A key assertion of Sampson and Laub's (1993) age-graded informal control theory is that while there is remarkable stability in criminal behaviour over time, there is also a likelihood of change in behaviour given new age appropriate social bonds. Adult social bonds, embodied through social capital are able to explain variations in adulthood behaviours that are not accounted for by experiences from childhood. Hagan and McCarthy (1997) have argued that social capital is underdeveloped in theories of crime. During childhood and adolescence, a large part of informal control from the family operates as attachment and supervision. Attachment involves the process

of the internalization of norms, morals and values through socialization (Hirschi 1969). Supervision of children and adolescents involves informal controls through monitoring of activities by parents, schools and communities. As an adult, the informal control from family is expected to operate less tangibly through resources embodied in social relationships (Coleman 1990). In other words, having social capital implies having access to resources through a system of reciprocal expectations and obligations. In the transition to young adulthood, traditional sources of informal control from adolescence are expected to have a diminishing effect on antisocial behaviour, while new sources embodied in relationships such as family and work will increasingly shape individuals' trajectories. As will be discussed in this section, the results of this analysis provide only limited support for Sampson and Laub's theory of modification in antisocial behaviour by adult social bonds (1993; 2005; Laub and Sampson 2003).

This section summarizes the findings based on the hypotheses outlined at the beginning of this chapter (Figure 8.1). It was expected that childhood and adolescent factors (community disorganization, family instability, and informal social bonds) would indirectly affect antisocial propensity in emerging adulthood *(hypothesis 1*). In the results of the NLSCY, background family and community characteristics have some indirect effects on antisocial behaviour in emerging adulthood. Social bonds from childhood indirectly explain adult offending mainly as they shape early childhood antisocial behaviours, which in turn account for consistency in antisocial behaviour over time. Adolescent informal social controls indirectly shape antisocial behaviour in emerging adulthood, mainly through adolescent antisocial behaviour. Thus, the results provide support for the hypothesis that the effects of childhood and adolescent factors on antisocial behaviour in emerging adulthood are mediated by adolescent antisocial behaviour. The

indirect effects of these childhood background characteristics, childhood social bonds and adolescent social bonds are almost entirely through adolescent antisocial behaviour and not through adult social bonds.

Based on empirical research and theory, it was also expected that there would be strong stability in antisocial propensity into emerging adulthood (*hypothesis 2*). The results of this analysis provide support for this hypothesis. Stability between individuals in underlying antisocial propensity, as measured by antisocial and criminal behaviours, is strong. Some of the behaviours used to measure antisocial propensity in adolescence are repeated in emerging adulthood, while other behaviours are new to emerging adulthood. This stability provides support for Sampson and Laub's (1993) argument that continuity is both homotypic and heterotypic. These general antisocial and criminal behaviours all measure an underlying propensity for criminal and antisocial behaviour.

In addition to the stability of antisocial behaviour from adolescence to adulthood, the results show that prior antisocial behaviours have consequences for adjustment to later sources of informal social control. It is more difficult for individuals to form social ties with families given prior antisocial behaviours. Furthermore, adolescent antisocial behaviour decreases job stability in emerging adulthood. As expected, prior antisocial behaviour increases associations with antisocial peers in emerging adulthood, regardless of prior antisocial peer associations. Therefore the results provide support for Sampson and Laub's (1993) argument of cumulative continuity, where the effects of antisocial behaviour affects ties to conventional society at later stages of the life course.

New bonds, in emerging adulthood are theorized to be important to understanding adult variations in behaviour. It was expected that new sources of informal control in emerging adulthood account for changes in antisocial behaviour, regardless of previous antisocial behaviour (*hypothesis 3*). First, antisocial peer associations appear to remain important throughout the life-course, and are not limited to childhood or adolescence (Laub and Sampson 2003; Haynie 2002; Warr 2002). Although the effect of antisocial peer associations in adulthood is weaker in the transition to adulthood, than during adolescence, the results provide support for the hypothesis that antisocial peer associations remain important in shaping antisocial tendencies through different life stages.

In childhood and adolescence, social bonds emphasize positive reinforcement, and supervision of behaviours. In emerging adulthood social bonds refer to having investments in relationships, emphasizing the quality of ties to family and work; having people to rely on and being relied upon. The results of this analysis provide very little support for the influence of adult informal social controls on changes in antisocial behaviour. Having family social capital appears to reduce antisocial behaviour in emerging adulthood, regardless of antisocial propensity, but the effect is weak. Other sources of social control from career investment and job stability did not modify antisocial behaviour in adulthood. The discussion will now explore some possible explanations for this finding.

During childhood, a great deal of variance in the development of antisocial behaviour is explained by childhood social bonds. This is consistent with general theory of crime and of age-

graded informal social control theory (Gottfredson and Hirschi 1990; Sampson and Laub 1993). During childhood effective socialization produces self-control (Gotffredson and Hirschi 1990). During adolescence, the results show stability in antisocial propensity and stability in social bonds between childhood and adolescence. As expected, based on a general theory of crime (Gottfredson and Hirschi 1990) prior antisocial behaviour has negative consequences for other life domains (as referred to as cumulative continuity). Prior antisocial behaviour weakens prosocial family bonds, increases harsh and erratic parenting, reduces school bonds, and increases antisocial peer associations.

During adolescence, concurrent social bonds appear to modify propensity for antisocial and delinquent behaviour, regardless of prior antisocial behaviour or social bonds. This is inconsistent with Gottfredson and Hirschi's (1990) general theory of crime, which limits the significance of social bonding to childhood. This provides support for a central tenet of age-graded informal social control theory: that antisocial propensity and its expression in behaviour are subject to continuity *and* change over the life course.

In emerging adulthood however, social bonds account for relatively little of the variance in antisocial behaviour. While the results of the analysis find family social capital has the ability to modify antisocial behaviour, the effect is weak. Job stability and career commitment have no significant effect on antisocial behaviour. Only prior antisocial behaviour and contemporaneous antisocial peer associations appear to have much effect on antisocial behaviour in emerging adulthood. These results provide some support for the general theory of crime (Gottfredson and Hirshi 1990) that suggests antisocial propensity is stable between individuals over time and the

causal effect of social factors at different life stages on crime is spurious. Despite potential support for the stability hypothesis of criminal propensity as stated by Gottfredson and Hirshi (1990), this dissertation has shown in previous chapters that modifications are possible to antisocial propensity given new social bonds. Perhaps then another explanation may exist.

An alternative explanation for the weak effect of adult sources of informal control may be the process of maturation (Moffitt 1993). Terrie E. Moffitt (1993) argues that the majority of adolescents who engage in delinquency are adolescence-limited delinquents and a very small percentage of offenders are life-course-persistent offenders. The adolescence-limited delinquents offend because they are trapped between biological adulthood and social adulthood (1993:692). The period of adolescence has been extended in duration (following modernization) and adolescents experience a maturity gap between social adulthood (e.g. ability to make decisions, live independently) and physical adulthood (sexual maturity) according to Moffitt (1993: 687). While inside this maturity gap, adolescents engage in "social mimicry" (Moffitt 1993: 687) where they mimic the actions of life-course persistent delinquents (based on social learning theory). Social mimicry is a means of attaining mature status and privileges among peers (Moffitt 1993: 686).

Moffitt explains desistence as a process of maturity. Once they reach adulthood, most adolescence-limited delinquents will mature and reach the realization that the rewards of illegal behaviour (such as peer status) "shift from rewarding to punishing, *in their perception"* (Moffitt 1993: 690; emphasis in original). These individuals maintain control over antisocial behaviours through adolescence and as they gain independence and maturity begin to realize the harmful

consequences of a criminal record for future job opportunities. Unlike social bonding theory, this realization of having something to lose is not tied to having external controls or reciprocal relationships. Some adolescence-limited delinquents will experience continuity of antisocial behaviours if they experience negative consequences from delinquent behaviours such as informal or formal sanctions. These sanctions may lead to cumulative continuity thereby reinforcing delinquency (Moffitt 1993: 688). This theory explains continuity (as a result of cumulative continuity) or change (as a result of maturation).The results of this dissertation suggest that young adults are not as subject to informal social controls as children and adolescents are. Perhaps at this life stage, young adults are more independent and less tied to social institutions for control.

Finally, it was expected that concurrent sources of informal social control indirectly affect antisocial behaviour in adulthood (*hypothesis 4*). The results of this analysis did not provide much support for this hypothesis. Family social capital had a negative effect on individuals' investment in careers, which was not expected. In adulthood, Laub and Sampson (2003) argue, antisocial peer associations affect criminal and antisocial behaviours. Baerveldt, Völker, and Van Rossem (2008: 576-577) suggest that antisocial peer associations also partially mediate the relationship between conventional institutions of family and work and criminal behaviour. Deviant peers are particularly attractive to individuals who have difficulty securing long-term employment and relationships (Laub and Sampson 2003). The results of this study suggest that antisocial peer associations continue to affect antisocial behaviours in emerging adulthood, but do not suggest that peer associations significantly mediate the relationship of conventional institutions of control (family, work) and emerging adulthood antisocial behaviour.

Overall the transition to young adulthood is characterized by stability and change. Underlying antisocial propensity and behaviour appears to be stable throughout the early life-course. Antisocial peer associations are not as stable as antisocial behaviour, and are particularly weak during the transition from adolescence to emerging adulthood (Warr 2002). Prior antisocial behaviour has negative consequences for building social relationships in emerging adulthood (cumulative continuity). During early adulthood, family social capital appears to have some informal social control on antisocial behaviour, but job stability and career investment do not. Associating with antisocial peers during emerging adulthood continues to support antisocial behaviour during this stage of life.

Chapter Nine: Conclusions and Discussion

Social control theories of crime and delinquency seek to explain why individuals do not engage in crime. The underlying assumption is that informal social control grows out of and reinforces ties to conventional society that prevent individuals from expressing their antisocial propensity in the form of antisocial behaviour. This dissertation has sought to understand the mechanisms by which informal social control lead to the development of, and continuity and change in antisocial behaviour over the early life-course. This chapter highlights the major findings based on the research questions and hypotheses. This study contributes to the growing body of literature that provides evidence in support of a life-course approach to the study of crime. To my knowledge, no national-level study of informal control and antisocial behaviour over the early life-course has been done in Canada, or possibly elsewhere. The National Longitudinal Survey of Children and Youth provides a rich source of data to study development, continuity and change in antisocial behaviour in a nationally representative sample of Canadians, from late childhood to emerging adulthood.

9.1 Summary of Results

Antisocial behaviour refers to behaviour that violates normative expectations such as breaking rules, stealing, hitting, or other aggressive behaviours. Normative values and expectations are learned through socialization. The key institutions of socialization in childhood are families, schools, communities and peers. Social bonds to these institutions act to informally regulate antisocial behaviour.

This dissertation integrates age-graded informal social control theory, social disorganization theory and collective efficacy theory. Age-graded informal social control theory by Sampson and Laub (1993) provides the theoretical framework for this dissertation, with a particular emphasis on earlier life stages. According to this theory, informal social control is the primary causal mechanism in the development of (or control of) antisocial propensity in childhood. Over time, individuals are subject to varying sources and forms of informal social control. New social bonds created at different life stages may modify propensity for antisocial behaviour. Therefore, this research takes a life-course approach to studying antisocial propensity and its expression in antisocial behaviour.

This dissertation also situates antisocial behaviour in the context of the community. Social disorganization theory is a theory about informal social control from the community. Social disorganization refers to communities characterized by instability and lack of resources. For example, communities with higher proportions of single-parent households are expected to have more crime. According to this theory, single parents do not cause crime themselves; rather the greater the proportion of single-parent households in the community, the fewer adults available for supervision in the community. Similarly, communities characterized by low socio-economic status (including percentage of low income households, percentage of households receiving government transfers, and percentage of unemployed residents) will have greater social disorganization. This social disorganization bars effective communication between neighbours and impedes social ties. Collective efficacy occurs when residents work together to monitor the community and take action to maintain an area free from crime. Activities may include monitoring the properties in the neighbourhood and talking to individuals hanging around the

community. Therefore social disorganization is theorized to increase antisocial behaviour by weakening collective efficacy.

The general conceptual framework guiding this dissertation is shown in Figure 9.1. The detailed conceptual causal model is shown in Figure 9.2. This represents the hypotheses tested in the dissertation. The hypotheses of the dissertation are focused around five central themes. The first is that institutions of informal social control are the foremost processes in the development, prevention, continuity and change of antisocial behaviour over the life-course. Secondly, these institutions of informal social control mediate the impact of broader community conditions and early family characteristics on pathways of antisocial and delinquent behaviour. Third, antisocial propensity and behaviour are characterized by stability and change over the life-course. Fourth, the social institutions of informal control are interconnected and work together to regulate antisocial behaviour. The fifth theme is that the importance of informal social control from various sources changes over time.

The analysis is divided into the three major life periods of interest to this study: childhood (Chapter 6), adolescence (Chapter 7), and emerging adulthood (Chapter 8). The following section begins with a brief review of the key findings from the research in these chapters as they address the hypotheses set out in Chapter 5, and are shown in Figure 9.2.

Figure 9.1 General Conceptual Model. Pathways of Antisocial, Delinquent and Criminal Behaviour: A life-course model of informal social control

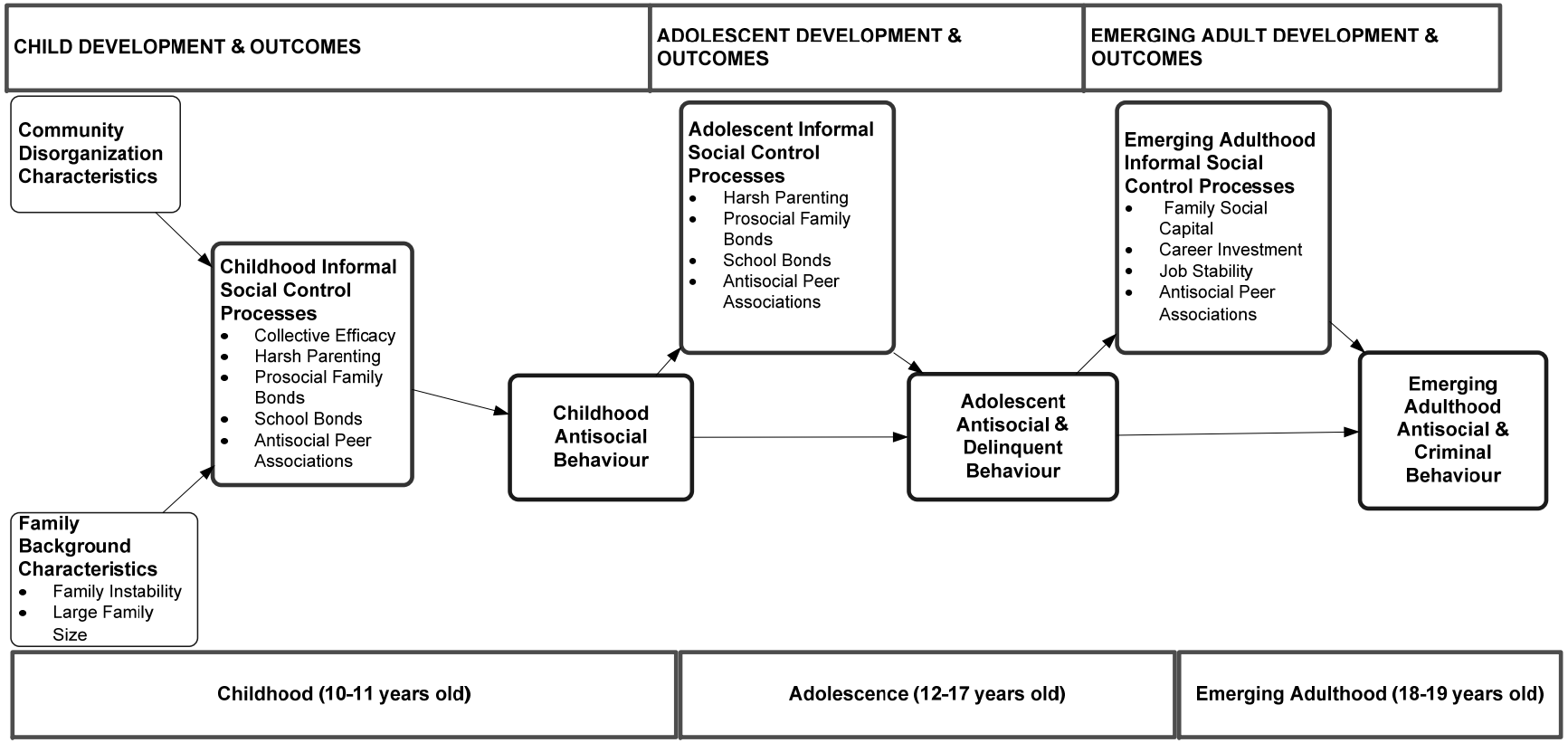
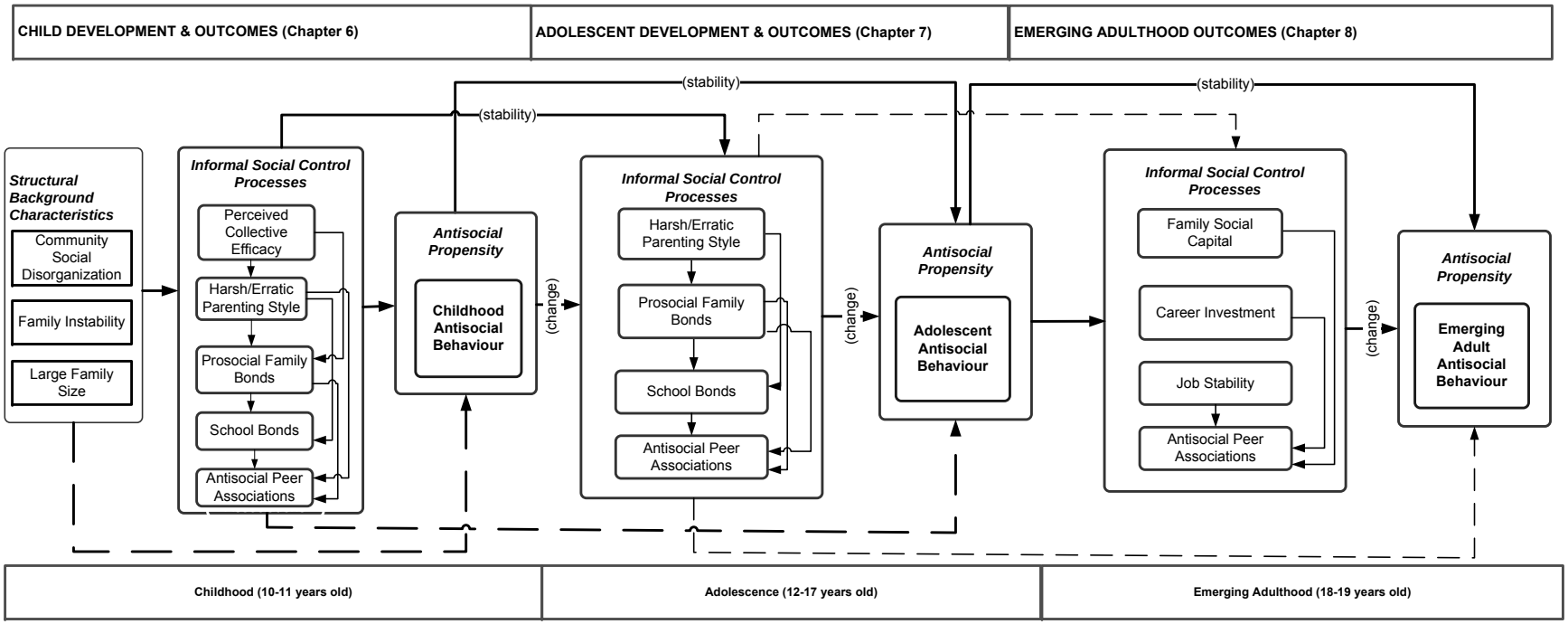


Figure 9.2 Conceptual Causal Model of Hypotheses. Development, continuity and change in antisocial propensity and behaviour over the life-course



9.1.1 Pathways to Childhood Antisocial Behaviour

According to social control theory, social bonds provide protection against delinquency regardless of personality because social bonds create ties to conventional society. During childhood informal bonds are theorized to be the central process in the development of, or the control of antisocial propensity. Sources of informal control include the community, the family, the school, and peers. Collective efficacy works to informally regulate behaviour when neighbours share social ties and a willingness to monitor the community. Having prosocial bonds to family by attachment to and supervision by parents of their children creates rules and expectations for behaviour within the family. At school, individuals create ties to conventional norms and values by committing to do well in school. Weak or negative bonds to institutions of control impede individuals from developing ties to conventional society. Specifically, harsh and erratic parenting practices create confusion about social expectations regarding acceptable behaviour. Other negative influences on antisocial behaviour include attachment to antisocial peers. According to age-graded informal control theory, social bonds to these institutions mediate the role of background characteristics. The analyses found support for many of the central hypotheses for the development of or the control of antisocial behaviour in childhood.

> Hypothesis 1: *The major causal explanation of childhood antisocial behaviour is informal social control processes (collective efficacy, prosocial family bonds, harsh / erratic parenting style, school bonds, and antisocial peer associations).*

The results of this study suggest that the major causal explanation of childhood antisocial behaviour is weak social bonds, especially with family and school. Consistent with the literature (e.g., Rankin and Kern 1994; Elliot, Huizinga, and Ageton 1985), the family was found to be an important agent of informal social control. Children who reported stronger attachment to, or closer supervision by, their parents also reported engaging in less antisocial behaviour. Moreover children who experienced harsh or inconsistent parenting were also more likely to have weaker family attachments, and thus to be subject to even less effective school control. The results support the view that conformity is developed through socialization when family social bonds are strong. It may be that harsh and / or consistent parenting hinders the development of self control by sending conflicting messages about accepted norm of behaviour.

The results suggest that the school offers another source of important informal social control. Children who reported liking school, wanting to do well in school and following school rules also reported less antisocial behaviour. It may be that committing to doing well in school increases an individual's stake in conformity. This means that individuals are less willing to risk what they have worked hard to achieve by engaging in behaviours considered to be antisocial (Hirschi 1969; Payne 2008; Herrenkohl et al. 2001). This finding is consistent with other research that has shown very strong relationships between low school achievement and deviant behaviour (Payne 2008; Farrington 2005; Herrenkohl, Chung, Hill, and Battin-Pearson 2001; Welsh, Greene, and Jenkins 1999; Loeber, Farrington, Stouthamer-Loeber, and van Kammen 1998; Jenkins 1997; Offord, Boyle, and Racine 1989; Velez, Johnson, and Cohen 1989).

Associating with antisocial peers was expected to lead to antisocial behaviour in childhood. The analysis found support for this hypothesis. Children who reported associating with antisocial peers – that is, having friends who smoked, drank alcohol or used drugs, or being part of a group that "does bad things" – also tended to report engaging in antisocial behaviour. However the effect size was weaker than expected. The findings of this study suggest that associations with antisocial peers are less influential in childhood than school bonds or family bonds. This finding supports the view that different sources of informal control are important at different life stages. During childhood, consistency in parenting and school bonds appear to have the greatest informal control over behaviour relative to other sources and background characteristics. As will be seen in the next section, the influence of antisocial peer associations was found to be much stronger in adolescence than in childhood.

The results of this study suggest that the collective efficacy of the community does not have much effect on childhood antisocial behaviour. The extent to which the PMK (Person most knowledgeable about the child, usually the mother) perceived that the community had strong collective efficacy, where community members work together, share a sense of trust, and willingness to intervene in situations for the good of the community, was not significantly associated with her child's antisocial behaviour. This finding is consistent with research on the likelihood that social ties do not predict active use of measures of informal social control by the community (Warner 2007).

