

**Linked Lives:  
The Role of the Mother in the Intergenerational Transmission  
of Aggression and Antisocial Behaviour**

**by**

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M.Sc., Université de Montréal, 2007

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## **Abstract**

The current dissertation examines the role of the mother in the intergenerational transmission of aggression and antisocial behaviour. More specifically, the link between maternal juvenile delinquency, adult offending, and the development of children's physical aggression in the early childhood period is investigated. This dissertation adopts a life-course framework to explore two particularly important life experiences that are especially relevant for many women: pregnancy and motherhood. Considering the negative adult outcomes that many female juvenile delinquents experience (e.g., social adversity, substance abuse, mental health problems), risky maternal behaviours during pregnancy, and difficulties with parenting are examined as potential mechanisms underlying the intergenerational transmission of antisocial behaviour.

This dissertation consists of three distinct, yet related empirical studies based on a sample of mothers and their preschool children. The sample is drawn from the Vancouver Longitudinal Study on the Psychosocial Development of Children. Study I of this dissertation explored how mothers with a history of juvenile delinquency experience pregnancy. It was found that they are more likely to use substances while pregnant, and their children are more likely to be physically aggressive. Study II examined specific patterns of maternal parenting practices. It was found that these practices are linked with maternal adult offending, mental health problems (e.g., depressive and anxious symptoms), cultural background (non-Caucasian ethnicity), and children's aggression. Study III focused on the persistence of children's physical aggression during the preschool years, and found that maternal criminogenic, mental health and parenting factors are related to the development of children's aggression. Importantly, cultural differences were found when comparing the predictors of children's aggression for mothers born in North America and those born elsewhere. Taken together, the three studies suggest that there is significant intergenerational transmission of aggression and antisocial behaviour from mother to child, and it emerges from the earliest developmental periods. Moreover, important cultural differences were identified, which have several implications for policy and treatment.

**Keywords:** life-course criminology; maternal delinquency and offending; childhood physical aggression; prenatal substance use; parenting practices; cultural differences

Pour ma grand-mère, Hélène

and for my mother, Halina

Que je puisse transmettre à mes futurs enfants votre résilience,

ténacité, et courage

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## Executive Summary

In criminology, studies examining the intergenerational transmission of offending primarily have traditionally emphasized the antisocial behaviour or criminal involvement of fathers while mothers have been somewhat neglected (for reviews, Loeber & Stouthamer-Loeber, 1986; van de Rakt, Nieuwbeerta, & de Graaf, 2008; Walters, 1992). Moreover, while several decades of empirical evidence seem to indicate that substantial transmission of offending occurs within families (McCord, 1979; Farrington, Barnes & Lambert, 1996; Farrington, Jolliffe, Loeber, Stouthamer-Loeber, & Kalb, 2001), the underlying processes remain much more tentative. The current study aims to fill this gap by exploring the role of the mother in this transmission and how some of the underlying mechanisms may be linked to their pregnancy and motherhood experiences.

In this regard, a life-course framework is adopted. This framework suggests that life experiences and turning points (e.g., marriage, employment, military service, trauma) can influence the course of offending, both positively and negatively (Laub & Sampson, 2003; Sampson & Laub 1993). Again, much of the research on turning points from crime focuses on males (e.g., Farrington & West, 1995; Horney, Osgood, & Marshall, 1995; Laub & Sampson, 2003), even though it seems likely that important life transitions such as pregnancy and motherhood are likely to carry substantially different meanings for women. In light of the research on the negative adult life outcomes of female delinquents, both pregnancy and motherhood are especially relevant in the context of the intergenerational transmission of antisocial behaviour. More specifically, women with a history of antisocial behaviour at are risk for a number of adverse outcomes in adulthood beyond further involvement in offending. These outcomes include low socioeconomic status, violent intimate partner relationships, mental health problems, and substance abuse (e.g., Moffitt, Caspi, Rutter, & Silva, 2001; Lanctôt, Cernkovich & Giordano, 2007; Pajer, 1998). Therefore, when many of these women are pregnant and when they begin mothering, they also experience substantial adversity. These at-risk situations and behaviours may also contribute to the transmission of antisocial and aggressive behaviour in their children. One possibility is that women with a history of delinquency may be more likely to compromise the prenatal environment of their children. Research from the field of medical and health sciences suggests that prenatal cigarette, alcohol, and drug exposure adversely impacts children's cognitive

development and their ability to regulate behaviour (Ernst, Moolchan, & Robinson, 2001). Another possibility is that because of their vulnerable adult situations, women with a history of delinquency have difficulty parenting and providing adequate caregiving environments (e.g., Jaffee, Belsky, Harrington, Caspi, & Moffitt, 2006). In order to explore these possibilities, an integrative, interdisciplinary approach is taken in the current dissertation. The literature from several disciplines and areas of research is considered, including life-course and developmental criminology, studies on female delinquency and offending, medical and health sciences research on the prenatal environment, and developmental psychology and the development of physical aggression in early childhood.

The current dissertation consists of three distinct, yet related, empirical studies based on the first two waves of the Vancouver Longitudinal Study on the Psychosocial Development of Children. The objective of this prospective study is to identify the early risk and protective factors for aggression and violence from the earliest developmental periods. Early childhood developmental periods (infancy/toddlerhood) were targeted because this is when socialization processes are underway, and those children who do not learn to inhibit problem behaviour are at risk for later delinquency and antisocial behaviour in adolescence and adulthood (e.g., Broidy et al., 2003; Stattin & Magnusson, 1989). The Vancouver Longitudinal study includes 287 biological mothers and their three to five year old children (boys and girls) recruited from February 2008 to August 2010 in the Vancouver and the Greater Vancouver region. The sample is diverse in terms of socioeconomic status and ethnicity and includes a substantial proportion of first-generation immigrants.

Study I explores the intergenerational transmission of antisocial behaviour by examining how mothers with a history of juvenile delinquency experience pregnancy, and how their children's physical aggression is influenced. Mothers with a history of juvenile delinquency are compared on a number of risk factors (e.g., sociodemographics, social adversity), but most importantly, on their prenatal substance use. Study II moves from pregnancy to another important life transition - motherhood - to examine parenting practices. The aim of Study II is to determine the profiles of parenting and whether these are linked to maternal history of delinquency, current adult offending, mental health issues, ethnicity, and children's aggression. Study III focused

on the persistence of children's physical aggression during the preschool years and examines the impact of maternal parenting, mental health, delinquency and offending on their children's aggressive behaviour. Importantly, Study III takes into account the role of cultural background and immigration by comparing mothers born in North America and those born elsewhere. Therefore, these three studies attempt to situate the role of the mother in the intergenerational transmission of aggression and antisocial behaviour. These three empirical studies are situated within a life-course theoretical framework, and stem from the literature on female offending, which are discussed in an introductory chapter. A concluding chapter underlines the global findings of the three studies, and the theoretical, methodological, empirical, and policy implications of the dissertation are highlighted.

The main findings from the current dissertation suggest that there is significant transmission from mother to child. In other words, mothers with a history of juvenile delinquency, and those who were offending as adults were more likely to have physically aggressive children. The findings from Study I of this dissertation indicate that women with a history of juvenile delinquency are more at risk for receiving social assistance, using alcohol and smoking during pregnancy, and subsequently having physically aggressive children. Study II finds that maternal adult offending rather than past delinquency is linked to more negative parenting practices, suggesting that parenting is more influenced by proximal rather than historical factors. Importantly, the findings also suggest that mothers who display negative parenting practices also rely on a number of positive ones (e.g., rewarding and playing with children), which can therefore provide an important avenue and target for intervention efforts. The findings from Study III show that maternal delinquency, adult offending, mental health and parenting practices contribute to the persistence of physical aggression of their children in early childhood. Critically, Study III found differences in the predictors of aggression between mothers born in North America and those born elsewhere, suggesting that there are cultural differences in the development of physical aggression.

Taken together, the results of these three empirical studies carry important implications for the study of female delinquency and the intergenerational transmission of antisocial behaviour. One of the most consistent empirical findings across the three studies of the current dissertation is that maternal juvenile delinquency is linked to

children's physical aggression. This historical factor maintains its importance years later, and is connected to the behavioural development of their children. While this relationship has been established for males, the criminological literature connecting behaviour between generations among females has been more limited. Therefore, the current findings add to this body of research and indicate that the intergenerational transmission of antisocial behaviour is also influenced through mother and child relationships, and the consequences emerge at the earliest developmental periods in children. From a theoretical perspective, this dissertation underscores the importance of merging and integrating literature from different disciplines, especially in the context of processes that touch on multiple aspects of people lives, such as the intergenerational transmission of behaviour. Moreover, in line with the growing body of research on the adult outcomes of female juvenile delinquents, findings also show that women with a history of delinquency were more vulnerable as adults, including participating in some risky behaviour during pregnancy. Future research needs to address the reasons for this adult vulnerability, as well as the contexts and situations leading to substance use during pregnancy. Finally, the findings show that there are several cultural differences in parenting practices and in the development of children's aggression. Therefore, policy and treatment efforts aimed at the prevention of aggression and violence need to account for cultural background, including immigration, in order to improve their effectiveness.

# Chapter 1.

## Introduction

### 1.1. **Linked Lives: The Intergenerational Transmission of Behaviour**

Life events, decisions, and experiences of members of one generation can significantly impact those of the next. The notion of linked or interdependent lives refers to the idea that human lives are embedded in social relationships (e.g., Elder 1995; 1998). Consequently, human lives can be structured, for better or worse, via multiple interlocking relationships with family and friends (Elder, 1995). The specific process of behaviour being transmitted from one generation to the next is referred to as intergenerational transmission (e.g., Thornberry, Freeman-Gallant, Lizotte, Krohn, & Smith, 2003). Intergenerational transmission therefore refers to the continuity of a behaviour of interest or, in other words, how parents and children are similar with respect to the behaviour, which can help in understanding the origins and course of behaviour (Thornberry, 2009). For example, risky behaviours and decisions related to parenting, such as child maltreatment, can lead to a number of problem behaviours in children of the subsequent generation. These include, but are not limited to subtle and wide-ranging effects on children's socioemotional functioning such as difficulties in social relationships, emotional instability, and cognitive reasoning (Cicchetti & Rizley, 1981) and also later criminal involvement and violence (Widom, 1989). There is a large body of longitudinal research confirming that different behaviours are transmitted from one generation to the next, such as child maltreatment, cigarette smoking, and other health risk behaviours (e.g., excessive drinking, poor eating) (e.g., Berlin, Appleyard, & Dodge, 2011; Chassin, Presson, Todd, Rose, & Sherman, 1998; Kandel & Wu, 1995; Weden & Miles, 2012; Pears & Capaldi, 2001; Wickrama, Conger, Wallace, & Elder, 1999). This intergenerational transmission process appears to also occur for offending and antisocial behaviour, which is the focus of the current dissertation.



In criminology, two key findings from seminal longitudinal studies are that a disproportionate amount of crime is committed by a small number of people (e.g., Wolfgang, Sellin & Figlio, 1972), and that crime tends to run in certain families (e.g., Farrington, 1979; McCord, 1979). In the classic Cambridge Study in Delinquent Development, six percent of families (n = 23) account for half of all convictions (n = 1218) (Farrington, Barnes & Lambert, 1996). Similarly, in the Pittsburgh Youth Study, around eight percent of families (n = 171) represent close to 43 % of arrests (n = 597) (Farrington et al., 2001). More recently, data from the National Longitudinal Study of Adolescent Health show that five percent of all families account for 53 % of all criminal arrests (n = 1298), for an average of almost 14 arrests per family (Beaver, 2013). Importantly, the intergenerational transmission of offending is not limited to high-crime families; simply having a parent with a criminal history increases the risk of children's criminal involvement. For example, the likelihood of having a parent with a criminal record is two to three times greater for juvenile delinquents compared to non-delinquent boys (Glueck & Glueck, 1950). Therefore, several decades of empirical evidence seems to indicate that substantial transmission of offending occurs within families.

The process underlying the intergenerational transmission of antisocial behaviour and offending is however much more tentative. Some researchers emphasize genetic markers (for a review, Rhee & Waldman, 2002), some stress environmental factors, (such as poor parenting practices, abuse and neglect) (e.g., Patterson, 1998; Simons, Wu, Conger, & Lorenz, 1994), and others underline interactions between the two (e.g., Jaffee, Strait, & Odgers, 2012; Kim-Cohen et al., 2006; Moffitt, 1993). Critically, in criminology, studies examining the intergenerational transmission of offending primarily emphasize the antisocial behaviour or criminal involvement of fathers. Nearly 30 years ago, in an extensive review of studies on parental criminality and delinquency in offspring, only one study was cited that measured maternal delinquency (see Loeber & Stouthamer-Loeber, 1986). Even more recent reviews also indicate that the primary focus of studies has been the criminality of fathers (e.g., van de Rakt et al., 2008; Walters, 1992). While one of the primary reasons for this omission in research is likely the fact that antisocial behaviour and criminality is much less frequent in females, more studies have begun examining the role of mothers (e.g., Smith & Farrington 2004; Thornberry, Freeman-Gallant, & Lovegrove, 2009). These studies indicate that there is

considerable continuity in antisocial behaviour between mothers and their children. In fact, recent findings suggest that in some cases, the risk of intergenerational and familial transmission might be stronger for females (e.g., Bijleveld & Wijkman, 2009; Frisell, Lichtenstein, & Langstrom, 2011). One explanation for this is the possibility that the mechanisms involved in the intergenerational transmission of antisocial behaviour may operate differently for males and females. Using data from the Rochester Youth Development Study, Thornberry and colleagues (2003) examine the impact of both maternal and paternal juvenile delinquency on behavioural problems in both male and female children. While the authors find evidence of intergenerational transmission between fathers and their children, for mothers the same relationship is mediated by ineffective parenting. In view of these findings, further exploring characteristics of female delinquents and offenders as they enter motherhood roles can potentially help to elucidate the underlying processes.

Considering that the study of female antisocial behaviour is only recently beginning to receive increased and serious research attention, it is perhaps not surprising that the role of mothers has been largely overlooked in the research on the intergenerational transmission of antisocial and criminal behaviour (e.g., Chesney-Lind & Pasko, 2004; Goldweber, Broidy, & Cauffman, 2009; Javdani, Sadeh, & Verona, 2011; Loeber, Capaldi, & Costello, 2013; Moretti, Odgers, & Reppucci, 2011). Unfortunately, ideology has contributed to fragmentations between theoretical perspectives and scholarly disciplines that contribute to this lack of understanding and knowledge on female antisocial behaviour (e.g., Lanctôt & Le Blanc, 2002; Loeber et al., 2013; Zahn-Waxler & Polanichka, 2004). This is somewhat surprising because the idea that substantial damage to society may result from neglecting the study of female delinquency and offending has been raised before (e.g., Kratzer & Hodgins, 1999). Furthermore, the costs of neglecting this phenomenon are particularly salient if we conceptualize female delinquency and criminality in the context of intergenerational transmission to subsequent generations, because females are typically the primary caregivers of children. To take one step forward in addressing this issue, an interdisciplinary focus is needed to overcome the limitations of a discipline or domain-specific focus.

In order to examine the role of mothers in the intergenerational transmission of antisocial behaviour, the current dissertation utilizes approaches and integrates findings from numerous disciplines and areas of research including: life-course and developmental criminology; studies on female delinquency and offending; medical and health sciences research on the prenatal environment; and developmental psychology and the study of physical aggression. The rationale for this specific focus is threefold. First, important life transitions and turning points that influence male offending (e.g., Sampson & Laub, 1993) are likely to affect women differently compared to men (i.e. parenthood). Second, female delinquency and offending can have long-term consequences on women's lives (e.g., Moffitt et al., 2001; Pajer, 1998) and place them at greater risk and adversity when they become mothers. Finally, women in vulnerable and adverse life situations during the transition to motherhood can potentially have difficulty providing adequate caregiving environments for their children in infancy and toddlerhood, at the most crucial points in their socialization and behavioural development (e.g., Tremblay et al., 1999). Potential mechanisms underlying the intergenerational transmission of antisocial behaviour are therefore explored.

## **1.2. Life Transitions and Turning Points: Applying a Life-course Framework of Crime to Women**

Sampson and Laub's age-graded theory of crime explains that informal social control in adulthood can alter the course of criminal behaviour over the life span (e.g., Laub & Sampson, 2003; Sampson & Laub 1993). This life-course framework is primarily based on the idea that human lives are embedded in social relationships (e.g., Elder 1995; 1998). Thus, individuals' lives are linked to one another and centrally, it is these relationships that shape choices and behaviour over time. In terms of explaining criminality, the life-course framework underlines the role of adult social bonds in influencing behaviour, and more specifically, indicates that offending is more likely when an individual's bond to society is weak or broken (Laub & Sampson, 1993). Accordingly, life experiences and transitions (e.g., marriage, employment, military service, trauma) can influence the trajectory of offending, both positively and negatively (Laub & Sampson, 2003; Sampson & Laub 1993). For instance, a cohesive marriage consisting of close emotional ties and mutual investment can increase the social bond between

individuals and consequently reduce the likelihood of offending behaviour (Laub & Sampson, 1993). Life transitions such as these can alter individuals' routine activities by reducing the amount of time spent with antisocial peers in favour of more family-oriented activities (e.g., Warr, 1998; Wright & Cullen, 1994). Not surprisingly, much of the research on the impact of important turning points from crime focuses on male offending (e.g., Farrington & West, 1995; Horney et al., 1995; Laub & Sampson, 2003; Uggen, 2000). Most longitudinal studies on the development of offending by individuals are concentrated on lower class urban males in Western industrialized countries over the past 80 years (Farrington, 2003). Furthermore, the majority of this line of research primarily considers either Caucasian men or those born in the country of origin of the study. However, this should be considered a major oversight because it is more than likely that certain life transitions are experienced differently for unique populations. Importantly, major life events such marriage, and not to mention pregnancy and parenthood, may carry substantially different meanings for women and also for individuals from different cultural backgrounds and immigrants.

### **1.2.1. Gendered Turning Points**

Marriage has been identified as a key turning point for change that influences (i.e., decreases) offending for males (e.g., Farrington & West, 1995; Horney et al., 1995; Laub, Nagin, & Sampson, 1998; Piquero, MacDonald, Parker, 2002). However, while many of these studies show that being married decreased the likelihood of offending for males, the effect of marriage does not seem to be as beneficial for women (Bersani, Laub, & Nieuwbeerta, 2009). One possible explanation for these findings is that males are significantly overrepresented in terms of criminal activity compared to females, it is possible that through marriage, men will generally tend to move towards more prosocial relationships, or marry "up", while women adopt the opposite pattern and marry "down" (e.g., Giordano, Cernkovich, & Rudolph, 2002; Sampson, Laub & Wimer, 2006). Indeed, qualitative research with females offenders suggests that becoming involved with a man with no history of offending may be unlikely for women from disadvantaged neighbourhoods (e.g., Leverentz, 2006). Similarly, Giordano and colleagues (2002) examine the life histories of marginal female offenders and find that high-quality marriages to prosocial men did influence some women's social bonding and prosocial

connections, but for others, this type of relationship was considered difficult to realize, and in some cases unattainable. The impact of marriage on female offending can also vary according to the likelihood of females to marry in the first place (King, Massoglia, & Macmillan, 2007). Thus, it is not necessarily marriage itself, but rather individual characteristics of females who are likely to get married that have a greater association with the likelihood of criminal behaviour. Therefore, one of the key turning points for males in life-course studies is not as straightforward or possibly even relevant for females.

Similarly, pregnancy is a life event that is uniquely experienced by females and can therefore also potentially influence the course of antisocial behaviour in a unique way. Very few studies consider the impact of pregnancy on female offending, or at least distinguish between pregnancy and motherhood in general. Kreager, Matsueda and Erosheva (2010) make this distinction and find that young women reduce their delinquent behaviour, as well as their drug and alcohol use, while pregnant. Several studies show that while women do decrease their use of cigarettes, alcohol and illicit substances while pregnant, after their child is born substance use often increases to just below pre-pregnancy levels (e.g., DeHart, 2011; Gilchrist, Hussey, Gillmore, Lohr & Morrison, 1996). Accordingly, while some women may reduce or stop their antisocial behaviour during pregnancy by discovering benefits to these positive lifestyle changes and subsequently decide that maintaining them is worthwhile, it is unclear whether these changes are typically sustained. Other research suggests that pregnancy in itself does not have a substantial impact on the cessation of criminal involvement, but rather becoming pregnant with a child who is wanted can contribute to lower levels of criminality (Giordano, Seffrin Manning & Longmore, 2011). The authors find that this is especially the case if wanting a child is indicative of a desire to follow a more conventional lifestyle compared to a more deviant, antisocial lifestyle. Therefore, while pregnancy is likely more relevant for women than men as a turning point away from criminal involvement, it is still somewhat unclear whether and how it impacts females' antisocial behaviour in the long term. Subsequently, little is also understood about the impact of continuing responsibilities associated with parenthood on the course of antisocial behaviour for females.

The shift in responsibilities and routines that accompanies parenthood impacts every new parent's life, and parenthood can be both a growth experience, and at the same time a problem situation that tests an individual's adaptive capacities (Elder, 1974). As a turning point for change from offending behaviour, becoming a parent seems to have less of an impact on the course of male offending (e.g., Sampson & Laub, 1993), and is more pertinent to females (Graham & Bowling, 1995). One possibility is that this disparity is linked to gender differences in caregiving. Despite increases in father's engagement in their children's lives in recent decades, it remains that women are most often the primary caregivers and spend the most time with children (Pleck & Masciadrelli, 2004). Qualitative studies indicate that among disadvantaged women, motherhood responsibilities alter women's daily routines and reduce criminogenic opportunities, consequently decreasing criminal involvement (Edin & Kefalas, 2005). Similarly, findings from the Denver Youth Study show that among disadvantaged young women in poor communities, motherhood is a key turning point and helps to pull them away from high-risk behaviour (Kreager et al., 2010). Other research suggests that becoming a mother makes some women more aware of the consequences of their behaviour, and as a result contributes to desistance from offending (McIvor, Murray & Jamieson, 2004).

While the responsibility of motherhood could provide an opportunity for an identity change, or a fresh start for some women, others find that motherhood is a source of stress that can promote criminal involvement (Michalsen, 2011). Not all women are able to assume the responsibilities of being a mother, and having children may not be sufficient for some women, particularly for serious offenders, to sustain their behaviour change. For instance, Giordano and colleagues (2002) find that there is considerable variability on the influence of parenthood, with some women dissociating their ongoing deviant behaviour from their role as good parents, while other women make a connection between the birth or maturation of their children and their lifestyle changes. Therefore, the impact of parenthood on offending very much depends much on personal capacities, stressors, and how a woman experiences becoming a mother. Mothers' life circumstances and personal preferences will likely shape the meaning of motherhood and impact its role on future criminal involvement.

### **1.2.2. *Motherhood in a New Cultural Context***

In a globalized era, another important turning point that has been largely overlooked, and which undoubtedly presents additional challenges to parenthood, is immigration. Cultural differences and immigration have been neglected in life-course criminology, as well as in the criminological research more generally (for a review, Morenoff & Astor, 2006). While only a few studies consider the trajectories of delinquency and offending for immigrants and different cultural groups (e.g., Bersani, 2012; Maldonado-Molina, Piquero, Jennings, Bird, & Canino, 2009), fewer consider immigration as a turning point, or its potential role on linked lives, particularly for subsequent generations of their children. Studies that compare immigrant and native-born Western individuals show that immigration produces protective effects against criminal involvement considering that first-generation immigrants tend to show the lowest levels of offending (e.g., Bui, 2009; Hagan, Levi, & Dinovitzer, 2008; Sampson, Morenoff, & Raudenbush, 2005). Subsequent research shows that second-generation immigrants then tend to catch up to the levels of delinquency of their native-born counterparts (Bersani, 2012). These studies suggest that there are important differences in offending patterns for those born elsewhere, and that these differences can vary across generations. Therefore, how exactly immigration experiences play a role in the intergenerational transmission of antisocial behaviour, and how this influences parenting and child behavioural development remains somewhat unclear. As immigration continues to be an integral part of Western societies, and particularly in large urban centres, this line of research will become increasingly important given the impact it can have on families.

Experiencing motherhood in a new cultural context likely presents additional challenges and strains on families (e.g., isolation, language barriers, lack of a support system). Studies from the field of nursing provide in-depth information about the process through which women attain a maternal role identity (i.e., acquiring a new self-definition as a mother) (e.g., Rubin, 1967; Koniak-Griffin, 1993). The research along these lines is fairly clear about the fact that this process can be extremely difficult for some women, and particularly for certain populations such as cultural minorities and adolescent mothers. However, all women do not experience motherhood the same way, and this is especially true for different cultural groups and immigrant mothers who are

highly influenced by their cultural of origin (Koniak-Griffin, Logsdon, Hines-Martin, & Turner, 2006). Cultural displacement has an important yet minimally understood effect on motherhood because it is potentially challenging for mothers to raise children to function effectively in two different cultures (Tummala-Narra, 2004). Therefore, accounting for cultural differences and immigration in the study of the relationship between motherhood and behavioural development in children is especially salient in multicultural nations.

The importance of understanding the impact of immigration experiences of mothers lies in the influence it has on women's physical and mental health. For example, research examining the health of immigrants suggests there is a protective effect similar to that found in studies on offending coined the 'healthy immigrant effect'. Immigrants typically report low rates of physical and mental health issues which eventually tend to converge with the levels of their native-born counterparts (e.g., Ali, 2002; McDonald & Kennedy, 2004). However, there is some evidence to suggest that this protective effect may not necessarily extend to pregnancy and motherhood experiences (e.g., Bollini, et al., 2009; Sword, Watt, & Krueger, 2006). More specifically, a review of 65 studies comparing pregnancy outcomes of immigrant and native born mothers in twelve European countries suggests that immigrant mothers have a much higher risk of birth complications (e.g., 43 % higher risk of low birth weight; 23 % preterm birth) (Bollini et al., 2009). A longitudinal Canadian study finds that the rates of maternal depression five months after childbirth are twice as high for immigrants belonging to minority groups (Mechakra-Tahiri, Zunzunegi, & Séguin, 2007). Importantly, these mothers are also more likely to be single and living in poverty. Other research supports this, finding that compared to native born females, immigrant females have higher levels of depression after childbirth, and their limited social support networks and isolation contribute to their mental health problems (e.g., Small, Lumley, & Yelland, 2003; Sword et al., 2006; Williams & Carmichael, 1985). Taken together, these research findings suggest that some immigrant women are faced with multiple challenges when becoming mothers, which may be somewhat unique compared to those of non-immigrant mothers, and that these challenges can have an important impact on motherhood experiences and parenting.



The research findings described above underscore the fact that life-course criminology research has largely neglected the impact of life transitions on females. Understanding how key life events influence female delinquency and offending, how female with antisocial histories and lifestyles experience pregnancy and motherhood, and the impact this has on the development of their children should be a central research concern. This is because there may be a series of cumulative consequences that extend beyond the participation of females in offending, and potentially impact future generations. Currently, there is little information about how the negative adult life outcomes of female delinquents as a potential contributor to the process underlying the intergenerational transmission of antisocial behaviour.

