

SUMMARY OF RESEARCH PROPOSAL

Aggression and antisocial behaviour among girls is a significant social, mental and physical health problem. Until recently, research has focused primarily on identifying risk and protective factors, and developmental trajectories, for boys. As a result, relatively little is known about the causes, course and consequences of involvement in aggression and antisocial behaviour among girls. In particular, developmental pathways from adolescence to adulthood among high-risk girls are not well understood. New studies are emerging, however few have undertaken a comprehensive investigation of mental health, social outcomes and physical health using Canadian samples and there is virtually no research comparing the risk profiles of Canadian girls with those in other countries. This is important as social contexts differ in the types and severity of risk they present to developing adolescents.

The transition to young adulthood presents a particularly risky developmental period for girls who have struggled with problems of aggression and antisocial behaviour. Research documenting the relation of risk and protective factors to different trajectories over this developmental period is a priority to better understand how risk can be minimized and healthy development can be promoted. Among the myriad of factors that contribute to risk and resilience, the quality of close relationships has been identified as particularly salient in determining healthy development of girls.

The proposed research capitalizes on the availability of one of the largest longitudinal studies of very high-risk adolescent girls in Canada and the US to date by following three cohorts totalling 320 high-risk adolescents (222 girls; 98 boys) through key windows of transition as they move from mid- to late-adolescence and into early adulthood. These cohorts were obtained through research completed under a CIHR New Emerging Team grant (Gender and Aggression Project) directed by Dr. Marlene Moretti and funded through the Institute of Sex, Gender and Health. The sample was strategically drawn to represent girls at the highest level of risk for engagement in aggression and antisocial behaviour from Canada and the US. A matched sample of adolescent boys was also recruited. Adolescents referred to a provincial centre mandated to serve youth with serious aggressive and antisocial behaviour and youth detained in custody centers were assessed using a comprehensive protocol that tapped extensive information on behavioural patterns, family, peer and romantic partner life experiences including exposure to maltreatment and other forms of adversity, child mental health problems, social-relational functioning; social cognitive, school and intellectual functioning; self-regulatory capacity; and personality characteristics. The first prospective follow-up of this sample is nearing completion with excellent retention across sites.

This research program extends our comprehensive follow-up of these cohorts at three additional points across a five year period. Combined with existing data, this research will permit mapping of trajectories from early adolescence (age 13/14) to early adulthood (age 23/24). New waves of data collection will assess a wider range of range of functional domains including adjustment in educational, vocational, romantic and parental roles. In addition, physical health outcomes will be investigated. Innovative longitudinal data analytic techniques will be employed to examine the relation between the domains of risk, protective factors and later functioning both concurrently and prospectively. Focus groups and in-depth interviews will be conducted to better understand how experiences of discrimination contribute to girls adjustment and to determine 'turning points' in development that facilitate healthy adjustment among some girls, but deepen poor adjustment in others. Our findings to date confirm the primary importance of a relational model of girls' development and well-being and this theme will be emphasized throughout the follow-up waves of assessment. This study will generate new findings on developmental trajectories among high-risk Canadian girls. It is the first comparative investigation of risk profiles and trajectories between Canadian and American girls.. Results will be instrumental in informing mental health and youth forensic policy and programming.

SUMMARY OF PROGRESS

The proposed research builds on progress made through a CIHR New Emerging Team grant (Gender and Aggression Project; nominated Principal Investigator: Dr. Marlene Moretti) and funded through the Institute of Sex, Gender and Health. A major focus of this research was launching a comprehensive, longitudinal study of adolescent girls at high-risk for involvement in aggressive and antisocial behaviour. A multi-disciplinary team was assembled with the aim of documenting the experiences of risk and protective factors in the lives of these young women along with their associated mental health and social outcomes. This proved to be a highly productive research initiative, resulting in recruitment and assessment of one of the largest samples of high-risk adolescent girls in Canada and the US to date, comprised of two cohorts totaling 220 high-risk girls and 98 matched adolescent boys of comparable risk status. At present, we have completed the first wave assessment and are nearing completion of the second wave of data collection in these cohorts with excellent retention rates.

The program of research conducted under the CIHR-NET was highly productive (see Appendix 1.H – Mid-Term CIHR-NET Report), with a number of significant contributions to research and practice originating specifically from these cohorts (see Appendix 1.B: scholarly work based specifically on target cohorts; Appendix 1.G: Selected CIHR-NET publications). Given the scope of this project, it is not feasible to fully summarize the completed results of this project here and, instead, key research findings are integrated throughout this proposal as they relate to the central themes that guide the next phase of our research. In terms of dissemination, our program of research has yielded an edited book presenting new findings on girls, aggression, risk and intervention (*Girls and Aggression: Contributing Factors and Intervention Principles*); a special journal issue dedicated to new findings on sex differences in aggression (*Aggressive Behaviour*, 32, pp.373-419); and the publication of 20 journal papers on topics ranging from basic information on rates of exposure to risk factors and concomitant mental health and social problems experienced by these girls, to research on heterogeneity within this sample and implications for the provision of mental health services. Our research has been widely disseminated through 28 invited talks, 76 papers at professional conferences and numerous presentations to government panels and community agencies (7). Continued work with this unique and understudied sample is underway with 3 papers under review and a number of papers in progress that involve collaborations across investigators, post-doctoral trainees and graduate students.

A significant investment has been made in training future researchers; to date, 8 trainees completed theses and dissertations through collaboration with the CIHR-NET specifically using data from our high-risk samples. A further 5 trainees are currently engaged in the project, with expected completion of 4 dissertations in this calendar year. Beyond these activities, we have organized a number of professional, community and network conferences where new findings from our research have been shared with others in the field. Finally, we have made considerable strides in translating our research into practice. Based on our research findings, we have developed and manualized a brief intervention (1, 2) to support the caregivers of high-risk youth which we are currently evaluating in communities across British Columbia. This intervention is linked closely to our findings related to the importance of close relationships as a cornerstone of healthy development.

The proposed research extends our comprehensive follow-up of these cohorts at three additional points across a five year period as they make the transition from adolescence into early adulthood. Combined with existing data, continued follow-up of our cohorts will permit mapping of trajectories from early adolescence (age 13/14) to early adulthood (age 23/24). New waves of data collection will assess a wider range of functional domains including adjustment in educational, vocational, romantic and parental roles. In addition, physical health outcomes will be investigated. Innovative longitudinal data analytic techniques will be employed to examine the relation between the domains of risk, protective factors and later functioning, both concurrently and prospectively. Focus groups and in-depth interviews will be conducted to better understand ‘turning points’ in development that facilitate healthy adjustment among some girls but deepen poor adjustment in others. To our knowledge, this study is the first comparative investigation of risk profiles and trajectories between high-risk Canadian and American girls. It will greatly extend our capacity to work with stakeholders and policy makers to stimulate evidence based prevention and intervention programs, a goal that we share (see Appendix 1.A – Letters of Support).

MORETTI, Marlene M.

\$190,340

Girls at Risk for Aggression and Antisocial Behaviour: Risk, Resilience and Developmental Trajectories

RESPONSE TO REVIEWS

Not applicable.

GIRLS AT RISK FOR AGGRESSION AND ANTISOCIAL BEHAVIOUR: RISK, RESILIENCE AND DEVELOPMENTAL TRAJECTORIES**OVERVIEW**

Until recently, research on aggression and violence has focused primarily on boys. This is understandable given the fact that compared to girls, boys engage in more serious acts of violence and inflict more physical injury on others at every stage of development. However, over the past several decades, juvenile justice statistics have documented an unprecedented increase in the rate of violent crime perpetrated by girls, a trend that has both alarmed and puzzled researchers, clinicians and social policy analysts. In addition, research has demonstrated that young women are often more physically aggressive toward their romantic partners than are young men (3).

Relatively little is known about the causes, developmental course and consequences of involvement in serious aggression and antisocial behaviour among girls. In particular, developmental pathways from adolescence to adulthood among girls at the highest level of risk are not well understood. Although many risk and protective factors appear to be similar for boy and girls, there is evidence to suggest that victimization experiences may have a stronger impact and be more severe among girls versus boys who become involved in aggressive and antisocial behaviour. Among a number of factors that contribute to resilience, the quality of close relationships has been identified as particularly salient in determining the health of girls.

The transition to young adulthood is a particularly risky developmental period for girls who have struggled with problems of aggression and antisocial behaviour. Research documenting the relation of risk and protective factors to adjustment over this developmental period is a priority to better understand how risk can be minimized and healthy development can be promoted. New studies are emerging; however few have undertaken a comprehensive investigation of psychiatric, social and physical health indicators using high-risk Canadian samples and no research has compared the risk profiles of Canadian girls with those in other countries. This is important as social contexts differ in the types and severity of risk they present to developing adolescents.

Why study the causes, concomitants and consequences of aggressive and antisocial behaviour in girls? Beyond the opportunity to generate new knowledge about child development, mental health and social well-being, the potential for cost-saving is extraordinarily high. The presence of severe behavioural problems in conjunction with other mental health problems, such as depression, substantially inflates health service costs, totalling as much as \$13,000.00 per child for outpatient services in a six month period (4, 5). Beyond mental health costs, forensic services for youth with serious aggressive and antisocial behaviour consume substantial public funds. In 1994, the estimated cost of detaining a young offender in Canada was \$100,000 per year (6). A more recent estimate in the UK puts the cost of incarceration at £4645 (\$10,559 CAN) per month (7). These estimates do not include other social costs incurred by victims, or projected lifetime costs as a result of lower educational achievement, poor vocational adjustment and early parenthood. Importantly, they also fail to factor in the costs associated with increased risk for psychopathology in the offspring of mothers with a history of severe behaviour problems (8). In sum, both our lack of knowledge and the high-cost of mental health and forensic services associated with serious aggressive and antisocial behaviour calls for an investment in research on aggressive and antisocial behaviour in girls.