Overall, the results of this research suggest that informal social controls from the school and the family have the strongest impact in reducing antisocial behaviour in childhood. The influence of

antisocial peer associations on childhood antisocial behaviour is relatively weak in comparison. The effect of the community's collective efficacy on antisocial behaviour in childhood is completely mediated by informal social controls.

> Hypothesis 2: *Structural background characteristics (community disorganization and family characteristics) will primarily affect childhood antisocial behaviour indirectly through their effects on childhood informal social controls.*

The results also support the assertion of age-graded informal control theory that the effects of family characteristics such as socio-economic status and family size on antisocial behaviour are mediated by informal social controls. Two dimensions of family characteristics were included in this analysis: (1) family instability (including low socioeconomic status, residential instability, and lone-parent family), and (2) large family size (three or more children). These family characteristics did not have direct effects on antisocial behaviour. However, family instability appears to affect the ability of families to closely monitor children. The results support the view that family instability indirectly affects the development of social bonds between a child and his or her family (Hirschi 1969; Jenkins 1997; Fomby and Cherlin 2007). The results also suggest that children living in families characterized by instability are more likely to have antisocial peer associations. Children who live in families characterized by instability also report weak emotional attachments to family and less parental supervision. In turn, these children report higher associations with peers who drink alcohol or use drugs, or "do bad things".

Second, the analysis suggests that living in a family with three or more children increases the risk of being subject to inconsistent rule enforcement or punishments by parents. This finding supports the theory that large family size appears to disrupt the development of prosocial bonds. Jenkins (1997:340) offers the explanation that it is more difficult for parents to supervise the activities of children (such as monitoring homework or knowing what children are doing) in large families. Perhaps this inconsistency creates confusion about the norms and expectations of acceptable behaviour making it more difficult to build social bonds. Hirschi (1991: 181-183) argues that children in large families spend less time with adults and more time with other children and that parents have less time for indirect supervision of children (such as knowing where the children are or what they are doing). Coleman (1990) makes a similar argument that a smaller family size increases the effectiveness of supervision, while a larger family size decreases the effectiveness of normative supervision.

This dissertation also incorporates elements of the social disorganization theory of Shaw and McKay (1969). According to the results of the analysis, socially disorganized communities do not directly impact antisocial behaviour. That means children who live in areas characterized by a high percentage of lone-parent families, low income families, unemployment, low educational attainment, families receiving government transfers and families living in rented dwellings, are not significantly more likely to report engaging in activities such as lying, stealing, cheating, hitting, destroying property, and other antisocial behaviours. This is consistent with other Canadian research about neighbourhood effects on childhood behaviour (Foster et al. 2001). The results of the research suggest support for the view that community social disorganization lowers collective efficacy. The results suggest that social disorganization reduces residents' willingness

to monitor the activities of the neighbourhood, and to participate in the regulation of activities in the community. The results further suggest that the effect of collective efficacy on childhood antisocial behaviour is mediated by its tendency to reduce harsh or erratic parenting. This supports the findings by Chung and Steinberg (2006) who used a multilevel model of neighbourhood and individual characteristics of serious offenders in Philadelphia. Their results show that neighbourhood instability and concentrated poverty indirectly affect individual offending by reducing social cohesion, which in turn has a negative effect on parenting behaviours (Chung and Steinberg 2006: 326).

The results also show that community social disorganization has an indirect effect on antisocial behaviour through antisocial peer associations. This is consistent with research by Dishion, Andrews and Crosby (1995), who found that boys who were the most antisocial came from the same neighbourhoods as their antisocial friends and that these were friendships of convenience. Perhaps antisocial peer associations are stronger in neighbourhoods characterized by instability. It is possible that it is easier for children to come together to do "bad things" in socially disorganized communities where their activities are less likely to be supervised.

> Hypothesis 3: *Institutions of informal social control are interconnected and some sources of control will also indirectly affect antisocial behaviour.*

Age-graded informal social control theory (Sampson and Laub 1993) focuses on the independent effects of informal social controls on delinquent and criminal behaviour. In this study, both the direct and indirect contributions of informal social controls are examined. The results suggest

that sources of informal social control shape or control antisocial behaviour in childhood independently and in collaboration. The results suggest that agents of socialization work together. First, perceived collective efficacy is related to lower levels of harsh parenting practices. This is consistent with research by Chung and Steinberg (2006) who also found that perceived neighbourhood social cohesion has an effect on parenting practices. Second, the results suggest that harsh parenting practices in childhood interfere with feelings of attachment within the family and levels of supervision. Furthermore, children who are subject to higher levels of inconsistent or harsh parenting are also more likely to have deviant peer associations. Therefore harsh parenting also indirectly affects antisocial behaviour through peer associations. The findings are consistent with research that suggests the quality of family bonding (e.g. attachment) is directly related to constraints on offending (e.g. discipline), (LeBlanc, McDuff and Kaspy 1998: 65).The results are also consistent with studies that have shown that parenting behaviours affect the choice of friends (Dishion et al. 1995; Patterson and Stouthamer-Loeber, 1984; Stoolmiller 1994). Third, the results show that prosocial family bonds positively reinforce bonds to school, further suggesting that institutions of informal control are interconnected. Overall, institutions of informal social control appear to work together, rather than in isolation to regulate antisocial behaviour.

9.1.2 Continuity and Change in Antisocial Behaviour during Adolescence

An age-graded informal control theory approach to crime and deviance suggests that social bonds are dynamic and may change over time. Antisocial and delinquent behaviour may also change or remain stable given age-relevant social bonds. In childhood, sources of informal

control from parents and schools might be most important, and diminish through adolescence. Chapter seven focuses on two themes: continuity in antisocial behaviour from childhood through adolescence, and change in antisocial behaviour during adolescence given sources of social control during adolescence.

Briefly, the results suggest there is stability in underlying antisocial propensity, as well as stability in social bonds from childhood to adolescence. Evidence also supports the cumulative effects of prior antisocial behaviours on social bonding in adolescence. Despite the stability of antisocial behaviour and the consequences of cumulative continuity, the results also suggest the possibility of modification to propensity for delinquent behaviour with concurrent social bonds. These results will now be discussed in more detail with respect to the hypotheses.

> Hypothesis 1: *The effects of childhood structural background characteristics (community social disorganization, and family characteristics) and childhood informal social controls on adolescent antisocial behaviour are mediated by childhood antisocial behaviour and adolescent social bonds.*

The results suggest that childhood antisocial behaviour as well as adolescent social bonds appears to mediate most of the effects of childhood background family characteristics and childhood social bonds on adolescent antisocial behaviour. Community social disorganization does not have a significant direct or indirect effect on adolescent antisocial behaviour.

Nearly half of the indirect effect of family instability on adolescent antisocial behaviour is mediated by adolescent school bonds while the other indirect paths are through childhood antisocial behaviour and adolescent antisocial peer associations. Family size mainly affects adolescent antisocial behaviour indirectly through its effect on childhood antisocial behaviour, as well as on adolescent school bonds. This suggests that the effects of the characteristics of the family during childhood on adolescent antisocial behavior are rather complex and indirect.

Most of the childhood informal social controls that were analyzed were found to have significant indirect effects on adolescent antisocial behaviour through their effects on childhood antisocial behaviour and on informal social controls in adolescence. The effects of community efficacy, harsh parenting, and prosocial family bonds operate mainly through their effects on childhood antisocial behaviour. Adolescent school bonds are also a significant path for the effect of childhood social bonds on adolescent antisocial behaviour, specifically in the case of childhood harsh parenting, prosocial family bonds and school bonds. On the other hand, the effect of childhood peer associations on adolescent antisocial behaviour operates indirectly through its impact on adolescent peer associations, rather than via childhood antisocial behaviour. Thus the results support the hypothesis and also show that the indirect paths from childhood bonds to adolescent antisocial behaviour are complex and not fully accounted for by childhood antisocial behaviour.

Hypothesis 2: *Continuity in antisocial behaviour is expected from childhood to adolescence.*

Continuity in antisocial behaviour is evident in (1) antisocial behavioural stability (heterotypic and homotypic), (2) social bond stability, and (3) cumulative continuity. The results suggest that propensity for antisocial behaviour manifests in a variety of behaviours over time (heterotypic continuity). Childhood antisocial propensity is manifested in behaviours such as hitting, threatening, bullying, destroying property, stealing, lying, cheating and other aggressive behaviours. In adolescence, antisocial behaviour was measured using many of the same behaviours, with the addition of delinquent (i.e. illegal) behaviours. From the age of twelve, Canadian youth are subject to the criminal law, although in a form modified by the provisions of the *Young Offenders Act* (until 2003) and the *Youth Criminal Justice Act* (from 2003). Behaviours recognized as delinquent for this age group and captured by the NLSCY include being questioned by police and/or security guards; breaking into properties with the intent to steal; stealing purses, wallets, from stores, schools; selling stolen goods; fighting leading to minor and / or serious injuries; carrying/using weapons (knives, guns) for the purpose of fighting; purposely setting fires and so on. Many of the behaviours included during adolescence are far more serious in nature than those in childhood, and yet the results suggest an underlying stability in behaviour over time. Antisocial behaviour developed in childhood persists into adolescence and manifests through a variety of behaviours. These behaviours persist over time, independent of adolescent social ties.

Hypothesis 3: *Stability is expected in social bonds from childhood to adolescence.*

Stability is also evident in social bonding from childhood through adolescence. Thus the results suggest that development of bonds to conventional society occurs early and remain relatively stable. Stability is strong among family bonds (both prosocial family bonds and harsh or erratic parenting) and school bonds from childhood to adolescence. Associations with antisocial peers however, are relatively less stable between childhood and adolescence. Stability in social bonds is consistent with the framework of the general theory of crime (Gottfredson and Hirschi 1990). The general theory of crime argues that stability between-individuals exists over time. They recognize that the age-crime curve varies over time, but argue the curve remains stable between individuals. Given the evidence of both behavioural stability and stability in social bonding, it might appear that longitudinal analyses are unnecessary (Gottfredson and Hirschi 1987: 45-69). However the results of this analysis provide evidence that change in social bonding during adolescence also occurs, which is the focus of hypothesis 5.

Hypothesis 4: *Antisocial propensity is expected to contribute to stability in antisocial behaviour by impeding social bonds during adolescence.*

Not only is there evidence of continuity in antisocial behaviour, but the results support Moffitt's (1993) hypothesis that, childhood antisocial behaviour has a negative effect on later bonds with social institutions. This means that cumulative continuity occurs where childhood antisocial behaviour has negative consequences for social bonds in adolescence. Antisocial behaviour has negative consequences for prosocial family bonds and school bonds in adolescence, regardless of

prior bonds. Prior antisocial behaviours further aggravate harsh or erratic parenting practices and increase the risk of having antisocial peer associations in adolescence. It may be that antisocial individuals use antisocial behaviour as a means of distancing themselves from their parents, as suggested by Moffitt (1993). Thus, the consequences of early antisocial propensity go beyond antisocial behavioural stability to affect other areas of individuals' lives.

Hypothesis 5: *Regardless of prior antisocial behaviour, sources of informal control in adolescence (family, school, peers) will partly account for changes in antisocial behaviour from childhood to adolescence.*

Hypothesis 6: *During adolescence, it is expected that there will be a shift in the importance of various sources of control (family, school, peers) as compared with childhood.*

Although continuity in antisocial behaviour appears to be strong, there is also evidence that levels of conformity / non-conformity may be modified by social bonds at different life stages. This is inconsistent with Gottfredson and Hirschi's (1990) general theory of crime, which limits the significance of social bonding to childhood. The results of this analysis support Sampson and Laub's (1993) argument that pathways to antisocial and delinquent behaviour are modified from childhood to adolescence by new social bonds. These results suggest that the concurrent school bonds continue to have the greatest protective influence on antisocial behaviour. Adolescents, who are doing well in school, follow school rules and enjoy school, report engaging in fewer

antisocial behaviours regardless of prior antisocial propensity. This finding is consistent with other research (Hallfors et al. 2006; Kasen, et al. 1998; LeBlanc et al. 1993). It may be that school bonds provide ties to conventional norms and expectations. Doing well in school and believing that school is important create stakes in conformity. This increases the sense of what a person has to lose by acting in an antisocial way. Overall, the results show that school bonds in adolescence have the greatest impact on adolescent antisocial behaviour, beyond other sources of informal social control and beyond stability in antisocial propensity. In other words, individuals who exhibit childhood antisocial behaviour may be re-socialized in a prosocial direction if they develop bonds to school during adolescence.

The roles of families and peers appear, however, to shift during adolescence, according to the results of the research. While antisocial peer associations have very little impact on antisocial behaviour in childhood, during adolescence, antisocial peer associations become a very prominent influence on antisocial behaviour. This is consistent with research on adolescent peer relationships and delinquency (Baerveldt et al. 2008; Özbay and Özcan 2008, Warr 2002; Gardner and Shoemaker 1989). Warr concludes "during adolescence, individuals frequently undergo rapid and enormous changes in exposure to delinquent peers, from a period of relative innocence in the immediate preteen years to a period of heavy exposure in the middle to late teens" (2002: 96). Tremblay et al. (1995) also stress the importance of capturing age-relevant peer relationships. They found friends tend to share similar characteristics to individuals during the same time period, rather than with earlier peer relationships (Tremblay et al. 1995: 649). The results of this dissertation suggest that regardless of individuals' antisocial propensity, concurrent

antisocial peer associations are the second strongest factor for change in individuals' antisocial behaviour during adolescence.

In adolescence, the results suggest that the influence of family bonds diminishes relative to other sources of informal social control. This is consistent with recent research that has found parenting practices are less predictive of adolescent deviance (Beaver and Wright 2007; Chung and Steinberg 2006). The results of the dissertation do suggest that the family continues to be a source of social control in adolescence but that almost half of the control is indirect via other social controls.

> Hypothesis 7: *Adolescent sources of informal social control are interconnected and some sources of control will also indirectly affect youth antisocial behaviour.*

The importance of family bonds diminished significantly in adolescence; however, they continued to influence other institutions of social control during adolescence. The negative effects of poor parenting practices (i.e. harsh and erratic parenting) on antisocial behaviour are partially mediated by prosocial family bonds and school bonds. Prosocial family bonds continued to be important indirectly through their influence on other institutions of informal social control, particularly on school bonds (commitment to doing well in school, enjoyment of school, and belief in following school rules). In turn school bonds are a strong protective factor against antisocial behaviour in adolescence, as it is during childhood. It may be, as Hoffmann

and Dufur (2008: 49) recently suggested that school bonds serve as a substitute for poor parental attachment and involvement in protecting against delinquency in adolescence.

Interestingly the results suggested that despite both family social controls and antisocial peer associations each having a direct impact on antisocial behaviour in adolescence, peer associations and family bonds appear to be unrelated. This is consistent with Warr (1993b) who found that parental attachment did not protect against delinquent peer influence. Warr's results suggest instead that *time* spent with parents reduced the impact of delinquent peer influence (1993b: 258). Warr suggests that the reason attachment is not directly effective in reducing peer influence is due to the great strength of immediate pressures on peers to break the law (1993b: 259).

Perhaps Warr's explanation may be extended to the relationship between school bonds and antisocial peer associations. The results of this dissertation suggest that youths with strong bonds to school have fewer antisocial peer associations. Conceivably, these youths invest time both in school and after school hours on their studies and related activities. According to Warr's argument, this time spent on school may reduce time available to spend with antisocial peers. The results do suggest support for a social control explanation that school bonds creates ties to conventional expectations of behaviour. It may be that youths who are committed to doing well in school are less willing to risk their achievements to associate with antisocial peers. Thus the

results suggest that school bonds both directly and indirectly reduce antisocial propensity in adolescence regardless of prior antisocial propensity.

9.1.3 Continuity and Change in Antisocial Behaviour During Emerging Adulthood

Over the life-course, it was expected that antisocial propensity would be characterized by stability and change. According to age-graded informal social control theory, new social bonds that emphasize quality of relationship in young adulthood account for modifications to propensity for antisocial behaviour. The features of social bonds in adulthood differ from those in childhood or adolescence. Social bonds in young adulthood emphasize the following qualities: (1) social capital, which promotes conformity through reciprocal ties; and (2) a structure to routine activities. For example, job stability constrains routine activities and thereby reduces the expression of antisocial propensity (Laub and Sampson 2003: 42-48). The discussion will now address each of the hypotheses examined in chapter 8. These hypotheses address stability and change in antisocial propensity including characteristics from childhood through the transition to young adulthood.

> Hypothesis 1: *Adolescent antisocial behaviour is expected to mediate the effects of adolescent informal controls on antisocial behaviour in the transition to young adulthood.*

The results suggest that the effects of adolescent social bonds on emerging adult antisocial behaviour are primarily indirect through adolescent antisocial and delinquent behaviour. Despite

the appearance of some direct effects of childhood background characteristics on adult social bonds, the results suggest that the effects of childhood family instability and family size are almost entirely through adolescent antisocial behaviour. Childhood social bonds mainly affect emerging adult antisocial behaviour through their effects on childhood antisocial behaviour and adolescent informal social controls, which in turn account for consistency in antisocial behaviour over time. Adolescent informal social controls indirectly shape antisocial behaviour in the transition to young adulthood, mainly through adolescent antisocial behaviour and not through emerging adult social bonds.

Hypothesis 2: *From childhood, through adolescence and into emerging adulthood, there is expected to be continuity in general antisocial propensity and behaviour.*

The behaviours expressed in underlying antisocial propensity were expected to be both homotypic (continuity of the same behaviours) and heterotypic (continuity of similar underlying behaviours) into emerging adulthood. In adolescence, there is an emphasis on delinquent activities such as breaking the law, theft from a store, assault, carrying weapons, driving under the influence of alcohol, and using illicit drugs. In the transition to young adulthood behaviours that underlie antisocial propensity include risky sexual behaviours, fighting with another person to the point where that person needed medical attention, selling illicit drugs and so on. The results suggest that there is stability in antisocial behaviour from adolescence to emerging adulthood. Furthermore they suggest an underlying antisocial propensity that manifests through a variety of antisocial and criminal behaviours.

Hypothesis 3: *Antisocial propensity is expected to contribute to stability in antisocial behaviour by impeding social bonds during the transition to young adulthood.*

Stability in antisocial propensity is arguably partly a result of cumulative continuity (Sampson and Laub 1993; Moffitt 1993). The results of this dissertation do show that prior antisocial behaviours have consequences for adjustment to later sources of informal social control. It is more difficult for individuals to form social ties with families or maintain stable jobs given prior antisocial behaviours. Furthermore the results suggest that prior antisocial behaviour increases associations with antisocial peers in emerging adulthood. Thus the cumulative effect of antisocial propensity through childhood and adolescence reinforces antisocial behaviour by undermining ties to conventional society at later stages of the life-course.

Hypothesis 4: *Regardless of prior antisocial behaviour, adult social bonds (family capital, job stability, career commitment and peer associations) are expected to account for changes in antisocial propensity from adolescence to emerging adulthood.*

First, the influence of antisocial peer associations appears to remain important throughout the life-course, and is not limited to childhood or adolescence according to the results. Antisocial peer associations appear to diminish during the transition to young adulthood, as compared with adolescence. This is consistent with the literature (Laub and Sampson 2003; Haynie 2002; Warr 2002). Warr (2002) suggests that "while life-course transitions like marriage and full-time work may drive some people from the company of their peers, others may display greater detachment solely as a consequence of increasing psychological and emotional autonomy" (2002:108).

Despite the relative instability in peer associations between adolescence and adulthood, the results suggest antisocial peer associations remain important in shaping antisocial behaviour through different life stages.

Second, having family social capital has little effect on antisocial behaviour in emerging adulthood, according to the results. Other sources of social control from career investment and job stability do not significantly modify antisocial behaviour in adulthood. During childhood, and adolescence, social bonds provide a good explanation of variations in the development, stability and modification of antisocial propensity and behaviour. This is consistent with age-graded informal social control theory of crime (Sampson and Laub 1993). The results of this study suggest that in emerging adulthood however, social bonds account for relatively little of the variance in antisocial behaviour. Perhaps an explanation for variation in adulthood antisocial and criminal behaviour lies outside a social control framework. Terrie E. Moffitt (1993) describes desistence from crime following adolescence as a process of maturation for most individuals. During adolescence, engaging in delinquent behaviours may bring adolescents desired privileges such as status and prestige among peers (Moffitt 1993:686). As individuals mature into young adults, the rewards of illegal behaviour (such as peer status) no longer seem beneficial (Moffitt 1993: 690). This explanation departs from social control theory by asserting that individuals maintain self-control over their actions even while committing crimes. Furthermore change is a self-motivated process with the realization that there are harmful consequences of a criminal record, such as limiting future job opportunities. Under a social control explanation, desistence is tied to external controls or investments in conventional relationships of family and work (Sampson and Laub 1993).

Hypothesis 5: *The development of prosocial bonds to adult institutions of informal social control (such as family, and work) indirectly works impedes antisocial behaviour in adulthood by preventing associations to antisocial peers.*

Finally, it was expected that sources of informal social control in adulthood may be interconnected. The results of this analysis did not provide much support for this hypothesis. Mark Warr (2002: 101) argues that peer influence is the main cause of crime. On that basis he reasons adult family social bonds will indirectly reduce delinquency by disrupting or dissolving associations with delinquent friends (Warr 2002: 101). Furthermore, Laub and Sampson (2003) argued that deviant peers are particularly attractive to individuals who have difficulty securing long-term employment and relationships. Although the results of this study found antisocial peers continue to have an impact on antisocial propensity in the transition to young adulthood, the results did not support the hypotheses that peer associations significantly mediate the relationship of conventional institutions of control (family, work) and adult antisocial behaviour.

9.2 Limitations and Future Directions

Despite the rich data available for this analysis, this study faces some limitations. First, although social disorganization theory and collective efficacy theory are intended for community-level application, this was not possible given the very small numbers of sampled individuals living in each neighbourhood. Other studies of these NLSCY data have had a broader scope, such as opening the sample to all individuals who were sampled rather than a single birth cohort

(Boulderice 2001; Foster et al. 2001). Also, in order to do the multilevel analysis with enough individuals living in the same area, the sample may no longer be representative at the national-level (Jones et al. 2002). Despite this, multilevel models with a larger sample might clarify the relationship between antisocial behaviour and community conditions. In this analysis, there was little to no direct relationship between community characteristics and antisocial behaviour; however, these characteristics appear to indirectly affect antisocial behaviour through social bonds in childhood. A future multilevel study of community social disorganization and antisocial behaviour may be possible if all individuals sampled are included in the study.

Although one of the interests at the outset of this dissertation was to integrate social disorganization theory, the Census variables available for inclusion were in some cases very weak indicators of the disorganization concepts and thus not included. For example, ethnic composition of the neighbourhood and the number of residents that had moved in the last five years were unavailable. So this research was limited to contextualizing antisocial behaviour within many but not all of the community disorganization characteristics identified in studies of social disorganization theory (Jacob 2006). This may also partially explain the weak to nonexistent relationship between community characteristics and antisocial behaviour. If integration of the Census and the NLSCY were possible[24], then a greater number of disorganization characteristics could be included.

[24] As discussed in Chapter Three (Section 3.3.2 Unit of Analysis), this integration was not possible. Although Census Enumeration Area (EA) codes are attached to individual records, many of them are missing or incorrect. Many records list five or more possible EA codes. Despite great efforts for this study, reliable concordance between the individuals in the NLSCY and the Census EAs was not possible.