### **1.3. Women and Crime**

One of the most widely accepted and longstanding findings in criminology is the robust relationship between gender and crime; males are much more likely to offend than females (e.g., Steffensmeier & Streifel, 1991; Quételet, 1833). This disparity between males and females has, in part, contributed to the unilateral focus on male offending in criminology. Nonetheless, scholars have been calling for additional studies on female delinquency and offending since the late sixties (e.g., Bertrand, 1969; Smart, 1976; Loeber et al., 2013). One of the earliest longitudinal studies that examined delinquency in females called attention to the unfavourable backgrounds of 500 women followed in the Glueck and Glueck data (1965). Many early studies on females were considered controversial and criticized for the negative way in which women were portrayed (e.g., Klein & Kress, 1976; Simon 1975). Classic feminist theory and the feminist movement (e.g., de Beauvoir 1949; Friedan, 1963) began to raise issues surrounding women's oppression and inequality that underscored problems with how criminology approached the study of female offenders. Early feminist criminologists argued there was a potential link between the female liberation movement and what appeared to be increases in female offending (e.g., Adler & Adler, 1975; Simon, 1975). However, many researchers quickly disputed this idea because of the lack of empirical evince to support these claims (e.g., Box & Hale, 1983; Steffensmeier & Steffensmeier, 1980; Weis, 1976). Feminist thought on crime and offending during the seventies and eighties was highly critical of mainstream theories in sociology and criminology, which

were considered male-focused, sexist, and unable to adequately explain female behaviour (for reviews Daly & Chesney-Lind, 1988; Simpson, 1989). In fact, some suggested that male-based theories should be completely discarded (Leonard, 1982). A particular focus of feminist criminology scholarship is the marginalization and very high rates of victimization experienced by females (e.g., Chesney-Lind, 1989; Faith, 1993). Research on adult outcomes of abused children, support this idea to a degree, showing that abused and neglected girls are at significantly greater risk of becoming delinquents and offenders (16 % of abuse girls vs. 9 % of controls), but also showed that, as with boys, most victimized girls do not become involved in offending (Widom, 1988; Widom & White, 1997). The feminist criminology movement was responsible for bringing to light the neglect of females in criminological theory, and the importance of considering the unique lives of females.

Currently, a more integrative approach is being suggested by many of those studying female offending, rather than completely abandoning existing theories (e.g., Heimer & Kruttschnitt, 2006; Lanctôt & Le Blanc, 2002; Miller & Mullins 2006). Although gender specific processes remain an important part of the literature on female offending, there is mounting evidence to suggest that the influences and mechanisms of male offending are also applicable, to some extent, to females (e.g., Giordano & Cernkovich 1997; Goldweber et al., 2009; Javdani et al., 2011; Lanctôt & Le Blanc, 2002; Zahn, 2009). Thus, progressive research on female offending is moving towards considering a broader range of factors and approaches, while specifically accounting for the girls' and women's unique lives and experiences. By merging the literature from a number of different disciplines, and specifically examining pregnancy and motherhood experiences, the current dissertation adopts such an integrative approach to the study of female delinquency and offending embedded in a life-course perspective.

While there has been extensive debate about how best to approach the study of female delinquency and offending, and despite increasing research focused on females, there is consensus that knowledge, empirical research, and explanations on the topic are still lacking (e.g., Chesney-Lind & Pasko, 2004; Goldweber et al., 2009; Javdani et al., 2011; Lanctôt & Le Blanc, 2002; Loeber, et al., 2013). Recent trends showing increases in the rates of female juvenile delinquency have called to attention the scarce research on factors associated with the development of female offending. Over the past

few decades, while youth crime has remained relatively stable or decreasing, official data suggest that violent offending, particularly for females, is on the rise (e.g., Brennan & Dauvergne, 2011; Puzanchera & Adams, 2011; Savoie, 1999). Some scholars dispute this idea because of the fact that, to some extent, this trend is an artefact of changes in enforcement policies and sentiment towards young women (e.g., Chesney-Lind, 2002; Steffensmeier, Schwartz, Zhong, & Ackerman, 05). Nonetheless, this debate brings to the forefront the fact that there is a paucity of knowledge about the developmental pathways and precursors of girls' aggression and antisocial behaviour (e.g., Moretti, Odgers, & Reppucci, 2011). Longitudinal studies increasingly include a substantial number of females and are able to provide some insight on the development of female delinquency and offending.

### **1.3.1. *Patterns of Female Delinquency and Offending***

There is a growing body of research on the long-term development of female delinquency and offending. Several studies have established that females tend to participate in different crime types compared to males; specifically, females are less commonly involved in violence (e.g., Daigle, Cullen and Wright, 2007; Elliott, Huizinga & Menard, 1989; Wolfgang, Sellin & Figlio, 1972). These gender differences were comprehensively examined in the Dunedin Multidisciplinary Health and Development Study, an important birth cohort that interviewed one thousand boys and girls every few years from age three to thirty-two (e.g., Moffitt et al., 2001; Odgers et al., 2008). The Dunedin Study finds that from adolescence to adulthood, for both self-report and official convictions, males account for the vast majority of all types of offenses committed by the sample, but particularly for violence (67 % to 97 % depending on the year). On the other hand, females, account for a much smaller proportion of offenses, specifically, around one fifth of violent offenses, and up to one third of property offenses. This study shows that females only tend to resemble males in their participation in drug and alcohol offenses during adolescence. Along these lines, a recent study on a large sample of offenders in the Netherlands over a twenty-five year period shows that females are rarely involved in violence, and primarily involved in property crimes (58 % to 78 % of all offenses they committed), regardless of the frequency of their offending (Block et al., 2010). Therefore, compared to males, females not only are less involved in offending

compared to males, but when they are, they tend to participate in less serious offences such as property and drug offences rather than violence.

Males and females are much more similar regarding the age of onset of offending. Findings from the Dunedin study show that fewer females participate in antisocial behaviour at all ages; however, among those girls who are involved in antisocial behaviour, they start at approximately the same age as boys (within 6 months of each other). Importantly, the Dunedin Study shows that a very small number of girls (i.e., 1 %) begin showing antisocial behaviour in childhood that persists into adulthood compared to boys (i.e., 10 %). Recent reviews of longitudinal studies of females have supported these results, finding that female antisocial behaviour is more likely to remain an adolescent phenomenon, and those girls who start exhibiting antisocial behaviour very early (i.e., childhood) and show persistence into late adolescence and adulthood are a vast minority (e.g., Fontaine et al., 2009; Goldweber et al., 2009). Although Fontaine and colleagues (2009) specify that trajectories of female antisocial behaviour are diverse and can emerge at different ages, in general, they tend to decline by the end of adolescence, and stop by adulthood.

Overall, most studies find that female involvement in antisocial behaviour and offending is less persistent and declines at a faster rate compared to males (e.g., Ageton, 1983; Moffitt et al., 2001; Rutter, Giller, Hagwell, 1998). Research from the second Philadelphia Birth Cohort shows that 42 % of male juvenile delinquents persisted in adulthood, compared to 12 % of females (Tracy and Kempf-Leonard, 1996). Others show that even among girls involved in violent offending during adolescence, by adulthood, violence decreases substantially (e.g., Goldweber et al., 2009; Lanctôt, Émond & Le Blanc 2004). Although few females persist, unfortunately, simply having a history of juvenile delinquency or antisocial behaviour places females at a much greater risk (up to 4 times more likely) to be involved in offending as adults (Kempf-Leonard, Tracy & Howell, 2001; Lanctôt et al., 2007; Moffitt et al., 2001). Moreover, it is those girls with a history of serious, violent and chronic offending who are more much more likely to continue to offend in adulthood (Kempf-Leonard et al., 2001). Furthermore, the minority of females who persist in offending beyond adolescence are also more likely to be involved in violence as adults including violence towards their partners and their children (Odgers et al., 2008). Therefore, females with a more serious and extensive

history of delinquency are more likely to be involved in crime as adults, including violence. However, it is important to remember that involvement in offending in adulthood is only one aspect of these women's lives. In fact, it would be remiss to think that females with a history of antisocial behaviour are not at risk for other difficulties in adulthood, particularly when many of them are transitioning to motherhood roles.

### **1.3.2. *Beyond Offending: Adult Outcomes of Female Delinquency***

Research on the adult outcomes of juvenile delinquency shows that even though the majority of individuals stop offending as adults, they are often not completely free of the consequences of their adolescent behaviour (for reviews, Cauffman, 2008; Fontaine et al., 2009; Goldweber et al., 2009; Pajer, 1998). In the Dunedin Study, both males and females with a history of conduct disorder are more likely to have a wide range of adverse young adulthood outcomes including: low education, unemployment, early parenthood, welfare support, conflicts with partner, abusive intimate partner relationships, poor mental and physical health, and substance abuse and dependence (Moffitt et al., 2001). Furthermore, females with a history of conduct disorder appear to fare worse than males; they suffer from poorer physical health, symptoms of depression, and are in less satisfying and abusive relationships with their partners (Moffitt et al., 2001). In line with this, Lanctôt et al. (2007) find that while both male and female juvenile delinquents are more vulnerable to negative life outcomes in adulthood (i.e., intimate partner violence, drug and alcohol problems, poor emotional well-being), females face more socioeconomic disadvantages. This evidence suggests that in certain contexts, the impact of delinquency on later life outcomes may be more pronounced for females.

Taken one step further, some of these negative adult outcomes experienced by females are particularly salient in the context of pregnancy and motherhood, and potentially have an impact on their children. Given that a number of studies find that females with a history of antisocial behaviour are particularly at risk for mental health problems (e.g., depression, anxiety) and substance abuse in adulthood (e.g., Corneau & Lanctôt, 2004; Fergusson, Horwood & Ridder 2005; Hawkins, Catalano, & Miller, 1992; Pajer, 1998; Zoccolillo, 1992), one possible mechanism in the transmission of antisocial behaviour is through women's pregnancy experiences. Yet another possibility is that the

intergenerational transmission of antisocial behaviour also operates via caregiving difficulties these women experience when they become mothers. For instance, women with a history of aggression and conduct disorder tend to be less responsive, less positive, and more punitive parents (e.g., Bailey, Hill, Oesterle, & Hawkins, 2009; Cassidy, Zoccolillo & Hughes, 1996; Huh, Tristan, Wade, & Stice, 2006; Jaffee et al., 2006; Serbin et al., 1998). Additionally, the mental health problems some of these women are experiencing as adults could also be contributing to difficulty parenting, including more negative parenting practices.

Adult outcomes of female adolescent antisocial behaviour therefore potentially include substantial adversity in adulthood that makes these women much more vulnerable on a number of levels. Their difficult adult situations may lead to more at-risk behaviour beyond offending, and can result in risky pregnancies and problems functioning as a parent. Thus, there is a need to examine how mothers with a history of delinquency experience pregnancy, especially in view of research from medical and health sciences.

#### **1.4. Female Delinquents and At-risk Pregnancies**

Criminologists have only recently begun to consider the importance and role of the prenatal period and the prenatal environment in the development of antisocial behaviour (e.g., Loeber, Slot & Stouthamer-Loeber, 2008; Moffitt, 1993; Tibbetts, 2009). The field of medical and health sciences on the other hand provides significant insight about the prenatal environment and its influence on child development. For example, numerous studies now have examined the consequences of nicotine, alcohol and drug use during pregnancy and their long-term impact on cognitive, emotional and behavioural development, especially during infancy and toddlerhood (e.g., Bennett et al., 2002; Connor et al., 2000; Cornelius et al., 2007). Specifically, maternal smoking during pregnancy increases the likelihood of children being physically aggressive (e.g., Huijbregts, Séguin, Zoccolillo, Boivin, & Tremblay, 2008; Tremblay et al., 2004), and having conduct and attention problems (D'Onofrio & al., 2008; Fergusson et al., 1993). Similarly, prenatal alcohol exposure negatively impacts children's conduct problems (D'Onofrio & al., 2007) attention, memory, and response inhibition (Streissguth & al.,

1994). Illicit drug use during pregnancy such as cocaine (Bennett et al., 2002; Richardson et al., 1996), methamphetamine (Smith et al., 2008) and marijuana (Fried, O'Connell, & Watkinson, 1992) increases the likelihood of externalizing behavioural problems in children. Another study shows that children who are exposed to substances during pregnancy are not only more likely to show higher levels of physical aggression in early childhood, but also of sexual behaviours (Lussier, Tzoumakis, Corrado, Reebye & Healey, 2011). In sum, it should be somewhat clear that there are numerous detrimental consequences that substance exposure can have on children's behaviour development.

Despite the well-established link between prenatal exposure and children's behavioural problems, some women continue to use substances while pregnant. Public concern over maternal prenatal substance use peaked in the mid-1980s, which coincided with an increase in the widespread use of crack cocaine in the United States (Lester, Andreozzi & Appoah, 2004). Epidemiological studies conducted in the 1980s and 1990s show that a number of mothers were exposing their children to substances that may impact their children's health and also have potentially long-term negative consequences on child development (for a review, Smeriglio & Wilcox, 1999). Since the mid 1990s, prevalence rates in the US and Canada show relative stability in the use of illicit drugs (3-5 %), alcohol (11-15 %), and cigarettes (16-20 %) during pregnancy (e.g., Cormier, Dell & Poole, 2003; Ebrahim & Gfroerer, 2003; Substance Abuse and Mental Health Services Administration, 2011). Therefore, despite information campaigns aimed at informing women of the risks of substance use during pregnancy over the past 30 years, it is clear that a number of pregnant women continue to engage in risky behaviours that are now shown to have profound negative effects on their children's development. Research on the effectiveness of these health communication/educational prevention campaigns indicates that, overall, they generally have poor outcomes, particularly for those dealing with an addictive behaviour such as smoking (Snyder et al., 2004). Taking the example of smoking, research indicates that women who successfully stop smoking during pregnancy tend to be younger, more educated, do not drink alcohol, and have a partner who did not smoke (Severson, Andrews, Lichtenstein, Wall, & Zoref, 1995). In contrast, mothers who use substances while pregnant are often poly-substance users, unemployed, depressed, and have low levels of social and financial support (Bendersky et al., 2006; Fergusson et al., 2002; Fried,

Watkinson, & Gray, 1992; Nichter et al., 2007). Not surprisingly, these characteristics are also similar to the factors characterizing the adult outcomes of female delinquents (e.g., Moffitt et al., 2001; Pajer, 1998).

A clear possibility is that there is a link between maternal juvenile delinquency and unhealthy decisions during pregnancy. Research shows that parental antisocial behaviour and offending is associated with smoking during pregnancy (e.g., Fergusson, Woodward & Horwood, 1998; Wakschlag et al., 1997; Zoccolillo et al., 2005). Moreover, the study of Huijbregts and colleagues (2008) suggests that the impact of prenatal smoking on children's physical aggression is compounded by parental history of antisocial behaviour because maternal prenatal smoking might be indicative of a broader antisocial construct. In fact, their findings show that maternal antisocial behaviour, smoking during pregnancy, and the interaction between the two increases the likelihood of children belonging to high and rising aggression trajectories. In other words, mothers with antisocial histories are more likely to smoke when pregnant, and their children showed the highest levels of physical aggression. Moreover, these relationships are exacerbated among children from low-income families.

Taken together, it seems possible that women with a history of delinquency may be more likely to compromise the prenatal environment of their children. This in turn may be one mechanism by which the transmission of aggressive and antisocial behaviour occurs to subsequent generations. Prenatal exposure to harmful substances adversely impacts children's cognitive development and their ability to regulate their behaviour (Ernst et al., 2001). Importantly, it also seems clear that these mothers are also likely to be more vulnerable in general, and therefore exposed to a number of other risk factors that also can contribute to their parenting difficulties. In this regard, a developmental prevention perspective that identifies and is targeted toward at-risk mothers, particularly those most likely to use substances during their pregnancies, may be a more effective strategy than broadly targeted educational campaigns. This level of primary prevention is critical because behaviour problems in early childhood are related to those in later childhood at school and subsequent delinquency in adolescence and criminality in adulthood (e.g., Broidy et al., 2003; Loeber, 1990). These general developmental patterns of aggression and antisocial behaviour have been emphasized in developmental psychology for some time.



## **1.5. The Development of Physical Aggression in Early Childhood**

For several decades now, research in developmental psychology on child behaviour problems has focused on the toddlerhood and preschool years, and more specifically the social, emotional, cognitive, and linguistic developmental changes that are rapidly occurring during this period (for a review, Campbell, 1995). Moreover, this body of research shows that the serious behaviour problems of many adolescents originate in the early childhood years (e.g., Loeber & Dishion, 1983; Moffitt, 1993). Moffitt (1993) proposes a unique antisocial developmental trajectory of at-risk offspring with behavioural manifestations emerging as early as infancy (i.e., difficult temperament) and toddlerhood (i.e., behavioural problems). Tremblay (2000; 2010) also emphasizes the importance of these early periods in understanding the origins of behavioural development, and of physical aggression in particular. Importantly, he underlines the problems stemming from aggregating different types of antisocial behaviour. Notably, he points out that using simple scales to represent aggression that include behaviours that are merely socially undesirable (e.g., lying, arguing, getting into trouble) are problematic because they do not improve our understanding of qualitatively different manifestations of aggression. Thus, because aggression co-occurs with a range of other problematic behaviours, aggregating these behaviours will impede the understanding the origins or the course of specific behavioural development. For these reasons, there are some clear advantages to examining physical aggression in specific developmental periods such as early childhood. Physical aggression is clearly more straightforward to measure and quantify than other behaviour problems (e.g., difficult, moody, disobedient). Moreover, in preschool children, other forms of aggression such as indirect aggression (e.g., bullying) typically will have yet to emerge, primarily because children have yet to develop sufficient linguistic skills. This is one of the reasons that major studies on childhood physical aggression (e.g., Broidy et al., 2003; Tremblay et al., 2004), as well as the current dissertation, focuses specifically on physical aggression (e.g., kicking, biting, hitting, throwing things at people, physical fights).

Research in developmental psychology emphasizes the importance of the early childhood period in the development of physical aggression (e.g., Coie & Dodge, 1998; Tremblay, Japel, Pérusse et al., 1999). Aggression in the preschool years is considered

a normal part of child development. In fact, many toddlers exhibit some form of physical aggression, such as forcefully taking a toy away from a peer (e.g., Fagot & Hagan, 1985; Hay, Castle & Davies, 2000). The frequency of physical aggression typically reaches its peak at approximately one and a half, and, two to three and a half years of age (Hay, 2005; Tremblay et al., 1999). Moreover, aggression tends to decline dramatically after this early childhood period when children are of school age (e.g., Cummings, Iannotti, & Zahn-Waxler, 1989; Goodenough, 1931; Hartup, 1974). Therefore, while physical aggression in the first few years of life is normal, understanding patterns in the unfolding of aggression is important because this is when socialization is underway and will provide information about the extent to which children are learning to inhibit aggressive tendencies. From this perspective, it is those children who do not learn to inhibit their aggression by school entry who are at higher risk for continued antisocial behaviour problems, delinquency and offending in adolescence and early adulthood (e.g., Broidy et al., 2003; Nagin & Tremblay, 1999; Tremblay, 2007).

### ***1.5.1. Trajectories of Physical Aggression***

Developmental trajectories of physical aggression beginning in childhood provide information about the long-term patterns of physical aggression (e.g., Broidy et al., 2003; Côté, et al., 2007; Côté, Vaillancourt, Le Blanc, Nagin & Tremblay, 2006; NICHD, 2004; Maldonado-Molina & al., 2010; Tremblay, Nagin, Séguin, Zoccolillo, Zelazo, Boivin, Pérusse & Japel, 2004; van Lier et al, 2009). These studies demonstrate that a substantial proportion of preschool children are not frequently physically aggressive (i.e., up to half). Conversely, a much smaller proportion of preschool children (i.e., less than one-fifth) show the highest levels of physical aggression levels of frequent and persistent patterns of aggression compared to the other children. These patterns of physical aggression in childhood and adolescence are also relatively stable over time. Although physical aggression increases or decreases over time, physical aggression trajectories display much rank stability (i.e., low-rate groups tend to remain low, and high-rate groups tend to remain high). Finally, children who are highly physically aggressive are significantly more likely to persist and develop antisocial behaviour including violence in adolescence and early adulthood. Importantly, a number of psychosocial risk factors are associated with high physical aggression trajectories that begin in early childhood.

These include being male, having younger siblings, coming from a low income family, having a young mother with low education, a history of past antisocial behaviour, a harsh coercive parenting style, and who smoked during pregnancy (Côté et al., 2007; Côté, et al., 2006; NICHD, 2004; Tremblay, et al., 2004).

Unfortunately, this suggests that children showing high physical aggression are from more vulnerable families experiencing social adversity. The risk factors these children are exposed to can impede the socialization process among these families, and importantly, these factors begin to operate very early in children's development. For instance, some of these risk factors (e.g., maternal history of conduct problems, prenatal mood disorder) are linked to physical aggression as early as 12 months old (Hay et al., 2011). Therefore, some children are being exposed to numerous risk factors during a developmental period when they are learning to inhibit their aggressive behaviour. The period before children begin school is crucial because this is when socialization processes are taking place where children learn alternatives to aggression and other maladaptive behaviour (e.g., Kochanska, 1993; Kopp, 1982; Maccoby 1980; Tremblay, 2003). Indeed, interventions during early childhood, particularly parent training programs, are effective not only in decreasing behavioural problems in childhood, but also have positive long term effects on delinquency and offending in adolescence and adulthood (e.g., Dishion & McMahon, 1998; Piquero, Farrington, Welsh, Tremblay & Jennings, 2009; Tremblay & Japel, 2003). Further examination of the processes occurring with vulnerable children and their parents during this crucial time period will therefore help to improve prevention and intervention efforts, in addition to improving our understanding of the origins of aggressive behaviour.

Trajectory studies reaffirm the importance of understanding aggression during the early childhood period, while also informing us about the risk factors associated with the long-term development of aggression. Critically, virtually none of these studies examine an ethnically diverse sample, or the impact of ethnic or cultural differences in the development of physical aggression. Another limitation is that they do not necessarily capture heterogeneity of patterns of physical aggression in the short-term. How patterns of behavioural development manifest in the short-term may yield very different observations than broader patterns over a five or ten year period. Examining trajectories of children over long time periods lends to the possibility that observations of

behavioural development are being homogenized. Therefore, the influences on physical aggression may differ over specific a shorter period of time. Currently, it is unclear whether correlates associated with short-term change are the same or different from those associated with the long-term trajectories of physical aggression in children. Studying the period before children begin school is critical because it provides an important window of opportunity for primary and secondary intervention. Examining the more proximal factors and life circumstances of families with preschoolers with aggression and behavioural problems will be informative for program development.

## **1.6. Aims of the Dissertation**

The current dissertation explores the role of mothers in the intergenerational transmission of aggressive and antisocial behaviour, particularly considering that females have been neglected in this area of criminological research. The main focus is on female delinquents as mothers, and whether their children are at-risk of aggressive behaviour. The focus on mothers as a source of the transmission of antisocial behaviour is critical because females carry much of the burden of juvenile delinquency into adulthood, in various ways that extend beyond simply continued antisocial involvement. They are responsible for the decisions they make during pregnancy, and for many of the parenting decisions once their children are born. Moreover, they are typically the primary caregivers of young children, and sometimes the sole caregivers.

Therefore, this dissertation merges a wide range of literature from different disciplines. Specifically, a life-course framework of crime is adopted, and considers how women experience important life events. In other words, how female involvement in juvenile delinquency can impact pregnancy and motherhood. The negative adult outcomes of female delinquents suggest that these women may be more vulnerable, and consequently have more difficulty providing adequate caregiving environments after their children are born. Considering that substance abuse is one of these life adversities, this dissertation also integrates research from medical and health sciences on the prenatal exposure to substances and children's subsequent cognitive and behavioural development. The focus on the critical developmental period of early childhood, when children are learning to control their behaviours is also understood

through a developmental psychology framework. Therefore, taken together, this dissertation uses a multidisciplinary approach to investigate potential processes by which the intergenerational transmission of antisocial behaviour operates across mothers' experiences of pregnancy and motherhood during the pivotal infant/toddler years. This dissertation is also unique given the investigation of mothers from diverse cultural backgrounds, and importantly, first generation immigrant women.

As noted earlier, the current dissertation is based on the first two waves of the ongoing Vancouver Longitudinal Study on the Psychosocial Development of Children conducted in Vancouver, British Columbia, Canada. The objective of this on-going prospective study is to identify key early risk and protective factors of violence and delinquency in at-risk children from the earliest developmental periods (Lussier, Corrado & Tzoumakis, 2012; Lussier, Tzoumakis et al., 2011). The Vancouver Longitudinal Study is a general population study that is diverse and represents a wide range of mothers and their children (boys and girls) from different socioeconomic and cultural backgrounds reflecting the diverse sociodemographic composition of the city of Vancouver. This sample differs from other studies on female offenders and childhood aggression in its diversity; approximately half of the women are non-Caucasian and born outside of North America. Recruitment began in February 2008 to August 2010 in Vancouver and the Greater Vancouver Regional District (GVRD), and Wave II was completed in May 2013. As a result, rather than using a traditional dissertation approach, this dissertation consists of three individual empirical studies (based on different waves and sample sizes). Studies I and II are based on Wave I, and Study III includes both Wave I and Wave II. Therefore, three empirical studies were conducted using data from Vancouver Longitudinal Study in order to explore the link between maternal delinquency and preschoolers' physical aggression.

Study I explores the intergenerational transmission of antisocial behaviour by examining how mothers with a history of juvenile delinquency experience pregnancy. This is accomplished by identifying profiles of mothers with a history of juvenile delinquency. Mothers who reported delinquency during adolescence are compared on a number of risk factors (e.g., sociodemographics, social adversity), but most importantly, on their prenatal substance use. By integrating research from health sciences about the prenatal environment, and criminological analyses about adult outcomes of juvenile

delinquents, this study examines whether mothers who were juvenile delinquents are more likely to compromise the prenatal environment of their children by making unhealthy decisions during pregnancy. Next, this study explores the link between mothers' delinquency and their children's aggressive behaviour. The specific question is whether mothers with a history of juvenile delinquency are more likely to have physically aggressive children, especially those having used substances during their pregnancies. The onset and prevalence of different manifestations of physical aggression are examined during early childhood. Therefore, Study I explores whether one of the mechanisms underlying the intergenerational transmission of antisocial behaviour may be operating via risky decisions during pregnancy.

Study II moves from pregnancy to another important life transition, motherhood, and examines parenting practices. Since many of the adverse adult outcomes of female delinquency (e.g., mental health, social adversity) are likely to affect parenting, this study focuses on exploring specific patterns of parenting practices. The aim of Study II is to determine the profiles of parenting among this unique sample of mothers from diverse cultural backgrounds. Importantly, this study adopts a methodological approach (i.e., latent class analysis) to identify patterns of individual parenting practices that takes into account that parents can show both positive and negative practices. In other words, this study considers that one does not preclude the other, and therefore reflects the complexities of individual parenting experiences. The aim is also to determine the link between profiles of parenting and a number of criminogenic, sociodemographic, historical, and developmental factors. More specifically, Study II explores whether mothers' past delinquency, current adult offending, mental health, cultural background, as well as children's physical aggression are linked to profiles of maternal parenting. A key aim is to determine how mothers' criminogenic risk factors and mental health are linked to specific types of parenting.