BACKGROUND & SIGNIFICANCE**I. AGGRESSION AND VIOLENCE: RECENT TRENDS AND SEX DIFFERENCES**

It is important to keep in mind that the rate of violent crime, particularly serious violent acts such as homicide, is consistently higher in boys than girls. For example, in Canada, the rate of violent crime among girls is a mere one third of the rate among boys. Nonetheless, between 1988 and 1998, this rate more than doubled for girls (+127%) compared to a smaller increase for boys (+65%; 9). Furthermore, between 1996 and 2002, when a slight decrease was noted in the rate of violent crime committed by boys (from 1385 to 1332 per 100,000 youth), a modest increase was observed for girls (from 451.9 to 512.1 per 100 000 youth; 10). In both cases, the increase for girls was due to

more frequent engagement in violent acts of lesser seriousness (i.e., common assault).

These findings parallel statistics reported in the United States: overall the growth in person offense cases over the last two decades has been greater for adolescent females (157%) than for males (71%) (11), and between 1993 and 2002 arrests for aggravated assault decreased 29% for males and increased 7% for girls. Outside North America, the picture is much the same: in the UK, between 1981 and 1999, there was a 23% decrease in juvenile male offenders and an 8% increase in female offenders.

In sum, juvenile justice statistics across several countries consistently reveal a trend toward greater involvement of girls in the perpetration of aggressive and violent acts. This trend is mirrored in what girls report about their own behaviour. According to the US Surgeon General's report (2001; 12), studies of self-reported engagement in serious aggression show the gap between adolescent girls and boys has shrunk by approximately 50%. These trends signal the need to fast track research on aggression in girls and develop prevention and treatment programs. More specifically, we need a better understanding of the factors that place girls at risk for aggression and violence, the developmental course of aggression among girls, and potential factors that may buffer girls from risk and promote their healthy transition into young adulthood.

The proposed study builds on research already completed under a CIHR-NET grant investigating aggressive and antisocial behaviour in girls. Our research to date has provided a rich picture of the complex factors that place girls at risk for aggressive and antisocial behaviour (13 – 33). Our inclusion of high-risk samples from both Canada and the US affords a unique opportunity to compare self-reported rates of aggressive and antisocial behaviour along with juvenile and adult records of criminal offending. Our protocol contains well validated measures of risk and protective factors, with a strong focus on the experiences of girls in close relationships and social contexts. The three proposed follow-up waves will allow us to track variability in indicators of aggressive and antisocial behaviour for girls across the two countries to better understand how risk, protective and other contextual factors (e.g., cultural and social marginalization; differences in criminal law and charging practices) contribute to persistence vs. desistance in aggression across development.

II. AGGRESSION AND VIOLENCE: EXPANDING OUR CONCEPTUALIZATION

The term physical aggression refers to physical acts with no reference to their consequences. In contrast, the term violence is defined with reference to the consequences of physical aggression (34). It is important to distinguish between aggression and violence and to recognize that aggression extends beyond physical acts. Other forms of aggression include covert acts that harm others through social exclusion, public humiliation and personal rejection. Collectively, these behaviours have been termed social aggression. Research over the past decade has revealed that, in general, girls engage in equal levels of social aggression but lower physical aggression than do boys (e.g., 3). Social aggression can be reliably detected as early as preschool and children who engage in it are more likely to suffer rejection from their peers and are more likely to affiliate with deviant peers who also engage in aggression (35).

How serious is social aggression? The common view is that while social aggression is unpleasant and ill-mannered, acts of physical aggression are far more damaging – ‘sticks and stones will hurt my bones, but words can never hurt me’. Interestingly, studies show that girls suffer more than boys when they are the targets of social aggression in that this type of victimization is associated with high rates of depression, loneliness and low self-esteem (36). For girls in high risk contexts, social aggression often co-occurs with physical aggression and may play an important role in shaping the contexts in which violence occurs. In our research (e.g., 24), we found a high correlation between social and physical acts of aggression among high-risk girls. Anecdotally, these girls reported that they often became involved (as both perpetrators and victims) in highly socially aggressive peer groups, marked by rumors of sexual impropriety and fast changing loyalties, eventually escalating to acts of physical aggression. Girls differed in how well they fared in these complex social interactions. Some emerged at the top of the social ladder and were admired yet feared by their peers. Others found themselves more frequently in the victim role. These dynamics were apparent in the events leading up to the murder of Reena Virk in 1997 (Report of the BC Children's Commission). Similar events

precipitated the suicide of Dawn-Marie Wesley from Mission B.C. in 2000.

As a result of the increased focus on alternative forms of aggression, proposals have been made to add female-specific symptom criteria to research and clinical protocols assessing antisocial behaviour and aggression. Yet, to date, there are no empirical data available to evaluate whether the inclusion of sex-specific symptoms improves the prediction of girls' prognosis within clinical settings. Many of the symptoms that have been suggested for girls, such as social aggression, are highly correlated with physical forms of aggression and this redundancy implies that they may not provide incremental predictive validity for long-term prognosis. Research is required that comprehensively maps the 'construct space' for antisocial behaviour by including traditional indicators of antisocial behaviour together with a broad range of candidate female-specific symptoms derived from developmental research and clinical practice (37).

In sum, there is a need to expand our definition and measurement of aggression. Measuring social forms of aggression helps us to better understand the interpersonal context in which physical aggression may be embedded, and evaluate whether the inclusion of alternative forms of aggression helps to predict adult adjustment among high-risk females. There is good reason to believe that this is particularly important in understanding how and why some girls become involved in physical acts of aggression. The assessment of multiple forms of aggression (e.g., physical, social, instrumental, and proactive) over time provides the opportunity to examine the unique and shared relationships between risk and protective factors and various forms and functions of aggressive behaviour (31). Comparisons with our matched sample of high-risk boys allows us to examine sex differences in the rates, risk factors and developmental consequences of engagement in various forms of aggression.

III. A GENDER SENSITIVE PERSPECTIVE TO RISK, RESILIENCE AND DEVELOPMENT IN HIGH-RISK CLINICAL SAMPLES

• Gender Specific Risk Factors and Developmental Trajectories

As researchers begin to piece together information from across diverse samples, the question of whether female-specific theories of antisocial behaviour are required is beginning to come into focus. To date, however, there is no comprehensive theory of the development of antisocial or aggressive behaviour that is *specific* to females. A number of studies show that many of the known risk factors for conduct disorder (CD) in boys, such as parental criminality, exposure to parental conflict, physical maltreatment, sensation-seeking, low IQ, and poor self-esteem, also increase risk for girls (38, 22, 23). Moffitt and Caspi (2001; 39) found that early-onset delinquents, whether male or female, had backgrounds characterized by poor parenting, difficult temperament, inattention and hyperactivity, and neurocognitive deficits. Studies comparing risk and normative samples, and those focused on high-risk samples, suggest a somewhat different view. Although some markers of risk for CD, such as capacity for motor inhibition, have been found to be similarly associated with risk for conduct problems in girls and boys (40), other studies suggest that certain risk factors have a more profound effect on risk status in girls. For example, in a study of approximately 300 adolescents from a clinical sample, girls who had been physically abused at home had a 4.2 fold risk of having CD with violent behaviour compared to those not exposed to physical abuse (41). Family breakdown was also associated with increased risk for CD. Neither of these risk factors was significantly related to CD and violence in boys. One large scale study has also suggested that cumulative social risk factors differentiated early versus later onset of aggression problems in girls while biological factors differentiated early versus later onset aggression in boys (42). Research from our CIHR-NET program is also revealing in this regard: our first wave of data collection revealed that psychopathy, often described as a biologically based personality disorder that has been shown to place males at risk for antisocial behaviour and violence, was not predictive of concurrent aggression, offense history and future recidivism in girls once maltreatment experiences were taken into account (17).

Research is mixed on whether developmental trajectories are comparable for girls and boys. Moffitt (42, 43) argues that the distinction between early onset life-course persistent versus adolescent time-limited trajectories applies similarly to girls and boys. Some researchers have questioned the applicability of this distinction for females based on the fact that antisocial and aggressive behaviour in girls typically begins in adolescence rather than childhood (44) but that adolescent onset among girls carries the same poor prognosis as that known for early onset boys (45). This

has lead some diagnosticians to propose that the new version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-V) should specify different subtypes of CD for girls and, specifically, that DSM-V should eliminate the childhood-onset type for females (37).

Emerging sex differences in the nature and impact of risk factors for aggression and antisocial behaviour have given rise to a new perspective on the problem of aggression in girls, one that focuses on the importance of relational contexts in female development and adjustment. Findings from our CIHR-NET are consistent with this view; for example, we have found that girls at very high-risk for aggression and antisocial behaviour are more likely than boys to have a history of early removal from their biological parents; more frequent care outside their parental home; and greater likelihood of being relinquished by their parents to government care. Although we find very high rates of maltreatment in both girls and boys, rates of sexual abuse are significantly higher in girls and girls report greater exposure to physical maltreatment by their mothers than do boys (16), a finding that has emerged in other studies of incarcerated girls (23). Caution must be exercised when interpreting findings from clinical or high-risk samples in terms of etiology as these findings may not apply to the general population. However, the fact that similar findings have emerged across both normative (46 – 48) and high-risk samples, suggests that these results are not merely artifacts of extreme populations and may bear relevance to understanding girls' development and aggression more generally. Thus, longitudinal research with high-risk samples of girls, with sufficient numbers of females involved in aggressive and antisocial behaviour, is needed to better understand the link between relational factors and associated developmental pathways and consequences of aggressive behaviour.

- **Protective Factors**

Despite the fact that knowledge of protective versus risk factors may be far more informative to the development of interventions, the field of child health and psychopathology continues to focus disproportionately on risk. This is also true of research on aggression and violence in girls. The field has yet to come to a consensus on the definition of protective factors (49 – 52). Some define protective factors as the opposite of risk factors, while others contend that protective factors are independent domains of influence that help buffer or moderate the impact of risk factors and promote positive outcomes (53). Both definitions of protective factors will be used in the proposed research using both quantitative (examining statistical main effects and interactions, e.g., 54) and qualitative approaches (focus groups and content analysis e.g., 55).