Change in antisocial propensity and behaviour over the life-course is a key theoretical interest for age-graded informal control theory, but this study had to be limited to following the subjects up to the age of 18-19 years old. Sampson and Laub (1993) emphasize adult bonds through marriage, children, and work as the reason for change in antisocial behaviour in adulthood. Thus a limitation of this dissertation is that many of the participants are still too young (18-19 years old) to have made some of the commitments that Sampson and Laub (1993) refer to. Thus this dissertation is limited to the early period of the transition to young adulthood. In Cycle 6 of the NLSCY, when members of the selected cohort were 20-21 years old, the antisocial and criminal behaviour questions were not included in the survey. Cycle 7 (ages 22-23 years old) was recently released and does include a few items of criminal behaviour, so an analysis of change in adulthood antisocial behaviour may be more viable. Furthermore, more detailed social bond questions are included in later cycles such as investment and enjoyment of work. Also, marriage is more likely to occur during the twenties than before the age of twenty. The interest in doing this future research will be to test the effects of turning points (such as marriage, children and career) as outlined by Sampson and Laub (1993). Alternatively, a study of adulthood may provide evidence in favour of adult social bonds. A study that reaches further into adulthood may further the argument that modifications to antisocial propensity are a process of maturation. At this point in the transition to young adulthood (ages 18-19) this study found that individuals are not influenced much by social bonds, suggesting that variations in antisocial propensity may be due to maturation.

This dissertation would not have been possible without the rich data collected by Statistics Canada and made available through the Research Data Centre program. One limitation of data

collected by another organization is a lack of control over the questions included in the survey. In some instances, inconsistency in questioning and dropped questions made analyses difficult. For example: (1) some questions were asked in some cycles but not in others, (2) the response categories of many variables changed over the cycles, and (3) question wording was inconsistent in many cases over the cycles. However for the purposes of this particular study, these limitations were overcome with recoding and with an emphasis on general antisocial propensity and behaviour as a broad underlying concept.

Another related issue, is the lack of available official delinquency data. Sampson and Laub (1993) were able to test their hypotheses on both official and unofficial delinquency reports and found very similar trends in the data (Sampson and Laub 1993: 92-94; 111-112; 154-155). In the Cambridge Study of Child Development, Farrington also found a considerable overlap in self-report and official reports of delinquency and conclusions were generally similar based on the two types of reports (Farrington 1995: 935-936). This suggests that including official offence records in the analysis of the NLSCY might lead to the same conclusions as the current analysis. It would be interesting to link offence records with individual records in the NLSCY. Such a study may be able to suggest whether social bonds are the primary causal explanation for antisocial behaviour in general and / or specific delinquent and criminal behaviours. Sprott, Jenkins and Doob (2005) found, for example, that early deviant peer associations are better able to explain self-reported non-violent offending than violent offending. Even without official data, a future study might examine the effects of social bonds on offence-specific behaviours.

Also, as discussed earlier in the dissertation, antisocial peer associations are limited to the reports of individuals about their friends' delinquent activities. Research has shown that individuals tend to exaggerate their friends' behaviour (Warr 2002). This was limited as much as possible in two ways. First, peer associations were aggregated to crude categories of presence or absence of deviant peer associations, and second by recoding the variable on account of those who had higher than the sample average peer associations and those with below the average levels of antisocial peer associations. Although the data do not allow for a more in-depth understanding of peer associations, they do suggest a trend similar to that found in the literature: that the influence of deviant peers is strong in adolescence, and diminishes in the transition to young adulthood.

9.3 Policy Implications

A life course perspective on crime offers policy considerations about ways to prevent crime. The results of this dissertation support policies that emphasize building positive social bonds to society before crime is a problem or to prevent further crime. Building social bonds facilitates informal social control during each life stage and therefore offers the opportunity for crime control throughout life. The results support the argument by Laub et al. (1995: 96) that there are predictable and often stable pathways toward adolescent and adult delinquency through poor parent attachments, supervision and parenting, weak commitment to school, and influences from antisocial peers. However the results also suggest that changes in age-relevant social bonds may lead to modifications in antisocial pathways. This means that policies that emphasize building positive social bonds at various life stages may be effective at preventing crime, regardless of prior crime and delinquency.

The implications of this research suggest that targets for crime prevention should be directed toward building social relationships between young people and key agents of socialization, particularly schools and families. Rather than focusing on specific offences or personality disorders, the life-course perspective would focus on building prosocial bonds. The results of the dissertation suggest that there are many dimensions of parenting that can be focused on especially in childhood. First, programs could target consistent parenting. For example, programs might focus on teaching parents to use positive reinforcement to build attachments. This includes praising children, showing children they are proud of them, and making sure children know they are appreciated. Teaching parents about the importance of supervision may also build parenting skills and foster prosocial bonds with children. This means teaching parents about knowing where their children are, having rules about how late children should be out, and monitoring activities, such as homework completion. One of the most consistent findings about parenting behaviour in the literature, and in this dissertation, is the importance of consistent parenting. Policies that target teaching parents how to consistently apply rules and moderate consequences for behaviours may be very beneficial. Inconsistent application of rules such as threatening punishment but not following through with the punishment creates difficulties for children in establishing expectations for socially acceptable and unacceptable behaviour.

According to the results, school bonds are a powerful source of informal control against antisocial behaviours in childhood and adolescence. Policies that facilitate increased commitment to school, enjoyment of school, and respect for school rules by children and youths may be effective for crime prevention at various life stages. The results from this dissertation

suggest that building school bonds during adolescence is also important. The results of this analysis suggest concurrent school bonds have a strong negative effect on adolescent antisocial behaviour. This means that social bonds are dynamic and that the importance of fostering commitment to school, doing well in school and following school rules is important beyond childhood. Thus policies that extend school programs into adolescence may be especially beneficial.

The results of this dissertation suggest that the negative influence of peers who behave antisocially or engage in illegal activities increases during adolescence. Policy interventions might focus on providing teenagers with tools to make decisions about avoiding peer pressure and making positive choices about friends. Perhaps this might include providing prosocial activities for youths to meet friends, such as after school extracurricular activities. Activities that revolve around shared interests such as music, sports, mechanics, for example may foster prosocial peer bonds.

There is support for policy development based on building social ties through the work by J. David Hawkins, Richard Catalano and colleagues. Hawkins and colleagues designed a project to prevent childhood delinquency and aggression by emphasizing both direct and indirect control by families and schools. The Seattle Social Development Project (SSDP) promoted building social bonds with schools and families through training for teachers, skills training for children (communication, decision-making and conflict resolution), by offering parent-skills training (such as consistent and moderate consequences for behaviour), and encouraging parents to increase social support within families by spending quality family time and fostering school

achievement in grades one through six. To assess the effectiveness of this on-going program Hawkins and colleagues (Hawkins et al., 2001; Hawkins et al. 1999) randomly assigned children entering grade one into the SSDP group or the control (no treatment) group. A late-intervention group was given the interventions in grades five and six only. Comparisons were done on these groups at the end of grade five and at the end of the 18th birthday. The results of the SSDP project do suggest strong bonds to school and lower tendencies for drinking alcohol heavily, lifetime violence, and sexual behaviours through the age of 18 (Hawkins et al. 1999: 231). Interestingly, the groups did not differ significantly on many measures of official delinquency (Hawkins et al. 1999: 232). Perhaps this is related to the finding by Hawkins et al. (2001) that there is a linear decline in school bonds throughout adolescence, even for those in the intervention group.

As suggested by the results of this dissertation, programs that target success in school would be useful during adolescence as well. School remains an important source of informal control through adolescence, regardless of prior antisocial behaviour. The results suggest that building social bonds to the school during adolescence may modify antisocial behaviours. A dynamic program that maintains and builds commitment to school, and enjoyment in school may be just as important during adolescence as it is in childhood for preventing crime and deviance in the long-term.

The results also suggest that policies that build these ties may reduce propensity for crime even in communities characterized by social disorganization. This means that policies that target building social relationships between children and youth with their families and schools, as well

as with prosocial peers, will potentially be effective regardless of community disadvantage. Recently in Toronto, Ontario, the Toronto District School Board implemented a program to target building relationships between students (up to grade eight) and the school. "Model Schools" is a project that currently involves seven inner city schools (Yau 2010). The project emphasizes community and parent involvement, meeting nutritional needs of students, providing structured programs after school and on weekends. The program includes having a child and youth worker and social worker available at each school to help kids make better choices. The program reaches out to parents by providing information on services that may be helpful to struggling parents of children in the school. The program also emphasizes innovative teaching and learning practices among teachers, establishing the school as the heart of the community. The results of Model Schools after the first three years are positive. The schools have noted improvements in reading, writing and math skills. As well, the program found student attendance has increased, and school violence has decreased (Yau 2010). As the results of this dissertation suggest, a large reason for lower antisocial behaviour is doing well in school, being committed to school and following school rules. Thus policies such as those for the Model Schools program may reduce crime by building school commitment and success.

The results of this dissertation also suggest that institutions of social control are interconnected. This means that although the direct influence of families diminishes in adolescence, the family continues to indirectly affect antisocial behaviour. Policies that target multiple sources of informal social control may be more successful in preventing antisocial behaviour than policies that focus on only one institution of informal social control (such as families but not schools).

9.4 Summary

This dissertation assessed the role of informal social control on the development of, and continuity and change in, antisocial propensity and behaviour, set in a context of family and community. This life-course explanation of antisocial behaviour integrated age-graded informal social control theory, collective efficacy, and social disorganization theory. The results suggest that weak bonds to social institutions in childhood increase the risk of developing a propensity for antisocial behaviour. Prosocial family bonds and school bonds appear to be the most important sources of informal control during childhood, while harsh parenting practices reduce informal social control. Antisocial peer associations in childhood appear to have less influence in the development of antisocial behaviour relative to school and families. Informal social controls from the community, family, school and peers work together directly and indirectly to control the development of childhood antisocial behaviour. The main contribution of childhood background community and family characteristics on the development (or control) of antisocial behaviour is through informal social controls.

The significance of social bonds is not limited to childhood. While the results suggest there is remarkable stability in both social bonds and antisocial propensity and behaviour from childhood through adolescence, there is also evidence that new social bonds in adolescence may modify pathways of antisocial propensity. Concurrent informal social controls are the primary mechanism through which change in antisocial behaviour occurs. School bonds during adolescence are a powerful source of informal social control both directly and indirectly. During adolescence, antisocial peer associations are particularly influential above and beyond individuals' antisocial propensity. The role of the family appears to shift during adolescence. The

direct negative effects of harsh and erratic parenting on antisocial behaviour are weaker in adolescence than in childhood. However, harsh parenting during adolescence has negative consequences for bonds to family and school. Prosocial family bonds continue to informally control antisocial behaviour, but much of that informal social control is mediated through school bonds. Overall, adolescent antisocial pathways are subject to stability and change given age-graded social bonds. Clearly, childhood social bonds are important but so are the social bonds individuals create during adolescence.

Overall underlying antisocial propensity and its expression in behaviour appears to be relatively stable into emerging adulthood. The results suggest that emerging adults are not as subject to informal social controls as children and adolescents are. Informal social controls in the transition to young adulthood appear to have little impact on modifications to antisocial pathways at this time. Perhaps at this life stage, young adults are more independent and less tied to social institutions for control. However, as these individuals are followed by the NLSCY into their adult years, a fuller understanding should become possible of the influence of adult social bonds on continuity and turning points in adult criminal behaviour.

Appendices

Appendix A: Sampling Design, Survey Weights, and Analysis Implications

Sampling Design, Survey Weights, and Analysis Implications, based on information from NLSCY User Guide, Cycle 1 (Statistics Canada 1995a)

Items/Issues	NLSCY Cycle 1 Response	Implications for Analysis
Target Population (sample eligibility)	Canadian children (newborns - 11 years old). Calculated by age as of reference date (interviews between Nov 1994 & June 1995)	May bias due to exclusions (i.e. children living in Canada, without citizenship yet)
Sampling Unit	Individual	Must generalize to the individual level only
Sample Size	13,439 households, 22,831 children aged 0 to 11; 3,434 children aged 10 to 11 in these households.	
Collection Period	4 Collection periods between November 1994 and June 1995. **Main** Component Collected in December 1994 and February 1995. **Integrated** Component (with NPHS) November 1994 & March 1995	
Stratification	Primary Strata are provinces, secondary are combinations of LFS Strata (outside Northwest Territories).	Possible bias due to exclusions (such as persons living in institutions or that are homeless)
Allocation of Sample to Strata	In order to ensure a sufficient sample size (to produce reliable estimates) over-sampling of the smaller provinces was done to include all ten provinces. Thus the sample size is not proportional to stratum size within provinces. In addition, measures were taken to ensure that large enough samples were taken for each of the seven age groups: 0 to 11 months, 1, 2 to 3, 4 to 5, 6 to 7, 8 to 9, and 10 to 11 years. 0 -1 year-olds were over sampled as per survey objectives. (See Tables A2 and A3 below)	Sample sizes do not accurately represent population in some provinces, though this will ensure adequate sample sizes.
Sampling in Stages? (sample clustering?)	The Labour Force Survey employs a stratified, multistage probability sample, with households as its sampling unit. All individuals within the units who are eligible, are part of the LFS sample. Each province is a strata and is divided into 2 parts- large and small cities (PSUs). Through stratification, **clusters** of dwellings are chosen (EAs) from which a sample of dwellings are drawn. For the Northwest Territories component PSUs are Northwest Territories EAs are all private occupied dwellings, households are not selected systematically- all households with children are selected for sample.	Household sample is clustered assuming that no clustering leads to underestimated standard errors Clustering may affect variance estimations, so should be watched. Though clustering occurs at the household level.
Self-weighting at household level within Strata?	Approximately since LFS design is used	Efficiency of estimation for Household variables
Selection of Individuals	First a relationship grid was developed with the members of the household and their relationship to each other. Then one child was randomly selected (0-11 years old) with the aid of a computer. The person most knowledgeable (PMK) with the child was then selected	This minimizes the clustering of the sample at the individual level - thus individual weights are variable.
Other Sampling Issues	To insure adequate numbers of youths in the sample, NLSCY examine the LFS recent and current households involved in the LFS to determine which households had children. Based on these households, 12,900 children were selected for the sample. Different design in Quebec and in the Northwest Territories	Inclusion adequacy for children- as only about 26% of households in Canada have at least 1 child 0-11 years old.

Basic Weights	This is the inverse of the probability for selecting the person to who the record refers.	Weights can affect the efficiency of estimation and construction can lead to sampling bias
Non-response Adjustments	Item non-response was replaced with 'plausible' responses For the children's survey, 75.1% of all key answers were complete and for 10.1% of the children, no key items have responses. Non response usually compensated for by proportionally correcting the sub-weights of the responding households. A different correction was made in each of the strata and replicates specially defined for non-response. Each of the strata and replicates retained had to contain at least 10 households and have a response rate of at least 70%.	
Other weighting issues	During cycle one, 2 LFS designs were used, and different weights have been applied to these.	
Informed Consent	The questionnaire for 10 to 11 year-olds, was a self-completed survey, providing permission was given by the PMK. To help foster honest responses from the children, the interviewer encouraged the children to complete the survey alone and the children read and were told that their parents would not see their answers.	
Mode of Data Collection	Face- to- Face interviews with assistance of CAPI, except children's survey, which was self-administered.	It was hoped that children would be more honest filling out the survey themselves. But then there is no chance to clarify if a child misunderstood the question
Effort to Contact, follow up	1. "carry forward" the non-respondents to a future collection period (for example if missed in the December collection, the household would be contacted in the February collection). 2. The response rates were still lower than desired at the end of the four collection periods so efforts were put on "converting" non-respondents and the most effective interviewers were sent out to these households again. 3. After three weeks those who had not responded were telephoned and encouraged to participate.	
Response Rates overall and for subgroups	It is clear that children who are doing poorly in school and have less prosocial behaviour were less likely to respond to the survey. Females also had a slightly higher response rate than males. In addition, children in households with lower average incomes were more likely to participate in the surveys.	This may result in some bias favouring well adjusted children, and may downplay delinquency.
Who is respondent? Extent of Proxy reporting	For the children survey (10-11 year-olds), individual children are the respondents. Proxy reporting was not permitted for the 10-11 survey Proxy reporting occurred in the PMK questionnaires in less than 15% of the cases.	This may lead to some measurement bias and variability for some groups. The only question affected in my research is the occupation question.
How are Missing data handled	In cases where for whatever reason (refusal or unavailability) no information was completed "the household was dropped from the NLSCY file and the sampling weights for the corresponding households were inflated to account for these 'dropped' households If respondent was kept in the survey, then all item non-response was set to 'Not Stated' or was Imputed. Respondents not kept are 'Missing'.	

Table A2: Sample Sizes by Province

Province	Sample Size
Newfoundland	1,232
Prince Edward Island	764
Nova Scotia	1532
New Brunswick	1,426
Quebec	4,065
Ontario	6,020
Manitoba	1,789
Saskatchewan	1,878
Alberta	2,185
British Columbia	1,940
TOTAL	22,831

Table A3: Sample Sizes by Age

Age (in Yrs)	Sample Size (responding)
0	2,227
1	2,469
2	1,963
3	1,946
4	1,935
5	1,793
6	1,800
7	1,750
8	1,780
9	1,734
10	1,766
11	1,668
TOTAL	22,831

Appendix B: Specific Questions included as indicators

Childhood Antisocial Behaviour (N=24 items)

Each item was recoded to 0 = no / never or 1= yes/agree /at least once

I destroy my own things
I destroy things belonging to my own family, or other children
I steal at home
I steal outside the home
When I am mad at someone I become friends with another as revenge
I am impulsive, act without thinking
I tell lies or cheat
I assume when another child accidentally hurts me (such as by bumping into me), that the other child meant to do it, and then react with anger and fighting?
When I am mad at someone, I say bad things behind the other's back
I physically attack people
I vandalize
I threaten people
I am cruel, bully or am mean to others
I kick, hit, or bite other children
I get into many fights
Have you ever tried smoking, even just a few puffs?
Have you ever drunk alcohol?
Have you ever tried drugs or sniffed glue or solvents?
In the past year, how many times did you run away from home?
In the past year, how many times did you stay out later than your parents said you should?
In the past year, how many times did you stay out all night without permission?
In the past year, how many times did you skip a day of school without permission?
In the past year, how many times were you questioned by police about anything you may have done such as stealing, damaging property or anything else?
In the past year, how many times did you get drunk?

Adolescent Antisocial Behaviour (N=22 items in each of cycles 2 and 3; N=27 in Cycle 4)

Each item was coded 0 = no / never or 1= yes/agree /at least once

Cycle 2 (12-13 years old) and Cycle 3 (14-15 years old)
I destroy my own things
I destroy things belonging to my own family, or other children
I steal at home
I steal outside the home

When I am mad at someone I become friends with another as revenge
I am impulsive, act without thinking
I tell lies or cheat
I assume when another child accidentally hurts me (such as by bumping into me), that the other child meant to do it, and then react with anger and fighting?
When I am mad at someone, I say bad things behind the other's back
I physically attack people
I vandalize
I threaten people
I am cruel, bully, or am mean to others
I kick, hit, or bite others
I get into many fights
In the past year, how many times did you run away from home?
In the past year, how many times did you stay out later than your parents said you should?
In the past year, how many times did you stay out all night without permission?
In the past year, how many times did you skip a day of school without permission?
In the past year, how many times were you questioned by police about anything you may have done such as stealing, damaging property or anything else?
Have you ever tried drugs?
Have you ever been drunk (had 5 or more drinks at once)?
Cycle 4 (16-17 years old)
During the past 12 months, have you stayed out later than your parents said you should?
During the past 12 months, have you stayed out all night without permission?
During the past 12 months, have you been drunk (had 5 or more drinks at once)?
During the past 12 months were you questioned by police about anything you may have done such as stealing, damaging property or anything else?
During the past 12 months were you questioned by a security guard, a teacher or a principal about anything they thought you did such as stealing , damaging property or anything else?
During the past 12 months, have you stolen something from a store or school?
During the past 12 months, have you taken money from your parents without their permission? 0=never 1= 1-2 times 2=3 or more
During the past 12 months, have you damaged or destroyed anything that didn't belong to you?
During the past 12 months, have you broken into place with intention of stealing?
During the past 12 months, have you used or bought or tried to sell something you knew was stolen?
During the past 12 months, have you fought with someone to the point where they needed care for their injuries?
During the past 12 months, have you been in a fight where you hit someone with more than just hands (for example, a stick, club, knife, or rock)?
During the past 12 months, have you attacked someone with idea of seriously hurting him/her?
During the past 12 months, have you run away from home?
During the past 12 months, have you carried a knife to defend yourself or using it in fight?

During the past 12 months, have you carried a gun other than for hunting or target shooting?
During the past 12 months, have you threatened someone to get their money or things?
During the past 12 months, have you sold drugs?
During the past 12 months, have you attempted to touch someone's private parts (while knowing they would probably object to this)?
During the past 12 months, have you tried to force someone into having sex with you? 0=never 1= 1-2 times 2=3 or more' .
During the past 12 months, have you bought, or gotten drugs for your own use, or for someone else?
During the past 12 months, have you set fire on purpose to a building, a car, or something else not belonging to you?
During the past 12 months, have you carried any other weapon such as a stick or a club?
During the past 12 months, have you used drugs?
During the past 12 months, have you taken car, motorbike, or motorboat without permission? 0=never 1= 1-2 times 2=3 or more' .
During the past 12 months, how many times have you operated a motorized vehicle after drinking alcohol or doing drugs?
During the past 12 months, how many times have you been a passenger in a motor vehicle after the driver was drinking alcohol or doing drugs?

Emerging Adulthood Antisocial Behaviour (N=14 items)

Each item was coded 0 = no / never or 1= yes/agree /at least once

During the past 12 months, have you been drunk (had 5 or more drinks at one time)?
During the past 12 months, how many times were you questioned by police?
During the past 12 months, how many times have you stolen something?
During the past 12 months, how many times have you damaged or destroyed anything that didn't belong to you?
During the past 12 months, how many times have you fought with someone to the point where they needed care for their injuries?
During the past 12 months, how many times have you attacked someone with idea of seriously hurt him/her?
During the past 12 months, how many times have you times sold drugs?
During the past 12 months, how many times have you carried any a weapon for purpose of defending yourself or using it in a fight?
During the past 12 months, how many times have you been a passenger in a vehicle when the driver has been drinking alcohol or using drugs?
During the past 12 months, how many times operated a motorized vehicle after drinking alcohol or doing drugs?
During the past 12 months, have you used drugs?
During the past 12 months, how many times have you attempted to touch someone in a sexual way knowing that he/she would probably object to this?
I get angry easily
When I get angry, I act without thinking

Social Disorganization (1991 Census)

Note: Neighbourhood refers to the Census Enumeration Area unit (EA)

The percentage of unemployed individuals in the neighbourhood
The percentage of residents with less than high school certificate
The percentage of families Receiving Government Transfers in the Neighbourhood
The percentage of lone parent families in the neighbourhood
The percentage of low income families in the neighbourhood
The percentage of rented dwellings in the neighbourhood

Family Instability (Cycle 1)

Note: Responses are from the PMK

Lone parent family status (1=single parent household, 0=two parent household)
How many years have you lived at this address?
Is this dwelling owned by anyone in this household? (Not included in final analysis)
How many times in the past 12 months have (PMK/ spouse) had 5 or more drinks on one occasion? (Not included in final analysis)
*Family socio-economic status

***** Family socioeconomic status is a derived variable in the NLSCY (See Statistics Canada 1995b for further details) based on the standardized means and standard deviations gathered from the following five variables: the level of education (years of schooling) from the PMK (person most knowledgeable), and of the spouse; occupational prestige (the pineo occupation code[25]) of the PMK, and of the spouse; and household income (in thousands of dollars). Adjustments were made to reflect single parent households. The range for this variable is -2.0 at the lower end and +1.75 at the upper end. For example, (Statistics Canada 1995b: 465-467).