The focus of Study III shifts specifically to the development of children's physical aggression in early childhood. The aim is to examine the persistence of children's physical aggression during the preschool years because there are long-term consequences and costs associated with those who continue after this period. Moreover this is an ideal time to intervene with young children and their families. The impact of mothers' sociodemographic, socioeconomic, parenting, mental health, delinquency and

offending on their children's aggressive behaviour are examined while taking into account the role of cultural background and immigration. Therefore, Study III also examines cultural differences in the development of physical aggression in the early years, and some of the challenges faced by women who are experiencing motherhood in a new cultural context.

Taken together, these three studies situate the role of the mother in the intergenerational transmission of aggression and antisocial behaviour by merging multiple disciplines and areas of research. By taking into account gendered turning points in the life-course, and focusing on pregnancy and motherhood experiences of females, this dissertation explores potential underlying mechanisms in this transmission. Considering the importance of the early childhood developmental period, the overall goal of the dissertation is that the findings of these studies will be useful for tailoring more effective policy and interventions for families, especially for females and different cultural groups.

## **Chapter 2.**

### **Study I: Maternal History of Delinquency, Pregnancy, and Children's Physical Aggression**

#### **2.1. Abstract**

The current study explores the intergenerational transmission of aggression and antisocial behaviour by examining mothers' juvenile delinquency, their pregnancies, and the impact on children's aggressive behaviour. The sample consists of the first 181 biological mothers recruited as part of the Vancouver Longitudinal Study on the Psychosocial Development of Children (British Columbia, Canada). Results indicate that mothers with a history of juvenile delinquency are more likely to experience social adversity, to use substances during pregnancy and to offend in adulthood. Furthermore, mothers who reported juvenile delinquency had children that were more physically aggressive and had an earlier onset of physical aggression. This pattern of association held when controlling for sociodemographics, social adversities, prenatal substance exposure, and criminal involvement in adulthood. The study findings highlight the importance of understanding the role and impact of female delinquency and motherhood on the intergenerational transmission of antisocial behaviour.

#### **2.2. Introduction**

For several decades now, criminologists have been examining the association between parents' criminal involvement and their children's delinquency (e.g., Farrington, 1979; Glueck & Glueck, 1950; McCord, 1979). While these studies have established such a link, the process by which this transmission operates remains tentative, with



some researchers emphasizing genetic markers (for a review, Rhee & Waldman, 2002), some stressing environmental factors, (such as poor parenting practices, abuse and neglect, etc.) (e.g., Patterson, 1998; Simons, Wu, Conger, & Lorenz, 1994), and others emphasizing the interactions between the two (Kim-Cohen et al., 2006; Moffitt, 1993). Traditionally, however, the focus has been on the antisociality or the criminal involvement of the father, rather than the mother (for a review, Loeber & Stouthamer-Loeber, 1986). More recently, greater emphasis has been placed on the antisocial behaviour of the mother and the role of the prenatal environment to explain this transmission. Several empirical studies from the field of medical and health sciences have investigated the consequences of maternal substance use during pregnancy on children's cognitive, emotional and behavioural development during infancy and toddlerhood (e.g., Bendersky, Bennett & Lewis, 2006; Fergusson, Horwood & Northstone, 2002; Fried, Watkinson, & Gray, 1992). Studies have shown that early phases of development are critical for the development of physical aggression and, most importantly, for the socialization process by which children learn to control their aggression by developing prosocial behavioural alternatives (Côté et al., 2006; Tremblay et al., 1999; Tremblay, 2010). The current study attempts to bridge together these three corpuses of research from three distinct disciplines: criminology and the intergenerational transmission of crime and delinquency; medical and health science research on the study of the prenatal environment and its impact on child development; and developmental psychology and the study of physical aggression in infancy.

The focus of this study is on the female delinquent as a mother and whether the children of these mothers are at-risk of a trajectory of antisocial behaviour. Specifically, this study is concerned with the process by which intergenerational transmission operates by examining how mothers who were juvenile delinquents experience two pivotal phases of their children's development: the prenatal period and the infant-toddler period. The current study investigates the possibility that mothers with a history of delinquency are more likely to use nicotine, alcohol and drugs during their pregnancy, which have all been associated with deficits during infancy, and are precursors to later problem behaviour. At the earliest developmental stages, problem behaviours may take the form of physical aggression. Therefore, this study examines whether mothers who reported delinquency are at risk of using substances during their pregnancy, and

whether their children are more physically aggressive. The current study will therefore explore the intergenerational transmission of antisocial behaviour by examining maternal juvenile delinquency, pregnancy experiences, and the link with preschoolers' aggressive behaviour. The literature on the adult life outcomes of juvenile delinquents, the intergenerational transmission of antisocial behaviour, the impact of prenatal substance exposure, and the development of physical aggression in early childhood is reviewed in the next section.

### **2.2.1. *Parenthood and Life-course Criminology***

Proponents of age-graded theory of informal social control have emphasized a life-course view on crime and delinquency (Elder, 1998; Laub & Sampson, 2003; Sampson & Laub, 1993). According to this life-course framework, life transitions, such as marriage, employment, and military service may impact the course of offending. Transitions can be described as turning points when they affect the life-course (positively or negatively) by significantly increasing competence (e.g., skills, knowledge, etc.) or decreasing coping abilities (e.g., trauma, war, etc.) (Elder, 1998). Parenthood represents such a life transition since parenting responsibilities are thought to lead to significant changes in routine activities which can reduce unstructured time spent with antisocial peers in favour of more family-oriented activities (Laub & Sampson, 2003; Warr, 1998). Considering this, parenthood can be seen as a significant agent of change associated with desistance from crime. One study which examined the question suggested that parenthood did not have a significant effect on offending, but interactions between gender and parenthood were not controlled for (Blokland & Nieuwbeerta, 2005), and it is reasonable to think that parenthood may not be experienced the same way for men and women. A mother's social context, life circumstances and personal preferences will likely shape the meaning of pregnancy and impact its role on future criminal involvement (Kreager et al., 2010). Life-course research has mostly focused on how parenthood impacts male criminality, and, as a result, less is known about how it influences females. Qualitative studies have suggested that while convicted mothers may perceive motherhood as contributing to their desistance from offending, they also reported that motherhood is a source of great stress that can promote criminal involvement (see, Michalsen, 2011). The current study is interested in what becomes of

juvenile female delinquents in adulthood, more specifically when they experience motherhood.

### **2.2.2. *Adult Life Outcomes of Female Delinquents***

There is a growing body of research that has examined the adult life outcomes of female juvenile delinquents. As with males, longitudinal studies have shown that female juvenile offenders are at-risk of adult criminality, although to a lesser degree (Lanctôt & Le Blanc, 2002). Using data from the second Philadelphia Birth Cohort study, Tracy and Kempf-Leonard (1996) showed that female juvenile offenders were four times more likely to have at least one arrest after age 18 (see also, Moffitt et al., 2001). However, this study also showed that continuity is significantly more important for males, as 42 % of male juvenile delinquents persisted in adulthood, compare to 12 % of females. However, the impact of juvenile delinquency on women's lives goes beyond further criminal involvement in adulthood. A review of the empirical literature on the adult outcomes of delinquent or conduct disordered females showed that these women also had higher rates of mortality, psychiatric problems, abusive relationships, social assistance, and involvement with social services (Pajer, 1998). Lanctôt and colleagues (2007) found that both delinquent boys and girls were more vulnerable to negative life outcomes in adulthood (i.e. domestic violence, drug and alcohol problems, criminal activity, number of partners, depressive tendencies), but that females faced more socioeconomic disadvantages. In addition, the female delinquents who fared the worst as adults were those who belonged to the high-rate and more persistent offending trajectories (Colman, Kim, Mitchell-Herzfeld, & Shady, 2009; Odgers et al., 2008). These studies suggest that female juvenile delinquents are exposed to multiple risk factors as adults.

### **2.2.3. *The Intergenerational Transmission of Offending***

A central tenet of the life-course approach is the importance of linked lives to understand behavioural development (Elder, 1998). Linked lives refers to the notion that the decisions made by members of one generation can significantly impact those of the next, through a process also referred to as intergenerational transmission (e.g., Thornberry, 2009). The intergenerational transmission of crime and delinquency has

received much attention from criminologists. In the past, the criminal involvement of the father (rather than the mother) has been the subject of much empirical scrutiny (e.g., Farrington, 1979; Loeber & Stouthamer-Loeber, 1986; Osborn & West, 1978). While females have recently been included in more studies examining the link between parental and child antisocial behaviour, the gender of the parents is often not controlled for (e.g., Bailey et al., 2009; Fergusson & Horwood, 2002). Findings have shown that parents exhibiting antisocial behaviour were more likely to have children manifesting externalizing behaviour (Bailey et al., 2009; Hicks et al., 2004; Lahey and Waldman, 2003), or difficult to manage behaviour (Jaffee et al., 2006). However, the link between parental antisocial behaviour and children's behaviour is not necessarily direct, as some studies have suggested that it is mediated by the number of the mother's relationship transitions (Capaldi & Patterson, 1991), by ineffective parenting (Thornberry et al., 2003), or by maternal age at first birth (Wakschlag et al., 2000). Moreover, while some of these studies have examined how parental antisocial behaviour impacts their children's behaviour, they have not examined how it influences pregnancy experiences.

#### ***2.2.4. Female Delinquency and Risky Behaviour During Pregnancy***

One possibility to explain the link between a mother and her children's antisociality is through her behaviour during pregnancy. In the last two decades, research from medical and health sciences has focused on the prenatal environment and its influence on child development. These studies have examined the consequences of nicotine, alcohol and drug use during pregnancy and their long-term impact on cognitive, emotional and behavioural development, especially during infancy and toddlerhood (e.g., Bennett, Bendersky, & Lewis, 2002; Connor, Sampson, Bookstein, Barr, & Streissguth, 2000; Cornelius, Goldschmidt, DeGenna, & Day, 2007). For instance, studies that have focused on maternal smoking during pregnancy have found that it increases the likelihood of children being physical aggressive (Lussier, Corrado, & Reebye, 2013; Tremblay et al., 2004), having oppositional defiant disorder and attention deficit disorder (D'Onofrio et al., 2008), or having deficits in cognitive and language ability (Fried et al., 1992). Huijbregts and colleagues (2008) examined both the impact of prenatal smoking and maternal antisocial behaviour and found higher levels of physical aggression in these children. Another study found that children of who

were exposed to substances during pregnancy were not only more likely to show higher levels of physical aggression in early childhood, but also of sexual behaviours (Lussier, Tzoumakis et al., 2011). Several studies have found that mothers who used substances while pregnant tended to be poly-substance users, unemployed, depressed, and had low levels of social and financial support (Bendersky et al., 2006; Fergusson et al., 2002; Fried et al., 1992; Nichter et al., 2007). As a result of these findings and those on the negative adult life outcomes of female delinquents, it is possible that female delinquents are more likely to compromise the prenatal environment of their children. Unhealthy decisions during pregnancy may therefore facilitate the transmission of aggressive and antisocial behaviour.

### ***2.2.5. At-risk Pregnancies and Physical Aggression in Early Childhood***

The intergenerational transmission of antisocial behaviour may manifest itself at the earliest stages of behavioural development. In this regard, research stemming from developmental psychology and criminology has shown some degree of continuity between physical aggression in infancy and conduct disorder in childhood. For example, problem behaviour measured at age one (i.e., difficult temperament, aggression, and noncompliance) was significantly predictive of externalizing behaviours at age five (Keenan et al., 1998). Moreover, several studies have examined trajectories of physical aggression over different developmental periods: from early to late childhood (Côté et al., 2006); from mid to late childhood (Broidy et al., 2003); and, from childhood until adolescence (Bongers et al., 2004; Nagin & Tremblay, 1999; Maughan et al., 2000; Schaeffer et al., 2003). Overall, these studies identified three to four trajectories, with the majority of children exhibiting low to moderate levels of aggression, and a minority exhibiting high and stable or increasing levels of aggression. Aggression in preschoolers is therefore the norm and not the exception; however, while studies have shown that the majority of children stopped using physical aggression before school entry, a small proportion continued to exhibit elevated levels of physical aggression from its onset (Brame, Nagin, & Tremblay, 2001; Tremblay, 2000). This small but aggressive group of children is of particular concern since studies have found that high levels of aggressive behaviour in childhood were associated with offending and aggression in

adulthood for both boys and girls (Huesmann, Eron, Lefkowitz, & Walder, 1984; Stattin & Magnusson, 1989). Several risk factors were found to be associated with this high physical aggression trajectory, including: early motherhood, maternal antisocial behaviour before the end of high school, maternal smoking during pregnancy, postpartum maternal depression, low income, low education, and hostile parenting practices (Tremblay et al., 2004; Côté et al., 2006). Rather than examining the frequency of physical aggression over time (i.e., trajectories), others have considered the onset of physical aggression in early childhood (for a review, Tremblay, 2010). Studying the onset of a phenomenon is particularly important to clarify its origins. One study found associations between maternal antisocial behaviour and the risk factors of children's early and chronic physical aggression (i.e. young parent, low education, low income, smoking during pregnancy), but the authors did not examine the link between maternal antisociality and their children's behaviour (Zoccolillo et al., 2005). More recently, Lussier, Tzoumakis and colleagues (2011) found an association between the early onset of children's physical aggression and delivery and birth complications as well as prenatal nicotine exposure. Based on these findings, it is possible that mothers with a history of delinquency, especially those having used substances during pregnancy, are more likely to have physically aggressive children.

### **2.3. Aims of Study I**

The aim of the current study is to explore the intergenerational transmission of antisocial behaviour by examining female juvenile delinquents in adulthood, particularly when experiencing pregnancy. Specifically, the research questions examined are whether: (1) mothers who were delinquent are more likely to compromise the prenatal environment of their children by making unhealthy decisions during pregnancy such as using nicotine, alcohol, and drugs; (2) mothers who were delinquent are more likely to have physically aggressive children, especially those having used substances during their pregnancies; and, (3) physical aggression in early childhood is more specific to children whose mothers reported violent delinquency.

## **2.4. Methodology**

### **2.4.1. Sample**

Prior studies on female delinquents and female offenders have often relied on specialized samples of adjudicated youth or incarcerated women (e.g., Colman et al., 2009; Michalsen, 2011). Samples comprised of convicted female delinquents in a youth detention center or incarcerated female offenders are biased because they include women who committed more serious crimes, who were found guilty, and who were charged and convicted. Therefore, such samples exclude those who committed less serious offences, which is more typical of females' involvement in crime and delinquency, and they also exclude those who avoided detection or conviction. Furthermore, these samples are influenced by variations in law enforcement and court practices across jurisdictions, making it difficult to generalize the findings outside of the specific jurisdiction where the study was conducted. Additionally, while findings from such studies are informative, their generalizability is also limited to the small subgroup of females that have been caught for their acts. Moreover, these studies often do not include comparison groups of non-delinquent females. Hence, to tackle such methodological issues, and in line with other empirical studies (e.g., Fergusson et al., 2002; Moffitt et al., 2001) a community sample was used. More specifically, the current study is based on the first 181 biological mothers and their children of the on-going Vancouver Longitudinal Study on the Psychosocial Development of Children conducted in Vancouver, British Columbia, Canada. The objective of this longitudinal study is to provide empirical information for policymakers about key early risk and protective factors of aggression and violence from the earliest developmental periods (Lussier, Corrado et al., 2011).

Recruitment for the mothers and their children (boys and girls) included in the current study was conducted between February 2008 to August 2010 in the city of Vancouver and the Greater Vancouver Region (i.e., Burnaby, Coquitlam, New Westminister, Surrey, Port Coquitlam). This sample is composed of three groups, reflecting three recruiting strategies: a clinical sample, an at-risk community sample, and a community sample. Participants were recruited as follows: (1) a clinical sample of mothers whose children (n = 13) were referred for externalizing disorder at the Infant

Psychiatric Clinic at the BC Children's Hospital; (2) a community at-risk sample (n = 122) of mothers and their children were recruited from daycares located in neighbourhoods having been ranked in the lowest twenty fifth percentile by two provincial surveys in terms of various socioeconomic and psychosocial indicators of child development (Kershaw, Irwin, Trafford, & Hertzman, 2005); and (3) a community comparison sample of mothers and their children (n = 46) were recruited from randomly selected daycares located in neighbourhoods in the remaining three quarters of the provincial ranking. It should be noted that for the community at-risk and community comparison samples, it was the neighbourhoods, and not the families or the children that were sampled for the study. Although at-risk neighbourhoods were sampled, this does not mean that all of the mothers and children included in the community at-risk sample were all at-risk, but suggests that there may be a higher proportion of at-risk cases in these neighbourhoods.

While daycares in vulnerable neighbourhoods were targeted for the at-risk sample, by also including the community sample, a wide range of families in terms of risk factors (i.e., low-risk, medium-risk, and high-risk) were included in the total sample. The mothers were on average 35 years old (SD = 5.0) and ranged from 20 to 46 years old at the time of data collection. Mothers in the sample were relatively educated, with over half having a university degree or higher. Approximately 20 % of the sample consisted of low-income families. However, there was a wide range of families in terms of income as shown by the mean family income of over 85,000\$ (SD = 64,807). The children of these mothers were between three and five years old at the time of the study (Mean = 3.8; SD = 0.7). The sample consisted of an almost equal proportion of both boys (54.1 %) and girls (45.9 %). The ethnic diversity in the study is noteworthy because just over one half of the children (58.0 %) are Caucasian, and the next two largest ethnic groups are Asian (mainly Chinese) (13.8 %) and South-Asian (7.7 %). A description of the sample can be found in Table 2.1.

### **2.4.2. Procedures**

The current study is based on the first wave of data collected from in-person interviews with the biological mothers. Interviews were conducted at a research lab located at BC Children's Hospital or at the participant's residence. Standardized interviews were conducted by trained graduate students using a computerized



questionnaire and lasted about two and a half hours. Ethics approval was obtained from Simon Fraser University, the University of British Columbia, and BC Children's Hospital. Participation was voluntary and the mothers were informed that they could withdraw from the study at any time. Mothers received forty dollars for participating. More information about the research design and sampling procedures can be found elsewhere (Lussier, Corrado et al., 2011; Lussier, Tzoumakis et al., 2011).

### **2.4.3. Measures**

#### **Delinquency and Offending**

Mothers were asked to report information about their juvenile delinquency and adult criminality using the MASPAQ (Le Blanc et al., 1996). The validity of the MASPAQ has been empirically tested with both males and females and with different sample types (i.e. adjudicated, community, and at-risk) (e.g., Le Blanc & Fréchette, 1989; Le Blanc et al., 1996). More specifically, the inter-item reliability of the scales for both males and females were found to be high for general ( $\alpha = 0.88$ ) and for violent ( $\alpha = 0.76$ ) delinquency (Le Blanc et al., 1996). The construct validity (Le Blanc & Bouthillier, 2003) and the predictive validity (Le Blanc, 1997) have also been empirically tested and were shown to be high and significant for both males and females. The MASPAQ includes a series of 26 different delinquent/criminal behaviours (see Appendix A). For each of these, the research participants were asked (a) if they had ever committed the behaviour (i.e., prevalence), (b) the age at first occurrence (i.e., age of onset), and (c) the number of times they committed the behaviour in the last year (i.e., frequency). For the purpose of this study, delinquency is differentiated by the nature of the behaviour. Selecting a broad enough measurement of parental antisocial behaviour is important, because even limited previous antisocial behaviour in the parent can have an impact on their children (Zoccolillo et al., 2005). Therefore, those who reported having committed at least one of the nine violent behaviours under the age of 18 were categorized as violent delinquents (23.8 % of the sample). The behaviours most prevalently reported by the violent delinquents were: having been involved in a fist fight (74.4 %), thrown objects at people (37.2 %), and threatened to beat someone up to force them to do things they did not want to do (23.3 %). Of importance here is that almost all of the violent delinquents also

reported nonviolent behaviour (90.7 %). Therefore, their delinquency was not only more serious, but it was also versatile.

Mothers who reported having committed at least one nonviolent act of delinquency under the age of 18 were categorized as nonviolent delinquents (31.5 % of the sample). The most prevalent behaviours reported by the nonviolent mothers were: shoplifting (64.9 %), taking soft drugs (46.4 %), and minor theft (37.5 %). Mothers who never reported any of the 26 behaviours under the age of 18 were categorized as non-delinquent mothers (44.8 % of the sample). Although none of these women reported delinquency as juveniles, a few of them did report offending in adulthood (n = 16) with the most prevalent behaviours being: taking soft drugs (14.8 %), drunk driving (11.1 %), shoplifting (3.7 %). Indicators for maternal current offending (prevalence in the past year) and age of onset into adulthood were also created based on the same categorization. An indicator for variety of offending was also calculated by summing the total number of different behaviours that were reported by each mother (the scores ranged from 0 to 26). Mothers were also asked questions regarding their contact with the justice system (ever having been arrested or convicted), as well whether their current partner/the child's father was ever arrested. Descriptive statistics for these indicators can be found in Table 2.1.

**Table 2.1. Descriptive Statistics for the Sample and the Maternal Delinquency Groups**

	Total sample (N = 181)		Violent delinquents (N = 43)		Nonviolent delinquents (N = 57)		Non-delinquents (N = 81)	
	%	N	%	N	%	N	%	N
<b>Sociodemographics</b>								
Child's gender (male)	54.1	98	48.8	21	57.9	33	54.3	44
Child's ethnicity (Caucasian)	58.0	105	65.1	28	71.9	41	44.4	36
<b>Sample</b>								
Clinical	7.2	13	14.0	6	5.3	3	4.9	4
At-risk	67.4	122	58.1	25	70.2	40	70.4	57
Comparison	25.4	46	27.9	12	24.6	14	24.7	20

	Total sample (N = 181)		Violent delinquents (N = 43)		Nonviolent delinquents (N = 57)		Non-delinquents (N = 81)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Mother's age	35.4	5.0	33.7	5.9	35.8	5.0	36.1	4.3
Child's age	3.8	0.7	3.7	0.7	3.7	0.8	3.8	0.7
<b>Social adversity</b>	%	N	%	N	%	N	%	N
Low income	19.9	35	25.6	11	14.0	8	21.1	16
Social assistance	20.4	37	34.9	15	22.8	13	11.1	9
Education ( $\leq$ grade 12)	14.9	27	25.6	11	14	8	9.9	8
Marital status (single)	20.4	37	27.9	12	21.1	12	16.0	13
Partner ever arrested	18.6	27	27.3	9	26.1	12	9.1	6
	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>
Family income	\$85,228	64,807	\$89,911	86,647	\$84,547	48,078	\$83,089	62,065
Family Hollingshead	42.3	13.7	39.4	15.4	44.0	14.1	42.7	12.4
Mother Hollingshead	40.7	16.0	38.6	17.1	42.3	16.4	40.7	15.1
Partner Hollingshead	46.5	13.4	45.0	14.6	48.0	12.7	46.1	13.5
<b>Maternal criminality</b>	%	N	%	N	%	N	%	N
Current adult offending								
Overall	21.5	39	34.9	15	29.8	17	8.6	7
Violent	6.1	11	18.6	8	5.3	3	0.0	0
Nonviolent	19.3	35	30.2	13	26.3	15	8.6	7
Ever arrested	10.5	19	18.6	8	15.8	9	2.5	2
Ever convicted	2.8	5	7.0	3	1.8	1	1.3	1
	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>	<b>Mean (SD)</b>	<b>N</b>
Overall age of onset	12.3 (5.7)	116	9.2 (3.3)	43	11.8 (3.8)	57	22.3 (5.4)	16
Violent age of onset	13.5 (7.0)	53	10.8 (3.6)	43	24.9 (6.5)	9	27 (n.a.)	1
Nonviolent age of onset	12.9 (5.6)	112	10.8 (4.1)	39	11.8 (3.8)	57	22.3 (5.4)	16
Variety of offending	2.7 (3.9)	182	6.8 (5.6)	43	3.0 (1.7)	57	0.4 (1.4)	81

	Total sample		Violent delinquents		Nonviolent delinquents		Non-delinquents	
	(N = 181)		(N = 43)		(N = 57)		(N = 81)	
<b>Prenatal substance use</b>	%	N	%	N	%	N	%	N
Nicotine								
Prevalence	8.8	16	20.9	9	8.8	5	2.5	2
Daily	6.6	12	16.3	7	5.3	3	2.5	2
1/2 pack or more	2.2	4	4.7	2	1.8	1	1.3	1
Throughout pregnancy	3.3	6	11.6	5	0.0	0	1.3	1
Alcohol								
Prevalence	26.9	49	48.8	21	29.8	17	13.6	11
Daily or weekly	5.4	9	9.3	4	7.4	4	1.4	1
4 drinks or more	3	5	9.3	4	0.0	0	1.4	1
Throughout pregnancy	4.8	8	4.9	2	1.9	1	6.9	5
Soft drugs								
Prevalence	4.4	8	14.3	6	0.0	0	2.5	2
Daily or weekly	2.8	5	9.3	4	0.0	0	1.3	1
Throughout pregnancy	0.6	1	0.0	0	0.0	0	1.3	1
Hard drugs								
Prevalence	3.3	6	9.3	4	1.8	1	1.3	1
Daily	0.6	1	2.3	1	0.0	0	0.0	0
Throughout pregnancy	1.1	2	2.3	1	0.0	0	1.3	1

## Prenatal Substance Use

Mothers were asked about their use of different substances during their pregnancy using a structured interview format based on a standardized instrument to favour memory recall of prenatal adversities (Lussier, Tzoumakis et al., 2011). While retrospective data were used for this study, the recall period was relatively short. Studies have examined the advantages and disadvantages of using both self-report and biological indicators of substance use during pregnancy (Lester et al., 2001), and have shown some concern for underreporting within high-risk populations (Magura & Kang, 1996). While it would have been ideal to include both measures, large clinical studies on alcohol use have shown that biological and collateral information do not sufficiently add to self-report accuracy, particularly if the interview is clearly conducted for research

purposes outside of treatment delivery, if confidentiality and anonymity are ensured, and if the questions are specific rather than open-ended (Babor, Steinberg, Anton, & Del Boca, 2000; Del Boca & Noll, 2000), which was the case in the current study. The prevalence of the following three behaviours was considered in this study: (a) nicotine; (b) alcohol; and (c) soft or hard drugs. Mothers were asked about their frequency, quantity and duration of consumption. Table 2.1 shows the most prevalent type of substance use during pregnancy was alcohol (26.9 %), followed by nicotine (8.8 %), soft drugs (4.4 %) and hard drugs (3.3 %). Moreover 6.6 % of this sample smoked, 5.4 % used alcohol, 2.8 % used soft drugs, and 0.6 % used hard drugs on a regular basis. Similarly, 3.3 % smoked, 4.8 % used alcohol, 0.6 % used soft drugs, and 1.1 % used hard drugs throughout their pregnancies. Hence, regular and persistent substance use during pregnancy was relatively infrequent and characterized by a relatively small subgroup of this sample. Prevalence of prenatal alcohol use during pregnancy in Canada is estimated to be around 14 % (Cormier, Dell, & Poole, 2003), nicotine use 8 % (Nichter et al., 2007), and the use of any illicit drug during pregnancy in the United States was 4.4 % (Substance Abuse and Mental Health Services Administration, 2011). As such, substance use prevalence during pregnancy in the current study is mostly in line with findings elsewhere for smoking and drugs, but somewhat higher for alcohol use.