Our research protocol includes a range of protective factors that have been emphasized in past research, such as academic and vocational achievement, positive peer relations, capacity for cognitive control and adaptive affect regulation. Relational factors (e.g, positive family, peer and romantic partner relationships) are also important in reducing vulnerability to risk and engagement in aggressive behaviour, and perhaps particularly so for girls. Indeed, many studies have been shown family and peer factors to be more influential than school and neighbourhood factors (e.g., 54). Kim-Cohen and colleagues (2004; 56) found that maternal warmth promoted positive adjustment in children, even against the backdrop of low socio-economic family status. The protective benefit of positive social relationships may also extend to those cultivated outside the family. For example, research suggests that having a boyfriend, who is at least moderately prosocial during adolescence, can be a protective factor for highly aggressive and antisocial girls (57), and a number of researchers have suggested that social support is a stronger protective factor for girls than boys (58, 59). More research is needed to identify key protective factors, particularly those which buffer girls growing up in the most adverse environments – as is the typical case for girls within high-risk clinical and forensic samples.

Findings from our CIHR-NET research confirm the importance of the protective influence of positive close relationships for girls. Our protocol includes both interview-based and self-report measures of parent-child attachment, along with other measures of relationship quality. Findings thus far show that girls' ratings at Time 1 of their parents/caregivers willingness to provide support and their caregivers' capacity to assist them in managing distress are related to lower levels of aggressive and antisocial behaviour 18-24 months later. In contrast, insecure attachment measured at Time 1 is associated with increased aggression at follow-up particularly for girls (60). These

findings highlight the potential of relationship factors to both increase risk, as well as promote resilience, among high-risk girls.

Our findings are consistent with a relational model that emphasizes the importance of caregiving contexts and intimate relationships in the development of girls' health and well-being. This view is consistent with the work of Debra Pepler and colleagues (61) focused on normative samples, again, suggesting that relational factors are of universal importance to girls regardless of setting. Recently, Ehrensaft (2005; 62) summarized this emerging work and concluded that: 1) disrupted relationships are more likely to give rise to aggression and antisocial behaviour in girls than boys; 2) aggression is more likely to be expressed within close relationships by girls than boys; and, 3) the long term impact of aggression on development is more likely to extend to relationship domains for girls than boys.

Building on the growing consensus of the importance of relational factors in girls' development and engagement in aggression, our prospective longitudinal study from early adolescent to young adulthood will allow us to: 1) generate new knowledge on the nature and quality of experiences within close relationships of girls at high-risk for aggression; and, 2) evaluate the role of relational factors in determining the prognosis for girls as they transition across key developmental stages.

IV. CONTEXT MATTERS: THE ROLE OF CULTURAL AND SOCIAL MARGINALIZATION

Research in youth detention facilities has commonly shown that a disproportionate number of non-Caucasian girls from impoverished background are incarcerated. In Canada, girls of Aboriginal heritage are over-represented in the juvenile justice system; in the US, African American girls are disproportionately incarcerated. Research on social and cultural marginalization of ethno-cultural minority girls and problems of aggressive and antisocial behaviour is extremely limited. In general, studies have simply documented the higher rates of marginalized youth in the system but few have examined differences in the nature, severity and relationships between risk/protective factors and outcomes. Understanding how protective factors influence adjustment is critical, especially for girls of minority status who also frequently grow up in impoverished inner-city neighbourhoods. Disentangling the effects of socio-cultural marginalization from the socio-psychological may be a major challenge but a critical issue in this population (63). Progress has been made in this regard with US samples (64, 65), but research in Canada is just beginning.

Consistent with previous research, findings from our CIHR-NET have revealed a disproportionate representation of girls of Aboriginal heritage in our Vancouver sample (23% vs. 4.4% of Canadian population); and of African American heritage in our Virginia sample (49% vs. 13% of the American population). Participatory action research led by Dr. Margaret Jackson, and funded by our CIHR-NET in conjunction with Heritage Canada and National Crime Prevention Centre, provided a unique opportunity to better understand the experiences of discrimination and victimization among girls of Aboriginal heritage (55, 66 – 70). Through the use of focus groups and interviews, girls revealed how their communities were marked by experiences of racial and sexual discrimination interspersed with violence and victimization. Yet these same communities also provided a context for close connection with their families and cultural heritage. These mixed experiences often presented a dilemma to these girls in understanding how to move forward toward young adulthood without relinquishing close ties to family and community (see Appendix 1.F – Community Mobilization Program Report).

Our proposed research offers a unique opportunity to combine quantitative and qualitative methods to examine issues of cultural and social marginalization. Quantitative methods will be used to evaluate whether similar models of risk and resilience apply across samples of ethically marginalized versus non-marginalized girls, while qualitative methods will be adopted to better understand the lived experiences of cultural and social marginalization among Canadian and American girls involved in aggressive behaviour. Of particular interest is whether similar themes will emerge across girls of cultural minority status in Canada and the US; and whether experiences will be shared across girls growing up in contexts characterized by varying levels of socioeconomic deprivation.

Understanding pathways towards healthy development among girls will also require a consideration of developmental 'turning points'(71). Turning points have been defined as life events in which individuals undergo substantial change. Recent narrative research has examined personal memories, particularly those occurring in

relationship contexts, as encapsulating turning point events. Following the methodology developed by McLean and colleagues (72, 73) we will examine personal narratives for turning point events in relation to continuity versus change in risk status. The prospective longitudinal design of our study, combined with the life-events calendar will allow us to characterize the impact of important life events quantitatively. For example, we will examine how trajectories of aggression and antisocial behaviour are altered following the birth of a child or the formation of a healthy relationship.

Our measurement of social context also allows us to examine differences between neighbourhood factors for girls in Canada and the US. Our research to date indicates that girls growing up in the US are exposed to higher levels of neighbourhood violence than girls growing up in Canada. Interestingly, however, in our research the strength of the relationship between exposure to neighbourhood violence and engagement in aggressive and antisocial behaviour is similar across sites. These findings raise a provocative point: Canadian versus American girls may be exposed to less neighbourhood violence (or qualitatively different types of neighborhood violence), however, when Canadian girls are exposed to neighborhood-level violence the consequences for development may be the same. Thus, it is premature to conclude that Canadian communities are healthier places for all girls to grow up and continued follow-up of our Canadian and American samples will provide rich data to speak to this question.

V. DEVELOPMENTAL CONSEQUENCES: BROADENING OUR PERSPECTIVE ON HEALTH

Research shows that aggressive and antisocial behaviour in girls and women is associated with a wider range of concurrent and prospective mental health problems. Costello et al.'s (2003; 74) analysis of psychiatric disorders in a large normative sample revealed significant sex differences in concurrent comorbidity between behavioural disorders and internalizing conditions. Most notably, depression was comorbid with conduct disorder (CD) for girls but not boys. High levels of homotypic continuity were found for most disorders; however, findings indicated significant heterotypic continuity particularly among girls. As one would expect, girls who meet criteria for CD often meet criteria for a broad range of comorbid conditions, including attention deficit hyperactivity disorder (ADHD), depression, PTSD and substance use disorders (23, 75, 76).

In our CIHR-NET research with high-risk girls, we conduct a full structured diagnostic interview and routinely find that girls with aggressive and antisocial behaviour problems meet criteria for upwards of three to four comorbid disorders from both the internalizing and externalizing domains (13). More research is required to understand the sequence of risk exposure and the emergence of disorders in relation to aggressive and violent behaviour in girls. In the meantime, however, these findings highlight the need for a comprehensive evaluation of mental health needs in girls identified at high-risk for aggression and violence.

Few longitudinal studies of girls at the highest risk for aggression and antisocial behaviour have been undertaken, particularly in Canada. What is known from existing research is that the developmental outcomes for girls extend far beyond continued involvement in aggressive behaviour, criminality and psychiatric disorder. Girls involved in aggressive and antisocial behaviour are at higher risk for early sexual involvement and pregnancy (77, 78) and when they partner with older delinquent boys, their prospects for healthy adjustment are particularly compromised (79). As young adults they experience higher rates of divorce and child custody loss (80, 81).

In one of the few Canadian studies of at-risk girls, Serbin and colleagues (8; 82) found that elevated childhood aggression was related to later problems in parenting and negative mental and social outcomes for young women and their offspring. These girls were more likely to leave school early, achieve limited occupational success and rely on social assistance to support themselves and their children. In sum, as girls involved in aggressive and antisocial behaviour move into adulthood, they appear to be at heightened risk for a wide range of psychiatric and social adjustment problems. More research is needed with girls at the highest level of risk to investigate the mechanisms that underlie continuity; it is equally if not more important to pursue research on what factors support girls in desistance.

Research on the developmental repercussions of involvement in aggressive and antisocial behaviour has pushed further to examine effects on physical health. The physical health burden that is associated with antisocial behaviour is just beginning to be realized in population based samples (83, 84) And the interplay between mental and physical health may be particularly important for females. According to the Institute of Medicine, women are the primary consumers of mental health services and they may experience unique health concerns as they enter into early adulthood and their child-bearing and child-rearing years. Adolescence and early adulthood is a time when the majority of serious mental disorders onset and the chronic and recurrent course of mental disorder during this developmental window is likely to have significant implications for women's physical health and parenting capacity. While normative samples are providing insights into the relationship between developmental trajectories of antisocial behavior and mental and physical health outcomes during the transition to adulthood (83), virtually nothing is known about this relationship among adolescent girls and young women at the highest level of risk.

Our existing CIHR-NET data and proposed follow-up into early adulthood provides a unique opportunity to better understand a wide range of concurrent and prospective mental health, social and physical health outcomes associated with adolescent girls' involvement in aggressive and antisocial behaviour. Findings to date confirm a high rate of concurrent and prospective mental health problems in this sample (13). Expanding our investigation to new domains, such as early pregnancy, problems with parenting, and health status will produce new knowledge about the scope of developmental repercussions of aggressive and antisocial behaviour. Linking these outcomes with prospectively gathered risk and protective factors affords the opportunity to model complex relationships that will help us to better understand developmental processes in this population.