1.5 - Both the PMK and spouse have a university degree, both employed professionals, and the household income is approximately $77,000

0.5 - The PMK has a university degree, is semi-professional and the spouse has grade 13, and is semi-skilled clerical position, with household income of approximately $57,000

0.0 - The PMK has grade 13 and is not in the labour force and the spouse grade 12, and is working semi-professional position with household income of approximately $25,000

-0.5 - The PMK and spouse have both completed grade12, are employed in semi-skilled positions with household income of approximately $16,000

-1.5 - Neither the PMK nor the spouse have completed and neither the PMK nor the spouse are in the labour force with household income is approximately $12,000

-2.0 - No spouse, PMK is not in the labor force and has not completed high school, and income is less than $10,000

[25] Based on a "modified version of a scale developed by Pineo, Porter and McRoberts (1977). The classification system groups occupations described in Statistics Canada's 1980 Standard Occupational Classification into 16 somewhat homogeneous categories", from Farm laborer (01) to (16) Self-employed professional (Statistics Canada 1995b:463-464),

Large family size (Cycle 1)

Note: Response is from the PMK

Number of children living in the household

Perceived Collective efficacy

Note: Response is from the PMK

If there is a problem around here, the neighbours get together to deal with it
There are adults in the neighbourhood that children can look up to
People around here are willing to help their neighbours
You can count on the neighbours here to watch out that kids are safe and don't get into trouble
When I'm away from home, I know my neighbours will keep eyes open for possible trouble

Harsh or Erratic Parenting (Cycles 1, 2 and 3; ages 10-11, 12-13, 14-15)

Note: Response is from the child

My parents soon forget rules they made
My parents threaten punishment more often than they use it
My parents only keep rules when it suits them
My parents find out about my misbehaviour
My parents enforce a rule or don't enforce a rule depending on their mood
My parents hit me or threaten to do so

Prosocial Family Bonds (Cycles 1, 2 and 3; ages 10-11, 12-13, 14-15)

Note: Response is from the child

Attachment
My parents smile at me
My parents praise me
My parents make sure I know I'm appreciated
My parents speak of the good things I do
My parents seem proud of the things I do
Supervision
My parents want to know where I am and exactly what I am doing
My parents let me go out any evening I want to
My parents make sure I do my homework
My parents tell me what time to be home when I go out

School Bonds (Cycles 1, 2 and 3; ages 10-11, 12-13, 14-15)

Note: Response is from the child: Scale is from weak (0) to strong (4), so all items were reverse coded to reflect this scale)

How do you feel about school? (reverse coded from “like very much” to “hate school”)
How well do you think you are doing in school? (reverse coded from “very well” to “very poorly”)

How important is it to you to get good grades? (reverse coded from "very important" to "not important at all")
I am disobedient in school (reverse coded from "strongly disagree" to "strongly agree"

Antisocial Peer Associations

Note: questions varied from cycle to cycle so each one is presented separately
Each item was coded 0 or 1 (0=no or none; 1=yes or at least 1)

Cycle 1 (10-11 years old)
How many of your friends smoke cigarettes?
How many of your friends drink alcohol?
How many of your friends have tried drugs or sniffed glue or solvents?
In the past year, were you part of a group that did bad things?
Cycle 2 (12-13 years old)
How many of your friends smoke cigarettes?
How many of your friends drink alcohol?
*How many of your friends have tried the following substances…
a) Marijuana ("pot", "grass") or hash
b) Glue or solvents (LSD/acid)
c) Hallucinogens
d) Crack/cocaine
e) Other drugs (such as heroin, speed, PCP)
In the past year, were you part of a group that did bad things?
Cycle 3 (14-15 years old)
How many of your friends smoke cigarettes?
How many of your friends drink alcohol?
*How many of your friends have tried …
a) Marijuana ("pot", "grass") or hash
b) Drugs other than marijuana?
How many of your close friends break the law by stealing, hurting someone, or damaging property
Cycle 4 (16-17 years old) and Cycle 5 (18-19 years old)
How many of your friends smoke cigarettes?
How many of your friends drink alcohol?
*How many of your friends have tried …
a) Marijuana ("pot", "grass") or hash
b) Drugs other than marijuana?
During the past 12 months, were you part of a gang that broke the law by stealing, hurting someone, damaging property, etc.?

* recoded to: Have your friends tried drugs? 0=No, 1=Yes

Family Social Capital (18-19 years old, Cycle 5)

Note: variable is a scale created by Statistics Canada

If something went wrong, no one would help me (reverse coded)
I have family and friends who help me feel safe, secure, and happy
There is someone I trust and would turn to if I were having problems
There is no one I am comfortable talking to about problems (reverse coded)
I lack a feeling of closeness with another person(reverse coded)
There are people I can count on in an emergency
I am part of a group who shares my attitudes and values
There is no one that shares my interests and concerns (reverse coded)

Career Commitment (18-19 years old, Cycle 5)

Note each item was coded 0=no, or less than university or 1= yes, or at least a university degree

What steps have you taken to find out about future careers?
a) Talked to a guidance counselor?
b) Talked to a person working in a job you like?
c) Completed a questionnaire to find out your interests and abilities?
d) Read information on the types of careers you might like?
e) Gone to an organized visit of a work-place?
f) Taken co-op
g) Attended a presentation by people working in the job you like?
h) Done other things
i) Done at least one thing to find out about future jobs?
What level of education, training, and experience are needed to fulfill your aspirations?

Job Stability (18-19 years old, Cycle 5)

How long have you been employed in your current job?

Appendix C: Correlation Matrix

Legend: C = Census Variable (community) F= family characteristic
1= Childhood characteristic (ages 10-11) 2=Adolescent characteristic (ages 12-17)
3=Emerging Adulthood characteristic (ages 18-19)

Variable labels:

Efficacy1	Childhood Community Efficacy	C. L-p	Community % lone parent families
Harsh1	Childhood harsh parenting style	C. Lowinc	Community % low income families
Attachent1	Childhood family attachment	C. Unemp	Community % unemployed
Supervision1	Childhood parental supervision	C. Lowed	Community %low educational attainment
School1	Childhood school bonds	C. Govtrans	Community % receiving government transfers
Peer1	Childhood antisocial peer associations	C. Rent	Community % Rented dwellings
Del1	Childhood antisocial behaviour	F. SES	Family socio-economic status
Harsh2	Adolescent harsh parenting style	F. L-p	Family lone parent status
Attachent2	Adolescent family attachment	F. Stability	Family residential stability
Supervision2	Adolescent parental supervision	F. Size	Family size (3 or more children=1)
School2	Adolescent school bonds		
Peer2	Adolescent antisocial peer associations		
Del2	Adolescent antisocial behaviour		
Famcap3	Adult family capital		
Invest3	Adult career investment		
Wkwork3	Adult # of weeks worked in last year		
Peer3	Adult antisocial peer associations		
Del3	Adult antisocial behaviour		

Correlation Matrix (N=735; Normalized funnel weight applied, Listwise deletion)

	Efficacy1	Harsh 1	Attachment1	Supervise11	School1	Peer1	Del1	Harsh2	Attachment2	Supervise2	School2	Peer2	Del2	Famcap3
Efficacy1	1.00													
Harsh 1	-0.17	1.00												
Attachment1	0.24	-0.26	1.00											
Supervise1	0.16	-0.02	0.35	1.00										
School1	0.22	-0.24	0.34	0.17	1.00									
peer1	-0.12	0.19	-0.09	-0.02	-0.10	1.00								
Del1	-0.25	0.39	-0.28	-0.16	-0.54	0.21	1.00							
Harsh2	-0.04	0.37	-0.15	-0.07	-0.15	0.17	0.26	1.00						
Attachment2	0.14	-0.28	0.37	0.18	0.24	-0.12	-0.25	-0.31	1.00					
Supervise2	0.00	-0.15	0.25	0.28	0.06	-0.09	-0.13	-0.19	0.47	1.00				
School2	0.10	-0.11	0.16	0.11	0.42	-0.13	-0.33	-0.29	0.36	0.22	1.00			
Peer2	-0.13	0.08	-0.07	-0.08	-0.26	0.23	0.28	0.14	-0.15	-0.17	-0.36	1.00		
Del2	-0.08	0.13	-0.13	-0.08	-0.31	0.21	0.44	0.36	-0.29	-0.21	-0.57	0.52	1.00	
Famcap3	0.04	-0.11	0.13	0.16	0.08	-0.06	-0.14	-0.14	0.24	0.22	0.18	-0.08	-0.19	1.00
Invest 3	-0.06	-0.08	-0.08	0.01	-0.05	0.06	0.08	-0.03	-0.02	0.00	-0.21	0.11	0.14	-0.18
Wkwork3	-0.07	-0.02	-0.06	-0.04	-0.16	0.12	0.04	-0.05	0.03	-0.04	0.00	0.04	0.02	-0.01
Peer3	-0.01	0.02	0.06	-0.05	-0.10	0.02	0.13	0.09	-0.09	-0.06	-0.15	0.21	0.30	-0.11
Del3	-0.04	0.09	-0.02	0.00	-0.17	0.23	0.23	0.22	-0.18	-0.12	-0.29	0.32	0.52	-0.17
C. L-p	-0.34	0.13	-0.16	-0.04	-0.08	0.22	0.12	0.11	-0.08	-0.03	-0.02	0.11	0.11	-0.04
C. Lowinc	-0.12	0.03	-0.09	-0.05	-0.05	0.18	0.06	0.04	-0.12	-0.07	-0.07	0.12	0.09	-0.03
C. Unemp	-0.09	0.05	-0.06	-0.05	-0.04	0.11	0.01	0.07	-0.13	-0.07	-0.03	0.02	0.04	-0.04
C. Lowed	-0.09	0.06	0.02	-0.07	0.02	0.15	0.05	0.05	-0.07	-0.07	-0.04	0.14	0.04	-0.03
C. Govtrans	-0.12	0.02	-0.03	-0.03	-0.01	0.14	0.02	0.01	-0.10	-0.04	-0.05	0.07	0.05	-0.02
C. Rent	-0.25	0.06	-0.11	-0.03	-0.07	0.23	0.05	0.08	-0.11	-0.02	0.00	0.12	0.10	-0.05
F. SES	0.25	-0.06	0.10	0.15	0.12	-0.19	-0.13	-0.05	0.07	-0.03	0.13	-0.16	-0.11	0.10
F. L-p	-0.22	0.02	-0.07	-0.06	-0.11	0.09	0.12	0.05	-0.02	-0.03	-0.14	0.14	0.08	-0.08
F. Stability	0.14	-0.12	0.11	0.03	0.03	-0.07	-0.11	-0.09	0.07	0.04	0.11	-0.08	-0.12	0.10
F. Size	-0.02	0.13	-0.14	-0.06	-0.07	0.05	0.11	0.06	-0.20	-0.17	-0.09	0.04	0.10	0.02

	Invest3	Wkwork3	Peer3	Del3	C. L-p	C. Lowinc	C. Unemp	C. Lowed	C. Govtrans	C. Rent	SES family	F. L-p	F. Stability	F. Size
Invest 3	1.00													
Wkwork3	0.02	1.00												
Peer3	0.01	-0.01	1.00											
Del3	0.04	0.01	0.29	1.00										
C. L-p	-0.02	0.04	-0.01	0.08	1.00									
C. Lowinc	0.00	0.05	0.00	0.05	0.53	1.00								
C. Unemp	-0.09	0.06	-0.02	0.05	0.32	0.51	1.00							
C. Lowed	0.03	0.00	0.03	0.02	0.24	0.70	0.47	1.00						
C. Govtrans	-0.04	0.05	0.02	0.04	0.39	0.84	0.68	0.73	1.00					
C. Rent	0.03	0.08	0.01	0.06	0.70	0.52	0.23	0.18	0.28	1.00				
F. SES	-0.11	-0.16	0.01	-0.04	-0.30	-0.42	-0.34	-0.44	-0.39	-0.26	1.00			
F. L-p	0.09	0.06	0.03	0.05	0.27	0.12	0.09	0.04	0.09	0.24	-0.33	1.00		
F. Stability	0.00	-0.06	-0.10	-0.02	-0.09	0.13	0.08	0.13	0.15	-0.07	0.07	-0.24	1.00	
F. Size	0.01	0.08	0.04	0.00	-0.07	0.03	-0.08	0.03	0.02	-0.12	0.09	-0.13	0.04	1.00

Means and Standard Deviations for listwise deletion (N=735, normalized funnel weight)

VARIABLE	Efficacy1	Harsh1	Attachment1	Supervision1	School1	Peer1	Del1	Harsh2	Attachment2
MEAN	10.84	2.83	83.34	51.76	49.85	0.3	4.26	2.6	79.96
STDDEV	3.05	2.5	23.62	14.53	17.24	0.46	3.07	2.14	24.62

VARIABLE	Supervise2	School2	Peer2	Del2	Famcap3	Invest3	Wkwork3	Peer3	Del3
MEAN	40.08	46.4	0.27	4.45	19.87	33.81	6.37	0.14	6.43
STDDEV	14.97	15.71	0.44	2.58	3.31	18.32	2.03	0.34	2.64

VARIABLE	C. L-p	C. Lowinc	C. Unemploy	C. Lowed	C. Govtrans	C. rent	F. SES	F. L-p	F. Stability	F. Size
MEAN	11.88	38.05	9.91	37.07	11.72	26.78	0.07	0.18	7.14	0.33
STDDEV	5.78	17.18	6.02	12.93	6.68	19.51	0.84	0.38	5.1	0.47

Appendix D: Chapter Six

Table A6.1.a: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the exogenous variables (t-values). (LISREL θ_{δ} matrix)

X indicators	Community social Disorganization						Family instability			Large family
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
A) Community Social Disorganization										
X1 % lone parent families	0.10** (2.17)									
X2 % low income families	0.13*** (4.19)	0.83*** (18.09)								
X3 % unemployed	- -	0.37*** (11.17)	0.89*** (18.89)							
X4 % low education	- -	0.60*** (16.10)	0.39*** (10.43)	0.94*** (19.06)						
X5 % receiving government transfers	- -	0.68*** (17.45)	0.55*** (14.11)	0.63*** (15.48)	0.84*** (18.74)					
X6 % dwellings rented	- -	0.22*** (7.99)	- -	- -	- -	0.46*** (12.36)				
B) Family instability										
X7 SES	- -	-0.28*** (-9.29)	-0.24*** (-7.21)	-0.37*** (-7.21)	-0.27*** (-8.18)	- -	0.31 (1.71)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.27* (2.04)	0.46*** (3.79)		
X9 residential stability	- -	0.16*** (5.43)	0.11*** (3.30)	0.15*** (4.22)	0.18*** (4.22)	- -	-0.20*** (-4.03)	- -	0.89*** (16.86)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.17*** (-3.30)	- -	-0.11*** (-4.00)	- -	- -	-0.18*** (5.48)	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance);
Note: Diagonal Matrix

Table A6.1b: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (t-values). (LISREL θ_{ε} matrix)

Y indicators	Perceived collective efficacy (Y1)	Harsh Parenting (Y2)	Family attachment (Y3)	Family supervision (Y4)	School bonds (Y5)	Antisocial Peer Association (Y6)	Childhood antisocial behaviour (Y7)
Perceived collective efficacy (Y1)							
Harsh parenting (Y2)	- -						
Family attachment (Y3)	- -	- -	0.72*** (11.17)				
Family supervision (Y4)	- -	0.13*** (3.30)	0.16*** (3.84)	0.88*** (16.30)			
School bonds (Y5)	- -	- -	0.08* (2.04)	- -			
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -		
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance);
Note: Diagonal Matrix

Table A6.1c: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (t-values). (LISREL **Φ** matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (12.95)		
Family instability (ξ2)	0.37*** (7.57)	1.00*** (4.23)	
Large Family Size (ξ3)	0.10 (1.47)	-0.13*** (-3.39)	1.00*** (19.21)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A6.1d: Variance-covariance matrix (standardized) for the residual terms (t-values) in the causal model (LISREL **ψ** matrix)

	Perceived collective efficacy (ζ1)	**Harsh Parenting (ζ2)**	**Prosocial family bond (ζ3)**	**School bonds (ζ4)**	**Antisocial peer associations (ζ5)**	**Childhood antisocial behaviour (ζ6)**
Perceived collective efficacy (ζ1)	0.83*** (18.67)					
Harsh Parenting (ζ2)	- -	0.95*** (19.22)				
Prosocial family bond (ζ3)	0.16*** (5.49)	- -	0.68*** (3.47)			
School bonds (ζ4)	- -	- -	- -	0.76*** (13.02)		
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.91*** (19.18)	
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.59*** (15.08)

* p<.05; ** p<.01; ***p<.001

- - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Appendix E: Chapter Seven

Table A7.1a Structural Equation Model #1 of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ). (t-values) below estimates.

	Disorganization ξ_1	Family Instability ξ_2	Large family ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	ζ
Childhood														
Collective efficacy (η_1)	-0.28*** (-6.70)	-0.23*** (-3.84)	- -											0.82*** (18.41)
Harsh parenting (η_2)	- -	- -	0.13*** (3.88)	-0.17*** (-4.82)										0.95*** (19.25)
Prosocial family bonds (η_3)	- -	-0.29*** (-3.93)	-0.18*** (-3.58)	- -	-0.40*** (-7.34)									0.67*** (3.87)
School bonds (η_4)	- -	- -	- -	- -	- -	0.47*** (8.39)								0.78*** (15.51)
Antisocial Peer Associations (η_5)	0.18*** (4.28)	0.09* (2.11)	- -	- -	0.16*** (4.44)	- -	- -							0.92*** (19.12)
Childhood antisocial behaviour (η_6)	- -	- -	- -	-0.04 (-0.91)	0.17*** (3.62)	-0.20* (-2.09)	-0.39*** (-9.86)	0.10*** (3.36)						0.60*** (16.94)
Adolescence														
Harsh parenting (η_7)	0.05 (1.31)	0.01 (0.25)	0.08 (1.58)	- -	-0.21 (-0.80)	- -	- -	0.08* (2.09)	0.16** (2.25)					1.06*** (5.83)
Prosocial family bonds (η_8)	0.00 (0.06)	0.05 (0.85)	-0.15*** (-3.36)	- -	-0.05 (-0.61)	0.38** (2.69)	- -	- -	0.08 (1.02)	-0.26*** (6.60)				0.55*** (4.80)
School bonds (η_9)	0.11** (2.78)	-0.23** (-3.27)	-0.02 (0.60)	- -	- -	- -	0.29 (-1.21)	- -	-0.03 (-0.31)	-0.11** (-2.56)	0.27*** (4.85)			1.08 (3.59)
Antisocial Peer Associations (η_{10})	0.09 (1.51)	0.10 (1.74)	0.00 (0.07)	- -	- -	- -	-0.01 (-0.10)	-0.15 (-0.61)	0.14** (2.85)	- -	- -	-0.28*** (-5.37)		0.93*** (4.96)
Adolescent antisocial behaviour (η_{11})	0.06 (1.58)	-0.02 (-0.43)	0.03 (0.88)	- -	- -	- -	- -	- -	-0.11 (-1.08)	0.21 (1.51)	-0.06 (-0.53)	-0.39*** (-8.67)	0.37** (2.70)	0.50** (2.96)

FIT: RMSEA=0.03 CHI SQUARE (150) =248.55, p<0.001; GFI=0.97; AGFI = 0.95; CFI=0.98; PNFI =0.58

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i, endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}.

Tables A7.1b, A7.1c, A7.1d and A7.1e provide information for additional matrices

Table A7.1b: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the exogenous variables (LISREL θ_δ matrix) Note: this is a diagonal Matrix

X indicators	Community social Disorganization X1	X2	X3	X4	X5	X6	Family instability X7	X8	X9	Large family X10
A) Community Social Disorganization										
X1 % lone parent families	0.11* (2.48)									
X2 % low income families	0.12*** (4.24)	0.83*** (18.25)								
X3 % unemployed	- -	0.37*** (11.19)	0.90*** (18.90)							
X4 % low education	- -	0.60*** (19.52)	0.39*** (10.45)	0.94*** (19.05)						
X5 % receiving government transfers	- -	0.68*** (17.49)	0.55*** (14.12)	0.64*** (15.47)	0.85*** (18.74)					
X6 % dwellings rented	- -	0.22*** (8.06)	- -	- -	- -	0.45*** (12.33)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.20)	-0.24*** (-7.36)	-0.36*** (-10.32)	-0.27*** (-8.17)	- -	0.47*** (3.91)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.16 (1.77)	0.53*** (5.94)		
X9 residential stability	- -	0.16*** (5.47)	0.11*** (3.30)	0.15*** (4.32)	0.19*** (5.55)	- -	-0.18*** (-3.98)	- -	0.88*** (16.91)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.15** (-2.91)	- -	-0.12*** (-4.30)	- -	- -	-0.18*** (-4.33)	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001 - - - - parameter set to zero based on empirical results (of non-significance);

Table A7.1c: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the endogenous variables (LISREL $\boldsymbol{\theta_{\varepsilon}}$ matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**
childhood													
Perceived collective efficacy (Y1)													
Harsh parenting (Y2)	- -												
Family attachment (Y3)[a]	- -	- -	0.67*** (10.40)										
Family supervision (Y4)[a]	- -	0.13*** (4.20)	0.13*** (3.16)	0.88*** (16.71)									
School bonds (Y5)	- -	- -	0.07 (1.94)	- -									
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -								
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -							
Adolescence													
Harsh parenting (Y8)	- -	0.05 (0.32)	- -	- -	- -	- -	- -						
Family attachment (Y9)[b]	- -	- -	0.01 (0.41)	- -	- -	- -	- -	- -	0.27*** (4.05)				
Family supervision (Y10)[b]	- -	- -		0.16*** (4.99)	- -	- -	- -	- -	- -	-0.69*** (15.35)			
School bonds (Y11)	- -	- -	- -	- -	-0.15 (-1.48)	- -	- -	- -	- -	- -			
Antisocial Peer association (Y12)	- -	- -	- -	- -	- -	-0.10 (-0.69)	- -	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y13)	- -	- -	- -	- -	- -	- -	0.30 (0.438)	- -	- -	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001

[a] = Prosocial family Bonds (childhood) [b]= Prosocial family bonds (adolescence) - - parameter set to zero based on empirical results (of non-significance)

Note: Diagonal Matrix

Table A7.1d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (t-values). (LISREL **Φ** matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (13.01)		
Family instability (ξ2)	0.41*** (7.76)	1.00*** (4.86)	
Large Family Size (ξ3)	0.08 (1.16)	-0.15*** (-3.48)	1.00*** (19.23)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A7.1e: Variance-covariance matrix (standardized) for the residual terms (t-values) in the causal model (LISREL **ψ** matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.82*** (18.41)										
Harsh Parenting (ζ2)	- -	0.95*** (19.25)									
Prosocial family bond (ζ3)	0.26*** (5.18)	- -	0.67*** (3.87)								
School bonds (ζ4)	- -	- -	- -	0.78*** (15.51)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.92*** (19.12)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (16.94)					
Adolescence											
Harsh Parenting (ζ7)	- -	0.44 (1.73)	--	--	- -	- -	1.06*** (4.80)				
Prosocial family bond (ζ8)	- -	- -	0.22* (2.11)	--	- -	- -	- -	0.55*** (4.97)			
School bonds (ζ9)	- -	- -	- -	0.68*** (3.41)	- -	- -	- -	- -	1.08*** (3.59)		
Antisocial peer associations (ζ10)	- -	- -	- -		0.38 (1.57)	--	- -	- -	--	0.93*** (4.96)	
Adolescent antisocial behaviour (ζ11)	- -	- -	- -			-0.06 (-0.07)	- -	- -	--	--	0.50** (2.96)