### **Social Adversity**

Mothers were also asked questions regarding their socioeconomic status during the interviews. Several measures of social adversity were included in the current study in order to examine the relationship between these indicators and maternal delinquency. Mothers were asked to report the family's annual income. Low-income status was also calculated for each family using Statistics Canada established cut-offs and the annual incomes provided by the mothers. Low income cut-offs are income thresholds established by Statistics Canada below which a family will likely devote a larger share of its income to the necessities of food, shelter and clothing than an average family would, and are based on community size, family size and annual income (Statistics Canada, 2011). Using income and employment information, Hollingshead social status indexes were also calculated for the mother, her partner and the family (Hollingshead, 1975). Additional indicators of socioeconomic status were also reported for descriptive purposes. Social assistance consisted of whether the mother had reported ever having

received social assistance. Education consisted of whether the mother had received a high school diploma or less. Marital status consisted of whether the mother stated that she was single, divorced or separated at the time of the interview.

### **Sociodemographics**

A number of sociodemographic characteristics were also considered as follows: (a) gender of the child; (b) ethnicity of the child (i.e., Caucasian, non-Caucasian), (c) age of the child at the time of interview; (d) age of the mother at the time of interview; (e) sample (i.e., clinical, community at-risk, community comparison).

### **Children's Physical Aggression**

Mothers were asked about their children's physical aggression using the Multi-Dimensional Aggression Index (MDAI; Lussier et al., 2011). Five indicators were used to examine children's physical aggression: (a) take away things from someone; (b) kick, bite, or hit anyone; (c) push, shove; (d) throw things at people; and (e) fight (physical), which are in line with other major studies on childhood physical aggression (Broidy et al., 2003; Tremblay et al., 2004). Mothers were asked whether their children had ever exhibited any of the behaviours as well as the estimated age at first occurrence. Indicators were also created for the prevalence and onset of any of the five aggressive behaviours. Most of the children had taken away things (83.4 %), kicked (77.3 %), pushed (69.1 %), while fewer had ever thrown things (48.1 %) or fought (21.5 %). The age of onset of these behaviours followed an increasing trend as follows: taken away things (Mean = 2.2, SD = 0.9), kicked (Mean = 2.1, SD = 0.9), pushed (Mean = 2.4, SD = 0.9), thrown things (Mean = 2.6, SD = 1.0), and fought (Mean = 2.9, SD = 1.0).

#### **2.4.4. Analytic Strategy**

First, in order to obtain descriptions of the mothers, the three groups (violent delinquents, nonviolent delinquents, and non-delinquents) were compared based on several child sociodemographic, social adversity, prenatal substance use, and crime indicators. Second, a series of multinomial logistic regressions were conducted in order to determine the profiles of the three groups of mothers on these indicators. Next, the relationship between maternal delinquency and the prevalence and onset age of their

children's physical aggression was examined using both logistic regression and Cox proportional hazards (Cox regression) analyses. Logistic regression was used to analyze the prevalence of physically aggressive behaviours while Cox regression was used to examine the age of onset. Both types of regression were completed to compare the three groups of mothers (violent delinquents, nonviolent delinquents, and non-delinquents), and another set of analyses was conducted to compare the violent delinquents with nonviolent delinquents (removing the non-offenders from the analyses). Both logistic and Cox regression models were conducted while adjusting for various covariates (i.e., sociodemographic, social adversity, prenatal substance use, crime). Survival analyses such as Cox regression are most appropriate for time-dependent phenomenon such as age of onset. This method is particularly helpful in developmental studies where right-censoring data is present (e.g., Pickles et al., 1994). More specifically, at the time of the first wave interview, children's age ranged from three to five years old. As a result, the period of observation was not the same across children sampled. Cox regression can adjust for this variability of observation. Indeed, with a longer follow-up, some children may start showing some of the behaviours that had not been manifested at the time of the interview (i.e., right-censoring). Hence, a simple analysis of variance would lead to inaccurate parameter estimates since cases without an onset would be removed from the analyses. This fundamental limitation does not occur with Cox regression because, analytically, it determines how long the child has "survived" the onset of a particular phenomenon. Most importantly, the Cox-regression method allows for inspecting time-to-onset of a particular form of physical aggression. These combined advantages facilitated the simultaneous analysis of the covariates of onset of physical aggression, as well as whether the covariates prematurely activate a particular behaviour. Furthermore, Cox regression is a multivariate technique that allows for the analysis of several covariates simultaneously. All analyses were conducted using SPSS, version 18.0.

## 2.5. Results

### 2.5.1. *Group Comparisons between Violent, Nonviolent and Non-delinquent Females*

The sociodemographic, social adversity, maternal criminality, and prenatal substance use indicators for the three groups of mothers are presented in Table 2.1. Children's age, gender and sample type did not differ significantly across the groups, although children of the mothers classified as violent delinquents tended to be recruited from the Infant Psychiatry Clinic (14.0 %) more than the other two groups (5.3 % and 4.9 %). Children's ethnicity did however differ, with a higher prevalence of Caucasians in the two maternal delinquent groups [ $X^2(2) = 11.55, p < .01$ ]. Furthermore, mothers classified as violent delinquents reported the highest prevalence of social assistance (34.9 %) and this was statistically significant [ $X^2(2) = 10.05, p < .01$ ]. Having less than a grade twelve education also followed a similar trend and approached significance [ $X^2(2) = 5.51, p = .06$ ]. Having a partner who was ever arrested was also significant [ $X^2(2) = 7.28, p < .05$ ] with mothers classified as violent delinquents showing the highest prevalence.

Statistically significant group differences were also found regarding substance use during pregnancy. It should be noted that for the purpose of the analyses, soft and hard drugs were combined as a single category due to the low prevalence of these behaviours. When looking specifically at group differences in terms of having used any of the substances at least once, nicotine [ $X^2(2) = 11.73, p < .01$ ], alcohol [ $X^2(2) = 18.00, p < .001$ ], as well as soft/hard drugs [ $X^2(2) = 15.87, p < .001$ ] were all significantly different. As shown in Table 2.1, the general trend observed for these three behaviours suggested that mothers classified as violent delinquents had the highest prevalence, followed by mothers classified as nonviolent delinquents, and mothers classified as non-delinquents with the lowest prevalence. Although few mothers used substances while pregnant frequently, in large quantities, and throughout the pregnancy, those who did tended to be in the violent delinquent group.

Mothers classified as violent delinquents also showed an earlier age of onset of general offending [ $F(2,113) = 67.33, p < .001$ ]. Indeed, on average this group started



their offending at age nine, as opposed to about age twelve for the nonviolent delinquents. Note that the analysis for the age of onset of violence is also informative. For mothers classified as violent delinquents, the average age of violence onset was around eleven years old. Yet, 15.8 % of the mothers classified as nonviolent initiated violent behaviours in adulthood (Mean = 24.9; SD = 6.5). These findings suggest that the violent delinquents were more likely to consist of child-onset offenders, whereas the nonviolent group was more likely to consist of adolescent-onset offenders. Additionally, it should be noted approximately one fifth of the mothers classified as non-delinquents were adult-onset offenders (N = 16). This group showed an average age of onset of 22.3. The violent delinquents were the most criminally versatile offenders [Welch(2, 82.83) = 63.94,  $p < .001$ ] amongst the three groups of mothers. On average, the mothers classified as violent delinquents reported having committed close to 7 out of the 26 delinquent behaviours, as opposed to 3 for the nonviolent delinquents, and 0.4 for the non-delinquents. The findings also highlighted the continuity of offending in adulthood. Indeed, the mothers categorized as delinquents (violent = 34.9 %, nonviolent = 29.8 %) reported having been involved in at least one crime in the past year compared to the non-delinquent group (8.6 %) [ $X^2(2) = 14.82$ ,  $p < .01$ ]. Approximately one third of both delinquent groups reported being involved in offending in adulthood at the time of the interview (past year). Similar results were found for violent [ $X^2(2) = 17.13$ ,  $p < .001$ ], and nonviolent offending [ $X^2(2) = 10.99$ ,  $p < .01$ ] in the past year, although the prevalence of violence was lower (18.6 % for the violent delinquents and 5.3 % for the nonviolent delinquents). Not surprisingly, ever having been arrested was significant [ $X^2(2) = 10.10$ ,  $p < .01$ ] with mothers classified as violent delinquents showing the highest prevalence of arrest.

### **2.5.2. Profiles of Female Delinquents and Non-delinquents**

Separate multinomial regression models were conducted to compare and contrast the three groups of mothers. Odds ratios (OR) for each of the models are presented in Table 2.2.

**Table 2.2. Multinomial Regression Models for Predicting Maternal Delinquency**

	Violent delinquents (N = 43)		Nonviolent delinquents (N = 57)	
	O.R.	95% C.I.	O.R.	95% C.I.
<b>Model 1: Sociodemographics</b>				
Child's age	0.87	0.50-1.51	0.98	0.60-1.61
Mother's age	0.91*	0.84-0.98	0.98	0.91-1.06
Child's gender (male)	0.95	0.43-2.07	1.31	0.64-2.72
Child's ethnicity (Caucasian)	2.24+	0.97-5.16	3.56**	1.65-7.70
Sample <sup>a</sup>				
Clinical	2.14	0.48-9.53	0.87	0.16-4.64
Community at-risk	0.89	0.36-2.19	1.36	0.59-3.16
Model summary: $X^2(12) = 23.08$ , $p = 0.027$ , $R^2 = 0.14$				
<b>Model 2: Social adversity</b>				
Low income	0.62	0.15-2.62	0.35	0.09-1.38
Social assistance	4.94**	1.55-15.75	3.39*	1.09-10.60
Education ( $\leq$ grade 12)	2.21	0.59-8.37	1.92	0.51-7.26
Family income	1.08	0.43-2.68	0.81	0.36-1.83
Family's Hollingshead index	1.00	0.96-1.05	1.02	0.98-1.06
Model summary: $X^2(10) = 17.32$ , $p = 0.068$ , $R^2 = 0.11$				
<b>Model 3: Prenatal substance use</b>				
Nicotine	6.30*	1.12-35.35	4.24	0.74-24.18
Alcohol	5.19**	2.00-13.45	3.16*	1.28-7.76
Drugs (soft/hard)	1.94	0.30-12.55	0.24	0.17-3.20
Model summary: $X^2(6) = 31.70$ , $p = 0.000$ , $R^2 = 0.18$				
<b>Model 4: Maternal criminality</b>				
Current overall offending	4.95**	1.80-13.62	3.74**	1.40-9.99
Ever arrested	6.04*	1.16-31.29	5.51*	1.10-27.47
Model summary: $X^2(4) = 23.47$ , $p = 0.000$ , $R^2 = 0.14$				

<sup>a</sup> Reference category is the community comparison sample;

Note. Reference category for the dependent variable is the group of non-delinquent mothers. The model  $R^2$  is the Pseudo  $R^2$  (Nagelkerke).

+ $p < .10$  \* $p < .05$  \*\* $p < .01$

Four models were tested separately (i.e., sociodemographic, social adversity, prenatal substance use, and maternal crime indicators) to maintain adequate statistical power due to the relatively small sample size. For each of the models tested, the two groups of mothers classified as delinquents were compared to the non-delinquent group.

Three of the four (i.e., sociodemographic, prenatal substance use, maternal crime) regression models tested were statistically significant ( $p < .05$ ), while the other one (social adversity) approached significance ( $p < .07$ ). Examining each block of indicators is informative about the most important characteristics distinguishing the three groups of mothers. Of the sociodemographic indicators examined, both children's ethnicity [OR = 3.56,  $p < .001$ ] and maternal age [OR = 0.91,  $p < .05$ ] were significant. The children of mothers classified as nonviolent delinquents were more likely to be Caucasian. Regarding the social adversity indicators, ever having been on social assistance significantly differentiated maternal violent [OR = 4.94,  $p < .01$ ] and nonviolent delinquents [OR = 3.39,  $p < .05$ ], although it should be noted that the confidence intervals for both were large indicating much variability in the odds ratios. For the prenatal risk factors, prenatal nicotine use [OR = 6.30,  $p < .05$ ] and prenatal alcohol use [OR = 5.19,  $p < .01$ ] were significantly more likely for the violent delinquent group, while alcohol use [OR = 3.16,  $p < .01$ ] was significantly more likely for the nonviolent delinquents. Similarly, current offending [violent delinquents: OR = 4.95,  $p < .001$ ; nonviolent delinquents: OR = 3.74,  $p < .001$ ] and ever having been arrested [violent delinquents: OR = 6.04,  $p < .05$ ; nonviolent delinquents: OR = 5.51,  $p < .05$ ] significantly predicted membership in the two maternal delinquency groups. Of interest here, the models showed that mothers who were violent delinquents were close to 5 times more likely to be adult offenders than mothers who were classified as non-delinquents. Similarly, mothers classified as nonviolent were close to 4 times more likely to be adult offenders as opposed to the non-delinquents.

### **2.5.3. Female Delinquency and Children's Physical Aggression**

The relationship between maternal delinquency and children's physical aggression is examined and presented in Table 2.3. First, several findings emerged from the prevalence of children's physical aggression across the three groups of mothers. The vast majority of children in the three groups were physically aggressive at least once. In fact, all of the children of the mothers classified in the violent delinquent group were physically aggressive, compared to just over 96 % of the children of the nonviolent delinquent mothers, and 84 % of the children of the non-delinquent mothers. This reinforces the idea that, generally speaking, physical aggression in toddlers is age-

normative. However, more in-depth analysis showed that the prevalence varies across different manifestations of physical aggression. For the three groups of mothers, it can be observed that the prevalence was highest for 'take away things', followed by 'kick, bite and hit', followed by 'push, shove', followed by 'throw things at people', while 'fight' had the lowest prevalence. Findings from logistic regression analyses showed that, aside from the least prevalent form of aggression, physical fighting, all forms of physical aggression were significantly more prevalent (all p values < .01) for the children of the mothers classified as delinquents (violent and nonviolent) than those of the mothers classified as non-delinquents (Table 2.3). Note that none of the comparisons between the children of the two groups of delinquent mothers produced significant differences (all p values > .10), suggesting that the highest prevalence of physical aggression was not limited to the children to mothers who were violent in youth.

Second, the three groups of mothers were also compared in terms of their children's age of onset for the six indicators of physical aggression using Cox regression models. The findings for age of onset were similar to those found for prevalence. The mean age of onset for (any) physical aggression was 1.7 years old for the children of mothers classified as violent delinquents, 1.8 for those of mothers classified as nonviolent delinquents and 2.2 for those of non-delinquent mothers. Therefore, there was a 4 to 5 month gap between the children of mothers classified as delinquent and those of non-delinquent mothers. The trend for age of onset of physical aggression was more or less the same as the one observed for prevalence. More precisely, the most prevalent behaviours occurred the earliest, with the least prevalent forms occurring later. Aside from fighting, all group comparisons between the children of the mothers who were delinquent (violent and nonviolent) and those of the non-delinquent mothers were statistically significant (all p values < .01). In other words, children whose mothers were delinquent had an earlier age of onset of physically aggressive behaviours. No significant differences were found for the onset of physical aggression between the two groups of mothers classified as delinquents.

**Table 2.3. Prevalence and Age of Onset of Children’s Physical Aggression Based on Maternal Delinquency**

	<b>Violent delinquents</b> (N = 43)	<b>Nonviolent delinquents</b> (N = 57)	<b>Non-delinquents</b> (N = 81)	<b>Delinquent vs. Non-delinquent<sup>a</sup></b> (N = 181)		<b>Violent vs. nonviolent<sup>b</sup></b> (N = 100)	
<b>Prevalence of aggression<sup>c</sup></b>	% (N)	% (N)	% (N)	O.R.	95% C.I.	O.R.	95% C.I.
Any aggression	100.0 (43)	96.5 (55)	84.0 (68)	9.37**	2.05-42.85	- <sup>d</sup>	- <sup>d</sup>
Take away things	93.0 (40)	91.2 (52)	72.8 (59)	4.29**	1.79-10.26	1.28	0.29-5.69
Kick, bite, hit	93.0 (40)	89.5 (51)	60.5 (49)	6.60***	2.92-14.95	1.57	0.37-6.66
Push, shove	76.7 (37)	80.7 (46)	56.8 (46)	2.82**	1.49-5.49	0.79	0.30-2.07
Throw things	58.1 (25)	57.9 (33)	35.8 (29)	2.48**	1.35-4.53	1.01	0.45-2.25
Fight	25.6 (11)	24.6 (14)	17.3 (14)	1.60	0.77-3.32	1.06	0.42-2.63
<b>Onset of aggression<sup>e</sup></b>	Mean (SD)	Mean (SD)	Mean (SD)	O.R.	95% C.I.	O.R.	95% C.I.
Any aggression	1.7 (0.9)	1.8 (0.8)	2.2 (1.0)	1.79***	1.31-2.46	1.14	0.77-1.71
Take away things	2.1 (1.1)	2.1 (0.9)	2.3 (0.9)	1.60**	1.15-2.22	0.97	0.64-1.46
Kick, bite, hit	2.0 (0.8)	1.9 (0.8)	2.4 (1.0)	2.24***	1.57-3.19	1.11	0.73-1.68
Push, shove	2.3 (1.1)	2.4 (0.9)	2.6 (0.8)	1.84**	1.27-2.64	0.98	0.63-1.54
Throw things	2.4 (1.1)	2.6 (0.9)	2.7 (1.0)	2.00**	1.28-3.13	0.98	0.58-1.64
Fight	2.7 (0.9)	3.2 (0.9)	2.9 (1.1)	1.53	0.79-2.94	1.03	0.47-2.27

<sup>a</sup> Reference category is the group of non-delinquent mothers;

<sup>b</sup> Reference category is the group of nonviolent mothers;

<sup>c</sup> Logistic regression was used to predict the prevalence of children’s physical aggression;

<sup>d</sup> Odds were not computed because all of the children of the juvenile violent delinquent mothers exhibited the behaviour;

<sup>e</sup> Cox regression was used to predict the onset of children’s physical aggression.

\*\*p<.01 \*\*\*p<.001

Next, it was important to examine whether the link between maternal delinquency and children’s physical aggression could be confounded by other factors. The results for the onset of aggression analyses accounting for sociodemographics, social adversity, prenatal substance use, and crime indicators are presented in Table 2.4. Separate Cox regression analyses were completed for each of these four indicators along with the indicator for the maternal delinquency. Several notable findings emerged from these models. Importantly, the link between the mothers’ delinquency and their children’s early onset of physical aggression is confirmed even after adjusting for sociodemographics, social adversities, prenatal substance use, and current offending. In fact, 18 out of the 24 models tested showed a significant association between

maternal delinquency and children's physical aggression ( $p$  values  $< .05$ ). The same analyses were conducted using logistic regression to examine the prevalence of children's physical aggression (not presented in Table 2.4). The results were very similar (i.e. 17 of the 24 models were statistically significant with  $p$  values  $< .05$ ), and as with the results for age of onset, the models for fought were consistently not significant. Moreover, the mothers' delinquency remained important while adjusting for sociodemographic, social adversities, prenatal use of substance, and current offending. Few of these indicators reached significance, and when they did, the results followed the same pattern as those for age of onset. It should be noted that in order to control for more frequent substance use, additional analyses were completed using indicators of daily nicotine and daily/weekly alcohol use. This was not possible for drug use due to low prevalence of high frequency users. Separate models were completed for frequent nicotine and alcohol use for each of the six children's physical aggression indicators. Results were very much in line with those presented in Table 2.4 (Model 3). Findings of the Cox regression models showed that mothers' juvenile delinquency remained significantly associated with an earlier age of onset of aggression. Neither frequent alcohol or nicotine use during pregnancy reached significance after controlling for history of maternal delinquency. This should not be interpreted as the lack of negative consequences of frequent substance use during pregnancy on the children's outcome (see for example, Lussier, Tzoumakis et al., 2011), but rather, showing that frequent substance use may not precipitate the activation of physical aggression. As with the results in Table 2.4, the only models that were not statistically significant were those for children's physical fighting, the behaviour with the lowest prevalence.

Moreover, the only behaviour for which the mother-child association was consistently absent was physical fighting. Recall that this is the least prevalent and the behaviour that starts the latest among those examined. Perhaps with a longer follow-up period, the link between maternal delinquency and children's onset of fighting would emerge; this hypothesis cannot be ruled out. Additionally, few covariates examined were found to be statistically significant after controlling for the maternal delinquency. Of importance, the indicator of maternal delinquency remained statistically significant across the models, while none of the other indicators were consistently linked to children's physically aggressive behaviours. This speaks of the relative importance of

female delinquency on children's onset of physical aggression. Finally, the delinquency of the mother did not account for all of the significant effects found, as some covariates were significantly associated to the onset of physical aggression. The child being Caucasian increased the likelihood of pushing and shoving [OR = 1.84,  $p < .01$ ]. Furthermore, clinical cases showed an early onset of throwing things at people [OR = 2.34,  $p < .05$ ] even after controlling for the mothers' delinquency. Finally, alcohol exposure during pregnancy increased the likelihood of 'taking away things' from someone after adjusting for the mothers' delinquency [OR = 1.58,  $p < .05$ ].

**Table 2.4. Cox Regression Analyses for the Onset of Children's Physical Aggression Accounting for Covariates**

	Any		Take away things		Kick, bite, hit		Push, shove		Throw things		Fight	
	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.
<b>Model 1: Sociodemographics</b>												
Child's gender (male)	1.13	0.8-1.6	1.06	0.8-1.5	1.18	0.8-1.7	1.18	0.8-1.7	1.29	0.8-2.0	1.54	0.8-3.0
Child's ethnicity (Caucasian)	1.24	0.9-1.7	1.12	0.8-1.6	1.41+	1.0-2.0	1.84**	1.2-2.8	0.86	0.5-1.4	1.45	0.7-3.0
Child's age	0.75*	0.6-0.9	0.71**	0.6-0.9	0.90	0.7-1.2	0.71	0.5-0.9	0.76+	0.5-1.1	0.72	0.4-1.2
Mother's age	0.98	0.9-1.0	1.00	1.0-1.1	0.99	0.9-1.0	0.99	0.9-1.0	1.01	1.0-1.1	0.99	0.9-1.1
Sample <sup>a</sup>												
At-risk	1.05	0.7-1.5	0.88	0.6-1.3	0.87	0.6-1.3	1.27	0.8-2.0	1.00	0.6-1.7	0.96	0.4-2.0
Clinical	0.94	0.5-1.8	0.99	0.5-1.9	0.97	0.5-1.9	1.25	0.6-2.5	2.34*	1.1-5.1	1.36	0.4-4.5
Maternal delinquency <sup>b</sup>												
Violent	1.86**	1.2-2.8	1.53*	1.0-2.3	2.18**	1.4-3.4	1.65*	1.0-2.6	1.83*	1.0-3.2	1.37	0.6-3.1
Nonviolent	1.56*	1.1-2.3	1.55*	1.0-2.3	1.90**	1.3-2.9	1.61*	1.1-2.5	2.11**	1.2-3.6	1.33	0.6-2.9
Model summary $X^2(8) = 23.40^{**}$ $X^2(8) = 17.52^*$ $X^2(8) = 26.98^{**}$ $X^2(8) = 28.43^{***}$ $X^2(8) = 18.03^*$ $X^2(8) = 6.61$												
<b>Model 2: Social adversity</b>												
Social assistance	0.95	0.6-1.5	0.79	0.5-1.3	1.40	0.9-2.3	0.87	0.5-1.5	1.09	0.6-2.0	2.36*	1.1-5.2
Education ( $\leq$ grade 12)	0.72	0.4-1.2	0.89	0.5-1.5	0.62+	0.4-1.1	1.03	0.6-1.8	0.70	0.4-1.4	0.94	0.4-2.4
Family income (logged)	0.87	0.7-1.1	0.88	0.7-1.1	0.93	0.7-1.2	0.95	0.7-1.2	0.82	0.6-1.1	1.02	0.6-1.6
Maternal delinquency <sup>b</sup>												
Violent	2.24***	1.5-3.4	1.73*	1.1-2.6	2.53***	1.6-4.0	1.89**	1.2-3.0	1.97*	1.1-3.4	1.41	0.6-3.3
Nonviolent	1.83**	1.3-2.7	1.74**	1.2-2.6	2.20***	1.5-3.3	1.91**	1.2-2.9	1.99**	1.2-3.3	1.54	0.7-3.4
Model summary $X^2(5) = 18.52^{**}$ $X^2(5) = 10.63^+$ $X^2(5) = 25.24^{***}$ $X^2(5) = 11.22^*$ $X^2(5) = 11.23^*$ $X^2(5) = 8.78$												



	Any		Take away things		Kick, bite, hit		Push, shove		Throw things		Fight	
<b>Model 3: Prenatal substance use</b>												
	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.
Nicotine	1.19	0.7-2.2	0.85	0.5-1.6	1.10	0.6-2.1	1.08	0.6-2.1	1.27	0.6-2.7	0.84	0.2-3.1
Alcohol	1.27	0.9-1.8	1.58*	1.1-2.3	1.36	0.9-2.0	1.27	0.8-1.9	1.07	0.6-1.8	1.36	0.7-2.8
Drugs (soft/hard)	0.85	0.4-1.8	0.92	0.4-2.0	0.94	0.4-2.0	0.63	0.3-1.5	0.72	0.3-1.9	0.70	0.1-3.7
Maternal delinquency <sup>b</sup>												
Violent	1.85**	1.2-2.8	1.44	0.9-2.2	2.25**	1.4-3.6	1.80*	1.1-3.0	2.07*	1.2-3.7	1.48	0.6-3.5
Nonviolent	1.56*	1.1-2.3	1.51*	1.0-2.2	1.99**	1.3-3.0	1.77**	1.2-2.7	1.99**	1.2-3.3	1.41	0.7-3.0
	Model summary		X <sup>2</sup> (5) = 16.25**		X <sup>2</sup> (5) = 13.99*		X <sup>2</sup> (5) = 25.09***		X <sup>2</sup> (5) = 13.35*		X <sup>2</sup> (5) = 11.05*	
<b>Model 4: Maternal crime</b>												
	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.	O.R.	95% C.I.
Current overall offending	0.97	0.6-1.5	0.91	0.6-1.4	1.14	0.7-1.7	1.17	0.8-1.8	1.12	0.7-1.8	1.79	0.9-3.7
Ever arrested	0.74	0.4-1.3	0.84	0.5-1.4	0.67	0.4-1.2	0.59+	0.3-1.1	0.83	0.4-1.6	1.23	0.5-3.1
Maternal delinquency <sup>b</sup>												
Violent	2.09***	1.4-3.1	1.67*	1.1-2.5	2.46***	1.6-3.9	1.87*	1.2-3.0	2.01*	1.1-3.5	1.34	0.6-3.1
Nonviolent	1.77**	1.2-2.6	1.70**	1.1-2.5	2.22***	1.5-3.4	1.94**	1.3-3.0	2.04**	1.2-3.5	1.32	0.6-2.9
	Model summary		X <sup>2</sup> (4) = 15.47**		X <sup>2</sup> (4) = 8.71+		X <sup>2</sup> (4) = 23.08***		X <sup>2</sup> (4) = 14.43**		X <sup>2</sup> (4) = 10.39*	

<sup>a</sup> Reference category is the community comparison sample.

<sup>b</sup> Reference category is the non-delinquent group.