SPECIFIC AIMS

The specific aims of the proposed research include:

LEVEL I: PSYCHOMETRIC VALIDATION AND PROFILING

0. Confirmation of structural properties and measurement reliability: Initial analyses will evaluate structural properties and measurement invariance (MI) of constructs within a structural equation modeling (SEM) framework. We employed this strategy using our first wave of data to refine our key constructs and test whether item content was being perceived and interpreted exactly the same way across sub-groups (e.g., sexes, age and minority groups). Establishing MI provides evidence for a common quantitative metric and helps to ensure that we are not comparing 'apples' and 'oranges' when mapping development across time (85); such analyses are an essential first step to the interpretation of subsequent hypotheses testing (86).
1. Confirmation of indicators that comprehensively map the construct space of aggression and antisocial behaviour to include gender sensitive items, such as social aggression, across adolescence and early adulthood and evaluate whether expanded item pools assist in predicting prognosis among high-risk females.
2. Establish a comprehensive profile of the mental health diagnoses and symptoms of girls involved in aggressive and antisocial behaviour in early, middle and late adolescence/early adulthood and evaluate the relation of early mental health problems to later mental health status.
3. Compilation of a comprehensive profile of exposure to risk and protective factors at multiple levels of the social ecology (from individual to social context) — and a profile of behavioural, social and physical health outcomes -- for girls at high-risk in Canada vs. the US. A separate comparative analyses will be conducted to contrast Canadian girls and boys at high-risk.

Based on prior research and our findings to date, we predict that the scope of mental health disorders and symptoms, exposure to risk factors, and the range of behavioural, social and physical health problems will increase over development as girls move toward young adulthood, as a function of cumulative and potentiation effects. Based on the gender paradox hypothesis (87), whereby disorders that are atypical in one sex manifest themselves with greater severity when present, we predict that the scope of these problems in high-risk girls will be significantly greater than those noted in high-risk boys. In light of exposure to racial discrimination, social marginalization and

higher level of exposure to multiple risk factors, we also predict that girls of Aboriginal and African American heritage will experience a great scope of mental health, social and physical health problems.

LEVEL II: MAPPING DEVELOPMENTAL TRAJECTORIES FROM EARLY ADOLESCENCE INTO ADULTHOOD

4. A small, albeit growing, body of research is accumulating regarding whether comparable developmental pathways of antisocial behaviour exist among females and males (42, 44, 88 - 93). The majority of researchers acknowledge that the mean or modal course of development fails to capture significant and important variance in the population. Developmental psychopathology researchers have been mindful of the heterogeneity of development, advancing concepts such as multifinality and equifinality to capture the fact that the same risk and protective factors can lead to different developmental outcomes and exposure to different risk and protective factors can lead to the same outcome (94). Findings generally confirm that there is significant heterogeneity masked by average risk and protective factor scores or prototypic diagnoses (21). Such findings underscore the need to go beyond simple analyses that describe the average profile within a given sample. With the emergence of semi-parametric group based modeling (95, 96) and the more generalized extension – growth mixture modeling (97, 98), we are now able to identify sub-groups of individuals based on common profiles of development across time.

The present study extends research based on large-scale normative cohorts by investigating developmental trajectories within a high-risk sample. Research with high-risk samples provides a unique and unprecedented opportunity to examine the role of key risk and protective factors on developmental trajectories and outcomes. High risk samples of girls are required, in part, because of the small numbers of antisocial and aggressive girls captured in population based research. For example, the most well known longitudinal study of developmental psychopathology (Dunedin Study) contained only 40 girls classified as life-course persistent (99). By examining a large sample of girls at high-risk for aggressive and antisocial behaviour we can potentially identify subgroups with distinct risk profiles and mental health needs. Such findings would highlight the fact that 'one size does not fit' all and interventions must be 'tailored to fit' the needs of girls who present with the same problems but have reached this point through quite different paths.

LEVEL III: EXAMINING THE ROLE OF RELATIONAL CONTEXT AND EXPERIENCES ON ADJUSTMENT IN GIRLS AT HIGH-RISK

Girls and boys may be more similar than different with respect to risk and protection from engagement in aggression and violence, but the differences that are apparent may be critical to understanding the development, course and treatment of these problems in girls and women. Close relationships, including those with parents/caregivers and romantic partners, may be of greater significance in understanding aggression and violence in girls. A number of predictions will be tested in relation to the relational model of girls' development. Analyses will examine the direct, moderated and mediated role of relational factors in accounting for girls' involvement in aggressive and antisocial behaviour. Based on prior research and our findings to date, we predict that: 1) relationship disruption (as evidenced in variables such as removal from parental care; relinquishment of guardianship) and impaired quality of caregiving relationships (as evidenced in variables such as insecure attachment; exposure to neglect) will be associated with higher levels of aggressive and antisocial behaviour in girls, and 2) the presence of a positive caregiving relationship will moderate the impact of risk exposure on level of aggressive and antisocial behaviour for girls but not to the same degree for boys.

LEVEL IV: INVESTIGATING THE ROLE OF CULTURAL AND SOCIAL CONTEXT

Questions about the role of cultural and social discrimination will be examined through quantitative methods, assessing rates of exposure to neighbourhood violence and discrimination, and qualitatively through focus groups and in-depth interviews. We predict that girls' exposure to neighbourhood violence and cultural discrimination will be related to their involvement in aggressive and antisocial behaviour beyond effects due to poverty. Furthermore we believe that continued experiences of discrimination will present a barrier for girls in moving toward healthy young adulthood. Our focus groups and in-depth interviews will assist us in understanding the lived experiences of discrimination and 'turning point' life events thus complementing our quantitative

investigations.

METHODS

COHORTS

- **Vancouver Girls and Boys Cohort**

Time 1: Participants at Time 1 were 180 adolescents (82 females, 98 males,) between the ages of 12 and 18 ($M = 15.3$, $SD = 1.5$) drawn from a maximum (28%) and minimum (29%) security custody center, a provincial assessment center (45%) in British Columbia's lower mainland directed under the direction of the Ministry of Children and Family Development to provide assessment and community planning for youth with severe conduct problems (Maples Adolescent Centre). Youth participating in the study came from regions across British Columbia, with approximately 50% living in the lower mainland. The ethnic composition of the sample included 66% ($n = 118$) Caucasian, 23% ($n = 41$) Aboriginal, and 11% ($n = 20$) of youth of other ethnicity. Attempts were made to enrol every new female admission to the custody and assessment centers who was then matched with a same aged male youth. Exclusion criteria for this sample were comprised of (a) IQ below 70, or (b) any significant Axis I psychotic symptoms. Youth agreeing to participate in this portion of the research study completed individual assessments comprised of semi-structured clinical interviews, computerized diagnostic assessments, and a battery of self-report measures. All sessions were digitally recorded, and informed consent was obtained from both the youth and his or her legal guardian before beginning the testing sessions. Confidentiality was ensured by using participant identification numbers on all of the testing materials. Ethics approval was obtained from the university and institutional review boards prior to the start of the study. Preliminary analyses using the first wave of data collection have confirmed the comparability of relationships between a wide range of risk/protective factors and outcomes across the two sites. Time two data collection will be completed by April 2007 with an anticipated retention rate of 85%.

- **Virginia Cohort**

Time 1. The sample included 140 adolescent females incarcerated at a correctional facility in state of Virginia. Participants ranged from 13 to 19 years of age ($M = 16.2$, $S.D. = 1.3$). The majority of participants belonged to an ethnic minority group, with 49% self-identifying as African American, 3% as Native American, 2% as Hispanic and the remaining 37% identified as Caucasian. All female adolescents sentenced to custody during a 14 month period were approached to participate in the study. Approximately 93% of the girls participated in the research. Active voluntary consent was obtained from participants and active parental consent was obtained for all girls under the age of 18. A Federal Certificate of Confidentiality from the Department of Health and Human Services was obtained in order to ensure the investigators could not be forced (e.g., by court subpoena) to disclose information that may identify participants in any federal, state, or local civil, criminal, administrative, legislative, or other proceedings. All measures were approved by the Institutional Review Board at the University of Virginia and as well as the Internal Review Board at the Virginia Department of Juvenile Justice which oversees the Culpeper Correctional Facility (CJCC). Given the standardization across sites, the procedure and measures administered in the Virginia cohort were identical to those administered in Vancouver. Youth participating in the study resided in various locations across the state. Time 2 data collection is now complete and includes 119 girls (85% of the original sample).

Gender and Aggression Research Protocol

The assessment protocol developed in our CIHR-NET draws on instruments used in the Pathways to Desistance Study, a large scale McArthur funded project of development in atypical populations in the United States; Dr. Debra Pepler's large scale longitudinal studies of aggressive behaviour and adjustment children and adolescents in Ontario; and a thorough review of the psychometric properties and research findings for measures appropriate to the developmental and clinical/forensic status of our sample. The protocol contains well established measures of risk and protective factors, mental health, social-relational functioning and aggressive and antisocial behaviour. Due to the scope of the protocol it is not possible to summarize it in the text of this proposal; thus the full baseline protocol and table summarizing all measures, their psychometric properties and source is included in Appendices 1.D and 1.E.. In brief, the protocol taps each of the following domains:

❖ Cultural heritage, SES, family composition, caregiving contexts, parental and sibling involvement in delinquency.	❖ Mental health functioning, including diagnostic interview and self-report measures.
❖ Exposure to community violence.	❖ Self-Esteem, Social Attitudes & Personality
❖ Quality of parental care and exposure to maltreatment and trauma.	❖ Emotional Functioning
❖ Attachment and relationship quality with parents, peers and romantic partners.	❖ Risk/Needs Assessment
	❖ Aggression & Antisocial Behaviour

Adaptations to the follow-up protocol include the addition of well-validated measures in the following domains:

❖ Employment, adjustment, and satisfaction.	❖ Physical health and well-being.
❖ Cultural and gender discrimination.	❖ Parental adjustment and functioning.

In addition, equivalency adaptations will need to be made in the domains of psychiatric diagnosis and symptoms reporting for assessment of youth 18 years and over (see Appendix 1.D – Summary of Assessment Protocol and Appendix 1.E – Full Assessment Protocol). These adjustments should not impair comparability of findings across age as data are collected at both the symptom and diagnosis level. Adaptations to the attachment interview will shift from a primary focus on parents to peers and romantic partners.