* p<.05; ** p<.01; ***p<.001 - parameter set to zero based on empirical results (of non-significance);
Note: Diagonal Matrix

Table 7.2a Structural Equation Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ). (t-values)

	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	ζ
Childhood														
Collective efficacy (η_1)	-0.29*** (-8.68)	-0.20*** (-4.31)	- -											0.83*** (19.63)
Harsh parenting (η_2)	- -	- -	0.14*** (4.78)	-0.17*** (-4.82)										0.95*** (19.23)
Prosocial family bonds (η_3)	- -	-0.27*** (-4.46)	- 0.16*** (-4.57)	- -	-0.39 *** (-6.76)									0.70*** (4.32)
School bonds (η_4)	- -	- -	- -	- -	- -	0.51*** (8.31)								0.74*** (12.73)
Antisocial Peer Associations (η_5)	0.18*** (5.50)	0.09* (2.43)	- -	- -	0.16 *** (4.47)	- -	- -							0.92*** (19.16)
Childhood antisocial behaviour (η_6)	- -	- -	- -	-0.03 (-0.56)	0.17*** (3.44)	-0.22* (-2.12)	-0.37*** (-8.50)	0.11*** (3.63)						0.59*** (16.00)
Adolescence														
Harsh parenting (η_7)	- -	- -	--	0.11 (1.85)	0.37 (1.42)	-0.10 (-0.98)	0.02 (0.46)	0.09** (2.65)	0.11 * (2.30)					0.84*** (13.12)
Prosocial family bonds (η_8)	- -	- -	-0.19*** (-5.37)	0.04 (0.43)	-0.16 (-1.68)	0.25 (1.09)	-0.15 (-1.92)	-0.06 (-1.57)	0.11 (1.11)	-0.20** (-2.97)				0.62** (2.75)
School bonds (η_9)	0.17** (3.04)	-0.26* (-2.41)	- -	0.19 (1.08)	0.00 (0.03)	-0.82 (-1.21)	0.45*** (3.80)	0.00 (-0.05)	-0.18 (-0.63)	-0.07 (-0.72)	0.85 (1.77)			0.56*** (5.07)
Antisocial Peer Associations (η_{10})	- -	- -	- -	-0.04 (-0.63)	-0.06 (-1.35)	-0.03 (-0.16)	-0.06 (-1.04)	0.17*** (4.71)	0.12** (2.44)	0.01 (0.27)	0.01 (0.07)	-0.27*** (-5.32)		0.92*** (19.14)
Adolescent antisocial behaviour (η_{11})	- -	- -	- -	-0.02 (-0.31)	-0.06 (-1.57)	0.24 (1. 48)	0.00 (0.04)	0.02 (0.79)	0.29*** (6.53)	0.15*** (4.28)	-0.23 (-1.87)	-0.30*** (-6.69)	0.32*** (10.86)	0.59*** (17.67)

FIT: RMSEA=0.03 $\chi^2(150)$ =241.7, p<0.001 GFI: 0.97; AGFI = 0.95; CFI= 0.98; PNFI = 0.58

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}. **Tables A7.2b, A7.2c, A7.2d and A7.2e provide information for additional matrices**

Table A7.2.b: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the exogenous variables (LISREL θ_δ matrix)

X indicators	Community social Disorganization						Family instability			Large family
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
A) Community Social Disorganization										
X1 % lone parent families	0.12** (2.64)									
X2 % low income families	0.13*** (4.39)	0.83*** (18.27)								
X3 % unemployed	- -	0.38*** (11.23)	0.89*** (18.88)							
X4 % low education	- -	0.60*** (16.11)	0.39*** (10.42)	0.94*** (19.04)						
X5 % receiving government transfers	- -	0.68*** (17.51)	0.55*** (14.09)	0.63*** (15.45)	0.85*** (18.71)					
X6 % dwellings rented	- -	0.22*** (8.11)	- -	- -	- -	0.44*** (12.20)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.25)	-0.24*** (-7.30)	-0.36*** (-10.34)	-0.27*** (-8.12)	- -	0.37* (2.39)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.24* (2.07)	0.47*** (4.27)		
X9 residential stability	- -	0.16*** (5.45)	0.11*** (3.30)	0.15*** (4.26)	0.15*** (5.50)	- -	-0.19*** (-4.07	- -	0.89*** (17.1)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.14*** (-2.95)	- -	-0.11*** (-4.30)	- -	- -	-0.17*** (-4.40)	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001 - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A7.2c: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the endogenous variables (LISREL $\boldsymbol{\theta_{\varepsilon}}$ matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**
childhood													
Perceived collective efficacy (Y1)													
Harsh parenting (Y2)	- -												
Family attachment (Y3)[a]	- -	- -	0.70*** (12.63)										
Family supervision (Y4)[a]	- -	0.12*** (3.82)	0.17*** (4.49)	0.89*** (17.88)									
School bonds (Y5)	- -	- -	0.06* (2.04)	- -									
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -								
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -							
Adolescence													
Harsh parenting (Y8)	- -	--	- -	- -	- -	- -	- -						
Family attachment (Y9)[b]	- -	- -	--	- -	- -	- -	- -	- -	0.30*** (5.53)				
Family supervision (Y10)[b]	- -	- -		0.16*** (4.96)	- -	- -	- -	- -	- -	-0.68*** (15.64)			
School bonds (Y11)	- -	- -	- -	- -	--	- -	- -	- -	- -	- -			
Antisocial Peer association (Y12)	- -	- -	- -	- -	- -	--	- -	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y13)	- -	- -	- -	- -	- -	- -	--	- -	- -	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001

[a] = Prosocial family Bonds factor (childhood) [b]= Prosocial family bonds factor (adolescence)

- - parameter set to zero based on empirical results (of non-significance);

Note: Diagonal Matrix

Table A7.2d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (t-values). (LISREL **Φ** matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (12.95)		
Family instability (ξ2)	0.38*** (7.75)	1.00*** (4.55)	
Large Family Size (ξ3)	0.07 (1.09)	-0.14*** (-3.52)	1.00*** (19.24)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A7.2e: Variance-covariance matrix (standardized) for the residual terms (t-values) in the causal model (LISREL **ψ** matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.63)										
Harsh Parenting (ζ2)	- -	0.95*** (19.23)									
Prosocial family bond (ζ3)	0.29*** (6.85)	- -	0.70*** (4.32)								
School bonds (ζ4)	- -	- -	- -	0.74*** (12.73)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.92*** (19.16)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.59*** (16.00)					
Adolescence											
Harsh Parenting (ζ7)	--	-0.09 (-0.36)	- -	- -	- -	- -	0.84*** (13.12)				
Prosocial family bond (ζ8)	--	--	0.47** (3.26)	- -	- -	- -	- -	0.62** (2.75)			
School bonds (ζ9)	- -	- -	- -	- -	- -	- -	- -	- -	0.56*** (5.07)		
Antisocial peer associations (ζ10)	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.81*** (19.14)	
Adolescent antisocial behaviour (ζ11)	- -	- -	- -	- -	- -	--	- -	- -	- -	- -	0.47*** (17.67)

* p<.05; ** p<.01; ***p<.001

- - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A7.3a Structural Equation Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ) (t-values)

	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	ζ
Childhood														
Collective efficacy (η_1)	-0.30*** (-7.28)	-0.20*** (-3.61)	- -											0.83*** (18.68)
Harsh parenting (η_2)	- -	- -	0.13*** (3.85)	-0.17*** (-4.69)										0.96*** (19.26)
Prosocial family bonds (η_3)	- -	-0.29*** (-3.77)	- 0.17*** (-3.34)	- -	-0.40*** (-6.80)									0.68*** (3.76)
School bonds (η_4)	--	- -	- -	- -	- -	0.48*** (8.17)								0.77*** (14.59)
Antisocial Peer Associations (η_5)	0.18*** (4.46)	0.10* (2.23)	- -	- -	0.15*** (4.43)	- -	- -							0.92*** (19.16)
Childhood antisocial behaviour (η_6)	--	- -	- -	-0.03 (-0.73)	0.17*** (3.77)	-0.21* (-2.28)	-0.38*** (-9.75)	0.10*** (3.58)						0.60*** (17.15)
Adolescence														
Harsh parenting (η_7)	- -	- -		-0.06 (-0.72)	0.41** (2.09)	- -	- -	0.08* (2.00)	0.10 (1.22)					0.82*** (5.70)
Prosocial family bonds (η_8)	- -	- -	-0.17*** (-4.66)	- -	--	0.20** (2.14)	- -	- -	0.03 (0.53)	-0.25*** (-6.02)				0.68*** (6.18)
School bonds (η_9)	0.11*** (3.21)	-0.17** (-3.12)	- -	- -	- -	- -	-0.14 (-0.77)	- -	-0.23 (-1.57)	-0.13*** (-3.49)	0.35*** (4.80)			0.76*** (8.92)
Antisocial Peer Associations (η_{10})	- -	- -	- -	- -	- -	- -	-0.13* (-2.15)	0.43*** (3.69)	0.07 (1.23)	- -	- -	-0.28*** (-5.47)		0.79*** (5.21)
Adolescent antisocial behaviour (η_{11})	- -	- -	- -	- -	- -	- -	- -	- -	0.55*** (3.54)	0.03 (0.23)	-0.18 (-1.55)	0.00 (0.01)	0.20 (1.55)	-0.63 (-0.54)

Fit: RMSEA=0.02 $\chi 2(151)$ =323.0 P<0.001; NFI -0.97; CFI = 0.99; GFI=0.98; AGFI=0.96; PNFI=0.58

- - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}.

Tables A7.3b, A7.3c, A7.3d and A7.3e provide information for additional matrices

Table A7.3b: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the exogenous variables (LISREL θ_δ matrix)

X indicators	Community social Disorganization						Family instability			Large family
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
A) Community Social Disorganization										
X1 % lone parent families	0.12** (2.66)									
X2 % low income families	0.12*** (4.29)	0.83*** (18.22)								
X3 % unemployed	- -	0.37*** (11.20)	0.89*** (18.88)							
X4 % low education	- -	0.60*** (16.09)	0.39*** (10.42)	0.94*** (19.04)						
X5 % receiving government transfers	- -	0.68*** (17.47)	0.55*** (14.09)	0.63*** (15.44)	0.84*** (18.71)					
X6 % dwellings rented	- -	0.22*** (8.08)	- -	- -	- -	0.44*** (12.28)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.20)	-0.24*** (-7.30)	-0.36*** (-10.32)	-0.27*** (-8.14	- -	0.37** (2.48)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.24** (2.13)	0.48*** (4.49)		
X9 residential stability	- -	0.16*** (5.46)	0.11** (3.31)	0.15*** (4.27)	0.19*** (5.51)	- -	-0.20*** (-4.15)	- -	0.89*** (16.99)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.13*** (-3.57)	- -	-0.11*** (-4.25)	- -	- -	-0.17*** (-4.43)	- -	- -	- -	- -

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A7.3c: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the endogenous variables (LISREL θ_{ε} matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**
childhood													
Perceived collective efficacy (Y1)													
Harsh parenting (Y2)	- -												
Family attachment (Y3) [a]	- -	- -	0.71*** (11.62)										
Family supervision (Y4) [a]	- -	0.13*** (4.14)	0.16*** (3.89)	0.87*** (16.67)									
School bonds (Y5)	- -	- -	0.08** (2.19)	- -									
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -								
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -							
Adolescence													
Harsh parenting (Y8)	0.12 (1.91)	-0.04 (-0.21)	- -	- -	- -	- -	- -						
Family attachment (Y9) [b]	- -	- -	0.09* (2.31)	- -	- -	- -	- -	- -	0.26*** (3.63)				
Family supervision (Y10) [b]	-0.05 (-1.85)	- -	0.09* (2.43)	0.17*** (5.24)	-0.07** (-2.72)	- -	- -	- -	- -	0.70*** (15.24)			
School bonds (Y11)	- -	0.10* (2.41)	--	- -	0.22 (0.96)	--	- -	- -	- -	- -			
Antisocial Peer association (Y12)	--	--	- -	- -	- -	-0.10 (-0.60)	- -	- -	- -	-0.07** (-2.49)	- -		
Adolescent antisocial behaviour (Y13)	0.11*** (3.56)	-0.17*** (-3.57)	--	- -	- -	- -	-1.20 (-1.27)	- -	- -	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001

[a] = Prosocial family Bonds (childhood) [b]= Prosocial family bonds (adolescence)

- - parameter set to zero based on empirical results (of non-significance)

NOTE: Residual covariances among repeated measures are shaded in gray; Diagonal Matrix

Table A7.3d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (t-values). (LISREL **Φ** matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (13.01)		
Family instability (ξ2)	0.39*** (7.75)	1.00*** (4.65)	
Large Family Size (ξ3)	0.06 (1.02)	-0.14*** (-3.50)	1.00*** (19.24)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A7.3e: Variance-covariance matrix (standardized) for the residual terms (t-values) in the causal model (LISREL **ψ** matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.68)										
Harsh Parenting (ζ2)	- -	0.96*** (19.26)									
Prosocial family bond (ζ3)	0.29*** (5.52)	- -	0.68*** (3.76)								
School bonds (ζ4)	- -	- -	- -	0.77*** (14.59)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.92*** (19.16)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (17.15)					
Adolescence											
Harsh Parenting (ζ7)	--	-0.07 (-0.29)	- -	- -	- -	- -	0.82*** (5.70)				
Prosocial family bond (ζ8)	--	--	0.24** (2.51)	- -	- -	- -	- -	0.68*** (6.18)			
School bonds (ζ9)	- -	- -	- -	0.13 (0.57)	- -	- -	- -	- -	0.76*** (8.92)		
Antisocial peer associations (ζ10)	- -	-0.12** (-2.79)	- -	- -	-0.16 (-0.78)	- -	- -	- -	- -	0.79*** (5.21)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.19* (2.34)	- -	- -	1.04 (1.15)	- -	- -	- -	- -	-0.63 (-0.54)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance).

NOTE: zeta covariances among repeated measures are shaded in gray: Diagonal Matrix

Table A7.4a: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the exogenous variables (LISREL θ_δ matrix)

X indicators	Community social Disorganization						Family instability			Large family
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
A) Community Social Disorganization										
X1 % lone parent families	0.11** (2.49)									
X2 % low income families	0.13*** (4.41)	0.83*** (18.31)								
X3 % unemployed	- -	0.38*** (11.23)	0.89*** (18.89)							
X4 % low education	- -	0.60*** (16.12)	0.39*** (10.43)	0.94*** (19.05)						
X5 % receiving government transfers	- -	0.68*** (17.52)	0.55*** (14.10)	0.63*** (15.46)	0.85*** (18.73)					
X6 % dwellings rented	- -	0.22*** (8.17)	- -	- -	- -	0.45*** (12.31)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.22)	-0.24*** (-7.25)	-0.36*** (-10.37)	-0.26*** (-8.08)	- -	0.36** (2.41)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.23* (2.07)	0.50*** (4.87)		
X9 residential stability	- -	0.16*** (5.46)	0.11** (3.32)	0.15*** (4.26)	0.19*** (5.53)	- -	-0.20*** (-4.21)	- -	0.8*** (16.76)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.14** (-3.04)	- -	-0.11*** (-4.27)	- -	- -	-0.18*** (-4.25)	- -	- -	- -	

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero

Table A7.4b: Variance-covariance matrix (standardized) for the residual terms (t-values) in the measurement model for the endogenous variables (LISREL θ_{ε} matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**
childhood													
Perceived collective efficacy (Y1)													
Harsh parenting (Y2)	- -												
Family attachment (Y3)[a]	- -	- -	0.73*** (12.10)										
Family supervision (Y4)[a]	- -	0.14*** (4.51)	0.15*** (3.70)	0.86*** (20.12)									
School bonds (Y5)	- -	- -	0.09* (2.50)	- -									
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -								
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -							
Adolescence													
Harsh parenting (Y8)	--	--	- -	- -	- -	- -	- -						
Family attachment (Y9)[b]	- -	- -	0.10* (3.35)	- -	- -	- -	- -	- -	0.22** (2.86)				
Family supervision (Y10)[b]	--	- -	0.11** (3.15)	0.19*** (5.68)	-0.07** (-2.80)	- -	- -	- -	- -	0.72*** (15.42)			
School bonds (Y11)	- -	0.11*** (4.14)	--	- -	--	--	- -	- -	- -	- -			
Antisocial Peer association (Y12)	--	--	- -	- -	- -	--	- -	- -	- -	-0.07** (-2.63)	- -		
Adolescent antisocial behaviour (Y13)	0.07** (3.01)	-0.14*** (-5.18)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	-

* p<.05; ** p<.01; ***p<.001

[a] = Prosocial family Bonds (childhood) [b]= Prosocial family bonds (adolescence)

- - parameter set to zero based on empirical results (of non-significance). Note: Diagonal Matrix

Table A7.4c: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (t-values). (LISREL **Φ** matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (12.99)		
Family instability (ξ2)	0.39*** (7.62)	1.00*** (4.60)	
Large Family Size (ξ3)	0.07 (1.16)	-0.14*** (-3.47)	1.00*** (19.42)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A7.4d: Variance-covariance matrix (standardized) for the residual terms (t-values) in the causal model (LISREL **ψ** matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.67)										
Harsh Parenting (ζ2)	- -	0.95*** (19.28)									
Prosocial family bond (ζ3)	0.30*** (5.50)	- -	0.67*** (3.58)								
School bonds (ζ4)	- -	- -	- -	0.77*** (14.61)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.92*** (19.18)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (16.57)					
Adolescence											
Harsh Parenting (ζ7)	--	--	- -	- -	- -	- -	0.84*** (19.21)				
Prosocial family bond (ζ8)	--	--	0.12 (1.31)	- -	- -	- -	- -	0.65*** (5.79)			
School bonds (ζ9)	- -	- -	- -	--	- -	- -	- -	- -	0.69*** (18.43)		
Antisocial peer associations (ζ10)	- -	-0.09*** (-2.53)	- -	- -	--	- -	- -	- -	- -	0.82*** (19.17)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.14** (2.56)	- -	- -	--	- -	- -	- -	- -	0.50*** (18.78)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Appendix F: Chapter Eight#

Table A8.1a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	η_{11}
Childhood														
Collective efficacy (η_1)	-0.28*** (-6.92)	-0.22*** (-3.98)	--	--										
Harsh parenting (η_2)	--	--	0.13*** (3.88)	-0.17*** (-4.85)	--	--								
Prosocial family bonds (η_3)	--	-0.30*** (-4.07)	-0.18*** (3.43)	--	-0.39*** (-7.02)	--								
School bonds (η_4)				--	--	0.49*** (8.25)	--							
Antisocial Peer Associations (η_5)	0.17*** (4.17)	0.11** (2.26)	--	--	0.17*** (5.00)	--	--	--						
Childhood antisocial behaviour (η_6)	--	--	--	-0.05 (-1.18)	0.18** (4.16)	-0.19* (-2.11)	-0.38*** (-9.43)	0.10*** (3.48)	--					
Adolescence														
Harsh parenting (η_7)	--	--	--	--	0.30*** (8.24)	--	--	0.09** (2.50)	0.13*** (3.40)					
Prosocial family bonds (η_8)	--	--	-0.16*** (-4.24)	--	--	0.40*** (4.97)	--	--	-0.01 (-0.16)	-0.26*** (-6.55)	--	--	--	--
School bonds (η_9)	0.11** (3.17)	-0.15*** (-3.31)	--	--	--	--	0.29*** (7.86)	--	-0.03 (-0.85)	-0.14*** (-4.19)	0.29*** (6.26)	--	--	--
Antisocial Peer Associations (η_{10})	--	--	--	--	--	--	--	0.17*** (4.89)	0.18*** (4.89)	--	--	-0.30*** (-8.39)	--	--
Adolescent antisocial behaviour (η_{11})	--	--	--	--	--	--	--	--	0.23*** (6.80)	0.14*** (4.55)	-0.08* (-2.20)	-0.34*** (-10.63)	0.31*** (11.27)	--
Emerging Adulthood														
Family Social Capital (η_{12})	0.03 (0.66)	-0.10* (-2.11)	0.07 (1.94)								0.28*** (5.54)			-0.08* (-2.17)
Career Investment (η_{13})	-0.09 (-1.95)	0.16** (2.74)	0.03 (0.71)											0.08 (1.44)
Job Stability (η_{14})	-0.04 (-0.82)	0.25*** (3.74)	0.14*** (3.67)											-0.19*** (-3.42)
Antisocial Peer Associations (η_{15})	-0.01 (-0.38)	-0.03 (-0.76)	0.01 (0.20)										0.08* (2.08)	0.24*** (5.92)
Young Adult antisocial behaviour (η_{16})	--0.05 (1.38)	-0.06 (-1.31)	-0.06 (1.95)											0.45*** (13.49)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

FIT: $\chi^2(252) = 353.42$, p<0.001; GFI=0.97; AGFI=0.95; RMSEA=0.02; CFI=0.99; NFI=0.96; PNFI=0.65

Notes: Cells contain standardized parameter estimates, with t-value in parentheses; Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Tables A8.1b, A8.1c, A8.1d, and A8.1e provide detailed information for additional matrices**

Table A8.1a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

(continued)	η_{12}	η_{13}	η_{14}	η_{15}	ζ
Childhood					
Collective efficacy (η_1)					0.82*** (18.58)
Harsh parenting (η_2)					0.95*** (19.30)
Prosocial family bonds (η_3)					0.70*** (4.34)
School bonds (η_4)					0.76*** (14.59)
Antisocial Peer Associations (η_5)					0.91*** (19.14)
Childhood antisocial behaviour (η_6)					0.60*** (17.30)
Adolescence					
Harsh parenting (η_7)					0.84*** (19.22)
Prosocial family bonds (η_8)					0.68*** (7.15)
School bonds (η_9)					0.68*** (18.25)
Antisocial Peer Associations (η_{10})					0.82*** (19.18)
Adolescent antisocial behaviour (η_{11})					0.50*** (19.00)
Emerging Adulthood					
Family Social Capital (η_{12})					0.90*** (18.59)
Career Investment (η_{13})	-0.16*** (-4.49)				0.94*** (18.99)
Job Stability (η_{14})	-0.01 (-0.23)	0.00 (-0.12)			0.98*** (17.83)
Antisocial Peer Associations (η_{15})	-0.06 (-1.74)	0.00 (0.08)			0.90*** (19.18)
Young Adult antisocial behaviour (η_{16})	-0.08** (-2.47)	-0.04 (-1.23)	0.02 (0.48)	0.15*** (4.73)	0.71*** (19.22)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes: Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Tables A8.1b, A8.1c, A8.1d and A8.1e provide detailed information for additional matrices**

Table A8.1b: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the exogenous variables (Lisrel θ_{δ} matrix)