+<.10 \* p<.05 \*\*p<.01 \*\*\*p<.001

## 2.6. Discussion

The aim of the current study was to explore the intergenerational transmission of aggression and antisocial behaviour by examining mothers who reported delinquency in adolescence, their substance use during pregnancy, and the link with children's aggressive behaviour. The first research question examined whether female delinquents were more likely to compromise the prenatal environment of their children by making unhealthy decisions during pregnancy such as using nicotine, alcohol, and drugs. The findings indicated that while mothers with a history of juvenile delinquency were more likely to expose their children to these prenatal risks, these children were also more likely to be exposed to other criminogenic risk factors (i.e., social adversities, criminal involvement of mother and her partner in adulthood).

Findings showed that children of mothers who had a history of delinquency initiate physical aggression earlier and were more likely to manifest different types of physically aggressive behaviours, including more serious behaviours, compared to children of mothers without a history of delinquency. Hence, the study found continuity not just in maternal antisocial behaviour, but also between maternal antisocial behaviour and children's physical aggression at the earliest stages of behavioural development. Moreover, the statistical association between mothers' delinquency and their children's physical aggression remained after considering several environmental risk factors. Third, results showed that the link between maternal delinquency and children's physical aggression was not limited to mothers having reported violent behaviours in youth. This suggests that children's physical aggression was tapping into a broader phenomenon than aggression and violence such as antisociality (Moffitt et al., 2001). Several studies on male offenders have examined the differences between violent and nonviolent offenders, with some suggesting that violent offenders may not be qualitatively different, and that they are indistinguishable from frequent offenders (Capaldi & Patterson, 1996; Farrington, 1989). Perhaps this is also the case in the current study, since the female violent delinquents were also very versatile (close to seven different types of delinquent behaviours on average), and almost all of them (90 %) participated in nonviolent delinquency.

### **2.6.1. *Adult Outcomes of Delinquent Mothers***

The self-report data from this community sample showed that 24 % of the mothers had reported violent delinquency, while another 31 % reported nonviolent delinquency. Their delinquency was not 'statutory' but included a wide array of mostly property and drug-related offenses as shown by their criminal versatility, especially for the violent delinquents. Based on the female delinquency literature, it was expected that mothers who reported delinquency in adolescence would have negative adult outcomes. Moreover, it was hypothesized that they may experience pregnancy differently, particularly regarding their risky decisions during the prenatal period. While the focus of this study was on how this impacted their children's physical aggression, the findings also showed that a significant proportion of mothers who reported delinquent behaviours in adolescence continued in adulthood. This persistence in offending in adulthood is in line with other longitudinal studies that found that juvenile female offenders were more likely to become adult offenders. For instance, female delinquents in the Philadelphia birth cohort study were four times more likely to be arrested in adulthood (Tracy and Kempf-Leonard, 1996). This odds ratio is congruent to those found in the current study for the two groups of delinquents. While the odds are in line with prior birth cohort studies, the current study found that a higher prevalence of female delinquents (30 to 35%) continued offending than would be expected, since 12% persisted into adulthood in the Philadelphia birth cohort, (Tracy and Kempf-Leonard, 1996), and 18% in the National Youth Survey (Elliott, 1994). Moreover, slightly less than half of the mothers reported no juvenile delinquency. This group of non-delinquent mothers is of interest for future research. More specifically, it was found that a number of these mothers were adult-onset offenders. Although adult-onset offending is considered by some to be uncommon and attributed to an artefact of official measurement (Moffitt, 2006), others have identified a small group that begin to offend in adulthood; however, few studies have examined this in females (for a review Eggleston & Laub, 2002). A Swedish cohort study found that 3.5 % of women were convicted of a first offense after age 18 (Kratzer & Hodgins, 1999), which is lower than the 8.8 % of adult-onset women identified in this sample. This could be explained by the self-report data in the current study, but future research should examine adult onset offending among females in particular.

Life-course theory of crime suggests that life events such as pregnancy and motherhood would provide an opportunity for mothers to alter their offending trajectories by having a structuring effect on their lifestyles and on opportunities for offending (Elder, 1998; Laub & Sampson, 2003). For some women, the responsibility of becoming a mother could provide an opportunity for an identity change, or a fresh start, and this has been shown to contribute to desistance (Kreager et al., 2010; Michalsen, 2011). Although the female delinquents in the current study were more likely to have received social assistance at some point, they also showed some positive adulthood outcomes regarding their socioeconomic status. Overall, family incomes were relatively high in the sample and this also applied to mothers who were juvenile delinquents. This suggests that motherhood may have been part of a series of positive events for many of these women, such as getting a degree, securing a job, and finding a partner. In this regard, Kreager and colleagues (2010) found that motherhood was a primary turning point for disadvantaged women in reducing their offending and substance abuse. Perhaps motherhood did curb the antisocial behaviour of the women included in the current study. After all, only a minority of them remained criminally active in adulthood (about 30% were active in the past year). However, motherhood did not eliminate the continuity of female delinquency in adulthood, nor did it moderate the intergenerational transmission of aggression and antisocial behaviour. This raises two related questions. What are the factors that favour the continuity of crime and delinquency in adulthood for females, and are women who offend in adulthood more likely to have more physically aggressive children? Consequently, there is a need to better understand the context in which the continuity of offending and the intergenerational transmission of antisocial behaviour occur. Life-course studies on men have examined marriage and the quality of marital bonds as a contributing factor to desistance (e.g., Laub et al., 1998). Some have suggested that the positive influence of a female partner can favour desistance from male offending (e.g., Laub & Sampson, 2003). Perhaps this applies for female offenders as well, and it is the quality of her relationship with her husband, especially having a non-delinquent husband, in conjunction with motherhood that contributes to desistance and minimizes the intergenerational transmission of antisocial behaviour.

### **2.6.2. Limitations**

The current study is not without limitations. The delinquency data and the pregnancy-related behaviours were from self-report interviews with the primary caregiver. There was no access to criminal records or medical records at the time of the study. The recall period is also longer for both the delinquency in youth, and the pregnancy-related behaviours. The sample was relatively small and consisted of Canadian children in the province of British Columbia. As such the findings may not generalize to other non-Canadian populations. Additionally, it was not possible to consider the impact of maternal delinquency and substance exposure on the other children of these mothers because of the sample size and the fact that the data was not available at the time of the study. Future studies should examine the role and impact of substance use across siblings within the same family. Unfortunately, follow-up data was not available at the time of the study to examine the continuity of the children's physical aggression. Moreover, data for the children's behaviour were obtained from the biological mothers. This study does not include multiple informants, however, using the primary caregiver has been found to be reliable (e.g., Kerr, Lunkenheimer, & Olson, 2007), and is typical of studies on preschool children. The current study highlights the importance of maternal delinquency on the transmission of antisocial behaviour, even after accounting for various risk factors. Nonetheless, other familial factors not accounted for in the models may have played a role. For example, parenting practices or styles were not considered, which may also explain how antisociality is transmitted to the child (see Patterson, 1998; Thornberry et al., 2003). Future studies should consider the interaction between mothers' delinquency and parenting.

### **2.7. Conclusion**

The current study set to merge three important corpuses of research from criminology, health sciences and developmental psychology. In doing so, the study findings highlighted key areas of research for the understanding of the role of female delinquency and motherhood on the intergenerational transmission of antisocial behaviour. The impact of motherhood and how female juvenile delinquents experience it is important and should be further examined, especially since it can have an impact on

children's early behavioural development. While prior studies have suggested that motherhood may contribute to reducing delinquent and antisocial behaviour, the current study found that female delinquents were more likely to become adult offenders and to have physically aggressive children. Some continuity in maternal antisocial behaviour in adulthood was found, although it may not necessarily have been criminal behaviour, these mothers persisted in their antisociality by smoking or drinking during pregnancy, which in turn contributed to the transmission of physical aggression in their children. As such, the prevention of female delinquency can perhaps have long-term implications beyond the prevention of future delinquency, and may, in turn, impact the intergenerational transmission of aggressive and antisocial behaviour.

## **Chapter 3.**

### **Study II: Profiles of Maternal Parenting in Early Childhood**

#### **3.1. Abstract**

Studies have often linked parenting to children's subsequent antisocial behaviour; however, the circumstances under which this might occur are less clear. The current study explores patterns in mothers' parenting practices, and associated correlates including maternal delinquency and offending, mental health, ethnicity, and children's physical aggression. This study is based on the first wave of the ongoing Vancouver Longitudinal Study; the objective of this prospective study is to identify the early risk and protective factors for aggression and violence from the earliest developmental periods. Parenting practices of 287 mothers with preschoolers are examined using a series of latent class analyses. Three different patterns of parenting emerged: Positive, Negative, and Intermittent. Patterns identified are associated with several key criminogenic, sociodemographic, historical, and developmental factors including: current maternal adult offending, mothers' mental health, ethnicity, and frequency of children's physical aggression. Importantly, mothers who show parenting in line with the more negative classes also rely on a number of positive practices. Implications of the study suggest that parenting is influenced by mothers' immediate situations and contexts, which can be targeted for intervention.

#### **3.2. Introduction**

Parents often remark that their distinctive traits, behaviours, and habits are reflected in their children. Intergenerational continuity of a specific parent/child behaviour is referred to as intergenerational transmission (Thornberry, 2009). There is

substantial longitudinal research confirming that different behaviours are transmitted from one generation to the next, such as health risk behaviours (Wickrama, Conger, Wallace, & Elder, 1999), cigarette smoking (e.g., Chassin, Presson, Todd, Rose, & Sherman, 1998; Kandel & Wu, 1995; Weden & Miles, 2012), and child maltreatment (e.g., Berlin, Appleyard, & Dodge, 2011; Pears & Capaldi, 2001). This appears to also be the case for antisocial behaviour and offending, as these behaviours are not distributed evenly among families. For instance, cohort studies indicate that a small number of families are responsible for a disproportionate amount of criminal behaviours (e.g., Farrington, Barnes, & Lambert, 1996; Farrington et al., 2001). Though intergenerational transmission of antisocial behaviour is well supported empirically, how this transmission occurs is less clear (e.g., Moffitt, 2005; Thornberry, Freeman-Gallant, & Lovegrove, 2009). One perspective relies on a genetic explanation (for a review Rhee & Waldman, 2002), while another emphasizes environmental factors, particularly parenting practices (e.g., Patterson, 1998; Simons, Wu, Conger, & Lorenz, 1994), and, yet another focuses on the interaction between genetic factors and environmental factors (e.g., Kim-Cohen et al., 2006; Moffitt, 1993). Moreover, criminological research has focused on the contribution of the antisocial father in this transmission, as opposed to the mother, despite the latter's typically primary caregiver role (for reviews, Loeber & Stouthamer-Loeber, 1986; van de Rakt, et al., 2008). This study focuses on mothers, and examines how maternal parenting practices of young children are connected to maternal histories of delinquency and current offending.

### **3.2.1. *The Antisocial Parent***

For more than three quarters of a century, criminological research has confirmed that children of antisocial parents are more likely to be antisocial (e.g., Farrington, 1979; Glueck & Glueck, 1950; McCord, 1979). Primarily because males are overwhelmingly more seriously antisocial and criminal than females (e.g., Steffensmeier & Allan, 1996), the role of the mother in the transmission of offending has been largely neglected, and the focus has traditionally been on the antisocial and criminal behaviour of fathers (for reviews, Loeber & Stouthamer-Loeber, 1986; van de Rakt et al., 2008; Walters, 1992). However, more recent developmental criminological research based on cohort studies has identified that mothers' antisocial behaviour could have several negative



consequences. First, mothers who were antisocial or delinquent during adolescence are subsequently likely to experience adolescent and adulthood problems, including: mental illness, substance dependencies, high unemployment, abusive interpersonal relationships, and criminal offending (e.g., Moffitt, 2001; Pajer, 1998; Silverthorn & Frick, 1999). Second, recent studies reported that female delinquents experience more adult social disadvantages and psychological problems than male delinquents (Corneau & Lanctôt, 2004; Lanctôt et al., 2007). Third, studies have begun examining the relationship between the history of female antisocial behaviour and their pregnancy and parenthood experiences. For instance, mothers with a history of antisocial behaviours are more likely to have lower levels of education and to smoke during pregnancy (e.g., Zoccolillo et al., 2005). In other studies, mothers with a history of juvenile delinquency are not only more likely to prenatally expose their children to substances (i.e., nicotine, alcohol, drugs), but they also have more physically aggressive children (Huijbregts et al., 2008; Tzoumakis, Lussier, & Corrado, 2012). Fourth, females with a history of antisocial behaviour who became parents are most likely to expose their children to social deprivation and poor caregiving environments (Jaffee et al., 2006). We can conclude from these observations that some at-risk women may contribute to the intergenerational transmission of antisocial behaviour through risky behaviours and vulnerable situations they may find themselves in when they become parents.

Given these findings, it is difficult to underestimate the theoretical importance of mothers' antisocial/delinquent profiles and the intergenerational transmission of similar behaviours in their children. Developmental approaches in criminology suggest focusing on the identification of such early explanatory factors predating the development of behaviour (e.g., Loeber & Le Blanc, 1990). Theoretically, from a developmental approach, one explanation of the intergenerational transmission of serious delinquency and criminality is based on the cumulative developmental and social adversities delinquent mothers experienced in their pregnancies/child births, and their children's infancy, toddler, childhood and adolescent developmental stages respectively (Farrington, 2005; Loeber, Slot, & Stouthamer-Loeber, 2008; Lösel & Bender, 2006). The antisocial female, who experiences cumulative deficits as a result of her history of maladaptive and antisocial behaviour, may not possess the cognitive, behavioural, and social skills associated with parenting. Consequently, this could become the basis for

their children repeating the delinquent and criminal trajectories of their mothers. Cumulative deficits and the greater social adversities (e.g., high unemployment, mental illness, substance dependencies) antisocial females experience in adulthood may impact the behavioural outcomes of their offspring in the early years. Particularly considering that mothers are the primary caregivers of children in early childhood, a period that is critical for child socialization where parenting skills are pivotal (Tremblay et al., 1999).

There is some empirical support for the idea that there may be cumulative effects of the maternal delinquency and parenting on children's behaviour. For example, an observational study found that mothers who rate high on antisocial beliefs and behaviours are more likely to exhibit hostile and harsh parenting and be less understanding of their children (Bosquet & Egeland, 2000). In turn, harsh and rejecting parenting is strongly associated with children's antisocial and aggressive behaviour in infancy, toddler and early childhood developmental stages (e.g., Beauchaine, Webster-Stratton, & Reid, 2005; Renken, Egeland, Marvinney, Mangelsdorf, & Sroufe, 1989; Shaw, Owens, Giovannelli, & Winslow, 2001). A mother's hostile parenting (Tremblay et al., 2004) also predicts children's high physical aggression developmental trajectories during the infant-toddler period. Similarly, during the early to late childhood (age two up to age eleven) period, a parent's hostile and ineffective parenting (e.g., gets angry, punishes, feels ineffective) is predictive of children's high physical aggression trajectories (Côté et al., 2006). However, the authors did not find an effect for positive (e.g., playing/laughing with child) or consistent parenting (e.g., getting away with things for which should have been punished) on these aggression trajectories. There is however, some evidence from studies assessing parenting interventions indicating that improving parenting practices can reduce children's conduct problems (Shaw, Dishion, Supplee, & Gardner, 2006; Webster-Stratton & Hammond, 1997) and aggression (Brotman et al., 2009).

The detrimental influence of negative parenting is therefore well established, and it is also likely that improving these parenting practices for more positive ones can potentially improve children's behaviour during this early developmental period. However, while the link between parenting and child behaviour is evident, less is known about the specific types of parenting and techniques used by vulnerable mothers. Therefore, when mothers are the primary caregivers, it would be important to explore the

parenting skills of those with criminogenic risk factors, since these might impact children's outcomes.

### **3.2.2. *The Development of Physical Aggression***

Developmental approaches in criminology emphasize the study and the impact of early life events on later antisocial behaviour (e.g., Moffitt, 1993; Farrington, 2005). Parents, and especially mothers, play a critical role in early childhood development by helping to socialize their children. It also during this early period, and in infancy, that differences in temperament and problematic behaviours begin to appear among children (Keenan, Shaw, Delliquadri, Giovannelli, & Walsh, 1998). Aggression, for instance, typically emerges in infancy around a child's first birthday, with peaks appearing at around one and a half years old, and another at approximately three years old (Hay, 2005). Although the capacity to use force emerges during this early developmental period, most toddlers do so very infrequently if at all. This is highlighted by findings from prospective longitudinal studies of young children. For instance, in a birth cohort, three developmental trajectories of physical aggression (a scale of six different physically aggressive behaviours) from age 17 to 60 months were identified (Côté, et al. 2007). More specifically, this study showed that the low trajectory (32.5 %) almost never used physical aggression, the moderate trajectory (50.5 %) occasionally exhibited physical aggression (between 0.5 to 1.5 acts), and the high trajectory (17.0 %) was more frequently aggressive (between 1.75 and 3 acts). Therefore, most children seldom use physical aggression, and even among those children belonging to the high trajectory, the frequency is relatively low. While physical aggression in young children is not manifestly maladaptive, it is concerning when it is frequent or severe, and especially when it persists after school entry (e.g., Baillargeon et al., 2007; Côté et al., 2006; Tremblay et al., 2004). These studies have shown that a small group of chronically physically aggressive children persist into the elementary school years, and are at risk for delinquency and offending in adolescence and adulthood, underlining the importance of understanding how physical aggression unfolds during early childhood.

The infant-toddler period is also a crucial developmental stage because it is when children learn to control their aggressive behaviour (Tremblay, 2010). Prior to school entry, it is typically the parents who are responsible for the socialization of their

children. Parents who are more vulnerable and who are exposed to more adversity (e.g., low socioeconomic status, more mental health issues) can have more difficulty parenting and providing adequate caregiving environments for their children (Jaffee et al., 2006; Zoccolillo et al., 2005). This highlights the importance of parenting practices during this developmental period, and the potential impact the primary caregiver can have on their children. Learning alternatives to aggression and antisocial behaviour in toddlerhood is also critical because these early individual differences have the potential to result in an accumulation of risk factors that cascade from one developmental period into another (Moffitt, 1993; Loeber et al., 2008). Examining the correlates of parenting practices of vulnerable mothers during this early developmental period could therefore be informative and help to target early childhood interventions (e.g., parent training).

### **3.3. Aims of Study II**

One of the foci of developmental approaches in criminology is the identification of explanatory or causal factors that both precede and influence the course of behavioural development (Loeber & Le Blanc, 1990). Moreover, key developmental theories on the development of antisocial behaviour and offending propose that manifestations of antisocial behaviour start early in the life-course (e.g., Farrington, 2003; Loeber, 1990; Moffitt, 1993). These theories suggest that some children are exposed to multiple disadvantages, which can have cumulative effects on an individual's development. The current study adopts a developmental approach in exploring the specific parenting profiles of mothers during the crucial early childhood period when differences are starting to emerge among children, and when children are learning to inhibit their antisocial behaviour. The focus of the study will be on mothers, a somewhat neglected area of research in criminology, at least in regards to the transmission of crime and delinquency. Some mothers who were delinquent in adolescence may be carrying the burden of this history into adulthood, influencing their current adult offending, socioeconomic status, mental health, intimate relationships (Lanctôt et al., 2007; Moffitt, et al., 2001; Odgers et al., 2008;), as well as their parenting practices. These same mothers are also likely to be the primary caregivers of young children and thus responsible for their early socialization. Mothers can differ substantially in their approaches to parenting, which are likely influenced by a number of personal and

situational factors. Therefore, this study aims to: 1) identify specific patterns of parenting among mothers of young children, and 2) determine the influence of criminogenic, sociodemographic, historical, and developmental factors on types of parenting. More specifically, key study variables examined include mothers' past delinquency, current adult offending, mental health, ethnicity, as well as children's physical aggression. In sum, this study will explore how mothers' antisocial behaviour may shape their reactions and approaches to their children's behaviour, which in turn can affect their children's behavioural development.

### **3.4. Methodology**

#### **3.4.1. Sample**

Data from the current study is based on Wave I of the Vancouver Longitudinal Study on the Psychosocial Development of Children conducted in Vancouver, British Columbia, Canada. The goal of this ongoing prospective study is to provide policymakers with empirical information about early risk and protective factors for aggression and violence from the earliest developmental periods (Lussier et al., 2012; Lussier, Tzoumakis et al., 2011). The current study includes 287 biological mothers and their children (3 to 5 year old boys and girls) recruited from February 2008 to August 2010 in the Vancouver and the Greater Vancouver region. In order to obtain a wide range of families in terms of risk factors, a multi-sampling strategy was used for recruitment. The three groups, which reflect the three recruiting strategies, consist of: (1) a clinical sample (n = 13) of mothers whose children were referred to the Infant Psychiatric Clinic at British Columbia Children's Hospital for externalizing disorder; (2) a community at-risk sample (n = 181) recruited from daycare centers located in neighbourhoods ranked in the lowest 25th percentile by two provincial surveys in terms of various socioeconomic and psychosocial indicators of child development (Kershaw, et al., 2005); and (3) a community comparison sample (n = 94) recruited from randomly selected daycare centers located in neighbourhoods in the remaining three-quarters of the provincial ranking.

### **3.4.2. Procedures**

The current study is based on in-person interviews with biological mothers from the first wave of data collection. Interviews were completed at a research laboratory located at BC Children's Hospital, or at the families' homes. Graduate students having received extensive training conducted the interviews following a standardized interview protocol. The data was collected using a computerized questionnaire, and the interviews typically lasted two and a half hours. Ethics approval for the research project was obtained from Simon Fraser University, the University of British Columbia, and the BC Children's Hospital. Participants signed consent forms notifying them that the information provided was confidential and collected for research purposes only. Participants were referred from the Infant Psychiatry Clinic at BC Children's Hospital, or they contacted the research team from posters describing the project that were distributed in the community. The mothers were paid \$40 Canadian for their participation. They were informed that participation was voluntary and that they could withdraw at any time.

### **3.4.3. Measures**

The Cracow is the main instrument of the Vancouver Longitudinal Study (Corrado, 2002; Lussier, Corrado et al., 2011). The Cracow instrument collects information on a wide range of risk and protective factors associated with the development of serious and violent delinquency (e.g., pre/perinatal risk, parenting practices, social adversity, individual and behavioural characteristics of the child, social/peer factors, as well as neighbourhood, victimization and community violence). The current study utilizes a number of sections of the Cracow including: a) maternal parenting practices; b) parental delinquency and offending; c) maternal psychological symptoms; d) children's physical aggression; e) family social adversity; and f) sociodemographic indicators. Descriptive information for the sample can be found in Table 3.1.

**Table 3.1. Descriptive Statistics for the Sample**

Maternal characteristics			Children's characteristics		
Mean age at interview		36.0 (5.1)	Gender	Male	55.2%
Mean age at child's birth		31.8 (5.2)	Mean age		4.2 (0.7)
Ethnicity	Caucasian	54.9%	Ethnicity	Caucasian	54.2%
	Asian	20.1%		Asian	19.1%
	South Asian	10.4%		South Asian	10.1%
	Other	14.6%		Other	16.7%
Place of birth	North America	57.8%	Place of birth	North America	93.7%
	Outside NA	42.2%		Siblings	Yes
Education	High school or less	15.6%	Sample type	Clinical	4.5%
	Post secondary, trade	27.8%		At-risk	62.8%
	University	35.8%		Community	32.6%
	Graduate, post graduate	20.8%		Take away	1.7 (1.0)
Social assistance	Yes	19.5%	Mean frequency of physical aggression	Kick, bite, hit	1.1 (0.9)
	Never	80.5%		Push, shove	1.1 (1.0)
				Throw	0.7 (0.9)
				Fight	0.3 (0.8)
<b>Family socioeconomic indicators</b>					
Family income	Mean annual income	\$84000 (62,000)	Social status	Mean Hollingshead	43.3(13.5)
	< \$25,000	10.7%		Level I: Unskilled labourers	6.3%
	\$25,000 to < \$50,000	20.0%		Level II: Semi-skilled workers	10.5%
	\$50,000 to < \$75,000	18.6%		Level III: Skilled, sales	20.2%
	\$75,000 to < \$100,000	16.4%		Level IV: Technical	43.6%
	\$100,000 to < \$125,000	16.8%		Level V: Professional	19.5%
	≥ \$125,000	17.5%		Single parent family	17.1%
<b>Parenting practices</b>			<b>Reported offending indicators</b>		
	Low	Medium	High	Maternal adult offending (past year)	20.8%
Reward child for behaving well	12.9%	43.2%	43.9%	Maternal criminal history	10.1%
Play games, do other fun things	3.6%	20.2%	76.2%	Partners' criminal history	18.4%
Calmly explain why behaviour wrong	1.1%	11.7%	87.2%	Mean onset age of maternal delinquency	12.1 (5.4)
Threaten to punish, then do not	47.0%	43.6%	9.4%	Variety of maternal delinquency	
Getting to obey > trouble than worth	68.2%	24.5%	7.2%	Mean	1.9 (3.0)
Get so busy forget where child is	91.2%	8.0%	0.8%	One to two types	29.3%
Punishment depends on mood	61.6%	32.1%	6.3%	Three or more types	27.2%
Ignore child when misbehaving	60.5%	37.8%	1.7%	Nature of maternal delinquency	
Yell or scream at child	54.4%	40.8%	4.9%	Non-violent	31.4%
Spank child with hand	81.1%	18.5%	0.4%	Violent	25.1%

Note. Standard deviations are in parentheses.

## **Maternal Parenting Practices**

During the interviews, mothers were asked about their parenting practices using a revised brief version of the Alabama Parenting Questionnaire (APQ; Frick, Christian & Wootton, 1999). The APQ is an assessment of parenting practices that examines the most important aspects of parenting relating to problem behaviours in school-age children. This instrument was originally developed to identify children with disruptive behaviour disorder (Shelton, Frick, & Wootton, 1996). The APQ has been validated on different populations (Shelton et al., 1996) and age groups (ages 4 to 18) in several countries (e.g., Dadds, Maujean, & Fraser, 2003; Essau, Sasagawa, & Frick, 2006). Mothers were asked about the frequency during the past year for ten parenting practices. The questions were originally on a five-point scale from 'never' to 'always'. In the current study, the indicators were recoded to reflect Low (never and seldom), Medium (sometimes), and High (most of the time and always). This was done in order to avoid empty cells for analysis for those indicators with low variability, and was preferred to dichotomizing indicators for a complex construct such as parenting. As shown in Table 3.1, mothers generally report medium or high levels of the more positive parenting behaviours, and few of them report low levels. For instance, over three quarters of mothers report high levels of frequently playing with their children (76.2 %), and calmly explaining why their children's behaviour is wrong (87.2 %). On the other hand, mothers tend to report low to medium levels of the more negative parenting behaviours. More specifically, slightly more than half of the mothers report low levels of ignoring and yelling at their children. The vast majority of parents (81.1 %) show low levels of the more serious negative parenting behaviours were such as spanking.