Procedure

Procedures used for data collection in Waves I and II will be followed in all subsequent waves of data collection. Thus, each participant will be contacted (consent to contact has already been secured in Wave II assessments) and explained the nature of their participation. For participants under the age of 18, guardian consent will be required for continued participation. Participants will be scheduled for two half-day assessment blocks during which they will complete approximately 3-4 hours of testing. We have found that with appropriate breaks and support, youth are able to manage this demand; where necessary, smaller blocks of assessment will be scheduled. For youth in outlying communities, research assistants will travel and book several days of assessment sessions to accommodate multiple participants. In light of the demands of participation and investment in continued participation in follow-up, youth will be paid \$75.00 for completing each wave of follow-up. Consent will be sought for access to official arrest data collected through the Ministry of Children and Family Development official records system in British Columbia (CORNET) and subsequently through the adult criminal records system. Similarly, in Virginia participants will be tracked through police record checks and the VA-DJJ correctional system, which records offences that occur at the state and national level as well as at both the juvenile and adult level.

Focus Groups and Interviews: As outlined above, understanding girls' experiences of cultural and social discrimination is a key component of our research. Dr. Margaret Jackson has extensive experience with this methodology, particularly working with ethno-cultural marginalized girls. As an example of this approach, we have attached our report to the National Crime Prevention Centre based on focus groups and interviews with inner-city Aboriginal Canadian girls (see Appendix 1.F – Community Mobilization Program Report). Two-hour focus groups consisting of 20 girls, randomly selected across age, will be organized at each site in each of the five years of the research program. Questions will be developed in conjunction with the girls themselves. These group discussions will be audio-taped and reviewed for themes regarding the experience of discrimination and violence in their lives and communities. Other emergent themes will be coded as they arise. A follow-up focus group will be held to discuss these themes with the girls. A subset of 10 girls will complete one-hour personal interviews specifically focused on 'turning point' memories – memories about events that changed their lives in some way. Both the questions and the responses are developed through an interactive discourse between the interviewer and the respondent (100). Employing an intersectional lens (101), these memories will be reviewed using McLean and colleagues (72, 73) system for coding complexity of meaning-making in relation to the self and personal relationships. This is a well-validated coding system which has been successfully used with adolescents across numerous studies (102, 103, 104). Because of our interest in life course events

we will attempt to follow the same girls in focus groups and interviews over the course of the research program. To support their continued involvement, we will contact these participants at 3 month intervals and provide them with an honorarium of \$40.00 for their participation plus a small travel allowance of \$15.00 per focus group/interview.

Data Analytic Plan

Our research team possesses strong skills in both advanced statistical modelling (Dr. Candice Odgers) and qualitative methods (Dr. Margaret Jackson). All team members have applied and published using the methods described below and we have a track record of successfully handling issues such as missing data, data reduction, and statistical power. We use various multivariate procedures, but when the complexity of modelling analyses impedes communicating findings to non-specialists, we present commonly-understood statistics and graphical presentations of the data to increase the translational component of our work.

Level 1. Psychometric Validation and Mental Health Profiling

Mental health and risk/protective factor profiling. Prevalence rates of antisocial behaviour and aggression, mental health problems, risk and protective factors will be estimated using basic descriptive techniques. Differences in prevalence rates across sex, age and cultural groups will be documented along with appropriate statistical tests of between-group differences (e.g., odds ratios, analysis of variance).

Psychometric validation of key constructs. When psychological constructs – such as aggression - are measured we cannot assume that the same ‘ruler’ or metric has been used at each age and subgroups (e.g., sex and cultural groups). Thus, measurement invariance of our antisocial behaviour and aggression scales will be tested using multiple-group confirmatory factor analysis (M-Group CFA), a technique that compares groups of individuals on latent variables underlying item sets (105).

Level II-A. Mapping Developmental Trajectories from Early Adolescence into Adulthood

Latent growth curve analysis (LGCA: 85, 106) will be applied to map the development of antisocial behaviour and aggression from early adolescence into adulthood. LGCA has the advantage of summarizing information from across assessment periods in relatively few *developmentally meaningful* parameters. In this case, LGCA will provide an estimate of both fixed (average levels of antisocial behaviour for the sample) and random effects (estimates for each individual) of (1) initial levels of antisocial behaviour and aggression at baseline and (2) rates of change in antisocial behaviour and aggression across the follow-up period. Full model specification is provided elsewhere (85). Models will be fitted in Mplus Version 4.2 (107) using maximum likelihood estimation.

We will also test for the existence of key subgroups (e.g., life-course persistent versus adolescent-limited subtypes) within our high-risk samples of females using general growth mixture modeling (GGMM) (97, 98). GGMM is an extension of LGCA described above, where, unlike LGCA, key parameters of the growth process are allowed to vary by trajectory class. GGMM has been applied to map heterogeneity in the developmental course of antisocial behaviour among normative populations (88, 89, 108, 109, 110) and will be used here to extend this approach into high-risk clinical samples of females.

Level II-B. LINKING RISK AND PROTECTIVE FACTORS TO DEVELOPMENTAL TRAJECTORIES AND ADULT OUTCOMES

Both LGCA and GGMM can be easily extended to: (1) test for differences in developmental patterns across defined groups (e.g., gender and cultural groups), (2) evaluate the impact of multiple predictors of change, and (3) evaluate differential outcome by each antisocial behaviour subgroup (83). For example, we will be able to test whether, males and females from the Canadian samples follow the same developmental trajectories of aggressive behaviour, evaluate the relative impact of key risk and protective factors on the developmental course of aggression through key developmental windows, and evaluate whether specific trajectories of aggression predict differential adult outcomes. Across each set of analyses special consideration will be given to (1) the inclusion of ‘gender sensitive indicators’ of antisocial and aggressive behaviour, (2) relational factors that may protect females as they transition through key developmental periods, and (3) adult outcomes that have been identified as particularly important for females (e.g., physical health outcomes, parenting and violence within the context of close relationships).

LEVEL III: EXAMINING THE ROLE OF RELATIONAL CONTEXT AND EXPERIENCES ON ADJUSTMENT IN GIRLS AT HIGH-RISK

A set of analyses has been designed to test hypotheses about how relational factors are linked to intra-individual change in antisocial behaviour trajectories and adult outcomes. By extending the LGCA models we can estimate how life experiences (e.g., trauma/loss vs. romantic relationship with pro-social partner) modify the slope and intercept of a behavioural and social functioning *within individuals developing across time*. These models also allow us to rule out self-selection effects, whereby an individual's past antisocial behaviour increases his/her risk of encountering subsequent life events. Intra-individual change will be further investigated using multiple group and cross-lagged regression models that help to disentangle the temporal ordering of the relationship between aggression and key life events (111, 112).

LEVEL IV. INVESTIGATING THE ROLE OF CULTURAL AND SOCIAL CONTEXT

As previously noted, our investigation of cultural and social marginalization will utilize both quantitative and qualitative approaches. Responses on a well-validated measure of racial discrimination will be used to quantify level of experienced discrimination. The direct, mediated and moderated role of discrimination on outcomes, concurrently and prospectively, will be evaluated. In addition, focus groups will be reviewed for emergent themes related to the role of culture and gender. Interviews will be coded for 'turning point' memories as previously summarized.

Attrition and Missing Data. Our goal is to keep sample attrition to an absolute minimum; based on estimates from other normative (e.g., Moffitt & Caspi, Dunedin Study; 113) and high-risk (e.g., Mulvey, Pathways to Desistance; 114) cohort studies we estimate 5% rate of attrition per year. We are currently implementing a number of strategies designed to minimize attrition over the follow-up period (e.g., 6 month follow up calls, mail out newsletters, and ongoing tracking through official records). In the analyses, Full Information Maximum Likelihood (FIML) will be used to maximize the use of all available data points. FIML is one of the most robust and advanced methods for dealing with missing data (115,116,117) and has the advantage of adjusting model results due to selective attrition.

Power Analyses.

Power Analyses were performed with: *Power and Precision version 2.1 (steps 1 & 2) and Mplus version 4.13 and SAS version 9.0 (Step 3)*. There are three ways to evaluate statistical power in the Gender and Aggression Project, all of which suggest that the study has sufficient power to detect small to medium associations.

Analysing categorical comparison groups. Power analyses for categorical data (118) show that the minimum detectable odds ratios range from 1.8 to 3.5 across female subgroups (e.g., Vancouver and Virginia sample) and from 2.3 to 2.7 across male and females subgroups, *given* (a) adult outcomes with expected prevalence rates ranging from 20% to 55% and (b) risk factors whose prevalence ranges from 30% to 50%. **Analysing continuously distributed data.** The majority of developmental analyses will rely on continuously distributed scales to quantify aggression and associated risk and protective factors. Overall, the study has 77% power to detect a small to medium size correlation of $r=.15$ and 95% power to detect a medium size correlation of $r = .24$ (Cohen 1988). When making comparisons across sex, the study has over 80% power to detect a medium size difference across sexes, $r=.24$, which is appropriate given the emphasis on findings that are large enough to be clinically significant and impact practice and policy related to girls involvement in aggression. **Power in latent growth curve models.** Given that many of our analyses will be testing developmental trajectories over time, we have also calculated power estimates for our LGCA. Power for LGCA combines information regarding both the number of individuals and the number of repeated observations (106). Thus for our sample size of 320 individuals, assessed on 5 separate occasions, with data present for approximately 80% of the sample at each period, we conservatively estimate having approximately 1000 data points across occasions and individuals. Power curves show that we can detect a small-to-medium main effect of change over the 5 time periods. One of the advantages of applying LGCA is that it yields higher power for detecting group differences than more traditional methods of measuring change (e.g., repeated analysis of variance) (119, 120) and, therefore, relatively small group differences can be reliably detected with samples of approximately 100 individuals.

Time Line

The time line for data collection is summarized in Table 1 for girls and Table 2 for boys (see Appendix 1.C – Description of Cohorts and Projection of Follow-Up Waves). Because this research builds on our existing cohorts using a highly similar protocol, data collection can begin following a brief two-month start up period in which we will train more interviewers, set up interviews and assemble the final research protocol. Data collection will be continuous over the five year period with the third wave completed by the 9th month of the fifth year. Data analysis and dissemination will be ongoing throughout the term of the grant as new findings emerge from waves III and IV.