X indicators	**Community social Disorganization**						**Family instability**			**Large family**
	X1	**X2**	**X3**	**X4**	**X5**	**X6**	**X7**	**X8**	**X9**	**X10**
A) Community Social Disorganization										
X1 % lone parent families	0.11** (2.37)									
X2 % low income families	0.12*** (4.12)	0.83*** (18.08)								
X3 % unemployed	- -	0.37*** (11.17)	0.89*** (18.90)							
X4 % low education	- -	0.60*** (1607)	0.39*** (10.44)	0.94*** (19.05)						
X5 % receiving government transfers	- -	0.68*** (17.44)	0.55*** (14.11)	0.63*** (15.47)	0.85*** (18.73)					
X6 % dwellings rented	- -	0.22*** (7.95)	- -	- -	- -	0.45*** (12.41)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.25)	-0.24*** (-7.37)	-0.36*** (-10.43)	-0.26*** (-8.20)	- -	0.43** (3.84)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.14* (1.96)	0.59*** (7.74)		
X9 residential stability	- -	0.16*** (5.48)	0.11*** (3.32)	0.15*** (4.34)	0.19*** (5.60)	- -	-0.20*** (-4.40)	- -	0.87*** (16.62)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.13*** (-2.80)	- -	-0.11*** (-4.23)	- -	- -	-0.17*** (-4.46)	- -	- -	- -	

Table A8.1c: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_ε matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**	**Y18**
childhood																		
Perceived collective efficacy (Y1)																		
Harsh parenting (Y2)	- -																	
Family attachment (Y3)[a]	- -	- -	0.69*** (12.02)															
Family supervision (Y4)[a]	- -	0.15*** (4.65)	0.13*** (3.33)	0.86*** (15.89)														
School bonds (Y5)	- -	- -	0.07* (2.12)	- -														
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -													
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -												
Adolescence																		
Harsh parenting (Y8)	--	--	- -	- -	- -	- -	- -											
Family attachment (Y9)[b]	- -	- -	0.12*** (3.84)	- -	- -	- -	- -	- -	0.28*** (4.70)									
Family supervision (Y10)[b]	-0.06* (-1.99)	- -	0.11** (3.27)	0.17*** (5.30)	-0.08** (-3.05)	- -	- -	- -	- -	0.70*** (15.453								
School bonds (Y11)	- -	0.10*** (3.94)	--	- -	--	--	- -	- -	- -	- -								
Antisocial Peer association (Y12)	--	--	- -	- -	- -	--	- -	- -	- -	-0.07** (-2.77)	- -							
Adolescent antisocial behaviour (Y13)	0.06*** (2.65)	-0.12*** (-5.08)	--	- -	- -	- -	--	- -	- -	- -	- -	- -						
Emerging Adulthood																		
Family social Capital (Y14)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -					
Investment (Y15)[b]	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -				
Job Stability (Y16)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -			
Antisocial Peer association (Y17)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y18)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

Table A8.1d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (LISREL Φ matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (13.09)		
Family instability (ξ2)	0.38*** (7.56)	1.00*** (5.02)	
Large Family Size (ξ3)	0.07 (0.97)	-0.14*** (-3.39)	1.00*** (19.25)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A8.1e: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_ε matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.82*** (18.58)										
Harsh Parenting (ζ2)	- -	0.95*** (19.30)									
Prosocial family bond (ζ3)	0.30*** (5.16)	- -	0.70*** (4.34)								
School bonds (ζ4)	- -	- -	- -	0.76*** (14.59)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.91*** (19.14)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (17.30)					
Adolescence											
Harsh Parenting (ζ7)	--	--	- -	- -	- -	- -	0.84*** (19.22)				
Prosocial family bond (ζ8)	--	--	- -	- -	- -	- -	- -	0.68*** (7.15)			
School bonds (ζ9)	- -	- -	- -	--	- -	- -	- -	- -	0.69*** (18.25)		
Antisocial peer associations (ζ10)	- -	-0.09*** (-2.41)	- -	- -	--	- -	- -	- -	- -	0.82*** (19.18)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.11** (2.32)	- -	- -	--	- -	- -	- -	- -	0.50*** (19.00)
Emerging Adulthood											
Family social capital (ζ12)	--	--	- -	- -	- -	- -	--	- -	- -	- -	- -
Career Investment (ζ13)	--	-0.13*** (-3.51)	--	- -	- -	- -	--	- -	-0.15*** (-4.51)	- -	- -
Job Stability (ζ14)	- -	- -	- -	-0.17*** (-5.01)	0.11*** (3.08)	- -	--	- -	- -	- -	0.11** (2.90)
Antisocial peer associations (ζ15)	- -	--	- -	- -	--	- -	--	- -	- -	- -	- -
Emerging Adulthood antisocial behaviour (ζ16)	- -	- -	--	- -	0.14*** (4.61)	--	--	- -	- -	- -	- -

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.1e: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_{ε} matrix)

(Continued)	ζ12	ζ13	ζ14	ζ15	ζ16
childhood					
Perceived collective efficacy (ζ1)					
Harsh Parenting (ζ2)					
Prosocial family bond (ζ3)					
School bonds (ζ4)					
Antisocial peer associations (ζ5)					
Childhood antisocial behaviour (ζ6)					
Adolescence					
Harsh Parenting (ζ7)					
Prosocial family bond (ζ8)					
School bonds (ζ9)					
Antisocial peer associations (ζ10)					
Adolescent antisocial behaviour (ζ11)					
Emerging Adulthood					
Family social capital (ζ12)	0.90*** (18.59)				
Career Investment (ζ13)	--	0.94*** (18.99)			
Job Stability (ζ14)	- -	- -	0.98*** (17.83)		
Antisocial peer associations (ζ15)	--	- -	- -	0.90*** (19.18)	
Emerging Adulthood antisocial behaviour (ζ16)	- -	--	- -	--	0.71*** (19.22)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.2a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	η_{11}
Childhood														
Collective efficacy (η_1)	-0.30*** (-7.36)	-0.20*** (-3.91)	--	--										
Harsh parenting (η_2)	--	--	0.14*** (4.04)	-0.17*** (-4.83)	--	--								
Prosocial family bonds (η_3)	--	-0.27*** (-3.93)	-0.17*** (-3.51)	--	-0.39*** (-6.99)	--								
School bonds (η_4)				--	--	0.49*** (8.05)	--							
Antisocial Peer Associations (η_5)	0.18*** (4.55)	0.10** (2.20)	--	--	0.17*** (4.98)	--	--	--						
Childhood antisocial behaviour (η_6)	--	--	--	-0.04 (-1.10)	0.18** (4.15)	-0.19* (-2.13)	-0.38*** (-9.31)	0.10*** (3.51)	--					
Adolescence														
Harsh parenting (η_7)	--	--	--	--	0.30*** (8.29)	--	--	0.09** (2.48)	0.13** (3.40)					
Prosocial family bonds (η_8)	--	--	-0.14*** (-3.68)	--	–	0.39*** (5.01)	--	--	-0.01 (-0.13)	-0.25*** (-6.50)	--	--	--	--
School bonds (η_9)	0.10** (2.97)	-0.14*** (-3.22)	--	--	--	--	0.29*** (7.81)	--	-0.05 (-1.21)	-0.14*** (-4.10)	0.28*** (5.96)	--	--	--
Antisocial Peer Associations (η_{10})	--	--	--	--	--	--	--	0.17*** (4.90)	0.18*** (4.89)	--	--	-0.30*** (-8.34)	--	--
Adolescent antisocial behaviour (η_{11})	--	--	--	--	--	--	--	--	0.23*** (6.62)	0.13*** (4.39)	-0.08* (-2.18)	-0.34*** (-10.69)	0.32*** (11.30)	--
Emerging Adulthood														
Family social Capital (η_{12})	--	-0.10* (-2.46)	--	--	--	--	--	--	--	-0.02 (-0.44)	0.23*** (4.49)	0.02 (0.49)	0.05 (1.11)	-0.10* (-2.06)
Career Investment (η_{13})	--	0.08 (1.84)	--	--	--	--	--	--	--	-0.05 (-1.23)	0.08 (1.27)	-0.15 (-1.32)	0.03 (0.77)	0.05 (1.04)
Job Stability (η_{14})	--	0.21*** (4.15)	0.13*** (3.65)	--	--	--	--	--	--	-0.02 (-0.31)	0.02 (0.31)	-0.01 (-0.11)	0.06 (0.73)	-0.24 (-1.19)
Antisocial Peer Associations (η_{15})	--	--	--	--	--	--	--	--	--	-0.02 (-0.57)	-0.02 (-0.37)	0.04 (0.93)	0.09* (2.10)	0.27*** (5.58)
Young Adult antisocial behaviour (η_{16})	--	--	--	-0.01 (-0.29)	-0.03 (-0.55)	0.20 (1.93)	-0.07 (-1.48)	0.14 (0.89)	0.03 (0.71)	0.04 (1.01)	-0.07 (-1.34)	0.00 (0.07)	0.05 (1.29)	0.40*** (7.92)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

FIT: $\chi^2(238) = 344.9$, p<0.001; GFI=0.97; AGFI=0.94; RMSEA=0.03; CFI=0.99; NFI=0.96; PNFI=0.61

Notes: Cells contain standardized parameter estimates, with t-value in parentheses; Exogenous variables are denoted by ξ_i; endogenous variables by η_i

The childhood informal social controls (η_1- η_5) and childhood antisocial behaviour (η_6) did not have a significant association with adult social bonds (η_{12}- η_{15}) when estimated in an alternate model not shown. In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21}; **Tables A8.2b, A8.2c, A8.2d, and A8.2e provide detailed information for additional matrices**

Table A8.2a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

(continued)	η_{12}	η_{13}	η_{14}	η_{15}	ζ
Childhood					
Collective efficacy (η_1)					0.83*** (18.76)
Harsh parenting (η_2)					0.95*** (19.29)
Prosocial family bonds (η_3)					0.69*** (4.30)
School bonds (η_4)					0.76*** (14.59)
Antisocial Peer Associations (η_5)					0.91*** (19.18)
Childhood antisocial behaviour (η_6)					0.60*** (17.17)
Adolescence					
Harsh parenting (η_7)					0.84*** (19.21)
Prosocial family bonds (η_8)					0.70*** (7.01)
School bonds (η_9)					0.69*** (18.47)
Antisocial Peer Associations (η_{10})					0.82*** (19.18)
Adolescent antisocial behaviour (η_{11})					0.50*** (18.87)
Emerging Adulthood					
Family social capital (η_{12})					0.90*** (18.82)
Career Investment (η_{13})	-0.17*** (-4.65)				0.91*** (18.75)
Job Stability (η_{14})	(-0.46)	0.00 (-0.09)			1.00*** (12.69)
Antisocial Peer Associations (η_{15})	-0.06 (-1.76)	-0.04 (-1.10)	-0.02 (-0.57)		0.90*** (19.19)
Young Adult antisocial behaviour (η_{16})	-0.07** (-2.45)	-0.04 (-1.33)	-0.02 (-0.39)	0.14*** (4.30)	0.67*** (17.44)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes: Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i, endogenous variables by η_i In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Tables A8.2b, A8.2c, A8.2d, and A8.2e provide detailed information for additional matrices**

Table A8.2b: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the exogenous variables (Lisrel θ_δ matrix)

X indicators	Community social Disorganization X1	X2	X3	X4	X5	X6	Family instability X7	X8	X9	Large family X10
A) Community Social Disorganization										
X1 % lone parent families	0.11** (2.54)									
X2 % low income families	0.13*** (4.26)	0.83*** (18.16)								
X3 % unemployed	- -	0.37*** (11.19)	0.89*** (18.89)							
X4 % low education	- -	0.60*** (16.09)	0.39*** (10.43)	0.94*** (19.05)						
X5 % receiving government transfers	- -	0.68*** (17.47)	0.55*** (14.10)	0.63*** (15.45)	0.85*** (18.72)					
X6 % dwellings rented	- -	0.22*** (8.01)	- -	- -	- -	0.45*** (12.27)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.23)	-0.24*** (-7.30)	-0.36*** (-10.42)	-0.26*** (-8.12)	- -	0.35** (2.71)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.21* (2.33)	0.55*** (6.51)		
X9 residential stability	- -	0.16*** (5.49)	0.11*** (3.35)	0.15*** (4.30)	0.19*** (5.58)	- -	-0.22*** (-4.67)	- -	0.87*** (16.57)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.13*** (-2.83)	- -	-0.12*** (-4.34)	- -	- -	-0.17*** (-4.47)	- -	- -	- -	

Table A8.2c: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_ε matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**	**Y18**
childhood																		
Perceived collective efficacy (Y1)																		
Harsh parenting (Y2)	- -																	
Family attachment (Y3)[a]	- -	- -	0.71*** (12.73)															
Family supervision (Y4)[a]	- -	0.15*** (4.75)	0.14*** (3.62)	0.85*** (16.17)														
School bonds (Y5)	- -	- -	0.07* (2.20)	- -														
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -													
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -												
Adolescence																		
Harsh parenting (Y8)	--	--	- -	- -	- -	- -	- -											
Family attachment (Y9)[b]	- -	- -	0.13*** (4.14)	- -	- -	- -	- -	- -	0.25*** (3.66)									
Family supervision (Y10)[b]	-0.05* (-1.99)	- -	0.12*** (3.58)	0.18*** (5.39)	-0.08** (-3.08)	- -	- -	- -	- -	0.71*** (15.60)								
School bonds (Y11)	- -	0.11*** (4.10)	--	- -	--	--	- -	- -	- -	- -								
Antisocial Peer association (Y12)	--	--	- -	- -	- -	--	- -	- -	- -	-0.07** (-2.76)	- -							
Adolescent antisocial behaviour (Y13)	0.07*** (2.78)	-0.14*** (-5.19)	--	- -	- -	- -	--	- -	- -	- -	- -	- -						
Emerging Adulthood																		
Family social capital (Y14)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -					
Investment (Y15)[b]	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -				
Job Stability (Y16)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -			
Antisocial Peer association (Y17)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y18)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

Table A8.2d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (LISREL Φ matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (12.98)		
Family instability (ξ2)	0.39*** (7.51)	1.00*** (5.02)	
Large Family Size (ξ3)	0.07 (0.96)	-0.14*** (-3.44)	1.00*** (19.25)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A8.2e: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_ε matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.76)										
Harsh Parenting (ζ2)	- -	0.95*** (19.29)									
Prosocial family bond (ζ3)	0.27*** (5.30)	- -	0.69*** (4.30)								
School bonds (ζ4)	- -	- -	- -	0.76*** (14.59)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.91*** (19.18)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (17.17)					
Adolescence											
Harsh Parenting (ζ7)	--	--	- -	- -	- -	- -	0.84*** (19.22)				
Prosocial family bond (ζ8)	--	--	- -	- -	- -	- -	- -	0.70*** (7.00)			
School bonds (ζ9)	- -	- -	- -	--	- -	- -	- -	- -	0.69*** (18.46)		
Antisocial peer associations (ζ10)	- -	-0.09** (-2.51)	- -	- -	--	- -	- -	- -	- -	0.82*** (19.02)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.13** (2.53)	- -	- -	--	- -	- -	- -	- -	0.50*** (18.82)
Emerging Adulthood											
Family social capital (ζ12)	--	--	- -	- -	- -	- -	--	- -	- -	- -	- -
Career Investment (ζ13)	--	-0.13*** (-3.31)	--	- -	- -	- -	--	- -	-0.04 (-0.51)	- -	- -
Job Stability (ζ14)	- -	- -	- -	-0.17*** (-4.92)	0.10** (3.03)	- -	--	- -	- -	- -	0.11 (1.27)
Antisocial peer associations (ζ15)	- -	--	- -	- -	--	- -	--	- -	- -	- -	- -
Emerging Adulthood antisocial behaviour (ζ16)	- -	- -	--	- -	0.14*** (4.34)	--	--	- -	- -	- -	- -

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.2e: Variance-covariance matrix (standardized) for the variances (ξ) and covariances (ψ) between the residual terms (ζ) in the causal model (LISREL ψ matrix)

(Continued)	ζ12	ζ13	ζ14	ζ15	ζ16
childhood					
Perceived collective efficacy (ζ1)					
Harsh Parenting (ζ2)					
Prosocial family bond (ζ3)					
School bonds (ζ4)					
Antisocial peer associations (ζ5)					
Childhood antisocial behaviour (ζ6)					
Adolescence					
Harsh Parenting (ζ7)					
Prosocial family bond (ζ8)					
School bonds (ζ9)					
Antisocial peer associations (ζ10)					
Adolescent antisocial behaviour (ζ11)					
Emerging Adulthood					
Family social capital (ζ12)	0.90*** (18.82)				
Career Investment (ζ13)	--	0.91*** (18.75)			
Job Stability (ζ14)	- -	- -	1.00*** (12.69)		
Antisocial peer associations (ζ15)	--	- -	- -	0.90*** (19.19)	
Emerging Adulthood antisocial behaviour (ζ16)	- -	--	- -	--	0.67*** (17.44)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.3a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

	ξ_1	ξ_2	ξ_3	η_1	η_2	η_3	η_4	η_5	η_6	η_7	η_8	η_9	η_{10}	η_{11}
Childhood														
Collective efficacy (η_1)	-0.29*** (-7.22)	-0.20*** (-3.94)	--	--										
Harsh parenting (η_2)	--	--	0.13*** (3.96)	-0.17*** (-4.94)	--	--								
Prosocial family bonds (η_3)	--	-0.26*** (-3.92)	-0.17*** (-3.29)	--	-0.39*** (-7.00)	--								
School bonds (η_4)				--	--	0.49*** (8.03)	--							
Antisocial Peer Associations (η_5)	0.17*** (4.42)	0.10** (2.29)	--	--	0.17*** (5.03)	--	--	--						
Childhood antisocial behaviour (η_6)	--	--	--	-0.05 (-1.18)	0.18** (4.14)	-0.19* (-2.09)	-0.38*** (-9.42)	0.10*** (3.51)	--					
Adolescence														
Harsh parenting (η_7)	--	--	--	--	0.30*** (8.23)	--	--	0.09** (2.49)	0.13*** (3.41)					
Prosocial family bonds (η_8)	--	--	-0.14*** (-3.78)	--	--	0.40*** (5.01)	--	--	-0.01 (-0.14)	-0.25*** (-6.54)				
School bonds (η_9)	0.10** (2.90)	-0.13*** (-3.01)	--	--	--	--	0.29*** (7.89)	--	-0.04 (-0.94)	-0.15*** (-4.25)	0.29*** (6.19)			
Antisocial Peer Associations (η_{10})	--	--	--	--	--	--	--	0.17*** (4.98)	0.18*** (4.80)	--	--	-0.30*** (-8.35)		
Adolescent antisocial behaviour (η_{11})	--	--	--	--	--	--	--	--	0.23*** (6.79)	0.14*** (4.64)	-0.08* (-2.15)	-0.34*** (-10.67)	0.31*** (11.26)	
Emerging Adulthood														
Family social Capital (η_{12})	--	-0.10* (-2.42)	--	--	--	--	--	--	--	--	0.25*** (5.27)	--	--	-0.09* (-2.27)
Career Investment (η_{13})	--	--	--	--	--	--	--	--	--	--	--	--	--	0.08 (1.85)
Job Stability (η_{14})	--	0.22*** (4.24)	0.13*** (3.72)	--	--	--	--	--	--	--	--	--	--	-0.19*** (-3.40)
Antisocial Peer Associations (η_{15})	--	--	--	--	--	--	--	--	--	--	--	--	0.02 (0.11)	0.24*** (2.78)
Young Adult antisocial behaviour (η_{16})	--	--	--	--	--	--	--	--	--	--	--	--	--	0.40*** (4.64)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

FIT: $\chi^2(259) = 370.5$ $p<0.001$; GFI=0.97; AGFI=0.95; RMSEA=0.02; CFI=0.99; NFI=0.96; PNFI=0.66

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i, endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Tables A8.3b, A8.3c, A8.3d, and A8.3e provide detailed information for additional matrices**

Table A8.3a Structural Model of causal relations among exogenous (ξ) and endogenous (η) variables with endogenous error terms (ζ)

(continued)	η_{12}	η_{13}	η_{14}	η_{15}	ζ
Childhood					
Collective efficacy (η_1)					0.83*** (18.71)
Harsh parenting (η_2)					0.95*** (19.30)
Prosocial family bonds (η_3)					0.70*** (4.34)
School bonds (η_4)					0.76*** (14.58)
Antisocial Peer Associations (η_5)					0.91*** (19.17)
Childhood antisocial behaviour (η_6)					0.60*** (17.30)
Adolescence					
Harsh parenting (η_7)					0.84*** (19.22)
Prosocial family bonds (η_8)					0.69*** (7.10)
School bonds (η_9)					0.69*** (18.42)
Antisocial Peer Associations (η_{10})					0.82*** (19.18)
Adolescent antisocial behaviour (η_{11})					0.50*** (19.01)
Emerging Adulthood					
Family social capital (η_{12})					0.90*** (18.75)
Career Investment (η_{13})	-0.18*** (-4.86)				0.96*** (19.14)
Job Stability (η_{14})	-0.01 (-0.23)	0.00 (0.08)			0.98*** (18.05)
Antisocial Peer Associations (η_{15})	-0.07 (-1.92)	-0.04 (-1.14)	-0.01 (-0.36)		0.91*** (15.21)
Young Adult antisocial behaviour (η_{14})	-0.10* (-2.01)	-0.01 (-0.09)	-0.08 (-0.81)	0.27 (1.59)	1.09** (2.48)

* p<.05; ** p<.01; ***p<.001 - - parameter set to zero based on empirical results (of non-significance); empty cells refer to parameters set to zero based on conceptual model

Notes:

Cells contain standardized parameter estimates, with t-value in parentheses

Exogenous variables are denoted by ξ_i; endogenous variables by η_i

In the text, paths from exogenous to endogenous variables are denoted by γ; e.g. the path from ξ_1 to η_2 is denoted by γ_{21}. Paths from endogenous to endogenous variables are denoted by β; e.g. the path from η_1 to η_2 is β_{21} **Tables A8.3b, A8.3c, A8.3d, and A8.3e provide detailed information for additional matrices**

Table A8.3b: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the exogenous variables (Lisrel θ_δ matrix)

X indicators	Community social Disorganization						Family instability			Large family
	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
A) Community Social Disorganization										
X1 % lone parent families	0.12** (2.61)									
X2 % low income families	0.13*** (4.25)	0.83*** (18.15)								
X3 % unemployed	- -	0.37*** (11.18)	0.89*** (18.88)							
X4 % low education	- -	0.60*** (16.09)	0.39*** (10.43)	0.94*** (19.04)						
X5 % receiving government transfers	- -	0.68*** (17.47)	0.55*** (14.09)	0.63*** (15.45)	0.85*** (18.72)					
X6 % dwellings rented	- -	0.22*** (8.00)	- -	- -	- -	0.44*** (12.20)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.22)	-0.23*** (-7.16)	-0.36*** (-10.43)	-0.26*** (-8.04)	- -	0.37** (3.02)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.19* (2.18)	0.57*** (6.98)		
X9 residential stability	- -	0.16*** (5.49)	0.12*** (3.39)	0.15*** (4.31)	0.19*** (5.63)	- -	-0.22*** (-4.69)	- -	0.86*** (16.36)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.13*** (-2.86)	- -	-0.11*** (-4.30)	- -	- -	-0.17*** (-4.50)	- -	- -	- -	

Table A8.3c: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_{ε} matrix)