## **Delinquency and Offending**

Mothers were asked to provide information about their history of juvenile delinquency and their adult offending using the MASPAQ (Measurement of Adolescent Social and Personal Adaptation in Québec; Le Blanc et al., 1996). This instrument has been used and validated with males and females, different age ranges, and sample types (e.g., community sample; adjudicated youth) (Le Blanc & Bouthiller, 2003; Le Blanc & Fréchette, 1989; Le Blanc et al., 1996). The MASPAQ includes 26 different delinquent/criminal behaviours (see Appendix A). Mothers were asked (a) if they had ever committed the behaviour (i.e., prevalence); (b) the age at first occurrence (i.e., age



of onset); and (c) the number of times in the last year (i.e., frequency). As shown in Table 3.1, indicators were created for maternal juvenile delinquency based on the variety (43.6 % non-delinquents; 29.3 % one to two types of delinquency; 27.2 % three or more types), nature (43.6 % non-delinquent; 31.4 % nonviolent delinquents; 25.1 % violent delinquents), and onset (34.4 % no onset; 56.6 % juvenile onset; 8.7 % adult onset). An indicator was also created for the participation in offending in the past year to reflect whether the mothers were still criminally active (20.8 %). The most common behaviours mothers report during the previous year were: taking soft drugs (9.0 %); drunk driving (6.1 %); shoplifting (5.0 %); throwing objects at people (3.8 %). During the interviews, mothers were also asked whether they had ever been arrested or convicted for a crime (10.1 %), and whether their partner or the child's father had ever been arrested or convicted (18.4 %).

### **Maternal Psychological Symptoms**

The Brief Symptom Inventory (BSI) was also administered to the mothers during the interviews (Derogatis & Melisaratos, 1983). The BSI consists of 53 items designed to assess the psychological symptom status of individuals. The BSI is widely used, is evaluated as one of the best brief self-report measures, and has high test-retest, internal consistency reliability, and validity (Derogatis, 1993; Derogatis & Melisaratos, 1983; Morlan & Tan, 1998). Mothers were asked how much each of the 53 symptoms distressed or bothered them during the past 7 days on a five-point scale. Raw scores and normalized T scores were calculated for the Hostility ( $\alpha = .71$ ), Anxiety ( $\alpha = .70$ ) and Depression ( $\alpha = .79$ ) dimensions, as well as for the Global Severity Index (GSI) ( $\alpha = .91$ ). More specifically, hostility reflects annoyance, irritability, urges to break things, frequent arguments, and uncontrollable outbursts of temper. Anxiety reflects symptoms clinically associated with high manifest anxiety: restlessness, nervousness, tension, free-floating anxiety and panic. Depression reflects a broad range of signs and symptoms of clinical depressive syndromes: dysphoric affect and mood, withdrawal, loss of energy, hopelessness, and futility. The Global Severity Index is considered the best and most sensitive indicator of current distress levels; it combines information on the numbers of symptoms and intensity of perceived distress (Derogatis, 1993). Comparing the mean raw scores in the current study for hostility (mean = 0.48, SD = 0.50), anxiety (mean = 0.47, SD = 0.50), depression (mean = 0.33, SD = 0.46) and the GSI (mean = 0.42, SD =

0.39) with those found in non-patients by Derogatis and Melisaratos (hostility mean = 0.35, SD = 0.42; anxiety mean = 0.35, SD = 0.45; depression mean = 0.28, SD = 0.46; GSI mean = 0.30, SD = 0.31) suggests that the mothers in this study have somewhat higher levels of psychological symptoms on average. Moreover, a T score of 63 or greater on the Global Severity Index can be used in order to screen for psychiatric disorders (Derogatis, 1993); in the current study, this consisted of 15.3 % of mothers.

### **Children's Physical Aggression**

Mothers were also asked to report on their children's physically aggressive behaviours. In line with other major studies on childhood physical aggression (e.g., Broidy et al., 2003; Tremblay et al., 2004), five indicators were included: taking things away from someone; kicking, biting, or hitting others; pushing, shoving; throwing things at people; and physical fighting. Mothers were asked if their children had ever exhibited the behaviour and the frequency of the behaviour in the past year using a four-point scale (never; once or twice; several times; very often). Indicators were also created for the prevalence and frequency of any of the five physically aggressive behaviours. Almost all of the children had ever exhibited any of the five behaviours (92.7 %), and most had taken things away (85.4 %), kicked, hit or bit (78.5 %), and pushed or shoved (70.1 %), while fewer had ever thrown things (49.7 %) or fought (19.4 %). The pattern for frequency of physical aggression was similar: 'taking away things' was the most frequent behaviour (mean = 1.7, SD = 1.0), and physical fighting was the least common one (mean = 0.3, SD = 0.8). The scale for the frequency of all five physically aggressive behaviours (mean = 5.0, SD = 3.2) ranged from 0 to 15 and has an alpha of 0.76.

### **Family Social Adversity**

Mothers were also asked a number of questions regarding their social adversity, including: (a) family income; (b) single parent family; (c) occupation; and, (d) maternal history of social assistance (i.e., ever received social assistance benefits; never received social assistance benefits). Hollingshead (1975) social status scores were also calculated for the families in the study. These were computed by combining scores for the education levels and occupations of both parents, which were then weighted to obtain a single total score reflecting family social status. This score was then used to categorize families in one of five social strata as shown in Table 3.1 for descriptive

purposes. A wide range of family incomes is represented in the current sample (Mean = \$84,000 Canadian, SD = 62,000). Just under a fifth of the mothers reported ever having received social assistance (19.5 %) and being single mothers (17.1 %).

### **Sociodemographics**

The following sociodemographic indicators were also included for the mother: (a) age at child's birth; (b) ethnicity (i.e., Caucasian, non-Caucasian); (c) place of birth (i.e., North America, outside North America); and, (d) education (i.e., high school or less; more than high school). Child indicators were as follows: a) age at the time of interview; (b) gender; (c) presence of siblings; and, (d) sample type (i.e., clinical, community at-risk, community comparison). Mothers were on average 36 years old at the time of interview (SD = 5.1), and just over half of are Caucasian (54.9 %) and born in North America (57.8 %). Most of the mothers have post-secondary education of some kind (84.4 %). The children were on average 4.2 years old at the time of the interview (SD = 0.7) and slightly more than half (55.2 %) are boys.

#### **3.4.4. Analytic Strategy**

Latent class analysis (LCA) was used in the current study to identify patterns of mothers' parenting practices. This statistical technique identifies individuals who exhibit similar patterns of characteristics or behaviours, rather than identifying a factor structure of linear relationships among variables, as is the case with factor analysis (Collins & Lanza, 2010). LCA is considered a special type of cluster analysis, and has been found to perform better than more traditional cluster analysis such as K-means (see Magidson & Vermunt, 2002). Importantly, LCA does not absolutely assign individuals into classes, but provides a probability of membership, which is more appropriate for constructs such as parenting. Moreover, because LCA identifies individuals who respond or behave similarly, it has been associated with a person-oriented approach (Bergman & Magnusson, 1997). LCA also allows for the identification of categorical latent classes while accounting for covariates (Lanza, Collins, Lemmon, & Schafer, 2007). The strategy in the current study was to: 1) identify a baseline model of classes of parenting practices; and 2) conduct a series of separate models including covariates to identify key sociodemographic, historical, and developmental factors linked to parenting. Due to

sample size restrictions, the individual covariates were analyzed in separate LCA models.

Model selection was completed by inspecting the G2 statistic (Agresti, 1990), the Akaike information criterion (AIC; Akaike, 1987), the Bayesian information criterion (BIC; Schwarz, 1978), the sample size adjusted Bayesian information criterion (aBIC; Sclove, 1987), and entropy (a measure of separateness between the classes ranging from 0 to 1, with higher values indicating better separation). Smaller values for the AIC, BIC, and aBIC suggest a better balance in fit and model parsimony, and recent simulation studies have shown that the aBIC is the best indicator, particularly for smaller samples with unequal class sizes (e.g., Swanson, Lindenberg, Bauer, & Crosby, 2011; Enders & Tofighi, 2008; Yang, 2006). Probabilities of class membership ( $\gamma$ ) of the mothers in the parenting classes were identified, as well as the item response probabilities ( $\rho$ ) of the mothers' responses to the different parenting practices. All analyses were conducted using SAS, version 9.3.

## **3.5. Results**

### **3.5.1. *Baseline Model Identification for Parenting Practices***

LCAs were completed for one-class to five-class models. The resulting model fit statistics are presented in Table 3.2. The lower values for the AIC and aBIC suggest a better three-class solution. Although the BIC value is lower for a two-class model, the entropy is lower suggesting less separation between the classes. Considering the smaller sample size in the current study (where the aBIC has been shown to be a better indicator), and the higher entropy suggesting more distinct classes, the three-class model was selected. The four-class solution was inspected as well, but it did not differ substantively from the three-class solution other than identifying a very small fourth class, which is not meaningful since the sample size is relatively small and would include only a few mothers.

**Table 3.2. Model Fit Statistics for Latent Class Analyses of Parenting Practices**

Model	G <sup>2</sup>	df	AIC	BIC	Adjusted BIC	Entropy
1-class	1061.68	59028	1101.68	1174.87	1111.44	1.00
2-class	886.53	59007	968.53	1118.57	988.55	.66
3-class	821.93	58986	945.93	1172.82	976.21	.75
4-class	781.16	58965	947.16	1250.89	987.69	.80
5-class	754.53	58944	962.53	1343.11	1013.32	.72

Probabilities of class membership ( $\gamma$ ) and the item response probabilities ( $\rho$ ) of the resulting three-class model are presented in Table 3.3.

**Table 3.3. Item Response Probabilities for the Three-class Model of Parenting Practices**

Parenting practices	Latent Class I: Positive ( $\gamma=.56$ )			Latent Class II: Negative ( $\gamma=.05$ )			Latent Class III: Intermittent ( $\gamma=.38$ )		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Reward child for behaving well	.16(.03)	.44(.04)	.40(.04)	.14(.09)	.09(.08)	.77(.11)	.08(.03)	.47(.06)	.45(.06)
Play games, do other fun things	.01(.01)	.14(.03)	.85(.04)	.25(.13)	.01(.04)	.74(.13)	.04(.02)	.31(.05)	.64(.06)
Calmly explain why behaviour wrong	.01(.01)	.02(.02)	.97(.02)	.07(.07)	.33(.13)	.61(.14)	.01(.01)	.23(.05)	.76(.05)
Threaten to punish, then do not	.71(.06)	.28(.05)	.01(.01)	.22(.11)	.42(.14)	.36(.14)	.14(.05)	.67(.06)	.18(.05)
Getting to obey more trouble than it's worth	.85(.04)	.13(.04)	.03(.01)	.03(.07)	.22(.14)	.75(.14)	.53(.06)	.43(.06)	.04(.02)
Get so busy forget where child is	.93(.03)	.07(.03)	.00(.00)	.30(.16)	.54(.16)	.16(.10)	.97(.03)	.03(.03)	.00(.00)
Punishment depends on mood	.86(.04)	.14(.04)	.00(.00)	.02(.04)	.31(.15)	.67(.15)	.33(.07)	.60(.06)	.07(.03)
Ignore child when misbehaving	.70(.04)	.30(.04)	.00(.00)	.38(.15)	.62(.15)	.00(.01)	.50(.06)	.46(.06)	.04(.02)
Yell or scream at child	.72(.04)	.28(.04)	.00(.00)	.23(.13)	.44(.14)	.34(.13)	.33(.06)	.60(.06)	.08(.03)
Spank child with hand	.94(.02)	.06(.02)	.00(.00)	.68(.14)	.25(.13)	.08(.00)	.64(.06)	.36(.06)	.00(.00)

Note.  $\rho$  estimates with standard errors in parentheses. Sample size is 287.

The largest class ( $\gamma = 0.56$ ), Latent Class I (Positive), is characterized by greater probabilities of frequent positive parenting practices (i.e. reward child for behaving well; play games, do other fun things with child; calmly explain why behaviour wrong), and lower probabilities of the negative parenting practices (i.e., threaten to punish and then do not; getting to obey is more trouble than it's worth; get so busy forget where child is; punishment depends on mood; ignore child when misbehaving; yell or scream at child; spank child with hand). Latent Class II (Negative), the smallest class ( $\gamma = 0.05$ ), is characterized by greater probabilities of high levels of two inconsistent parenting practices 'getting to obey is more trouble than it's worth' ( $\rho = 0.75$ , s.e. = 0.14) and 'punishment depends on mood' ( $\rho = 0.67$ , s.e. = 0.15), as well as greater probabilities of other medium-frequency negative parenting practices (i.e., threaten to punish and then do not; get so busy forget where child is; ignore child when misbehaving; yell or scream at child). Although Latent Class II shows a more prevalent pattern of medium to high frequency negative parenting practices, it should be noted that there is also a greater probability of high-frequency positive parenting practices (the  $\rho$  for the three positive parenting practices range from 0.61 to 0.77 for high-frequency).

Latent Class III (Intermittent) is situated between Classes I and II regarding size ( $\gamma = 0.38$ ) and probabilities of the different parenting practices. This intermittent group has little probability of being high frequent on the negative parenting practices ( $\rho$  for the seven negative parenting practices range from 0.00 to 0.18 for high-frequency). However, they have higher probabilities of being medium-frequent on a number of the negative parenting practices (especially compared to the Latent Class I) including: threatening to punish their child and not punish ( $\rho = 0.67$ , s.e. = 0.06); getting to obey is more trouble than it is worth ( $\rho = 0.43$ , s.e. = 0.06); punishment depends on mood ( $\rho = 0.60$ , s.e. = 0.06); ignore child when misbehaving ( $\rho = 0.46$ , s.e. = 0.06); and, spank child with hand ( $\rho = 0.36$ , s.e. = 0.06).

### **3.5.2. Covariates of Latent Parenting Classes**

LCA models with covariates (i.e., sociodemographic, historical, and developmental factors) were also conducted in order to examine what characteristics are associated with the parenting classes. Due to sample size restrictions, the covariates were analyzed in individual LCA models. Odds ratios for each covariate for the Negative

and Intermittent parenting classes are shown in Table 3.4. The Positive parenting class was used as the reference category to compute the odds ratios.

**Table 3.4. Latent Class Analyses of Parenting Practices Accounting for Covariates**

Covariates	Latent Classes of Parenting		Significance test
	Class II: Negative	Class III: Intermittent	Change in 2LL
<b>Maternal characteristics</b>			
Age at child's birth	0.6 (0.4-0.8)	1.0 (0.8-1.2)	6.29*
Non-Caucasian Ethnicity	12.2 (2.5-59.2)	2.4 (1.2-4.7)	18.35***
Born outside of North America	4.0 (1.1-14.0)	1.4 (0.8-2.7)	5.86+
High school education or less	2.5 (0.6-10.9)	3.2 (1.4-7.7)	7.49*
<b>Child characteristics</b>			
Age at interview	1.1 (0.7-1.8)	1.2 (0.9-1.6)	2.13
Male gender	1.9 (0.6-6.1)	1.4 (0.7-2.7)	1.65
Number of siblings	1.1 (0.7-1.9)	1.3 (0.9-1.7)	2.15
Sample type <sup>a</sup>			
Clinical	8.3 (1.13-60.6)	2.9 (0.5-17.1)	4.42
Community at-risk	0.9 (0.3-3.3)	1.4 (0.7-2.8)	1.23
<b>Social adversity</b>			
Average family income	1.2 (0.9-1.7)	0.7 (0.5-0.9)	3.98
Family income < \$25,000	4.7 (1.2-17.9)	1.3 (0.5-3.7)	4.05
Social status (Hollingshead)	0.7 (0.4-1.2)	0.6 (0.5-0.9)	9.52**
Social assistance mother (ever)	1.2 (0.2-6.6)	3.0 (1.3-6.9)	6.60*
Single parent family	1.9 (0.5-7.2)	0.7 (0.3-1.8)	1.79
<b>Reported offending indicators</b>			
Maternal adult offending (past year)	2.1 (0.5-8.5)	2.8 (1.3-6.1)	6.91*
Maternal criminal history	0.0 (0.0-0.0)	1.7 (0.7-4.6)	3.32
Partners' criminal history	0.3 (0.0-2.7)	1.0 (0.4-2.2)	1.27
Onset age of maternal delinquency	1.1 (0.7-1.8)	1.2 (0.9-1.5)	1.70
Variety of maternal delinquency	0.8 (0.4-1.5)	1.0 (0.8-1.3)	0.55
Nature of maternal delinquency <sup>b</sup>			
Nonviolent	1.4 (0.4-5.5)	1.0 (0.5-2.1)	0.29
Violent	0.8 (0.2-4.0)	0.8 (0.4-1.8)	0.23
<b>Maternal psychological symptoms</b>			
Hostility T score	6.0 (2.4-14.7)	1.6 (1.2-2.2)	22.09***

Covariates	Latent Classes of Parenting		Significance test
	Class II: Negative	Class III: Intermittent	Change in 2LL
Anxiety T score	1.7 (0.9-3.3)	1.4 (1.0-1.8)	6.76*
Depression T score	2.5 (1.4-4.4)	1.5 (1.1-2.0)	14.32***
Global Severity Index T score	2.8 (1.4-5.8)	1.6 (1.2-2.2)	17.30***
Global Severity Index T score $\geq$ 63	7.0 (1.9-25.3)	2.2 (0.9-5.3)	9.72**
<b>Child's physical aggression</b>			
Sum (all 5 items)	2.0 (1.2-3.3)	1.0 (0.7-1.3)	6.50*
Take away	1.9 (1.0-3.8)	0.9 (0.7-1.3)	4.91+
Kick, bite, hit	2.6 (1.4-5.1)	1.0 (0.7-1.4)	10.27**
Push, shove	1.7 (1.0-3.1)	0.8 (0.6-1.2)	5.38+
Throw	1.1 (0.6-2.0)	1.1 (0.8-1.4)	0.28
Fight	1.5 (0.9-2.3)	1.2 (0.9-1.6)	3.20

<sup>a</sup> A dummy variable was created for the sampling strategy, the reference group is the community control sample.

<sup>b</sup> A dummy variable was created for nature of mother's delinquency, the reference group is the nondelinquents.

Note. All of the individual covariates were analyzed in separate latent class models (e.g., Maternal age is one model, ethnicity is a separate model, and so forth). Odds ratios are presented with 95% confidence intervals in parentheses. The reference group is Class I: Positive parenting. Sample size varies between 272 and 287 across these analyses due to missing data.

\*\*\* $p < .001$ ; \*\* $p < .01$ ; \* $p < .05$ ; + $p < .10$

Regarding maternal characteristics, age at birth of child, ethnicity, and education were all statistically significant. More specifically, mothers who were younger when they had their child are more likely to show parental practices in line with the Negative Class (O.R. = 0.6,  $p < 0.05$ ) compared to the Positive parenting class. Mothers in the Negative parenting Class were more likely to be of non-Caucasian ethnicity compared to mothers in the Positive Class. Mothers in the Negative Class also tended to be born elsewhere, although this relationship only approached statistical significance (O.R. = 4.0,  $p = 0.05$ ). Mothers in the Intermittent parenting Class were more likely to have lower levels of education and to be of non-Caucasian ethnicity in comparison to mother in the Positive Class, but there were no other significant differences between the groups. None of the child characteristics were statistically significant. Children's ethnicity was also analyzed, but is not presented in Table 3.4. Unsurprisingly, the results for children's ethnicity are in line with those for maternal ethnicity; mothers of non-Caucasian children had higher odds of both Negative (O.R. = 7.5,  $p < 0.001$ ) and Intermittent (O.R. = 2.9,  $p < 0.05$ ) parenting. The two statistically significant social adversity indicators (i.e. social status and social assistance) suggest that lower socioeconomic status increases the odds of



Intermittent parenting. Moreover, the indicator reflecting low income (less than \$25,000 annual income) approaches significance (O.R. = 4.7,  $p > 0.05$ , 95 % C.I. = 1.2-17.9), suggesting that low-income mothers tend to be in the Negative Class compared to the Positive Class.

Next, several criminological indicators were examined. The only significant covariate was the presence of maternal self-reported offending in the past year. The findings suggest that mothers who are currently offending as adults have higher odds of belonging to the Intermittent Class (O.R. = 2.8,  $p < 0.05$ ), as well as to the Negative Class (O.R. = 2.1,  $p < 0.05$ ). Three dimensions of maternal psychological symptoms from the BSI as well as the more general GSI were also included in analyses as covariates. All of these psychological indicators were significantly associated with the parenting classes. More specifically, mothers in both the Negative and Intermittent Classes were more likely to score higher on both the Hostility and Depression dimensions. The same pattern emerged for the overall GSI T scores, but when examining the clinical cut-off of the GSI (T score  $\geq 63$ ), the mothers in the Negative Class seemed to be more affected (O.R. = 7.0,  $p < 0.05$ ). In general, these findings suggest that both of these two parenting classes are more likely to experience psychological symptoms compared to the Positive Class.

Several indicators of frequency of children's physical aggression in the past year are also included in the LCAs. The frequency of 'kick, bite or hit' is significant and suggests that mothers in the Negative Class (O.R. = 2.6,  $p < 0.01$ ) have children with a higher likelihood of exhibiting this behaviour compared to those in the Positive Class. Similarly, the sum of all five physically aggressive behaviours is statistically significant. Mothers in the Negative Class are more likely to have children who are physically aggressive overall (O.R. = 2.0,  $p < 0.05$ ). These two indicators of children's physical aggression (i.e., 'kick, bite, hit' and the sum of all five behaviours) are also the most consistently correlated with maternal juvenile delinquency and adult self-reported offending (see the correlation matrix in Appendix B). Two of the other children's physically aggressive behaviours approach significance ('take away' and 'push, shove') and show a similar pattern of association, with the effect being relevant for the Negative Class.

## **3.6. Discussion**

The current study aimed to explore patterns of mothers' parenting practices and associated sociodemographic, criminogenic, and developmental factors, since parenting is one of the potential mechanisms through which the intergenerational transmission of antisocial behaviour operates. The study focused on mothers rather than fathers given their role as the primary caregiver in the early stage of development for this sample, and examined the influence of their juvenile and adult offending on their parenting practices. Moreover, this study examined the link between maternal parenting and their preschool children's physically aggressive behaviours. First, findings showed that most mothers were often positive with their children. Regardless of their parenting class, most frequently played with their children, rewarded them for good behaviour, and calmly explained why their behaviour was wrong. Second, despite these encouraging findings, several concerning characteristics distinguished the mothers in the Negative and Intermittent Classes from those in the Positive Class. For instance, mothers who were more likely to show parental practices in line with to these two more maladaptive parenting classes were much more likely to be experiencing several psychological symptoms. Third, ethnicity was identified as an important predictor of Negative and Intermittent and parenting, indicating that there may be cultural differences in parenting practices. Fourth, with respect to offending and criminal history, the study findings suggested that parenting practices might be more influenced by mothers' current situations (i.e., adult offending) rather than past experiences.

### ***3.6.1. Positive Parenting During the Early Childhood Period***

The majority of the mothers in the current study had positive approaches to parenting their young children. The largest parenting class identified was the Positive Class, characterized by frequent positive behaviours and infrequent negative behaviours. Moreover, even among mothers with more adverse parenting practices (i.e., Intermittent and Negative Classes), positive parenting behaviours were still relatively frequent. Furthermore, the most serious negative behaviours (e.g., physical punishment, forgetting where child is) were uncommon. Problematic parenting practices that were most probable consisted of lack of discipline (e.g., getting child to obey is more

trouble than it is worth), inconsistent discipline (e.g., punishment depends on mood), and reactive parenting (e.g., screaming at child). Encouragingly, these same mothers also showed a number of positive behaviours, meaning that there is an opportunity to focus on their 'good' parenting while improving the other behaviours in the context of treatment. Mothers often feel guilt and are aware that certain of their parenting practices are not optimal; using their more positive behaviour as a starting point could be helpful. For instance, play-based therapies especially those including parents, are effective in improving emotional and behavioural problems including aggression in children (for reviews, Davenport & Bourgeois, 2008; Bratton, Ray, Rhine, & Jones, 2005). Therefore, using positive therapeutic play as a point of entry with parents of aggressive preschool children could be particularly helpful with some of these mothers.

These findings underline that parenting is not clear-cut (i.e., some negative practices do not imply the absence of positive ones), which is why it is important to examine different types (i.e., positive and negative) as well as different frequency levels (range from low to high) of parenting behaviours. This is also one of the advantages of using a technique such as LCA (rather than factor analysis for instance), since this technique was able to capture the fact that some of the more negative mothers also relied on positive practices.

### **3.6.2. *Vulnerable Mothers and Adverse Parenting***

Even though positive parenting practices were generally prevalent in the current study, two classes of more adverse parenting were also identified. Fortunately, the Negative Class, consisting of the most adverse and hostile behaviour, also consisted of the fewest mothers. Unfortunately, these mothers were also experiencing a number of difficulties and their children tended to be more physically aggressive. In their examination of broader family types, Le Blanc and Bouthillier (2001) identified a similar small but serious group of 'punitive' families characterized by very little supervision, frequent use of punishment, significant socioeconomic disadvantage, and high frequent antisocial behaviour among their adolescent children. In the current study, mothers in the Negative Class frequently showed a number of problematic parenting practices (i.e., getting child to obey is more trouble than it is worth; punishment depends on mood; get so busy forget where child is). Moreover, these mothers were more likely to be younger

when they had their child, to be of non-Caucasian ethnicity, and tended to be born outside of North America. These findings suggest that these mothers may be unprepared, isolated, and experiencing difficulty dealing with the challenges of parenting. They were not only more likely to experience symptoms of hostility and depression, but also important levels of overall psychological symptoms. Finally, their children were more physically aggressive in general, and are more likely to be kicking, biting and hitting. At this age, children's kicking, biting and hitting is likely directed at the mothers themselves, suggesting that there could be coercive parent-child interactions or transactions are occurring in these families (e.g., Caspi, Elder, & Bem, 1987; Patterson, 1982; Sameroff & Chandler, 1975). Therefore, these mothers were likely not equipped to appropriately punish their children's aggressive behaviour, while also being in more vulnerable situations. These types of family situations are particularly concerning because of their potential cyclical interactions between parent and child, which are difficult to break (e.g., Moffitt, 1993; Patterson, 1982).

The second largest class identified in the current study was the Intermittent Class. These mothers tended to be less consistent with their positive parenting practices, while also sometimes exhibiting adverse practices. Their negative parenting behaviour was not very frequent, but rather intermittent. This pattern is suggestive of a parent who is inconsistent with their parenting practices (whether positive or negative), rather than more overtly hostile or coercive. This pattern of parenting, combined with the fact that these mothers were experiencing significant socioeconomic disadvantage, suggests an overwhelmed parent who perhaps does not have the time or energy to consistently discipline their young children. Moreover, these mothers were not only more likely to be experiencing a number of psychological symptoms, but they were also currently involved in criminal activity. In line with this Intermittent Class, Le Blanc and Bouthillier (2001) similarly identified a 'deviant' family type highlighted by parental deviance, high levels of social (e.g., low parental occupation, social assistance) and structural (e.g., large family size, frequent number of moves) disadvantage. The authors found that these 'deviant' families were the second most detrimental on adolescents' delinquent and antisocial behaviour.