ETHICS

We are building on a longitudinal program of research which has received full ethical approval at both Simon Fraser University and the University of Virginia. We anticipate that our application for approval for additional follow-up points will be well received and we have already established procedures for managing risk and disclosure of abuse and victimization of others.

RESEARCH TEAM

Dr. Marlene Moretti holds a University Professorship at Simon Fraser University. She is experienced in leading major research programs, having held a number of major research grants, and currently serves as the nominated Principal Investigator on the multi-site CIHR New Emerging Team (NET) grant (\$1.3 million) which has been highly productive (see Appendix 1.H – Mid-Term Report) and resulted in the cohorts discussed in this proposal. Dr. Moretti also has extensive experience in knowledge translation through her participation as an invited member of the advisory committee for the development of the BC Child and Youth Mental Health Plan and as a member of the Conduct Disorder Experts Table for the BC Ministry of Children and Family Development. Her research focuses on adolescent development and psychopathology, including developmental trajectories, risk and protective factors, and the role of attachment in promoting healthy adolescent development. She has published widely and has received a number of awards including the Dean's Medal for Excellence in Teaching and Research and the Outstanding Alumni Award for Academic Achievement from Simon Fraser University.

Dr. Candice Odgers is a quantitative psychologist, who has served as a co-investigator and statistical consultant on a number of externally-funded national and international studies on aggression. She has published extensively in the areas of female adolescent offenders and violence, and was recently awarded the Alice Wilson Medal by the Royal Society of Canada and the Early Career Achievement Award by the American Psychological Association (Division 41) for her research related to sex, gender and aggression. Currently, Dr. Odgers is a Postdoctoral Research Trainee at Simon Fraser University and King's College London and a co-investigator on the CIHR-NET described in this proposal. As a co-investigator on this project, she will provide expertise related to advanced longitudinal data analyses exploring the developmental course of antisocial behavior in relation to physical-health outcomes

Dr. Dickon Reppucci currently serves as the director of graduate research training in community psychology at the University of Virginia. Dr. Reppucci's publication record includes close to 100-refereed papers, 11 books and over 50 book chapters on topics including sexual abuse, child custody, and prevention/intervention in juvenile justice. Among others, he is co-author of "*The Sexual Abuse of Children: A Comprehensive Guide to Knowledge and Intervention Strategies*", which established standards in field. Recently, his research has involved close collaboration with the Virginia Department of Juvenile Justice as a co-investigator on the CIHR-NET Gender and Aggression Project. Dr. Reppucci is the recipient of the Community Research and Action Award for distinguished contribution to theory and research in community psychology and, most recently (2007), received the American Psychology-Law Society award for Outstanding Teaching and Mentorship.

Dr. Margaret Jackson is a Professor in the School of Criminology at Simon Fraser University, and Director of both the Simon Fraser University Institute for Studies in Criminal Justice Policy and FREDa, a centre undertaking research on violence against women and children. Her research areas of interest include the above related topic areas as well as the sociocultural factors impacting marginalized girl. She has extensive experience in conducting and publishing qualitative research involving focus groups and individual interviews of youth, especially young women. Dr. Jackson has published and presented widely on those subjects.

References

1. Moretti, M.M., Holland, R., Braber, K., Cross, S., & Obsuth, I. (2006). *Connect: Working with Parents from an Attachment Perspective. A principle-based manual*. Ministry of Children and Family Development of British Columbia.
2. Obsuth, I., Moretti, M.M., Holland, R., Braber, C., & Cross, S. (2006). Conduct Disorder: New directions in promoting effective parenting and strengthening parent-adolescent relationships. *Canadian Child and Adolescent Psychiatry Review*, 15(1), 6-15.
3. Capaldi, D.M., Kim, H.K., & Shortt, J. W. (2004). Women's Involvement in Aggression in Young Adult Romantic Relationships: A Developmental Systems Model. In: *Aggression, antisocial behaviour, and violence among girls: A developmental perspective*. Putallaz, M., Bierman, K. L. (Eds.). New York, NY, US: Guilford Publications, pp. 223-241.
4. Foster, E.M., Jones, D.E. (2005). The High Costs of Aggression: Public Expenditures Resulting From Conduct Disorder. *American Journal of Public Health*, 95(10), 1767-1772.
5. McCrone, P., Knapp, M., & Fombonne, E. (2005). The Maudsley long-term follow-up of child and adolescent depression: Predicting costs in adulthood. *European Child & Adolescent Psychiatry*, 14(7), 407-413.
6. Ontario, Standing Committee on Social Development, Children at Risk, July 1994.
7. Barrett, B., Byford, S., Chitsabesan, P. (2006). Mental health provision for young offenders: Service use and cost. *British Journal of Psychiatry*, 188(6), 541-546.
8. Serbin, L.A., Stack, D.M., DeGenna, N. (2004). When Aggressive Girls Become Mothers: Problems in Parenting, Health, and Development across Two Generations. In: *Aggression, antisocial behaviour, and violence among girls: A developmental perspective*. Putallaz, M., & Bierman, K.L. (Eds.) New York, NY, US: Guilford Publications, 262-285.
9. Savoie, J. (1999). Youth violent crime. Canadian Centre for Justice Statistics: Juristat, 19(13).
10. Statistics Canada, 2005, Juristat: Youth court statistics 2003/2004. Catalogue number 85-002-XPE, Volume 25, no. 4.
11. Puzzanchera, C., Stahl, A.L., Finnegan, T.A., Tierney, N., Snyder, H.N. (2003). Juvenile court statistics 1998. Washington, D.C.: U. S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention, National Center for Juvenile Justice.
12. U.S. Surgeon General 2001, Youth Violence: A report of the Surgeon General. Available: www.surgeongeneral.gov/library/youthviolence/report.html#message [2004, 27 January].
13. Odgers, C. L., Moretti, M. M., Burnette, M. L., Chauhan, P., & Reppucci, N. D. (in press). A latent variable modeling approach to identifying serious and violent female juvenile offenders. *Aggressive Behaviour*.
14. Burnette, M.L., & South, S.C., & Reppucci, N.D. (in press). Cluster B personality pathology in incarcerated girls: Structure, comorbidity, and aggression. *Journal of Personality Disorders*.
15. Peled, M., & Moretti, M. M. (2007). Rumination on anger and sadness in adolescence: Fueling of fury and deepening of despair. *Journal of Clinical Child and Adolescent Psychology*, 36, 66-75.
16. Moretti, M. M., Obsuth, I., Odgers, C., & Reebye, P. (2006). Exposure to maternal versus paternal partner violence, PTSD and aggression in adolescent girls and boys. *Aggressive Behaviour*, 32 (4), 385-395.

17. Odgers, C., Reppucci, N. D., & Moretti, M. M. (2005). Nipping psychopathy in the bud: An examination of the convergent, predictive and theoretical utility of the PCL-YV among adolescent girls. *Behavioural Sciences and the Law*, 23, 1-21.
18. Penney, S. & Moretti, M. M. (2005). Psychopathy, concurrent aggression and antisocial behaviour in high risk adolescent girls and boys. *International Journal of Forensic Mental Health*, 4 (1), 19-37.
19. Odgers, C., Moretti, M. M. & Reppucci, N. D. (2005). Examining the science and practice of violence risk assessment with female adolescents. *Law & Human Behaviour*, 29, 7-27.
20. Moretti, M. M., Catchpole, R., & Odgers, C. (2005). The dark side of girlhood: Recent trends, risk factors and trajectories to aggression and violence. *Canadian Child and Adolescent Psychiatry Review*, 14, 32-38.
21. Odgers, C., Burnette, M., Chauhan, P., Moretti, M., & Repucci, D. (2005). Misdiagnosing the problem: Mental health profiles of incarcerated juveniles. *Canadian Child and Adolescent Psychiatry Review*, 14, 39-44.
22. Moretti, M. M., & Peled, M. (2004). Adolescent-parent attachment: Bonds that support healthy development. *Pediatrics & Child Health*, 9 (8), 551-555.
23. Odgers, C. & Moretti, M. M. (2002). Aggressive and antisocial girls: Research update and challenges. *International Journal of Forensic Mental Health*, 1, 103-119.
24. Moretti, M. M., & Odgers, C. (2006). Sex differences in the functions and precursors of adolescent aggression. *Aggressive Behaviour*, 32 (4), 373-375.
25. Moretti, M. M., Penney, S., Obsuth, I., & Odgers, C. (2006). Family lessons in attachment and aggression: The impact of interparental violence on adolescent adjustment. In J. Hamel & T. Nicholls (Eds.), *Family Therapy for Domestic Violence: A Practitioner's Guide to Gender-Inclusive Research and Treatment*. (pp. 191-214). NY: Springer.
26. Moretti, M. M., Leadbeater, B., & Marshall, A. (2006). Stepping into community-based research: Preparing students to meet new ethical and professional challenges (pp. 232-247). In B. Leadbeater, E. Banister, C. Benoit, M. Jansson, A. Marshall & T. Riecken (Eds.), *Ethical Issues in Community-Based Research with Children and Youth*. University of Toronto Press.
27. Moretti, M. M., DaSilva, K., & Holland, R. (2004). Aggression and violence from an attachment perspective: Gender issues and therapeutic implications. In M. Moretti, C. Odgers, & M. Jackson (Eds.), *Girls and aggression: Contributing factors and intervention principles*. *Girls and aggression: Contributing factors and intervention principles* (pp. 41-57). Kluwer-Plenum.
28. Odgers, C. L., Schmidt, M., & Reppucci, N.D. (2004). Reframing risk assessment for adolescent females. In, M. M. Moretti, C. L. Odgers, & M. A. Jackson (Eds.), *Girls and Violence: Contributing Factors and Intervention Principles* (pp. 195-210). Series: Perspectives in Law and Psychology. New York, NY: Kluwer Academic/Plenum Publishers.
29. Moretti, M., Odgers, C. L., & Jackson, M. (2004). Girls and aggression: A point of departure. In, M. M. Moretti, C. L. Odgers, & M. A. Jackson (Eds.), *Girls and Violence: Contributing Factors and Intervention Principles* (pp. 1-5). Series: Perspectives in Law and Psychology. New York, NY: Kluwer Academic/Plenum Publishers.
30. Antonishak, J., Reppucci, N.D., & Mulford, C. F. (2004) Girls in the justice system: Treatment and intervention, In M. Moretti, C. Odgers, & M. Jackson (Eds) *Girls and Aggression: Contributing Factors and Intervention Principles*, New York: Kluwer Press.
31. Moretti, M. M. & Holland, R. (2003). The journey of adolescence: Transitions in self within the context of attachment relationships (pp. 234-257). In S. Johnson & V. Whiffen (Eds.), *Attachment Processes in Couple and Family Therapy*, Guildford: New York.