Y indicators	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	Y16	Y17	Y18
childhood																		
Perceived collective efficacy (Y1)																		
Harsh parenting (Y2)	- -																	
Family attachment (Y3)[a]	- -	- -	0.70*** (12.08)															
Family supervision (Y4)[a]	- -	0.15*** (4.63)	0.14*** (3.38)	0.85*** (15.90)														
School bonds (Y5)	- -	- -	0.07* (2.13)	- -														
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -													
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -												
Adolescence																		
Harsh parenting (Y8)	--	--	- -	- -	- -	- -	- -											
Family attachment (Y9)[b]	- -	- -	0.12*** (3.89)	- -	- -	- -	- -	- -	0.26*** (4.12)									
Family supervision (Y10)[b]	-0.06* (-1.97)	- -	0.12*** (3.37)	0.17*** (5.34)	-0.08** (-3.07)	- -	- -	- -	- -	0.70*** (15.57)								
School bonds (Y11)	- -	0.10*** (3.94)	--	- -	--	--	- -	- -	- -	- -								
Antisocial Peer association (Y12)	--	--	- -	- -	- -	--	- -	- -	- -	-0.07** (-2.75)	- -							
Adolescent antisocial behaviour (Y13)	0.06*** (2.65)	-0.12*** (-5.06)	--	- -	- -	- -	--	- -	- -	- -	- -	- -						
Emerging Adulthood																		
Family social capital (Y14)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -					
Investment (Y15)[b]	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -				
Job Stability (Y16)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -			
Antisocial Peer association (Y17)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	-0.03 (-0.47)	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y18)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	0.96 (0.81)	- -	- -	- -	- -	

Table A8.3d: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (LISREL Φ matrix)

Latent factors (ξ)	Community Social Disorganization (ξ1)	Family instability (ξ2)	Large Family Size (ξ3)
Community Social Disorganization (ξ1)	1.00*** (12.95)		
Family instability (ξ2)	0.39*** (7.45)	1.00*** (5.00)	
Large Family Size (ξ3)	0.07 (1.01)	-0.14*** (-3.42)	1.00*** (19.25)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A8.3e: Variance-covariance matrix (standardized) for the variances (ξ) and covariances (ψ) between the residual terms (ζ) in the causal model (LISREL ψ matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.71)										
Harsh Parenting (ζ2)	- -	0.95*** (19.30)									
Prosocial family bond (ζ3)	0.27*** (5.25)	- -	0.70*** (4.34)								
School bonds (ζ4)	- -	- -	- -	0.76*** (14.58)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.91*** (19.17)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (17.30)					
Adolescence											
Harsh Parenting (ζ7)	--	--	- -	- -	- -	- -	0.84*** (19.22)				
Prosocial family bond (ζ8)	--	--	- -	- -	- -	- -	- -	0.68*** (7.10)			
School bonds (ζ9)	- -	- -	- -	--	- -	- -	- -	- -	0.69*** (18.42)		
Antisocial peer associations (ζ10)	- -	-0.08*** (-2.22)	- -	- -	--	- -	- -	- -	- -	0.82*** (19.18)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.11** (2.30)	- -	- -	--	- -	- -	- -	- -	0.50*** (19.01)
Emerging Adulthood											
Family social capital (ζ12)	--	--	- -	- -	- -	- -	--	- -	- -	- -	- -
Career Investment (ζ13)	--	-0.14*** (-3.66)	--	- -	- -	- -	--	- -	-0.15*** (-4.51)	- -	- -
Job Stability (ζ14)	- -	- -	- -	-0.15*** (-4.93)	0.11** (3.12)	- -	--	- -	- -	- -	0.11** (2.84)
Antisocial peer associations (ζ15)	- -	--	- -	- -	--	- -	--	- -	- -	0.13 (1.21)	- -
Emerging Adulthood antisocial behaviour (ζ16)	- -	- -	--	- -	0.14*** (4.55)	--	--	- -	- -	- -	-0.45 (-0.83)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.3e: Variance-covariance matrix (standardized) for the variances (ξ) and covariances (ψ) between the residual terms (ζ) in the causal model (LISREL ψ matrix)

(Continued)	ζ12	ζ13	ζ14	ζ15	ζ16
childhood					
Perceived collective efficacy (ζ1)					
Harsh Parenting (ζ2)					
Prosocial family bond (ζ3)					
School bonds (ζ4)					
Antisocial peer associations (ζ5)					
Childhood antisocial behaviour (ζ6)					
Adolescence					
Harsh Parenting (ζ7)					
Prosocial family bond (ζ8)					
School bonds (ζ9)					
Antisocial peer associations (ζ10)					
Adolescent antisocial behaviour (ζ11)					
Emerging Adulthood					
Family social capital (ζ12)	0.90*** (18.75)				
Career Investment (ζ13)	--	0.96*** (19.14)			
Job Stability (ζ14)	- -	- -	0.98*** (19.01)		
Antisocial peer associations (ζ15)	--	- -	- -	0.91*** (16.66)	
Emerging Adulthood antisocial behaviour (ζ16)	- -	--	- -	--	1.09** (2.48)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.4a: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the exogenous variables (Lisrel θ_δ matrix)

X indicators	Community social Disorganization X1	X2	X3	X4	X5	X6	Family instability X7	X8	X9	Large family X10
A) Community Social Disorganization										
X1 % lone parent families	0.12** (2.61)									
X2 % low income families	0.13*** (4.26)	0.83*** (18.16)								
X3 % unemployed	- -	0.37*** (11.19)	0.89*** (18.89)							
X4 % low education	- -	0.60*** (16.09)	0.39*** (10.43)	0.94*** (19.04)						
X5 % receiving government transfers	- -	0.68*** (17.47)	0.55*** (14.09)	0.63*** (15.45)	0.85*** (18.72)					
X6 % dwellings rented	- -	0.22*** (7.99)	- -	- -	- -	0.44*** (12.20)				
B) Family instability										
X7 SES	- -	-0.27*** (-9.20)	-0.23*** (-7.15)	-0.36*** (-10.43)	-0.26*** (-8.04)	- -	0.37** (2.97)			
X8 lone parent family status	- -	- -	- -	- -	- -	- -	0.19* (2.19)	0.56*** (6.86)		
X9 residential stability	- -	0.16*** (5.49)	0.12*** (3.40)	0.15*** (4.30)	0.19*** (5.60)	- -	-0.22*** (-4.66)	- -	0.86*** (16.40)	
C) Large Family Size										
X10 large family size (3+ kids)	-0.13*** (-2.92)	- -	-0.11*** (-4.31)	- -	- -	-0.17*** (-4.54)	- -	- -	- -	

Table A8.4b: Variance-covariance matrix (standardized) for the residual terms in the measurement model for the endogenous variables (LISREL θ_ε matrix)

Y indicators	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**	**Y7**	**Y8**	**Y9**	Y10	Y11	Y12	**Y13**	**Y14**	**Y15**	**Y16**	**Y17**	**Y18**
childhood																		
Perceived collective efficacy (Y1)																		
Harsh parenting (Y2)	- -																	
Family attachment (Y3)[a]	- -	- -	0.70*** (12.09)															
Family supervision (Y4)[a]	- -	0.15*** (4.59)	0.14*** (3.38)	0.85*** (15.92)														
School bonds (Y5)	- -	- -	0.07* (2.11)	- -														
Antisocial Peer association (Y6)	- -	- -	- -	- -	- -													
Childhood antisocial behaviour (Y7)	- -	- -	- -	- -	- -	- -												
Adolescence																		
Harsh parenting (Y8)	--	--	- -	- -	- -	- -	- -											
Family attachment (Y9)[b]	- -	- -	0.12*** (3.86)	- -	- -	- -	- -	- -	0.26*** (4.17)									
Family supervision (Y10)[b]	-0.06* (-1.98)	- -	0.12*** (3.38)	0.17*** (5.35)	-0.08** (-3.07)	- -	- -	- -	- -	0.70*** (15.57)								
School bonds (Y11)	- -	0.10*** (3.96)	--	- -	--	--	- -	- -	- -	- -								
Antisocial Peer association (Y12)	--	--	- -	- -	- -	--	- -	- -	- -	-0.07** (-2.66)	- -							
Adolescent antisocial behaviour (Y13)	0.06*** (2.68)	-0.12*** (-5.13)	--	- -	- -	- -	--	- -	- -	- -	- -	- -						
Emerging Adulthood																		
Family social Capital (Y14)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -					
Investment (Y15)[b]	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -				
Job Stability (Y16)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -			
Antisocial Peer association (Y17)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -		
Adolescent antisocial behaviour (Y18)	--	- -	- -	- -	--	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

Table A8.4c: Variance-covariance matrix (standardized) for the exogenous (ξ) variables (LISREL Φ matrix)

Latent factors (ξ)	**Community Social Disorganization (ξ1)**	**Family instability (ξ2)**	**Large Family Size (ξ3)**
Community Social Disorganization (ξ1)	1.00*** (12.95)		
Family instability (ξ2)	0.39*** (7.46)	1.00*** (4.99)	
Large Family Size (ξ3)	0.07 (1.06)	-0.14*** (-3.42)	1.00*** (19.25)

* p<.05; ** p<.01; ***p<.001; Note: Diagonal Matrix

Table A8.4d: Variance-covariance matrix (standardized) for the variances (ς) and covariances (ψ) between the residual terms (ζ) in the causal model (LISREL ψ matrix)

	ζ1	ζ2	ζ3	ζ4	ζ5	ζ6	ζ7	ζ8	ζ9	ζ10	ζ11
childhood											
Perceived collective efficacy (ζ1)	0.83*** (18.72)										
Harsh Parenting (ζ2)	- -	0.95*** (19.30)									
Prosocial family bond (ζ3)	0.27*** (5.27)	- -	0.70*** (4.34)								
School bonds (ζ4)	- -	- -	- -	0.76*** (14.55)							
Antisocial peer associations (ζ5)	- -	- -	- -	- -	0.91*** (19.17)						
Childhood antisocial behaviour (ζ6)	- -	- -	- -	- -	- -	0.60*** (17.30)					
Adolescence											
Harsh Parenting (ζ7)	--	--	- -	- -	- -	- -	0.84*** (19.22)				
Prosocial family bond (ζ8)	--	--	- -	- -	- -	- -	- -	0.69*** (7.10)			
School bonds (ζ9)	- -	- -	- -	--	- -	- -	- -	- -	0.69*** (18.42)		
Antisocial peer associations (ζ10)	- -	-0.09*** (-2.42)	- -	- -	--	- -	- -	- -	- -	0.81*** (19.17)	
Adolescent antisocial behaviour (ζ11)	- -	- -	0.11** (2.34)	- -	- -	--	- -	- -	- -	- -	0.50*** (19.00)
Emerging Adulthood											
Family social Capital (ζ12)	--	--	- -	- -	- -	- -	--	- -	- -	- -	- -
Career Investment (ζ13)	--	-0.13*** (-3.61)	--	- -	- -	- -	--	- -	-0.15*** (-4.54)	- -	- -
Job Stability (ζ14)	- -	- -	- -	-0.18*** (-5.50)	0.11** (3.10)	- -	--	- -	- -	- -	0.11** (2.84)
Antisocial peer associations (ζ15)	- -	--	- -	- -	--	- -	--	- -	- -	- -	- -
Emerging Adulthood antisocial behaviour (ζ16)	- -	- -	--	- -	0.14*** (4.63)	--	--	- -	- -	- -	- -

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

Table A8.4d: Variance-covariance matrix (standardized) for the variances (ς) and covariances (ψ) between the residual terms (ζ) in the causal model (LISREL ψ matrix)

(Continued)	ζ12	ζ13	ζ14	ζ15	ζ16
childhood					
Perceived collective efficacy (ζ1)					
Harsh Parenting (ζ2)					
Prosocial family bond (ζ3)					
School bonds (ζ4)					
Antisocial peer associations (ζ5)					
Childhood antisocial behaviour (ζ6)					
Adolescence					
Harsh Parenting (ζ7)					
Prosocial family bond (ζ8)					
School bonds (ζ9)					
Antisocial peer associations (ζ10)					
Adolescent antisocial behaviour (ζ11)					
Emerging Adulthood					
Family social capital (ζ12)	0.90*** (18.75)				
Career Investment (ζ13)	--	0.96*** (19.13)			
Job Stability (ζ14)	- -	- -	0.98*** (18.03)		
Antisocial peer associations (ζ15)	--	- -	- -	0.90*** (19.19)	
Emerging Adulthood antisocial behaviour (ζ16)	- -	--	- -	--	0.72*** (19.26)

* p<.05; ** p<.01; ***p<.001; - - parameter set to zero based on empirical results (of non-significance); Note: Diagonal Matrix

References

Andrews, D.A, and James Bonta (1994) *The Psychology of Criminal Conduct.* Cincinnati: Anderson.

Arnett, Jeffrey Jenson (2010) *Adolescence and Emerging Adulthood: A Cultural Approach.* Boston: Prentice Hall.

Baerveldt, Chris, Beate Völker, and Ronan Van Rossem (2008) "Revisiting selection and influence: An inquiry into the friendship networks of high school students and their association with delinquency", *Canadian Journal of Criminology and Criminal Justice.* 50(5): 559-587.

Baillargeon, Raymond, Richard E. Tremblay, J. Douglas Willms (1999) *The Prevalence of Physical Aggression in Canadian Children: A Multi-Group Latent Class Analysis of Data from the First Collection Cycle (1994-1995) of The NLSCY.* Applied Research Branch Strategic Policy Human Resources Development Canada

Baker, Wayne E. (1990) "Market Networks and Corporate Behaviour", *American Journal of Sociology.* 96: 432-445.

Beaver, Kevin M. and John Paul Wright (2007) "A Child Effects Explanation for the Association between Family Risk and Involvement in an Antisocial Lifestyle", *Journal of Adolescent Research*. 22(6) 640-664.

Birbeck, Christopher and Gary LaFree (1993) "The Situational Analysis of Crime and Deviance" *Annual Review of Sociology.* 19: 133- 137.

Bohrnstedt, George W. and David Knobe (1994) *Statistics for Social Data Analysis*, 3rd ed. Itasca, Illinois: F.E. Peacock Publishers.

Boidy, Lisa and Robert Agnew (1997) Gender and crime: A general strain theory perspective", *Journal of Research in Crime and Delinquency*. 34: 275-306.

Boislard, Marie-Aude, François Poulin, Jeff Kiesner, and Thomas J. Dishion (2009) "A longitudinal examination of risky sexual behaviors among Canadian and Italian adolescents: Considering individual, parental, and friend characteristics" *International Journal of Behavioral Development.* 33(3): 265–276.

Bollen, Kenneth A. (1989) *Structural Equation Models with Latent Variables.* New York: John Wiley.

Bollen, Kenneth A. and Patrick J. Curran (2005) *Latent Curve Models: A Structural Equations Approach*. New York: John Wiley

Bourdieu, Pierre (1985) "The social space and the genesis of groups", *Theory and Society.* 14(6): 723-744.

Brannigan, Augustine, Gemmell, William, Pevalin, David J. and Wade, Terrance J. (2002) "Self-control and social control in childhood misconduct and aggression: The role of family structure, hyperactivity, and hostile parenting", *Canadian Journal of Criminology*. 119-142.

Bursik, Robert J. Jr. (1988) "Social Disorganization and Theories of Crime and Delinquency: Problems and Prospects" *Criminology*, 23: 519-551.

Bursik, Robert J, Jr. and Harold G. Grasmick (1993) *Neighborhoods and Crime: The Dimensions of Effective Community Control*. Toronto: Maxwell Macmillan Canada, Lexington Books.

Burt, Ronald S. (1992) *Structural Holes*. Cambridge, MA: Harvard University Press.

Carr, Patrick J. (2003) The new parochialism: The implications of the Belway case for arguments concerning informal social control. *American Journal of Sociology* 108: 1249-1299.

Carrington, Peter J., Anthony Matarazzo, and Paul deSouza (2005) Court Careers of a Canadian Birth Cohort. Ottawa, Ontario: Canadian Centre for Justice Statistics, Statistics Canada Catalogue no. 85-561-MIE. Extrated from http://dsp-psd.pwgsc.gc.ca/Collection/Statcan/85-561-MIE/85-561-MIE2005006.pdf

Chung, He Len and Laurence Steinberg (2006) "Relations between neighborhood factors, parenting behaviors, peer deviance, and delinquency among serious juvenile offenders", *Developmental Psychology*. 42(2): 319-331.

Cline, Hugh F. (1980) Criminal behavior over the life span. In Orville G Brim, Jr., and Jerome Kagan (Eds.) *Constancy and Change in Human Development* (pp. 641-674). Cambridge, M.A: Presidents and Fellows of Harvard University.

Cohen, Lawrence E. and Marcus Felson (1979) "Social change and crime rates: A routine activity approach", *American Sociological Review*. 44:588-607.

Coleman, James S. (1988). "Social capital in the creation of human capital", *American Journal of Sociology* 94: 95-120.

Coleman, James S. (1990) *Foundations of Social Theory*. Cambridge, M.A.: Belknap Press of Harvard University Press.

Cornish, Derek B. and Ronald V. Clarke (1986) *The Reasoning Criminal*. NY: Springer.

Coulton, Claudia J., Jill E. Corbin, and Marilyn Su (1996) "Measuring neighborhood context for young children in an urban area", *American Journal of Community Psychology*. 24(1): 5-32.

Dishion, Thomas. J., David W. Andrews, and Lynn Crosby (1995) "Antisocial boys and their friends in early adolescence: Relationship characteristics, quality, and interactional process", *Child Development*. 66: 139-151

Dishion, Thomas J., Gerald R. Patterson, Mike Stoolmiller, and Martie L. Skinner (1991) "Family, school, and behavioral antecedents to early adolescent involvement with antisocial peers. *Developmental Psychology"*, 27, 172-180.

Elder, Glen H., Jr., (1985) Perspectives on the life-course. In Glen H. Elder, Jr. (ed.), *Life-course Dynamics: Trajectories and Transitions, 1968-1980*, (Chapter 1, pp. 23-49). (Project of SSRC Committee on the Life-course.) Ithaca, NY: Cornell University Press.

Elder, Glen H., Jr., Monika Kirkpatrick Johnson, and Robert Crosnoe (2003) The emergence and development of life-course theory. In Jeylan T. Mortemer and Michael J. Shanahan (eds.) *Handbook of the Life-course (*pp. 3-19)**.** New York: Springer.

Elliott, Delbert S., David Huizing and Suzanne S. Ageton (1985). *Explaining delinquency and drug use*. Newbury Park: Sage.

Farrington, David P. (1991) "Childhood aggression and adult violence: Early precursers and later-life outcomes." In Debra J. Pepler and Kenneth H. Rubin, (Eds.) *The Development and Treatment of Childhood Aggression* (pp. 5-29). Hillsdale, NY: Erlbaum.

Farrington, David P. (1995) "Childhood origins of antisocial behaviour", *Clinical Psychology and Psychotherapy*. 12: 177-190.

Farrington, David P (2003a) Developmental and Life-course Criminology: Key theoretical and empirical issues – the 2002 Sutherland Award Address, *Criminology*. 42(2): 221-255.

Farrington, David P (2003b) Key Results from the first forty years of the Cambridge Study in Delinquent Development. Pp. 137-183 in Terrence P. Thorberry and Marvin D. Krohn (eds.) *Taking Stock of Delinquency*. New York: Kluwer Academic/Plenum.

Farrington, David P. (2005) "The development of offending and antisocial behaviour from childhood: Key finidings from the Cambridge Study in Delinquent Development", Journal of Child Psychology and Psychiatry. 360(6): 929-964.

Farrington, David P. and Brandon C. Welsh (2007) *Saving Children from a Life of Crime*. NY: Oxford University Press.

Farrington, David P., Patrick Jolliffe, J. David Hawkins, Karl G. Hill and Rick Kosterman (2003) "Comparing delinquency careers in court records and self-reports", *Criminology* 41(3): 933-957.

Fein, Joanna C. (2000) *Does Gender Matter? Structural Correlates of Male and Female Youth Crime in Canada*. Unpublished M.A. thesis presented to the University of Waterloo.

Finkel, Steven E. (1995) *Causal Analysis with Panel Data*. Thousand Oaks, California: Sage.

Fitzgerald, Robin T. (2003) An examination of sex differences in delinquency. *Crime and Justice Research Paper Series.* Statistics Canada. Catalogue no. 85-561-MIE.

Fitzgerald, Robin T. (2007) *The Influence of Neighbourhood Contexts on Parenting, Social Support and Child Outcomes: Assessing neighborhood effects in a Canadian city*. Unpublished Ph.D. Dissertation presented to Carleton University.

Fitzgerald, Robin T. and Peter J. Carrington (2008) "The neighbourhood context of urban Aboriginal crime" *Canadian Journal of Criminology and Criminal Justice*. 50(5): 523-558.

Fletcher, Anne C., Nancy E. Darling, Lawrence Steinberg and Sanford M. Dornbusch (1995) "The company they keep: Relation of adolescents' adjustment and behaviour to their friends' perception of authoritarian parenting in the social network", *Developmental Psychology*. 31(2) 300-310.

Fomby, Paula and Andrew J. Cherlin (2007) "Family instability and child well-being" *American Sociological Review*. 72: 181-204.

Foster, Holly, John Hagan, Richard E. Tremblay and Bernard Boulerice (2001) *Neighbourhood and Family Contexts of Gendered Aggression. Multi-Level Effects on Behaviour Outcomes in Canadian Children - May 2001. Aplied Research Branch Strategic Policy HRDC*. W-01-2E. extracted from http://www.hrsdc.gc.ca/en/cs/sp/sdc/pkrf/publications/research/2001-000124/IW-01-2E.pdf May 2007

Gardner, LeGrande and Donald J. Shoemaker (1989) "Social bonding and delinquency: A comparative analysis", *Sociological Quarterly*. 30(3): 481-499.

Gifford-Smith, Mary, Kenneth A. Dodge, Thomas J. Dishion and Joan McCord (2005) "Peer influence in children and adolescents: Crossing the bridge from developmental to intervention science", *Journal of Abnormal Child Pyschology*. 33(3): 255-265.

Glueck, Sheldon, and Eleanor Glueck (1950) *Unraveling Juvenile Delinquency*. New York: The Commonwealth.

Glueck, Sheldon, and Eleanor Glueck (1968) *Delinquents and Nondelinquents in Perspective*. Cambridge, MA: Harvard University Press.

Gottfredson, Michael R. and Travis Hirschi (1987) "The methodological adequacy of longitudinal research on crime", *Criminology*. 25: 581-614. Reprinted in Travis Hirschi (Ed) *The Craft of Criminology*. NJ: Transaction.

Gottfredson, Michael R. and Travis Hirschi (1990) *A General Theory of Crime*. Palo Alta, CA: Stanford University.

Hagan, John and Bill McCarthy (1997) *Mean Streets: Youth Crime and Homelessness*. New York, NY: Cambridge University Press.

Hagan, John, A. Gillis, and John Simpson (1985) "The Class Structure of Gender and Delinquency: Toward a Power- Control Theory of Common Delinquent Behaviour," *American Journal of Sociology*: 90 (6): 1151-1178.

Hallfors, Denise, Hyunsan Cho, Paul H. Brodish, Robert Flewelling, and Shereen Khatapoush. 2006. "Identifying High School Students 'At Risk' for Substance Use and Other Behavioral Problems: Implications for Prevention", *Substance Use and Misuse.* 41: 1–15.

Hartnagel, Timothy J. (1997) "Crime among the Provinces: The effect of geographic mobility", *Canadian Journal of Criminology:* 387-402.

Hartnagel, Timothy J. and Lee, G. W. (1990) "Urban Crime in Canada," *Canadian Journal of Criminology*: 591-606.

Hawkins, J. David, Richard F. Catalano, Rick Kosterman, Robert Abbott, Karl G. Hill (1999) Preventing adolescent health-risk behaviors by strengthening protection during childhood, *Archives of Pediatrics and Adolescent Medicine*. 153: 22-234.

Hawkins, J. David, Brian H. Smith, Karl G. Hill, Rick Kosterman, Richard F. Catalano, and Robert D. Abbott (2003) In Terrence P. Thornberry and Marvin D. Krohn (Editors) *Understanding and preventing crime and violence. In Taking Stock of Delinquency: An Overview of Findings from Contemporary Longitudinal Studies* (pp. 255-312). New York: Kluwer Academic/Plenum Publishers.