Mothers in this Intermittent Class are therefore experiencing a number of stressors that seem to be affecting their parenting practices. Despite these difficulties,

children's concurrent physical aggression was not related to the Intermittent Class as it was for those in the Negative Class. In line with these findings, Côté and colleagues (2006) did not find an association between children's physical aggression trajectories and consistent parenting, but rather that hostile parenting was important. This could be due to the fact that in contrast to children of the mothers in the Negative Class, the children of mothers in the Intermittent Class may not be as aggressive in response to their mothers' requests, therefore limiting possible escalation to coercive parenting. Moreover, it is possible that this type of intermittent parenting will have an effect on the course of children's behaviour at a later stage (in the current study, both the parenting and physical aggression were measured simultaneously). Another possibility is that this more inconsistent type of parenting is not associated with physical aggression, but rather with other types of behaviour problems such as externalizing disorders or non-compliance. Intermittent parenting could impact more indirect or covert behaviours. Overt (e.g., aggression, arguing, temper tantrums, fighting) and covert (e.g., stealing, truancy, fire setting, vandalism) behaviours are thought to be developmentally distinct underlying patterns of antisocial behaviour (e.g., Loeber, 1990; Loeber & Schmalzing, 1985; Patterson, 1982). Covert behaviours are unlikely to manifest at this developmental period, as they require more advanced cognitive and social abilities that, typically, are not yet developed in preschoolers. Therefore, it is possible that intermittent parenting may influence children's covert behaviour when these manifestations appear in later childhood.

### **3.6.3. *Cultural Differences in Parenting Practices***

The current study found a link with more negative parenting patterns and children's aggression, but this was not consistent across the manifestations of physical aggression examined. This finding could be a result of the cultural differences in parenting practices and children's aggression. More specifically, the current study found that non-Caucasian ethnicity was linked to the more negative parenting patterns identified, and place of birth was marginally significant. Moreover, previous analyses of the Vancouver Longitudinal Study have shown the non-Caucasian children in the sample tend to be less physically aggressive than the Caucasian children (e.g., Lussier, et al., 2012; Tzoumakis et al., 2012). In other words, the non-Caucasian children in this

sample are less aggressive overall, despite the fact that non-Caucasian mothers tend to show more negative parenting practices. This relationship could explain the fact that children's aggression was not consistently related to negative parenting practices in the current study.

One explanation for this finding is that negative parenting practices do not influence all ethnic groups in the same way. For instance, research in the U.S. that has found that the link between physical punishment and child behaviour problems is culturally specific (e.g., Deater-Deckard et al., 1996; Deater-Deckard & Dodge, 1997). More specifically these studies found that physical punishment was only predictive of Caucasian Children's behaviour and not African-American children. However, more recent research using a large nationally representative American sample which included White, Black, Hispanic and Asian families, did not find any cultural differences on the influence physical punishment on children's behavioural problems (Gershoff et al., 2012). Therefore, it is not entirely clear whether physical punishment and other adverse parenting is equally detrimental across all ethnic groups. The Vancouver Longitudinal Study is very diverse in terms of its ethnicity and immigration profile. Notably, over 40 % of the mothers in this sample are born outside of North America, and are non-Caucasian (20 % Asian and 10 % South Asian). Considering the fact that many of the mothers in the Vancouver Longitudinal Study are foreign-born, research on the role of immigration may also clarify this finding. Studies in criminology have found evidence of a protective effect of immigration (e.g., Bui, 2009; Hagan, Levi, & Dinovitzer, 2008; Sampson, Morenoff, & Raudenbush, 2005). These studies show that immigrants, especially first generations, tend to show the lowest levels of offending. Similarly, research examining the health of immigrants identified a 'healthy immigrant effect' (e.g., Ali, 2002; McDonald & Kennedy, 2004). These studies indicate that immigrants typically report low rates of physical and mental health issues, especially for those who arrived in Canada recently, as well as for immigrants from Asia. Moreover, a Canadian study found that children of native-born parents tend to show higher levels of behavioural problems compared to the children of immigrant parents (Beiser, Hou, Hyman, & Tousignant, 2002). Therefore, it possible that there is a protective effect of immigration on children's aggression in the current study, despite the negative parenting practices of some of these mothers. Accounting for cultural differences and immigration in the study of motherhood and

antisocial behavioural development in children is especially salient in multicultural nations. This has been a neglected aspect of prior longitudinal studies in criminology (for a review, Morenoff & Astor, 2006) and most studies on the development of physical aggression in early childhood do not include diverse samples in terms of ethnicity or immigration (e.g., Tremblay et al., 1999; Côté et al., 2006; NICHD, 2004). Future research should consider examining the development of childhood aggression and the role of parenting practices among different cultural and immigrant groups in order to better understand this relationship, especially in the context of intergenerational transmission of antisocial behaviour.

#### **3.6.4. *Maternal Delinquency and Parenting***

Mothers with a history of juvenile delinquency tend to have children who are more frequently physically aggressive (see Appendix B), and their children also have an earlier onset of physical aggression (see Tzoumakis et al., 2012). However, in the current study, it was mothers' current rather than their past offending that influenced their parenting practices. This suggests that it is those mothers who are offending as adults whose parenting is more maladaptive. Although a number of mothers reported a variety of past delinquent behaviour (56.4 % one or more offense) such as shoplifting (33.6 %), taking soft drugs (26.9 %), minor theft (13.7 %), running away from home (12.9 %), few of the women reported official contact with the police (10.1 %). Moreover, just over 20% of these women were actively offending as adults (e.g., drunk driving, drug use, shoplifting, throwing objects at people). In line with this, Nagin, Farrington and Moffitt (1995) found that while adolescent-limited offenders were rarely officially convicted as adults, they were not fully reformed; specifically, they continued to drink heavily and use drugs, get into fights, and commit self-reported general delinquency. Most of the women in the current study are not chronic and serious offenders, but are more likely adolescent-limited type offenders, with a small proportion that continue to participate in risky activities that do not result in official police contact (e.g., Moffitt, 1993; Moffitt et al., 2001; Nagin et al., 1995). In the current study, findings suggested that it is not so much past involvement in delinquency that affected a mother's parenting but participation in an ongoing antisocial lifestyle as adults. These women may be caught up in life events that have entangled them in more deviant and vulnerable lifestyles, and

are unable to completely leave the consequences of their adolescent antisocial behaviour behind (e.g., Hodgins, 1994; Lanctôt et al., 2007; Moffitt et al., 2001). The women in this study may not completely be reformed from their juvenile delinquency, and their persistence in antisocial behaviour could be influencing their current situations, including their current parenting practices.

The parenting classes captured in the current study seem to reflect parenting as a state, something that is influenced by mothers' situations and contexts, rather than as a trait, or a more stable individual extension of mothers' personalities. A state dependent process in regards to offending refers to a process of contagion where an offenders' current activities worsen their life circumstances and consequently increase their future involvement in offending (Nagin & Paternoster, 2000). Similarly, the current study suggests that a mother's personal, socioeconomic, and psychological contexts are negatively influencing their approaches to parenting. The vulnerable situations they find themselves in could be contributing to their adverse parenting. A trait based or population heterogeneity approach on the other hand, focuses on a person's initial propensity to commit crime, and how stable individual differences in this trait or propensity affect current behaviour (Nagin & Paternoster, 2000). While this might be true for some behaviours, perhaps in the case of parenting or dealing with a difficult young child, a person's current context is more relevant. In line with this, a recent study examined trajectories of maternal harsh parenting from birth to age three, and found evidence of a developmental process of harsh parenting that was influenced by contextual factors (e.g., maternal alcohol abuse, partner aggression) (Kim, Pears, Fisher, Connelly, & Landsverk, 2010). These findings therefore highlight the importance of examining individual patterns of parenting, and future studies should consider patterns of parenting over time in order to determine specific developmental trends and influences. Indeed, Macmillan, McMorris and Kruttschnitt (2004) found that changes in a mother's circumstances (i.e., poverty, divorce) exacerbate antisocial behaviour in young children. The authors advocate for a dynamic approach in examining the influence of maternal and family circumstances on child behavioural development. Life events and circumstances are likely to influence trajectories of parenting, which could in turn influence children's behaviour. If parenting is more of a state dependent process, it is likely that current life situations may be more influential on adult parenting behaviours.



### **3.6.5. Limitations**

The Vancouver Longitudinal Study consists of Canadian mothers and their children from Vancouver, and the ethnic diversity of the city is reflected in the sample. A high proportion of the participants are immigrants of Asian and South Asian descent, and consequently the results may not be generalizable to other non-Canadian populations. Moreover, while the presence of siblings was not significantly associated with parenting practices, it would have been ideal to obtain additional information regarding sibling behaviour and parenting practices with siblings, considering that three quarters of the children in this sample have at least one sibling. The parenting measure used in the current study is a behavioural measure that specifically examines parenting practices and did not include parent-child attachment or interaction, which may have captured a different facet of parenting. However, this measure was chosen because it was specifically designed to reflect practices that are associated with disruptive child development (Shelton et al., 1996), which is in line with the main objective of the Vancouver Longitudinal Study. Additionally, the current study did not include multiple informants and all information on children's aggressive behaviour was obtained from the mother. Observational measures of children's aggression were obtained during the interviews and will be studied in the future. However, using parent-report information is a typical approach with children of this age since self-report measures would be inappropriate, and has been found to be reliable (e.g., Kerr et al., 2007). The sample size in the current study limited post hoc analyses that could be conducted with the latent classes identified, particularly considering the small size of the Negative Class. The Vancouver Longitudinal Study is an ongoing prospective longitudinal study, and unfortunately, data from the second wave were not available at the time of this study. The current study is therefore based on cross-sectional parenting and child aggression data, and as such it is currently not possible to assess temporal priority. As such, while the study findings showed that there is a relationship between negative parenting and children's aggression, future studies will analyze the continuity of children's physical aggressive behaviour, and the effect of parenting on the development of aggression.

### **3.7. Conclusion**

The current study examined the profiles of maternal parenting and associated factors. The aim was to explore whether delinquent/offending mothers respond differently to their children's behaviour and how it might be influencing their children's aggression. Mothers are typically the primary caregivers of children, and yet they have not been the focus of as much attention as fathers in the intergenerational transmission of antisocial behaviour. More recent research has begun to suggest that the role of the mother is important, and in fact, that the risk of intergenerational and familial transmission might be somewhat stronger for females (e.g., Bijleveld & Wijkman, 2009; Frisell, Lichtenstein, & Langstrom, 2011). Critically, it would seem that many mothers are quite vulnerable, struggling with symptoms of mental illness, and are persisting in antisocial behaviour in adulthood. Moreover, maternal mental health and stress have been linked with attachment security in children (for a review, Atkinson, et al., 2000). While parent-child attachment patterns were not included in the current study, it would be interesting to determine whether attachment influences the different parenting classes identified, and if it is linked to maternal criminogenic factors. Considering that some of these mothers are struggling with a number of stressors, it is unsurprising that they would have difficulty parenting young children, especially those children who are more difficult or aggressive. However, it is exactly these more challenging children at this particular age who need to learn alternatives to antisocial behaviour, since they are most at-risk of persisting later in life (Broidy et al., 2003; Tremblay et al., 2004). Fortunately, the mothers who are exhibiting adverse parenting are still playing and rewarding their children quite frequently. This offers a starting point to intervene regarding their parenting, but it seems that providing psychological support and assistance would need to be prioritized while also being aware of the potential social and legal complications associated with mothers who persist in antisocial behaviour. Finally, it is unclear how the parenting classes identified in the current study will impact children's behaviour in the long-term. Future studies will examine how maternal delinquency, current offending, and parenting practices affect the continuity of aggression into later childhood.

## **Chapter 4.**

### **Study III: The Persistence of Physical Aggression in Early Childhood**

#### **4.1. Abstract**

The aim of the current study was to examine the persistence of physical aggression in preschoolers and associated correlates (i.e., sociodemographic, socioeconomic, criminality, parenting practices, maternal mental health). One-year follow-ups are completed with 240 mothers and their preschool children (boys and girls) from the Vancouver Longitudinal Study on the Psychosocial Development of Children. A series of structural equation models were examined. Findings showed that maternal psychological symptoms, juvenile delinquency, and adult offending are associated with higher levels of physical aggression in their offspring. Moreover, the children of non-Caucasian mothers and those born outside of North were less physically aggressive. Several cultural differences in the correlates of physical aggression were identified. Overall, there was much stability in physical aggression during the early childhood period. Maternal past delinquency, current adult offending, and mental health are important factors in the development of children's physical aggression. Cultural differences should be taken into account when developing programs and intervening with families of children with behavioural problems.

#### **4.2. Introduction**

Criminology is progressively searching earlier in the life-course to explain the development of antisocial and criminal behaviour. Developmental criminologists

propose that early life events and circumstances can have cumulative consequences on an individual's behavioural development (e.g., Loeber et al., 2008; Moffitt, 1993). Similarly, Cullen (2011) suggests that criminology should focus on the developmental periods prior to adolescence, stressing that infants emerge from the womb with individual differences and such differences are carried on to the next developmental stages. The focus on these very early individual differences, especially those associated with later violent behaviour, is emphasized by longitudinal studies (e.g., Caspi et al., 2002). Genetic or biological studies may provide information on the magnitude of the influence of antisocial and violent behaviour (for reviews, Rhee & Waldman, 2002; Moffitt, 2005), but do not necessarily explain the underlying process by which the risk for violence develops over time. Recent research shows that known risk factors for violence are predictive of childhood aggression as early as 12 months old (Hay et al., 2011), while criminogenic risk factors are associated with patterns of physical aggression in preschoolers as young as 36 months old (Lussier, Corrado et al., 2011; Tzoumakis, et al., 2012). The period from infancy to early childhood is therefore important for theoretical development, and empirical evidence continues to indicate that antisocial behaviour originates during this time (e.g., Farrington, 2005; Moffitt, 2003).

The early childhood/infancy period, however, is also vitally important for policy reasons. For instance, a recent meta-analysis shows that early intervention programs (i.e., family/parent training) are effective not only in decreasing antisocial behaviour in childhood, but also have positive long-term effects on delinquency and offending in adolescence and adulthood (Piquero et al., 2009). The effectiveness of early intervention is therefore critical, since a substantial amount of research indicates the financial costs of delinquency and crime are extremely high (see Cohen, 1998; Cohen, Piquero, & Jenkins, 2010). If the origins of antisocial behaviour lie in infancy and early childhood, and interventions at this time period are proven to be effective, the broad societal benefits of focusing on this developmental period are substantial. Further understanding of the processes occurring with children and their parents during this crucial time period, particularly from a criminological perspective, can help to improve prevention, intervention, and approaches to studying the origins of antisocial behaviour. Moreover, as many communities become increasingly culturally and linguistically diverse, understanding these processes among different ethnic and immigrant groups

are also important. The current study explores the development of physical aggression during this early childhood period, and considers a number of potential correlates, including the role of maternal antisocial behaviour, mental health, and a considerably neglected area in current research along these lines, cultural differences.

#### **4.2.1. *Developmental Psychology and Childhood Physical Aggression***

Research in developmental psychology emphasizes the importance of the early childhood period, particularly regarding the development of physical aggression. Aggression during childhood is normative, and most children exhibit some form of physical aggression, with peaks in the frequency of aggression at approximately one and half, and, two to three and a half years of age (Hay, 2005; Tremblay et al., 1999). After this early childhood period however, aggression tends to decline dramatically (e.g., Cummings et al. 1989; Goodenough, 1931; Hartup, 1974). More recent studies have focused on identifying developmental trajectories of physical aggression in order to provide information on individuals' long-term patterns of frequency and participation in physical aggression, as well as risk factors associated with these trajectories. However, most have examined developmental trajectories of violence and aggression later in mid-to-late childhood and adolescence (mid/late childhood to adolescence, adolescence to adulthood) neglecting earlier childhood developmental periods (e.g., Barker et al., 2007; Brame et al., 2005; Broidy et al. 2003; Maldonado-Molina & al., 2010; Piquero et al., 2002; van Lier et al., 2009). A few studies are, however, focusing specifically on the development of physical aggression before school entry (Côté et al., 2007; Côté et al., 2006; NICHD, 2004; Tremblay et al., 2004). Findings from these studies show that: 1) approximately one third to half of preschool children belong to a very low (approaching zero) trajectory of physical aggression; 2) preschool children exhibiting the highest levels of physical aggression in a cohort were the smallest trajectory identified (approximately 15 %); 3) patterns of physical aggression in childhood and adolescence are relatively stable over time (i.e., rank stability); 4) those belonging to the high physical aggression trajectories are more likely to show antisocial behaviour and violence into adolescence and adulthood; and, 5) a number of risk factors are associated with belonging to the high physical aggression trajectories in early childhood, including: male gender, low

socioeconomic status, maternal past antisocial behaviour, maternal young age at birth of child, maternal low education, prenatal smoking, presence of young siblings, coercive parenting. Critically, virtually none of these studies examined an ethnically diverse sample, or the impact of ethnic or cultural differences in the development of physical aggression.

Findings from trajectory studies therefore reaffirm the importance of understanding aggression during the early childhood period, while informing us about the risk factors associated with the long-term development of aggression. However, one limitation is that they do not necessarily capture heterogeneity of patterns of physical aggression in the short-term, or explain how short-term physical aggression is influenced, particularly during the critical period before school entry. For example, the question of how patterns of behavioural development manifest in the short-term may yield very different observations than broader patterns over a five or ten year period. Moreover, it is unclear whether correlates associated with short-term change are the same or different from those associated with the predicted long-term trajectories of physical aggression in different children. The period before children begin school is critical as it provides an important window of opportunity for primary and secondary intervention because this is when socialization processes are taking place where children learn alternatives to aggression and other maladaptive behaviour (e.g., Kochanska, 1993; Kopp, 1982; Maccoby 1980; Tremblay, 2003). Therefore, examining the more proximal factors and life circumstances of families dealing with children with aggression and behavioural problems is also informative for program development, and for clinicians and others working with these families. A greater level of specificity, or targeted intervention, may be more beneficial in this context, especially for different cultural groups. As such, it is important to explore this specific period, and to examine the factors influencing children's aggression and socialization in the years prior to school entry.

#### **4.2.2. *Motherhood and the Transmission of Antisocial Behaviour***

The socialization process in the preschool years falls to the parents, and mostly to mothers, as they are typically the primary caregivers (Pleck & Masciadrelli, 2004). Studies in psychology often consider characteristics of mothers, such as mental health,

that contribute to the development of aggression and other behavioural problems in their children (e.g., Cummings & Davies, 1994; Shaw, Owens, Giovanelli, & Winslow, 2001; Jaffee et al., 2006). Criminologists on the other hand, traditionally focus on the role of the father in the context of the intergenerational transmission of antisocial and criminal behaviour (for reviews, Loeber & Stouthamer-Loeber, 1986; van de Rakt, Nieuwebeerta, & de Graaf, 2008). The main reason for this is that females are far less likely to participate in crime than males (Steffensmeier & Allan, 1996). However, the impact of maternal participation in delinquency and offending should not be underestimated. For instance, studies that have considered the role of both mothers and fathers in the development of children's antisocial behaviour find considerable continuity in antisocial behaviour from mothers to their children (Smith & Farrington 2004; Thornberry, Freeman-Gallant, & Lovegrove, 2009). Moreover, females with a history of conduct disorder and juvenile delinquency are at risk for experiencing a number of negative life circumstances in adulthood (e.g., Lanctôt et al., 2007; Moffitt et al., 2001; Odgers et al., 2008; Zoccolillo et al., 2005). Compared to their non-delinquent counterparts, women who were delinquent in adolescence are much more vulnerable in adulthood (e.g., low socioeconomic status, substance abuse, mental health problems, abusive interpersonal relationships). In other words, when these women become mothers, these research findings tend to suggest that they may find themselves in 'high-risk' situations that subsequently make it more difficult to provide ideal supportive and nurturing caregiving environments.

Sampson and Laub argue that informal social control in adulthood can change the course of criminal behaviour over the life span (e.g., Laub & Sampson, 2003; Sampson & Laub 1993). Moreover, research on desistance from crime suggests that becoming a parent can contribute to reducing antisocial and criminal behaviour for females (e.g., Graham & Bowling, 1995; Kreager et al., 2010). However, studies examining the adult outcomes of females with a history of antisocial behaviour also suggest that these women are more likely to continue participating in antisocial behaviour in adulthood (e.g., Lanctôt & Le Blanc, 2002; Moffitt et al., 2001). Therefore, based on the notion that human lives are embedded in social relationships (e.g., Elder 1995; 1998), the life-course framework in criminology highlights the important influence of adult social bonds on changing the course of antisocial behaviour. Socialization

experiences and life transitions (e.g., marriage, employment) can influence offending trajectories by reducing time spent with antisocial peers in favour of more family-oriented activities (e.g., (Laub & Sampson, 2003; Sampson & Laub 1993; Warr, 1998). In this context, becoming a parent is therefore a potential life-course transition that should be particularly relevant for women. However, some qualitative accounts show that while many women attribute the birth of their child and motherhood as positive events that play an important role in their desistance from delinquency and crime, for others it is a source of stress that compounds their parental difficulties (e.g., Giordano, 2010; Michalsen 2011). Hence, whether motherhood is a positive or negative experience may be contingent on a number of individual and life circumstances, but it may pose a particular challenge for women involved in antisocial and criminal behaviour.

#### **4.2.3. *Motherhood in a New Cultural Context***

In an era of increased globalization, scholars producing longitudinal studies and life-course criminological studies have surprisingly neglected to account for the impact of immigration and the influence of new cultural contexts on the transition to parenthood. On the one hand, research in the field of nursing has scrutinized the process of women attaining a maternal role identity (i.e., acquiring a new self-definition as a mother) for several decades (e.g., Rubin, 1967; Koniak-Griffin, 1993). Importantly, this field of research highlights that this process can be difficult for some women, and in particular for certain populations such as cultural minorities and adolescent mothers. On the other hand, all women do not experience motherhood the same way, and this is especially true for different cultural groups and immigrant mothers who are highly influenced by their culture of origin (Koniak-Griffin, Logsdon, Hines-Martin, & Turner, 2006). Cultural displacement has an important yet minimally understood effect on motherhood because it is potentially challenging for mothers to raise children to function effectively in two different cultures (Tummala-Narra, 2004). As such, accounting for cultural differences and immigration in the study of the relationship between motherhood and behavioural development in children is especially salient in multicultural nations.

The importance of understanding experiences of immigration lies in the impact it has on women's physical and mental health. For example, research examining the health of immigrants has identified the 'healthy immigrant effect', that indicates



immigrants typically report low rates of physical and mental health issues which eventually tend to convergence with those of native-born levels (e.g., Ali, 2002; McDonald & Kennedy, 2004). At the same time, there is some evidence suggesting that this healthy immigrant effect may not necessarily extend to pregnancy and motherhood experiences (e.g., Bollini, et al., 2009; Sword, Watt, & Krueger, 2006). Specifically, in a review of 65 studies comparing pregnancy outcomes of immigrant and native mothers in twelve European countries, Bollini and colleagues (2009) found that immigrant mothers had a much higher risk of birth complications (e.g., 43 % higher risk of low birth weight; 23 % preterm birth). Moreover, findings from a longitudinal Canadian study indicate that the rates of maternal depression five months after childbirth were twice as high for minority group immigrants (Mechakra-Tahiri, Zunzunegi, & Séguin, 2007). Importantly, these mothers were also more likely to be single and living in poverty. Compared to native-born females, immigrant females tend to have higher levels of depression after childbirth, and limited social support networks and isolation contribute to their mental health problems (e.g., Small, Lumley, & Yelland, 2003; Sword et al., 2006; Williams & Carmichael, 1985). Taken together, these research findings suggest that some immigrant women are faced with multiple challenges when becoming mothers, which may be somewhat unique compared to those of non-immigrant mothers, and can potentially impact motherhood experiences.

### **4.3. Aims of Study III**

The main aim of the current study is to examine the persistence of physical aggression in early childhood, since: a) this period is when physical aggression begins to decline and children are learning alternatives to aggression; b) this is an ideal time to intervene as interventions during this period are effective; c) there are long term consequences and costs associated with the persistence of aggressive behaviour after this period. Therefore, the current study focuses on children's short-term physical aggression during the preschool period when they are learning to inhibit their aggressive behaviour. In addition, a number of correlates (i.e., sociodemographic, socioeconomic, criminality, parenting practices, maternal mental health) of physical aggression are considered at two time points over a one-year period. The role of the mother is emphasized in the current study since mothers have been somewhat neglected in

criminology, and because they are typically the primary caregivers, and sometimes are the sole caregivers of their children. Mothers with a history of antisocial behaviour tend to have more negative outcomes as adults, potentially finding themselves in vulnerable situations when they become mothers, which may consequently influence their children's behaviour. Importantly, the current study takes into account the role of potential cultural differences within families, and considers the impact of experiencing motherhood in a new cultural context, a neglected aspect of prior longitudinal studies of the development and transmission of antisocial behaviour and aggression. The overall objective is therefore to examine the persistence of preschool children's physical aggression in the short-term, and explore associated correlates at this critical point in child development.

## **4.4. Methodology**

### **4.4.1. Sample**

The current study is based on data from the first two waves of the ongoing Vancouver Longitudinal Study on the Psychosocial Development of Children conducted in Vancouver, British Columbia, Canada. The objective of this prospective study is to identify key early risk and protective factors of violence and delinquency (Lussier et al., 2012; Lussier et al., 2011). The participants were recruited from February 2008 to August 2010 in Vancouver and the Greater Vancouver Regional District (GVRD). Wave I of the study consists of 288 biological mothers and their 3 to 5 year old children. Wave II consists of 242 participants, and was completed approximately one year later based on the mothers' availability to participate in the follow-up wave (Mean follow-up = 13.43 months; SD = 2.93). Mothers were on average 36 years old at Wave I (SD = 4.9), and over half have some form of university education. The children's average age was 4.2 years old at the first interview (SD = 0.7), and both boys (57.4 %) and girls (42.6 %) are included. The sample reflects the ethnic diversity of the city of Vancouver. There are over 200 ethnic groups in Vancouver and just over 40 % of the population is part of a visible minority according to the 2006 Canadian Census data. In the current sample, just over half of the mothers are Caucasian (57.4%) and born in North America (58.4%), and a wide range of incomes and social statuses are represented in the sample. Additional descriptive information for the sample is presented in Table 4.1.

**Table 4.1. Sample Description**

Maternal characteristics			Child characteristics		
Age at Wave I	Mean	36.0 (4.9)	Age at Wave I	Mean	4.2 (0.7)
Age at child's birth	Mean	31.9 (5.0)	Gender	Male	57.4%
Ethnicity	Caucasian	57.4%	Ethnicity	Caucasian	57.4%
	Asian	19.8%		Asian	19.4%
	South Asian	9.9%		South Asian	8.7%
	Other	12.8%		Other	14.5%
Place of birth	North America	58.4%	Place of birth	North America	92.9%
	Outside NA	41.5%		Outside NA	7.1%
Education	≤ High school	14.0%	Sample type	Clinical	4.5%
	Post secondary, trade	25.6%		At-risk	61.6%
	University	38.0%		Community	33.9%
	Graduate, post graduate	22.3%	Siblings	Yes	73.6%
Family social adversity					
Family income	< \$25,000	8.0%	Single parent family	Yes	13.7%
	\$25,000 to < \$50,000	19.0%	Social assistance (ever)	Yes	16.9%
	\$50,000 to < \$75,000	17.3%	Social status (Hollingshead)	Level I: Unskilled laborers	4.1%
	\$75,000 to < \$100,000	17.3%		Level II: Semi-skilled	10.0%
	\$100,000 to < \$125,000	18.6%		Level III: Skilled, sales	18.7%
	≥ \$125,000	19.8%		Level IV: Technical	44.8%
Mean	\$89,500 (63,800)	Level V: Professional		22.4%	
		Mean	44.8 (12.8)		
Maternal psychological symptoms (BSI)			Reported offending indicators		
Obsessive-compulsive	Mean	57.2 (9.9)	Variety of maternal delinquency	Mean	1.9 (3.1)
Depression	Mean	50.3 (8.4)		None	41.7%
Anxiety	Mean	50.9 (9.6)		One to two	29.8%
Hostility	Mean	54.5 (9.3)		Three or more	28.5%
Global Severity Index	Mean	52.6 (9.2)	Onset of maternal offending	Mean	12.0 (5.5)
Parenting practices			Maternal offending Wave I	Yes	20.1%
Positive parenting	Mean	17.7 (1.7)	Maternal criminal history	Yes	7.9%
Negative parenting	Mean	11.5 (3.2)	Partners' criminal history	Yes	16.5%
Children's physical aggression (PA)					
		Prevalence of high frequency PA <sup>a</sup>			Prevalence of high frequency PA <sup>a</sup>
Wave I PA	Mean frequency		Wave II PA	Mean frequency	
Kick, bite, hit	1.2 (0.9)	35.5%	Kick, bite, hit	1.4 (0.9)	47.7%
Push, shove	1.2 (0.9)	38.0%	Push, shove	1.2 (0.9)	37.8%
Throw	0.7 (0.9)	21.3%	Throw	0.8 (0.8)	17.4%
Fight	0.3 (0.8)	11.1%	Fight	0.5 (0.8)	14.2%

<sup>a</sup> Children who were reported engaging in the behaviour at least several times in the past year; Note. Standard deviations are in parentheses.