32. Moretti, M. M., Holland, R., & Moore, K. (2002). Youth at risk: Systemic intervention from an attachment perspective (pp. 233-252). In M. V. Hayes and L. T. Foster (Eds), *Too small to see, too big to ignore*. Victoria: Western Geographic Series, University of Victoria.
33. Lee, Z., Penney, S. R., Odgers, C. L., & Moretti, M. M. (manuscript under review). A confirmatory factor analysis of the Integrated Framework of Aggression in High-Risk Youth.
34. Archer J. 2000. Sex differences in aggression between heterosexual partners: A meta-analytic review. *Psychological Bulletin*, 126, 651-680.
35. Werner, N.E., & Crick, N.R. (2004). Maladaptive peer relationships and the development of relational and physical aggression during middle childhood. *Social Development*, 13(4), 495-514.
36. Prinstein, M., Boergers, J., & Vernberg, E. (2001). Overt and relational aggression in adolescents: Social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology*, 30(4), 479-491.
37. Moffitt, T.E., Arseneault, L., Jaffee, S.R., Kim-Cohen, J., Koenen, K.C., Odgers, C.L., Slutske, W., & Viding, E. (2007), DSM-V Conduct Disorder: Research needs for an evidence base. *American Psychiatric Association document*: www.advancingdx.psych.org.
38. Fergusson, D.M., & Horwood, L.J. (2002). Male and female offending trajectories. *Development and Psychopathology*, 14(1), 159-177.
39. Moffitt, T., & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescence-limited antisocial pathways among males and females. *Development and Psychopathology*, 13(2), 355-375.
40. Herba, C.M., Tranah, T., & Rubia, K. (2006). Conduct Problems in Adolescence: Three Domains of Inhibition and Effect of Gender. *Developmental Neuropsychology*, 30(2), 659-695.
41. Ilomäki, E., Viilo, K., & Hakko, H. (2006). Familial risks, conduct disorder and violence: A Finnish study of 278 adolescent boys and girls. STUDY-70 workgroup. *European Child & Adolescent Psychiatry*, 15(1), 46-51.
41. Brennan, P.A., Hall, J., Bor, W., Najman, J.M., & Williams, G. (2003). Integrating biological and social processes in relation to early-onset persistent aggression in boys and girls. *Developmental Psychology*, 39(2), Special issue: Violent children, 309-323.
42. Moffitt, T., Caspi, A., & Rutter, M., & Silva, P. (2001). *Sex differences in antisocial behaviour: Conduct disorder, delinquency, and violence in the Dunedin Longitudinal Study* New York: Cambridge Univ. Press.
43. Moffitt, T.E. (1994). Natural histories of delinquency. In: *Cross-national longitudinal research on human development and criminal behaviour*. Wietekamp, E., & Kerner, H.J. (Eds.) Dordrecht: Kluwer Academic Press, pp 3-61.
44. Silverthorn, P., & Frick, P.J. (1999). Developmental pathways to antisocial behaviour: The delayed-onset pathway in girls. *Development and Psychopathology*, 11, 101-126.
45. Silverthorn, P., Frick, P., & Reynolds, R. (2001). Timing of onset and correlates of severe conduct problems in adjudicated girls and boys. *Journal of Psychopathology and Behavioural Assessment*, 23, 171-181.
46. Pepler, D.J., Craig, W.M., & Connolly, J.A. (2006). A developmental perspective on bullying. *Aggressive Behavior*, 32(4), 376-384.
47. Pepler, D.J. & Craig, W.M. (2005). Aggressive girls on troubled trajectories: A developmental perspective. In: *The development and treatment of girlhood aggression*. Pepler, D.J., Madsen, K.C., Webster, C., & Levene, K.S., Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 2005. pp. 3-28.
48. Moore, T.E., & Pepler, D.J. (2006). Wounding words: Maternal verbal aggression and children's adjustment. *Journal of Family Violence*, 21(1), 89-93.

49. Borum, R., Bartel, P., Forth, A. (2002). *Manual for the Structured Assessment of Violence Risk in Youth (SAVRY)*. Tampa, FL: University of South Florida.
50. DeMatteo, D., & Heilbrun, K., & Marczyk, G. (2005). Psychopathy, risk of violence, and protective factors in a noninstitutionalized and noncriminal sample. *International Journal of Forensic Mental Health*, 4(2), 147-157.
51. Luthar, S.S. (1993). Annotation: Methodological and conceptual issues in research on childhood resilience. *Journal of Child Psychology and Psychiatry*, 34(4), 441-453.
52. Rutter, M. (1987). Psychosocial resilience and protective mechanisms. *American Journal of Orthopsychiatry*, 57(3), 316-331.
53. DeMatteo, D., & Marczyk, G. (2005). Risk factors, protective factors, and the prevention of antisocial behavior among juveniles. In: *Juvenile delinquency: Prevention, assessment, and intervention*. Heilbrun, K., Goldstein, N.E., & Redding, R.E., New York, NY, US: Oxford University Press, pp. 19-44.
54. Costa, F.M., Jessor, R., & Turbin, M.S. (2005). The role of social contexts in adolescence: Context protection and context risk in the United States and China. *Applied Developmental Science*, 9(2), 67-85.
55. Henderson, A.D., & Jackson, M. (2004). Restorative health: Lessening the impact of previous abuse and violence in the lives of vulnerable girls. *Health Care for Women International*, 25(9), 794-812.
56. Kim-Cohen, J., Moffitt, T.E., & Caspi, A. (2004). Genetic and environmental processes in young children's resilience and vulnerability to socioeconomic deprivation. *Child Development*, 75(3), 651-668.
57. Bender, D., & Lösel, F. (1997). Protective and risk effects of peer relations and social support on antisocial behaviour in adolescents from multi-problem milieus. *Journal of Adolescence*, 20(6), Special issue: Risk and resilience in adolescent development, 661-678.
58. Levene, K., Walsh, M., Augimeri, L., & Pepler, D. (2004). Linking identification and treatment of early risk factors for female delinquency. In: *Girls and aggression: Contributing factors and intervention principles*. Moretti, M., Odgers, C., & Jackson, M. New York, NY, US: Kluwer Academic/Plenum Publishers, 147-163.
59. Vaillancourt, T., & Hymel, S. (2004). The social context of children's aggression. In: *Girls and aggression: Contributing factors and intervention principles*. Moretti, M.M., Odgers, C.L., & Jackson, M.A. New York, NY, US: Kluwer Academic/Plenum Publishers, pp. 57-73.
60. Moretti, M. M. (2007). *Family Lessons in Attachment and Aggression: Research Findings and Intervention Strategies*. Understanding Girls' Problem Behavior, Invited Talk, Örebro University, Örebro, Sweden.
61. Pepler, D., & Madsen, K.C., & Webster, C. (2005). The development and treatment of girlhood aggression. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
62. Ehrensaft, M.K. (2005). Interpersonal relationships and sex differences in the development of Conduct Problems. *Clinical Child and Family Psychology Review*, 8(1), 39-63.
63. Jiwani, Y., Steenbergen, C., & Mitchell, C. (Eds.). *Girlhood: Defining the Limits*, Montreal: Black Rose Books.
64. Miller-Johnson, S., Moore, B.L., Underwood, M., & Coie, J.D. (2005). African- American Girls and Physical Aggression: Does Stability of Childhood Aggression Predict Later Negative Outcomes? in *The Development and Treatment of Girlhood Aggression*, D.J. Pepler, K.C. Madsen, C. Webster, K.S. Levene. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers.
65. Brody, G. H.; Chen, Yi-Fu; M., McBride, V. (2006). Perceived discrimination and the adjustment of African American youths: A five-year longitudinal analysis with contextual moderation effects. *Child Development*, 77(5), 1170-1189.