Haynie, Dana L. (2002) "Friendship networks and delinquency: The relative nature of peer delinquency", *Journal of Quantitative Criminology* 18(2): 99-129.

Heimer, Karen and Stacey DeCoster (1999) "The gendering of violent delinquency", *Criminology*. 37:277-318.

Herrenkohl, Todd I., J. David Hawkins, Ick-Joong Chung, Karl G. Hill, and Sara Battin-Pearson (2001) School and community risk factors and interventions, in Rolf Loeber and David P. Farrington (Eds). *Child Delinquents: development, intervention and service needs* (pp. 211- 246). Sage: Thousand Oaks, California.

Hirschi, Travis (1969) *Causes of Delinquency*. Berkeley: University of California Press.

Hirschi, Travis (1991) "Family structure and crime." In Bryce L. Christensen (Ed.) *When Families Fail... The Social Costs*. Reprinted in Travis Hirschi (Ed.) *The Craft of Criminology*. New Brunswick, NJ: Transaction.

Hoffmann, John P. and Mikaela J. Dufur (200) "Family and school social capital effects on delinquency: Substitutes or compliments?", *Sociological Perspectives.* 51: 29-61.

Hotton, Tina (2003) Childhood aggression and exposure to violence in the home. *Crime and Justice Research Paper Series*. Catalogue no. 85-561-MIE — No. 002

Hotton, Tina and Dave Haans (2004) Alcohol and drug use in early adolescence. *Health Reports* Statistics Canada. Catalogue 82-003.

Jacob, Joanna C. (2006) Male and female youth crime in Canadian communities: Assessing the applicability of social disorganization theory, *Canadian Journal of Criminology and Criminal Justice*. 48 (1): 31-60.

Jacob, Joanna C. (2007) Gender, crime and community: An ecological analysis of youth crime in Canada, Chapter 17, in Lorne Tepperman and Harley Dickinson (Eds). *Reading Sociology: Canadian Perspectives*. Toronto: Oxford University Press.

Jenkins, Patricia H. (1997) "School delinquency and the school social bond", *Journal of Research in Crime and Delinquency*. 34(3) 337-368.

Jones, Charles, Linn Clark, Joan Grusec, Randle Hart, Gabriele Plickert & Lorne Tepperman (2002) *Poverty, Social Capital, Parenting and Child Outcomes in Canada: Final Report.* Applied Research Branch Strategic Policy Human Resources Development Canada. No. SP-557-01-03E. Extracted from http://www.hrsdc.gc.ca/en/cs/sp/sdc/pkrf/publications/research/2002-002357/page01.shtml May 2007.

Juby, Heather and David P. Farrington. 2001. "Disentangling the Link between Disrupted Families and Delinquency", *British Journal of Criminology.* 41: 22–40.

Kamakura, Wagner A. and Michel Wedel (2000) "Factor analysis and missing data", *Journal of Marketing Research*. 37(4): 490-498.

Kasen, Stephanie, Patricia Cohen, and Judith S. Brook. 1998. "Adolescent School Experiences and Dropout, Adolescent Pregnancy, and Young Adult Deviant Behavior", *Journal of Adolescent Research*. 13: 49–72.

Kercher, Kyle (1988) "Criminology." In Edgar Borgatta and Karen S. Cook (Eds.). *The Future of Sociology* (pp. 294-316). Beverly Hills, CA: Sage.

Kierkus, Christopher A. and Douglas Baer (2002) "A social control explanation of the role between family structure and delinquent behaviour", *Canadian Journal of Criminology*. 44 (4) 425-434.

King, Ryan D., Michael Massoglia and Ross MacMillan (2007) "The context of marriage and crime: Gender, the propensity to marry, and offending in early adulthood", *Criminology*. 45(1) 33-66.

Kohen, Dafna E., Jeanne Brooks-Gunn, Tama Leventhal, and Clyde Hertzman (2002) Neighbourhood income and physical and social disorder in Canada: Associations with young children's competencies in Canada. *Child Development* 73 (6): 1844-1860.

Laub, John H. and Robert J. Sampson (2003) *Shared Beginnings, Divergent Lives.* London, England: Harvard University Press

LeBlanc, Marc, Pierre McDuff, and Nathalie Kaspy (1998) "Family and early adolescent delinquency: A comprehensive sequential family control model", *Early Child Development and Care*, 142(1): 63 -91.

LeBlanc, Marc and Rolf Loeber (1998) "Developmental criminology updated," *Crime and Justice*. 23: 115-198.

LeBlanc Marc, Evelyne Vallieres and Pierre McDuff (1993) "The prediction of males' adolescent and adult offending from school experience", *Canadian Journal of Criminology*. 35(4): 459-478.

Lockhart Burrell, Ginger and Mark W. Roosa: (2009) "Mother's economic hardship and behaviour problems in their early adolescents", *Journal of Family Issues.* 30(4): 511-531.

Loeber, Rolf, David P. Farrington, Magda Stouthamer-Loeber, and Welmoet B. van Kammen (1998). *Antisocial Behavior and Mental Health Problems: Explanatory factors in childhood and adolescence*. Mahwah, NJ: Erlbaum.

Lösel, Friedrich, and Doris Bender (2003) "Protective factors and resilience", in David P. Farrington and Jeremy W. Coid (Eds.) *Early Prevention of Adult Antisocial Behaviour.* Cambridge, UK: Cambridge University Press.

Loury, Glenn C. (1977) "A dynamic theory of racial income difference." In P.A. Wallace and A. Le Mund, eds., *Women, minorities, and employment discrimination* (pp. 153-186). Lexington, MA: Lexington Books.

McCord, Joan (1994) "Family Socialization and Anti-social Behaviour: Searching for Causal Relationships in Longitudinal Data." In I.G.M. Weitekamp and H-J Kerner (Eds.), *Cross-National Longitudinal Research on Human Development and Criminal Behaviour* (p177-188) Dordrecht, Netherlands: Kluwer.

McCord, Joan (1997) "Discipline and the Use of Sanctions" *Aggression and Violent Behaviour*. 2: 313-319.

Maruyama, Geoffrey (1997) *Basics of Structural Equation Modeling*. Thousand Oaks, CA. Sage.

Mears, Daniel P., Matthew Ploeger and Mark Warr (1998) "Explaining the gender gap in delinquency: Peer influence and moral evaluations of behaviour", *Journal of Research in Crime and Delinquency.* 35(3): 251-266.

Moffitt, Terrie E. (1993) "Adolescence-limited and life-course persistent antisocial behavior: A developmental taxonomy", *Psychological Review* 100(4): 647-701.

Moffitt, Terrie E. and Avshalom Caspi (2001) Childhood Predictors Differentiate Life-Course Persistent and Adolescence-limited Anti-Social Pathways among Males and Females. *Development and Psychopathology 13:* 355-375.

Moffitt, Terrie E., Avshalom Caspi, Nigel Dickson, Phil Silva and Warren Stanton (1996) "Childhood-onset versus adolescent-onset antisocial conduct in males: Natural history from age 3 to 18", *Development and Psychopathology*. 8: 399-424.

Morenoff, Jeffrey, Robert J. Sampson, and Stephen Raudenbush (2001) "Neighborhood inequality, collective efficacy, and the spatial dynamics of urban violence", *Criminology* 39:517-560.

Nagin, Daniel S., and Raymond Paternoster (2000) "Popullation heterogeneity and state dependence: State of the evidence and directions for future research", *Journal of Quantitativ Criminology*. 16(2): 117-144.

Offord, David R., Michael C. Boyle, and Yvonne A. Racine (1989). "Ontario Child Health Study: Correlates of disorder", *Journal of the American Academy of Child and Adolescent Psychiatry*. 28: 856–860.

Osgood, D. Wayne, Janet K. Wilson, Patrick O'Malley, Jerald G. Bachman, and Lloyd D. Johnson (1996) "Routine activities and individual behavior. *American Sociological Review*. 61:635-655.

Özbay, Özden and Yusuf Ziya Özcan (2008) "A Test of Hirschi's Social Bonding Theory: A Comparison of Male and Female Delinquency", *International Journal of Offender Therapy and Comparative Criminology*.52(2): 134-157.

Patterson, Gerald R., and Magda Stouthamer-Loeber (1984) "The correlation of family management practices anddelinquency", *Child Development. 55:* 1299-1307.

Payne, Allison Ann (2008) "A Multilevel analysis of the relationships among communal school organization, student bonding, and delinquency", *Journal of Research in Crime and Delinquency*. 45 (4): 429-455.

Piquero, Alex R., David P. Farrington, and Alfred Blumstein. "The criminal career paradigm." In Michael Tonry (ed.) *Crime and Justice. A Review of Research.* Volume 30 (pp. 359-506). Chicago: University of Chicago Press.

Pires, Paulo, and Jennifer M. Jenkins (2007) "A growth curve analysis of the joint influences of parenting affect, child characteristics and deviant peers on adolescent illicit drug use", *Journal of Youth and Adolescence.* 36(2): 169-183.

Portes, Alejandro (1998) "Social capital: It's origins and applications in modern sociology." *Annual Review of Sociology*, 24: 1-24.

Putnam, Robert D. (2000) *Bowling Alone: The Collapse and Revival of American Community*. Toronto: Simon & Schuster.

Rankin, Joseph H. and Roger Kern (1994) "Parental attachments and delinquency", *Criminology.* 32 (4): 495-515.

Sampson, Robert J. (2003) "The neighbourhood context of well-being", *Perspectives in Biology and Medicine.* 46(3): S53-S64.

Sampson, Robert J. (2006) How does community context matter? Social mechanisms and the explanation of crime rates. In Per-Olof H. Wikström and Robert J. Sampson (eds.), *The Explanation of Crime: Context, Mechanisms and Development*. New York: Cambridge University Press.

Sampson, Robert J., and Byron W. Groves (1989) "Community structure and crime: testing social disorganization theory", *American Journal of Sociology*. 94(4): 744-802.

Sampson, Robert J. and John H. Laub (1990) Crime and deviance over the life-course: The salience of adult social bonds. *American Sociological Review.* 55: 609-627.

Sampson, Robert J. and John H. Laub (1993) *Crime in the Making: Pathways and Turning Points.* London: Harvard University Press.

Sampson, Robert J. and John H. Laub (1995) "Understanding Variability in Lives through Time: Contributions of Life-Course Criminology" *Studies on Crime and Crime Prevention* 4:143-158.

Sampson, Robert J. and John H. Laub (2003) Desistance from Crime over the Life Course. In Jeylan T. Mortimer and Michael Shanahan (Eds.) *Handbook of the Life Course*. New York: Kluwer Academic/Plenum.

Sampson, Robert J. and John H. Laub (2005) "A general age-graded theory of crime: Lessons learned and the future of life-course criminology." In David P. Farrington (Ed) *Advances in Criminology (Volume 14): Testing Integrated Developmental/ Life-course Theories of Offending (*Chapter 7, pp.165-182).NJ: Transaction.

Sampson, Robert J., Jeffrey D. Morenoff and Felton Earls (1999) "Beyond social capital: Spatial Dynamics of collective efficacy for children" *American Sociological Review.* 64:633-660.

Sampson, Robert J., John H. Laub and Christopher Wimer (2006) "Does marriage reduce crime? A counterfactual approach to within individual causal effects", *Criminology* 44(3): 465-508.

Sampson, Robert J., Patrick Sharkey, and Stephen W. Raudenbush (2008) "Durable effects of concentrated disadvantage on verbal ability of African-American children", *Proceedings of the National Academy of Science.* 105: 845-852.

Sampson, Robert J., Stephen W. Raudenbush, and Felton Earls (1997) "Neighbourhoods and violent crime: A multilevel study of collective efficacy for children", *American Sociological Review* 64:633-660.

Schiff, Maurice (1992) Social capital, labor mobility, and welfare: The impact of uniting states. *Rationality and Society* 4 (2): 157-175.

Schulenberg, Jennifer L. (2003) "The social context of police discretion with young offenders: An ecological analysis", *Canadian Journal of Criminology and Criminal Justice* 45(2): 127-157.

Schulenberg, Jennifer L., Joanna C. Jacob, and Peter J. Carrington. (2007) "Ecological analysis of crime rates and police discretion with young persons: A replication," *Canadian Journal of Criminology and Criminal Justice* .49(2): 261-277.

Shaw, Clifford, R. and Henry D. McKay. (1969) *Juvenile Delinquency and Urban Areas* (Revised Edition), Chicago: University of Chicago Press. p. 170-176 in Voss, H. and Peterson, M., eds. (1971) *Ecology, Crime and Delinquency*. New York: Meredith Corporation.

Simcha-Fagan, Ora and Joseph E. Schwartz (1986) "Neighborhood context and delinquency: An assessment of contextual effects," *Criminology* 24(4):667-699.

Simms Blackwell, Brenda (2000) "Perceived Sanctions, threats, gender and crime: A test and elaboration of power-control theory," *Criminology* 38:439-488.

Simons, Ronald L., Leslie G. Simons, Callie H. Burt, Gene H. Brody, and Carolyn Cutrona (2005) "Collective efficacy, authoritative parenting, and delinquency: A longitudinal test of a model integrating community- and family-level processes," *Criminology*. 43: 989-1029.

Singh, Kultar (2007) *Quantitative Social Research Methods*. Thousand Oaks, California: Sage Publications.

Sloat, Elizabeth and J. Douglas Willms (2002) A gradient approach to the study of childhood vulnerability. In J. Douglas Willms, ed. *Vulnerable Children: Findings from Canada's National Longitudinal Survey of Children and Youth*. Edmonton, Alberta: University of Alberta Press.

Smith, Carolyn A. and David P. Farrington (2004) "Continuities in antisocial behaviour and parenting across three generations", *Journal of Child Psychology and Psychiatry*. 45(2): 230-247.

Smith, David J. (2002) Crime and the Life-course. In Mike Maguire, Rod Morgan, and Robert Reiner (Eds) *The Oxford Handbook of Criminology,* 3rd ed. NY: Oxford University Press.

Sokol-Katz, Jan, Roger Dunham, and Rick Zimmerman (1997) "Family structure verses parental attachment in controlling adolescent deviant behaviour: A social control model" *Adolescence*. 32: 199-215.

Sprott, Jane B. and Anthony N. Doob (2000) "Bad, Sad and Rejected: The lives of aggressive children", *Canadian Journal of Criminology*. 123-133.

Sprott, Jane B., Jennifer M. Jenkins, and Anthony N. Doob (2000) *Early Offending: Understanding the Risk and Protective Factors of Delinquency.* Applied Research Branch Strategic Policy Human Resources Development Canada.

Sprott, Jane B., Jennifer M. Jenkins, and Anthony N. Doob (2005) The importance of school: Protecting at-risk youth from early offending *Youth Violence and Juvenile Justice.* 3(1): 59-77.

Stafford, Mark C. and Mark Warr (1993) A reconceptualization of general and specific deterrence *Journal of Research in Crime and Delinquency*.30: 123-135.

Statistics Canada (1992) *1991 Census Dictionary*. Catalogue # 92-301. Ottawa.

Statistics Canada (1995a) *National Longitudinal Survey of Children and Youth, Cycle 1- User Guide: 1994 to 1995*. Extracted from http://prod.library.utoronto.ca:8090/datalib/codebooks/cstdli/nlsc/nlscr2/nlscyc1-gid.pdf May 2007.

Statistics Canada (1995b) *NLSCY User's Handbook and Microdata File Guide, Cycle 1- 1994 to 1995.* Extracted from http://www.chass.utoronto.ca/datalib/codebooks/cstdli/nlscy.htm

Statistics Canada. (1995b) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 1994-1995 Data Collection, Cycle 1.* Catalogue no. 89F0078XIE. Extracted from http://www.statcan.ca/english/freepub/89F0078XIE/96001.pdf May 2007.

Statistics Canada (1997a) *National Longitudinal Survey of Children and Youth, Cycle 2- User Guide: 1996 to 1997.* Extracted from http://prod.library.utoronto.ca:8090/datalib/codebooks/cstdli/nlsc/cycle2/nlscyc2gid.pdf May 2007

Statistics Canada. (1997b) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 1996-1997 Data Collection, Cycle 2.* Catalogue no. 89F0078XIE. Extracted from http://www.statcan.ca/english/freepub/89F0078XIE/overe.pdf May 2007.

Statistics Canada (1999a) *National Longitudinal Survey of Children and Youth, Cycle 3- User Guide: 1998 to 1999.* Extracted from http://prod.library.utoronto.ca:8090/datalib/codebooks/cstdli/nlsc/cycle3/nlscyc3pr_gidv2.pdf May 2007

Statistics Canada. (1999b) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 1998-1999 Data Collection, Cycle 3.* Catalogue no. 89F0078XPE, no. 3. Extracted from http://www.statcan.ca/english/freepub/89F0078XIE/99003.pdf May 2007.

Statistics Canada (2001) *Low Income Cutoffs from 1991 to 2000 and Low Income Measures from 1990 to 1999*. Prepared by Bernard Paquet. Catalogue # 75F0002MIE- 01007. Ottawa: Minister of Industry.

Statistics Canada (2003) *National Longitudinal Survey of Children and Youth, Cycle 4- User Guide: 2000 to 2001*. Extracted from http://data.library.ubc.ca/datalib/survey/statscan/kids/cycle4/synthetic/NLSCY_00_C4_UG.pdf May 2007

Statistics Canada (2003) *Survey Method and Practices*. Catalogue no. 12-587-XPE. Ottawa: Minister of Industry.

Statistics Canada. (2004) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 2000-2001 Data Collection, Cycle 4.* Catalogue no. 89F0078XIE. Extracted from http://www.statcan.ca/english/freepub/89F0078XIE/89F0078XIE2004001.pdf May 2007.

Statistics Canada (2005a) "National Longitudinal Survey of Children and Youth: Home Environment, income and child behaviour" in *The Daily*. Catalogue 11-001-XIE

Statistics Canada (2005b) *National Longitudinal Survey of Children and Youth, Cycle 5- User Guide: 2002 to 2003.* Extracted from http://www.statcan.ca/english/sdds/document/4450_D4_T9_V1_E.pdf May 2007

Statistics Canada. (2005c) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 2002-2003 Data Collection, Cycle 5.* Catalogue no. 89F0078XIE. Extracted from http://www.statcan.ca/english/sdds/document/4450_D2_T9_V1_E.pdf May 2007.

Statistics Canada. (2006a*) National Longitudinal Survey of Children and Youth, Cycle 6- User Guide: 2004 to June 2005*. Extracted from http://www.statcan.ca/english/sdds/document/4450_D4_T9_V2_E.pdf May 2007

Statistics Canada. (2006b) *National Longitudinal Survey of Children and Youth: Overview of Survey Instruments for 2004-2005 Data Collection, Cycle 6.* Catalogue no. 89F0078XIE. Extracted from http://www.statcan.ca/english/sdds/instrument/4450_Q3_V5_E.pdf May 2007.

Steffensmeier, Darrell and Haynie, Dana L. (2000a) "The structural sources of urban female violence in the United States: A macrosocial gender-disaggregated analysis of adult and juvenile homicide offending rates", *Homicide Studies* 4(2): 107-134.

Steffensmeier, Darrell and Haynie, Dana L. (2000b) "Gender, structural disadvantage, and urban crime: Do macrosocial aariables also explain female offending rates?" *Criminology*, 38(2): 403-439.

Stoolmiller, Mike (1994) "Antisocial behavior, delinquent peer association, and unsupervised wandering for boys: Growth and change from childhood to early adolescence", *Multivariate Behaviour Research*. 29: 263-288.

Svensson, Robert (2003) "Gender differences in adolescent drug use: The impact of parental monitoring and peer deviance", *Youth and Society.* 34, 300-329.

Thomas, Eleanor M. (2004) *Aggressive Behaviour Outcomes for Young Children: Change in Parenting Environment Predicts Change in Behaviour. Research Paper*. Statistics Canada Catalogue no. 89-599-MIE- No. 001

Thornberry, Terence P., Alan J. Lizotte, Marvin D. Krohn, Margaret Farnworth, and Sung Joon Jang. (1994) "Delinquent Peers, Beliefs, and Delinquent behavior: A Longitudinal Test of Interactional Theory", *Criminology* 32:601-637.

Tracy, Paul E. and Kimberly Kempf-Leonard (1996) *Continuity and Discontinuity in Criminal Careers*. New York: Plenum.

Tracy, Paul E., Marvin E. Wolfgang, and Robert M. Figlio (1990) *Delinquency Careers in Two Birth Cohorts*. New York: Plenum.

Tremblay, Richard E., Louise C. Mâsse, Frank Vitaro and Patricia L. Dobkin (1995) "The impact of friends' deviant behavior on early onset of delinquency: longitudinal data from 6 to 13 years of age", *Development and Psychopathology*, **7**, 649–667

Velez, Carmine N., Jim Johnson, and Patricia Cohen (1989) "A longitudinal analysis of selected risk factors for childhood psychopathology", *Journal of the American Academy of Adolescent Pyschiatry*. 28(6): 861-864.

Warner, Barbara D. (2007) "Directly intervene or call the authorities? A study of the forms of neighborhood social cohesion within a social disorganization framework", *Criminology* 45(1): 99-130

Warr, Mark (1993a) "Age, peers and delinquency", *Criminology* 31(1): 17-40.

Warr, Mark (1993b) "Parents, peers, and delinquency", *Social Forces*. 72(1): 247-264.

Warr, Mark (2002) *Companions in Crime: The Social Aspects of Criminal Conduct*. Cambridge, U.K.: Cambridge University Press.

Welsh, Wayne N., J. Greene, and Patricia H. Jenkins (1999) "School disorder: The influence of individual, institutional, and community factors", *Criminology* 37(1):73-115.

Werner, Emmy E. (2004) "Journeys from childhood to midlife: Risk, resilience, and recovery", *Pediatrics*. 114: 492.

Werner, Emmy E. and Ruth S. Smith (2001) *Journeys from Childhood to Midlife: Risk, Resilience and Recovery*. Ithaca, NY: Cornell University Press.

Wikström, Per-Olof H. and Loeber, Rolf (2000) "Do disadvantaged neighborhoods cause well-adjusted children to become adolescent delinquents? A study of male juvenile serious

offending, individual risk and protective factors, and neighbourhood context,", *Criminology*. 38(4): 1109-1142.

Willms, Douglas J. (2002) Socioeconomic gradients for childhood vulnerability. In J. Douglas Willms, ed. *Vulnerable Children: Findings from Canada's National Longitudinal Survey of Children and Youth*. Edmonton, Alberta: University of Alberta Press.

Wirth, L. (1938) "Urbanism as a Way of Life", *American Journal of Sociology,* XLIV: 3-24 in Fleis Flava, Sylvia, Ed. (1968) *Urbanism in World Perspective: A reader*. New York: Thomas Y. Crowell Company.

Wolfgang, Marvin E. and Franco Ferracuti (1982) *The Subculture of Violence: Toward an integrated theory in criminology* pp. 140-161. Beverley Hills: Sage.

Wolfgang, Marvin E., Robert M. Figlio, and Thorsten Sellin (1972) *Delinquency in a Birth Cohort*. Chicago: University of Chicago Press.

Wright, John Paul, Francis T Cullen, and Jeremy T. Miller. (2001) "Family Social Capital and Delinquent Involvement" *Journal of Criminal Justice*. 29: 1-9.

Yau, Maria (2010) *Model Schools for Inner Cities: 3-Year Highlights*. Extracted March 10, 2010 from http://www.tdsb.on.ca/wwwdocuments/schools/inner_city_schools/docs/Final Results.pdf

Zara, Gerogia and David P. Farrington (2009) "Childhood and adolescent predictors of late onset criminal careers", *Journal of Youth and Adolescence.* 38: 287-300.