66. Jackson, M. (2004). Race, Gender and Aggression: The Impact of Sociocultural Factors on Girls". In *Girls and Aggression: Contributing Factors and Intervention Principles*, M. Moretti, C. Odgers, and M. Jackson (Eds.). New York: Kluwer Academic Plenum Press.
67. Jackson, M., & Henderson, A. (2006). Restorative justice or restorative health: Which model best fits the needs of marginalized girls in Canadian society?", *Criminal Justice Policy Review*, 17, 234-251.
68. Jackson, M. (2006). Aboriginal Girls in Canada: Living histories of dislocation, exploitation and strength In *Girlhood: Defining the Limits*, Y. Jiwani, C. Steenbergen, and C. Mitchell (Eds.). Montreal: Black Rose Books.
69. Jackson, M. (2003). Race, Gender and Aggression: The Perception of Girls About the Violence in their Lives, *Humanities*, 2, 17-22.
70. Jackson, M., Moretti, M.M., Haley, J. (2005). The voices of marginalized girls: Understanding their needs as a first step in reducing violence and victimization. Final Report: National Crime Prevention Strategy's Community Mobilization Program: Vancouver.
71. McAdams, D.P. (1993). *The stories we live by: Personal myths and the making of the self*. New York: William Morrow.
72. McLean, K.C. & Pratt, M.W. (2006). Life's little (and big) lessons: Identity statuses and meaning-making in the turning point narratives of emerging adults. *Developmental Psychology*, 42(4), 714-722.
73. McLean, K. C., & Thome, A. (2003). Adolescents' self-defining memories about relationships. *Developmental Psychology*, 39, 635-645.
74. Costello, E. J., Mustillo, S. Erkanli, A., Keeler, G., & Angold, A. (2003). Prevalence in the development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*, 60, 837-844.
75. Keenan, K., Loeber, R., & Green, S. (1999). Conduct disorder in girls: A review of the literature. *Clinical Child and Family Psychology Review*, 2(1), 3-19.
76. Reebye, P., Moretti, M., & Wiebe, V. (2000). Symptoms of posttraumatic stress disorder in adolescents with conduct disorder: Gender differences and onset Patterns. *Journal of Canadian Psychiatry*, 45, 746-751.
77. Wakschlag, L.S.; Gordon, R.A., & Lahey, B.B. (2000). Maternal age at first birth and boys' risk for conduct disorder. *Journal of Research on Adolescence*, 10(4), 417-441.
78. Harachi, T., Fleming, C.B., & White, H.R. (2006). Aggressive behavior among girls and boys during middle childhood: Predictors and sequelae of trajectory group membership. *Aggressive Behavior*, 32(4), 279-293.
79. Stack, D.M., Serbin, L.A., & Schwartzman, A.E. (2005). Girls' Aggression Across the Life Course: Long-Term Outcomes and Intergenerational Risk. In: The development and treatment of girlhood aggression. Pepler, D.J., Madsen, K.C., Webster, C., & Levene, K. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 2005. pp. 253-283.
80. Bardone, A.M., Moffitt, T., & Caspi, A. (1996). Adult mental health and social outcomes of adolescent girls with depression and conduct disorder. *Development and Psychopathology*, 8(4), 811-829.
81. Giordano, P.C., Cernkovich, S.A., & Lowery, A.R. (2004). A long-term follow-up of serious adolescent female offenders. In: Aggression, antisocial behavior, and violence among girls: A developmental perspective. Putallaz, M., & Bierman, K. L.; New York, NY, US: Guilford Publications, pp. 186-202.
82. Serbin, L., & Karp, J. (2004). The intergenerational transfer of psychosocial risk: Mediators of vulnerability and resilience. *Annual Review of Psychology*, 55, 333-363.
83. Odgers, C.L., Caspi, A., Broadbent, J.M., Dickson, N.P., Hancox, R., Harrington, H., Poulton, R., Sears, M.R., Thomson, W.M., & Moffitt, T.E. (2007). Prediction of differential adult health burden by conduct problem subtypes in males. *Archives of General Psychiatry*, 64, 1-9.

84. Piquero, A.R., Gibson, C.L., Daigle, L., Piquero, N., & Tibbetts, S.G. (in press), Are life-course persistent offenders at risk for adverse health outcomes?
85. McArdle, J.J., & Nesselroade, J.R. (2003), Growth curve analysis in contemporary psychological research. In: *Handbook of psychology: Research methods in psychology*, Vol. 2, Schinka JA, Velicer WF, eds.: John Wiley & Sons Inc, pp. 447-480.
86. Byrne, B.M., & Watkins, D. (2003), The issue of measurement invariance revisited. *Journal of Cross-Cultural Psychology*, 34, 155-175.
87. Loeber, R., & Keenan, K. (1994). Interaction between conduct disorder and its comorbid conditions: Effects of age and gender. *Clinical Psychology Review*, 14(6), 497-523.
88. Broidy, L.M., Nagin, D.S., Tremblay, R.E., Bates, J.E., Brame, B., Dodge, K.A., Fergusson, D., Horwood, J.L., Loeber, R., Laird, R., Lynam, D.R., Moffitt, T.E., Pettit, G.S., & Vitaro, F. (2003), Developmental trajectories of childhood disruptive behaviours and adolescent delinquency: A six-site, cross-national study. *Developmental Psychology*, 39, 222-245.
89. Côté, S., Tremblay, R.E., Nagin, D.S., Zoccolillo, M., & Vitaro, F. (2002), Childhood behavioural profiles leading to adolescent conduct disorder: Risk trajectories for boys and girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 1086-1094.
90. Fergusson, D.M., & Horwood, J.L. (2002), Male and female offending trajectories. *Development and Psychopathology*, 14, 159-177.
91. Gorman-Smith, D., & Loeber, R. (2005), Are developmental pathways in disruptive behaviours the same for girls and boys? *Journal of Child and Family Studies*, 14, 15-27.
92. Schaeffer, C.M., Petras, H., Ialongo, N., Masyn, K.E., Hubbard, S., Poduska, J., & Kellam, S. (2006), A comparison of girls' and boys' aggressive-disruptive behaviour trajectories across elementary school: Prediction to young adult antisocial outcomes. *Journal of Consulting and Clinical Psychology*, 74, 500-510.
93. Xie, H., Cairns, B.D., Cairns, R.B., Pepler, D.J., Madsen, K.C., Webster, C., & Levene, K.S. (2005), The development of aggressive behaviours among girls: Measurement issues, social functions, and differential trajectories. In: *The development and treatment of girlhood aggression*. Mahwah, NJ: Lawrence Erlbaum Associates, pp. 105-136.
94. Rutter, M., & Sroufe, L.A. (2000). Developmental psychopathology: Concepts and challenges. *Development & Psychopathology*, 12(3), *Special issue: Reflecting on the past and planning for the future of developmental psychopathology*. 265-296.
95. Nagin, D.S. (2005). *Group-based modeling of development*. Cambridge: Harvard Univ. Press.
96. Nagin, D.S., & Land, K. (1993), Age, criminal careers, and population heterogeneity: Specification and estimation of a nonparametric, mixed poisson model. *Criminology*, 31, 327-362.
97. Muthén, B. (2004), Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data. In: *Handbook of quantitative methodology for the social sciences*, Kaplan D, ed. Newbury Park, CA: Sage Publications, pp. 345-368.
98. Muthén, B., & Shedden, K. (1999), Finite mixture modeling with mixture outcomes using the EM algorithm. *Biometrics*, 55, 463-469.
99. Odgers, C.L., Moffitt, T.E., Caspi, A., Broadbent, J.M., Dickson, N.P., Hancox, R., Harrington, H., Poulton, R., Sears, M.R., & Thomson, W.M. (in press-a). Female and male antisocial trajectories: From childhood origins to adult outcomes. *Development and Psychopathology*.
100. Holstein, J.A. & Gubrium, J.F. (2003). The life course. In: *Handbook of symbolic interactionism*. Reynolds, L.T., Herman-Kinney, N.J.; Walnut Creek, CA, US: AltaMira Press, pp. 835-855.

101. Cuádras, G.H. & Uttal, L. (1999). Intersectionality and in-depth interviews: Methodological strategies for analysing race, class, and gender. *Race, Gender and Class*, 6(3), 156-186.
102. McLean, K.C. (2005). Late adolescent identity development: Narrative meaning-making and memory telling. *Developmental Psychology*, 41, 683-691.
103. McLean, K.C. & Thorne, A. (2001). *Manual for coding meaning making in self-defining memories*. Unpublished manuscript. University of California, Santa Cruz.
104. McLean, K.C. & Thorne, A. (2003). Adolescents' self-defining memories about relationships. *Developmental Psychology*, 39, 635-645.
105. Sorbom, D. (1974). A general method for studying differences in factor means and factor structure between groups. *British Journal of Mathematical and Statistical Psychology*, 27, 229-239.
106. Muthén, B.O. & Curran, P.J. (1997). General longitudinal modeling of individual differences in experimental designs: A latent variable framework for analysis and power estimation. *Psychological Methods*, 2(4), 371-402.
107. Muthén, B. & Muthén, L.K. (1998-2006), *Mplus. 4.0 edition* Los Angeles: Muthén & Muthén
108. Nagin, D.S. & Tremblay, R.E. (2001). Parental and early childhood predictors of persistent physical aggression in boys from kindergarten to high school. *Archives of General Psychiatry*, 58, 389.
109. Schaeffer, C.M., Petras, H., Jalongo, N., Poduska, J., Kellam, S. (2003). Modeling growth in boys' aggressive behaviour across elementary school: Links to later criminal involvement, conduct disorder, and antisocial personality disorder. *Developmental Psychology*, 39, 1020-1035.
110. Wiesner, M. & Windle, M. (2004). Assessing covariates of adolescent delinquency trajectories: A latent growth mixture modeling approach. *Journal of Youth and Adolescence*, 33, 431-442.
111. Mulvey, E.P., Odgers, C., Skeem, J., Gardner, W., Schubert, C., & Lidz, C. (2006), Substance Use and Community Violence: A Test of the Relation at the Daily Level. *Journal of Consulting and Clinical Psychology*, 74, 743-754.
112. Skeem, J.L., Schubert, C., Odgers, C., Mulvey, E.P., Gardner, W., Lidz, C. (2006), Psychiatric symptoms and community violence among high-risk patients: A test of the relationship at the weekly level. *Journal Of Consulting And Clinical Psychology*, 74, 967-979.
113. Moffitt, T. E. & Caspi, A. (2001). Childhood predictors differentiate life-course persistent and adolescent-limited antisocial pathways among males and females. *Development and Psychopathology*, 13, 355-375.
114. Schubert, C.A., Mulvey, E.P., Steinberg, L., Cauffman, E., Losoya, S.H., Hecker, T., Chassin, L., & Knight, G.P. (2004). Operational Lessons from the Pathways to Desistance Project. *Youth Violence and Juvenile Justice*, 2(3), 237-255.
115. Arbuckle, J.L. (1996), Full information estimation in presence of incomplete data. In: *Advanced Structural Equation Modeling, Issues and Techniques*, Marcoulides GA, Schumacker RE, eds. Mahwah, NJ: Lawrence Erlbaum Associates, pp 243-277.
116. Enders, C.K. (2001), The performance of the full information maximum likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement* 61, 713-740.
117. Raykov, T. (2005), Analysis of longitudinal studies with missing data using covariance structure modeling with full-information maximum likelihood. *Structural Equation Modeling: A Multidisciplinary Journal*, 12, 493-505.
118. Dupont, W.D. & Plummer, W.D. (1991). POWER.FOR: A Computer Program for Power and Sample Size Calculations. *The American Statistician*, 45 (2), 158.
119. Fan, X. (2003). Power of latent growth modeling for detecting group differences in linear growth trajectory parameters. *Structural Equation Modeling*, 10, 380-400.

120. Fan, X. & Fan, X. (2005). Power of latent growth modeling for detecting linear growth: Number of measurements and comparison with other analytic approaches. *Journal of Experimental Education*, 73, 121-139.