A multi-sampling strategy was used to recruit a diverse sample of families in terms of socioeconomic risk factors. Three groups were recruited: a clinical sample of children, an at-risk community sample, and a community comparison sample. The

clinical sample (n = 11) was recruited from the Infant Psychiatric Clinic at the British Columbia (BC) Children's Hospital. Clinicians asked the primary caregivers if they wanted to participate in the Study. The inclusion criteria were: (1) the child was currently being assessed and/or treated for an externalizing disorder; (2) the child was between three and five years old; (3) both the child and the primary caregiver had a reasonable understanding of English; and (4) the family resided in and around the city of Vancouver and the GVRD. An at-risk community sample (n = 149) was recruited from within vulnerable socioeconomic neighbourhoods (e.g., subsidized housing, single parent families, lower employment, higher crime rates). Neighbourhoods in city of Vancouver and the GVRD that ranked in the lowest 25 percentile by two provincial surveys were selected for sampling (Kershaw et al., 2005). The families were not specifically sampled, but rather the neighbourhoods, in order to allow for a wide range of families (from low to high risk) to be included. A community comparison sample (n = 82) was recruited from neighbourhoods from the remaining 75 % of the provincial survey. The inclusion criteria for both the at-risk and the community comparison samples were the same as for the clinical sample, with the exception of having been referred for an externalizing disorder. Daycare managers were contacted to participate in the study, and posters were put up in each of the participating daycares.

#### **4.4.2. Procedures**

Wave I of the Vancouver Longitudinal Study is based on in-person interviews with biological mothers. Interviews were completed at a research laboratory located at BC Children's Hospital, or at the families' homes. Graduate students having received extensive training conducted the interviews following a standardized interview protocol. Data was collected using a computerized questionnaire, and the interviews typically lasted 2.5 hours. For Wave II, phone interviews using a shortened version of the standardized questionnaire were conducted with the mothers. Ethics approval was obtained from Simon Fraser University, the University of British Columbia, and BC Children's Hospital. Participants signed consent forms notifying them that the information provided was confidential and collected for research purposes only. Mothers were paid \$40 Canadian for their participation. They were informed that participation was voluntary and that they could withdraw at any time.

### **4.4.3. Measures**

The Cracow is the main instrument of the Vancouver Longitudinal Study (Corrado, 2002; Lussier, Corrado et al., 2011). This instrument collects information on a wide range of risk and protective factors associated with the development of serious and violent delinquency (e.g., pre/perinatal risk, parenting practices, social adversity, individual and behavioural characteristics of the child, social/peer factors, as well as neighbourhood, victimization and community violence). The current study uses several of sections of the Cracow (see Table 4.1 for descriptive statistics) including children's physical aggression, sociodemographic characteristics, delinquency and offending, psychological symptoms, parenting practices, and social adversity.

#### **Children's Physical Aggression**

Mothers were asked to report the frequency of their children's physical aggression in the previous year. In line with other major studies on childhood physical aggression (e.g., Broidy et al., 2003; Tremblay et al., 2004), four indicators were used: a) kicking, biting, or hitting; (b) shoving, pushing; (c) throwing things at people; and d) physical fighting. Mothers reported the frequency of their children's physical aggression at both Wave I and Wave II on a four-point scale: (0) never, (1) a few times, (2) several times, (3) very often.

#### **Delinquency and Offending**

During Wave I interviews, mothers were asked to report their history of juvenile delinquency and their adult offending using the MASPAQ (Measurement of Adolescent Social and Personal Adaptation in Québec; Le Blanc et al., 1996). The MASPAQ has been used and validated with males and females, adolescents as well as adults, and different samples (e.g., community; adjudicated youth) (Le Blanc & Bouthillier, 2003; Le Blanc & Fréchette, 1989; Le Blanc et al., 1996). For the 26 different criminal behaviours (see Appendix A), mothers were asked (a) if they had ever committed the behaviour (i.e., prevalence); (b) the age at first occurrence (i.e., age of onset); and (c) the number of times in the last year (i.e., frequency). As shown in Table 4.1, indicators were created for mothers' variety of juvenile delinquency ( $\alpha = .87$ ), age of onset of offending, and participation in offending in the year prior to the Wave I interview. Mothers were also

asked if they or their partner/the children's father had ever been arrested or convicted for a crime.

### **Maternal Psychological Symptoms**

The Brief Symptom Inventory (BSI) was also administered to the mothers during the Wave I interviews (Derogatis & Melisaratos, 1983). The BSI is widely used, is evaluated as one of the best brief self-report measures, and has high test-retest, internal consistency reliability, and validity (Derogatis, 1993; Derogatis & Melisaratos, 1983; Morlan & Tan, 1998). This instrument consists of 53 items designed to assess the psychological symptom status of individuals. Mothers were asked how much each had distressed or bothered them during the past seven days on a five-point scale. Dimensions for Obsessive compulsive ( $\alpha = .83$ ), Depression ( $\alpha = .81$ ), Anxiety ( $\alpha = .72$ ), Hostility ( $\alpha = .72$ ), and the Global Severity Index ( $\alpha = .93$ ) were used in the current study. The Obsessive compulsive dimension refers to thoughts and actions that are experienced as unremitting and irresistible by the patient but are of an ego-alien or unwanted nature. Depression reflects a broad range of signs and symptoms of clinical depressive syndromes, including: dysphoric affect and mood, withdrawal, loss of energy, hopelessness, and futility. Anxiety reflects symptoms clinically associated with high manifest anxiety, including: restlessness, nervousness, tension, free-floating anxiety and panic. Hostility reflects annoyance, irritability, urges to break things, frequent arguments, and uncontrollable outbursts of temper. The Global Severity Index is considered the best and most sensitive indicator of current distress levels; it combines information on the numbers of symptoms and intensity of perceived distress (Derogatis, 1993). Moreover, an indicator reflecting 'positive cases' were calculated using a cut-off of 63 or greater on the standardized T scores, which can be used in order to screen for psychiatric disorders (Derogatis, 1993). The Global Severity Index suggested that 14.9 % of mothers could be considered a positive case, and this proportion varied for the other dimensions: Obsessive compulsive = 31.8 %; Depression = 9.9 %; Anxiety = 11.2%; Hostility = 17.4%. Mothers were also asked during the Wave I interviews if they had ever been diagnosed with psychiatric disorder (14.0 %), and if they were currently (i.e., in the past year) receiving treatment for one (12.2 %).

## **Maternal Parenting Practices**

A shortened version of the Alabama Parenting Questionnaire (APQ; Frick et al., 1999) was used in the current study. The APQ is an assessment of parenting practices that examines the most important aspects of parenting relating to problem behaviours in school-age children (Shelton et al., 1996). It has been validated on different population and age groups (ages 4 to 18) in several countries (e.g., Dadds et al., 2003; Essau, et al., 2006; Tzoumakis, Lussier, & Corrado, 2013). Mothers were asked about the frequency of several parenting practices during the past year on a five-point scale. For the current study, scales were created reflecting positive parenting ( $\alpha = .54$ ) and negative parenting ( $\alpha = .67$ ). The four positive items consist of: a) have a friendly talk with your child; b) let your child know when they are doing a good job; c) play games or do other fun things with your child; d) calmly explain to your child why their behaviour was wrong when they misbehaves. The six negative items consist of: a) Threaten to punish your child and then do not; b) getting your child to obey you is more trouble than it's worth; c) get so busy that you forget where your child is; d) The punishment you give your child depends on your mood; e) Yell or scream at your child when he/she has done something wrong; f) You swore or cursed at your child.

## **Sociodemographics**

A number of child characteristics were included in the current study, including: age; gender (0 = girls; 1 = boys); ethnicity (0 = Caucasian; 1 = non-Caucasian); sample type (0 = community comparison; 1 = clinical and at-risk community); and presence of siblings (0 = no siblings, 1 = one or more siblings). Maternal characteristics examined included: age at birth of child; ethnicity (0 = Caucasian; 1 = non-Caucasian); place of birth (0 = outside North America; 1 = born in North America); and education (0 = more than high school; 1 = high school or less).

## **Social Adversity**

Several indicators of social adversity were also considered. Mothers were asked to report their family income, whether the family had ever been on social assistance (0 = never; 1 = yes), and whether the mothers were single parents (0 = no; 1 = yes). Hollingshead (1975) social status scores were calculated by combining scores for the education levels and occupations of both parents. These scores were then weighted to

obtain a single total score reflecting family social status, which were used in subsequent analyses. This score was also used to categorize families in one of five social strata, which are shown in Table 4.1 for descriptive purposes

#### **4.4.4. Attrition**

The Vancouver Longitudinal Study on the Psychosocial Development of Children includes 288 biological mothers and their children at Wave I, and 242 at Wave II. A total of 46 families did not participate in Wave II; the retention rate of the current study is therefore 84 %. Bivariate analyses indicated that there were no differences between those who continued to participate in the study and those who did not regarding children's physical aggression, gender, age, siblings, referral type. Nor were there any differences for maternal age, birthplace, education, history of juvenile delinquency, onset of offending, current offending, mental health symptoms, parenting practices, or partner's arrest history. However, mothers who did not participate in Wave II were significantly more likely to be single [ $X^2(1) = 12.14, p \leq .001$ ], non-Caucasian [ $X^2(1) = 4.06, p \leq .05$ ], have lower income [ $F(1) = 12.49, p \leq .001$ ], received social assistance [ $X^2(1) = 18.86, p \leq .001$ ], and to report having ever been arrested [ $X^2(1) = 8.23, p \leq .01$ ]. Logistic regressions to predict families who did not participate in Wave II were also completed including a number of demographic and social adversity covariates (i.e., children's gender, age, siblings, mothers' birthplace, education, family income, social assistance, single parent family) and key study variables (i.e., children's physical aggression, maternal variety of juvenile delinquency, maternal offending at Wave I, partner/fathers' criminal history, positive and negative parenting, and overall psychological symptoms). Maternal variety of juvenile delinquency and arrest history are conceptually similar and relatively highly correlated ( $r = .56, p \leq .01$ ), therefore, in order to avoid issues with multicollinearity as well as model over fitting, separate models were conducted interchanging variables these variables. The overall model including maternal variety of juvenile delinquency approached, but was not statistically significant [ $X^2(15) = 24.09, p = .06$ ], and examining the covariates, only having received social assistance was significant [ $\text{Exp}(B) = 5.00; 95 \% \text{ C.I.} = 1.42-17.58$ ]. The findings for the model that included maternal arrest history were almost identical; the overall model was not significant, and social assistance was the only significant covariate.

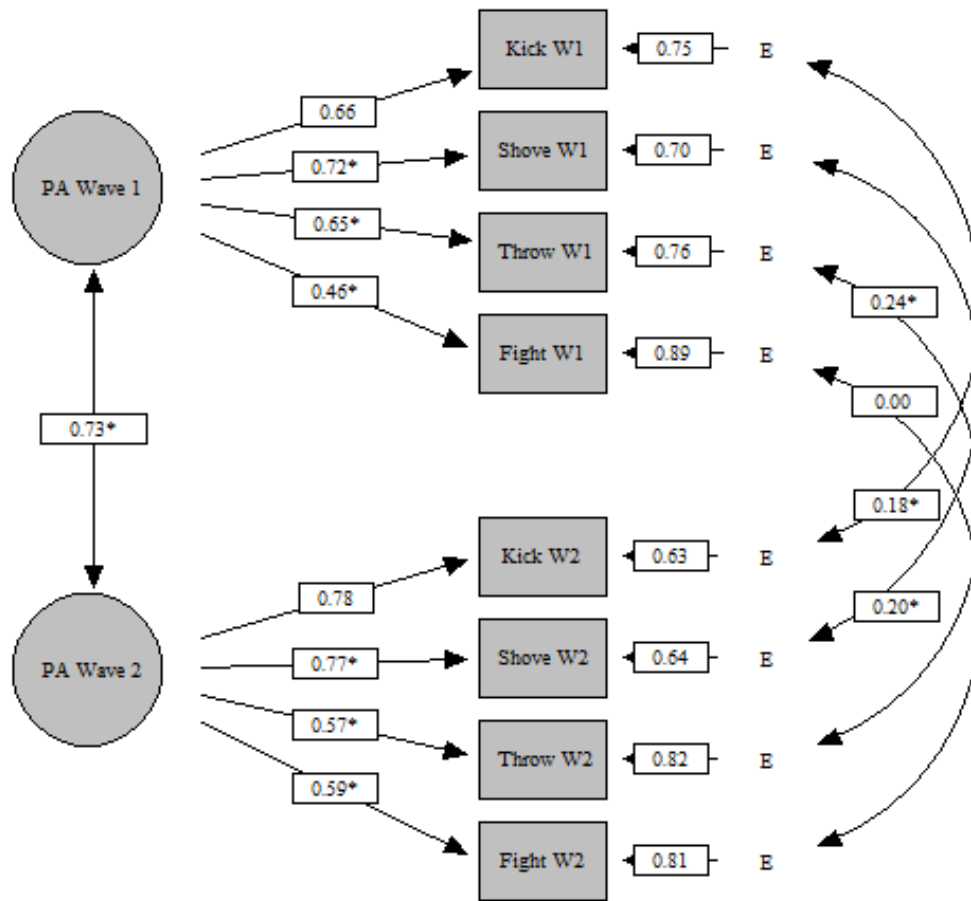


Attrition is an issue in longitudinal studies because it is often selective and tends to disproportionately affect at-risk families and antisocial individuals; however, it is particularly concerning if it affects the main study variables (Bergman & Magnusson, 1990). While some differences were identified in the current study (i.e. social adversity), the dependent variable (i.e., children's physical aggression) and other key variables (e.g., maternal delinquency, psychological symptoms) were not affected.

#### **4.4.5. Analytic Strategy**

In order to examine the persistence of children's physical aggression from Wave I to Wave II and its associated risk factors, a series of structural equation models were completed. This technique has several advantages, such as assessing or correcting for measurement error, as well as incorporating both observed and latent variables (see Byrne, 2006). First, the measurement model for the sample was identified (see Figure 4.1). Four indicators were used to represent physical aggression at Wave I and at Wave II: a) kicking, biting, or hitting; (b) shoving, pushing; (c) throwing things at people; and d) physical fighting. The error terms were allowed to correlate since theoretically, the frequency of physical aggression at Wave I is likely to be correlated with the frequency of physical aggression approximately one year later, considering that physical aggression in early childhood is relatively stable (e.g., Broidy et al., 2003). Second, a series of latent correlation models were completed (see Figure 4.2 Model 1), running a separate model for each risk factor (e.g., child characteristics, maternal characteristics, social adversity, criminality, parenting, psychological symptoms). Third, the analyses were conducted as structural models, controlling for time, in order to determine whether the risk factors have an independent effect on physical aggression at Wave I and Wave II (see Figure 4.2 Model 2). Fourth, all of the analyses were conducted again (Models 1 and 2), but separating mothers born in North America and those born outside of North America in order to determine if there are any cultural differences. For each of the models conducted, residuals were screened for, and multivariate kurtosis was examined. Model fit was examined using the Comparative Fit Index (CFI), Non-normed Fit Index (NNFI), and the Root Mean Square Error of Approximation (RMSEA). It should be noted that the goal of the current study was not to test a theoretical model or identify one specific best fitting model, but rather to individually explore various correlates associated

with the persistence of physical aggression. As a result, model fit was not the focus of the current analyses. Analyses were conducted using EQS 6.2 (Bentler, 2006).



**Figure 4.1. Measurement Model: Children's Physical Aggression (PA)**

Note. \* all paths significant at  $p < .01$

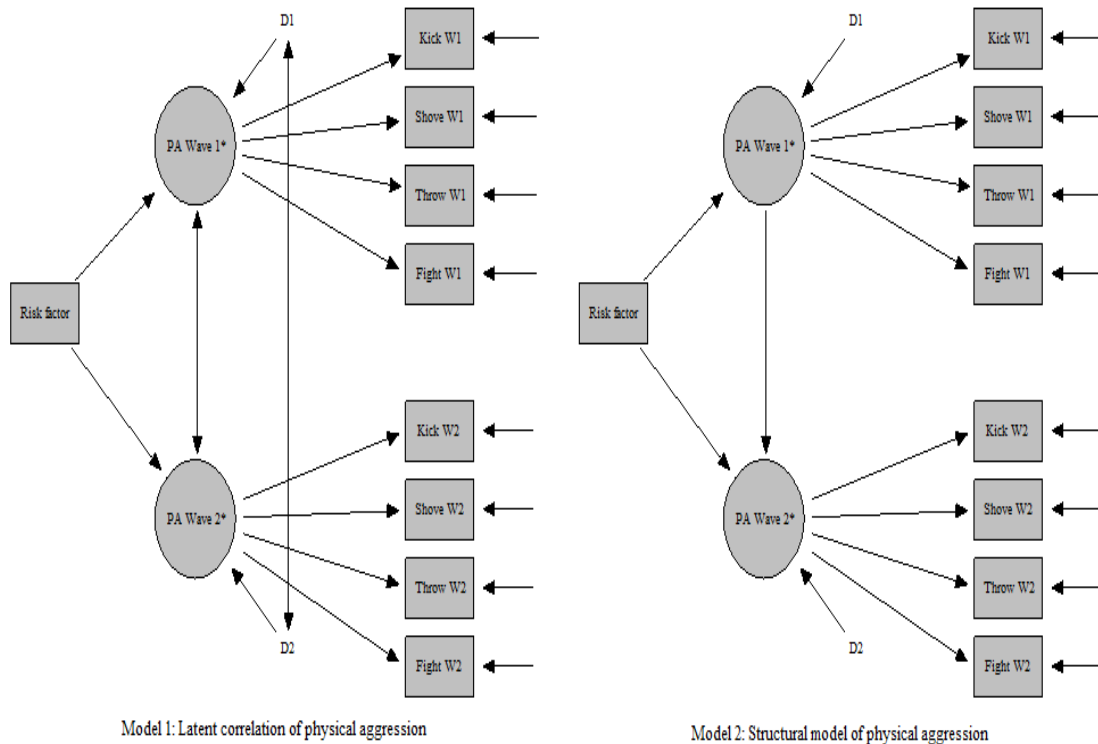
## 4.5. Results

### 4.5.1. Risk Factors Associated with the Persistence of Physical Aggression in Early Childhood

The measurement model was identified for children's physical aggression (PA), and is presented in Figure 4.1 (CFI = .97; NNFI = .94; RMSEA = .07). Aggression in early childhood was quite stable as indicated by the standardized path coefficient of .73 between the latent constructs of physical aggression at Wave I and Wave II. The factor loadings were relatively high (.57 to .78) for all of the indicators of PA, except for fighting

at Wave I (.46), which was also the least frequent physically aggressive behaviour at this age.

Each individual risk factor was included in a latent correlation model (Figure 4.2, Model 1). The results of this series of analyses are presented in Table 4.2. Regarding the child characteristics examined, Caucasian children were more likely to be physically aggressive at Wave I ( $\beta = -.17$ ;  $p < .05$ ), and this relationship approaches significance at Wave II ( $\beta = -.14$ ;  $p < .10$ ). A gender effect appeared as the children aged; boys were more likely to be physically aggressive at Wave II ( $\beta = .18$ ;  $p < .05$ ). The presence of siblings was significant at both waves, but appeared to be more important at Wave II ( $\beta = .30$ ;  $p < .001$ ), explaining 9 % of the variance. Of the maternal characteristics examined, ethnicity and place of birth were significant at both waves, with Caucasian mothers who were born in North America (NA) more likely to have aggressive children. Maternal place of birth was one of the strongest correlates of children's PA ( $\beta = -.38$ ;  $p < .001$ ), explaining 15 % of the variance at Wave I and 10 % at Wave II.



**Figure 4.2. Analytical Strategy for Examining the Risk Factors Associated with Children's Physical Aggression**

**Table 4.2. Latent Associations Between Children’s Physical Aggression and Child, Mother, and Family Risk Factors**

	Regression paths		Model fit		
	Wave I physical aggression	Wave II physical aggression	CFI	NNFI	RMSEA
<b>Child characteristics</b>					
Gender (male)	.12 (.01)	.18* (.03)	.97	.95	.06 (.02-.09)
Age at Wave I	.09 (.01)	-.01 (.00)	.96	.94	.06 (.03-.09)
Ethnicity (non-Caucasian)	-.17 (.03)*	-.14 (.02)+	.93	.87	.09 (.07-.12)
Sample type <sup>a</sup>	.03 (.00)	.02 (.00)	.95	.92	.07 (.05-.10)
Presence of siblings	.19 (.04)*	.30 (.09)***	.97	.95	.06 (.03-.09)
<b>Maternal characteristics</b>					
Age at birth of child	.01 (.00)	.04 (.00)	.97	.95	.06 (.02-.09)
Ethnicity (non-Caucasian)	-.26 (.07)***	-.25 (.06)***	.92	.87	.10 (.07-.12)
Place of birth (outside North America)	-.38 (.15)***	-.31 (.10)***	.94	.90	.08 (.06-.11)
Education (≤ high school)	.06 (.00)	.04 (.00)	.97	.94	.06 (.03-.09)
Family social adversity					
Family income	-.05 (.00)	-.03 (.00)	.95	.92	.07 (.04-.10)
Social assistance (ever)	.21 (.04)**	.14 (.02)+	.97	.94	.06 (.03-.09)
Social status (Hollingshead score)	-.04 (.00)	-.06 (.00)	.97	.95	.06 (.02-.09)
Single parent family	.18 (.03)*	.16 (.02)*	.96	.92	.07 (.04-.10)
<b>Reported offending indicators</b>					
Variety of maternal delinquency	.24 (.06)**	.21 (.04)**	.95	.91	.08 (.05-.11)
Onset of maternal offending <sup>b</sup>	-.24 (.06)**	-.17 (.03)*	.94	.94	.08 (.05-.11)
Offending at Wave I	.17 (.03)*	.15 (.02)*	.96	.93	.07 (.04-.10)
Maternal criminal history	.04 (.00)	.00 (.00)	.96	.94	.06 (.03-.09)
Partners’ criminal history	.16 (.03)*	.20 (.04)**	.96	.93	.07 (.04-.10)
<b>Parenting practices</b>					
Positive parenting scale	-.19 (.04)*	-.20 (.04)*	.97	.95	.06 (.02-.09)
Negative parenting scale	.20 (.04)*	.21 (.04)*	.94	.90	.08 (.05-.11)
<b>Maternal psychological symptoms (BSI)</b>					
Obsessive compulsive	.21 (.05)**	.20 (.04)**	.95	.91	.08 (.05-.11)
Depression	.13 (.02)+	.12 (.01)+	.96	.93	.07 (.04-.10)
Anxiety	.19 (.04)*	.15 (.02)*	.92	.96	.07 (.04-.10)
Hostility	.38 (.14)***	.23 (.06)**	.95	.92	.07 (.05-.10)
Global Severity Index	.25 (.06)**	.20 (.04)**	.94	.89	.09 (.06-.11)

<sup>a</sup> Dummy variables were created for the sampling strategy, the reference group is the community control sample.

<sup>b</sup> Age at Wave I interview was used for mothers with no age of onset.

Note. All of the factors were tested in separate models (see Figure 4.1, Model 1). The standardized regression path is reported for each risk factor and the added explained variance is presented in parentheses. 90% confidence intervals for RMSEA are in parentheses.

+p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001

Family social adversity was also examined. Single parent families as well as a history of receiving social assistance were statistically significant risk factors of children’s PA. Moreover, all of the criminality indicators were significantly associated with

children's PA except for maternal arrest history. This is not surprising since few mothers reported ever having been arrested or convicted for a crime (7.9 %). Mothers with a history of juvenile delinquency, those with an earlier onset of offending, and those who reported offending in the year prior to Wave I were also significantly associated with children's PA. Partners' arrest history was also a significant risk factor of PA at both Waves 1 and 2.

Models were also completed for maternal parenting practices and psychological symptoms at Wave I. Positive parenting was negatively associated with children's PA at both waves, while negative parenting was found to be positively associated. In other words, children who were lacking positive parenting and children receiving negative parenting were more aggressive. Psychological symptoms were positively associated with children's PA. All of the dimensions were significant, except for Depression, which approached significance. Maternal Hostility, (i.e., annoyance, irritability, urges to break things, frequent arguments, uncontrollable outbursts of temper) was the strongest predictor of the mental health dimensions of Wave I physical aggression ( $\beta = .38$ ;  $p < .001$ ), explaining 15 % of the variance. Analyses with all of the dimensions of psychological symptoms were also conducted but using the cut-offs for 'positive' of clinical cases (not presented in Table 4.2). The only dimension that was statistically significant was for clinical levels of Hostility, which was associated with children's PA at Wave I ( $\beta = .19$ ;  $p < .05$ ). Models were also completed using maternal report of psychiatric disorder (i.e., ever diagnosed, currently undergoing treatment), and none were significantly associated with children's PA.

All of the analyses presented in Table 4.2 were also completed as structural models, accounting for the relationship between PA at Wave I and Wave II (Figure 4.2, Model 2). The results (not presented in Table 4.2) remained the same for Wave I, but not for Wave II. More specifically, the path coefficients were identical between all of the risk factors and children's PA at Wave I, but all of the paths between the risk factors and Wave II PA lose their significance. The only exception to this finding is for gender, which was not significantly associated with PA at either wave for the structural model. This finding suggests that the risk factors are not predicting the unique variance of PA at Wave II, but rather that they predict the shared variance of PA at these two time points. Taking into account that the follow-up between Wave I and Wave II is approximately one

year, as well as the overall stability in PA between the two waves, it is not surprising that the risk factors do not have a unique contribution to PA at the specific waves, but rather account for the shared variance of PA.

#### **4.5.2. Cultural Differences in Risk Factors of Physical Aggression**

In order to examine cultural differences, models were also conducted separately for mothers born in North America (NA) (n = 141) and those born outside of NA (n= 100). First, the measurement models for children's PA were identified for the two groups. The measurement model identified for the mothers born in NA is almost identical to the one for the whole sample (see Figure 4.1), although the standardized path coefficient between PA at Wave I and Wave II is slightly higher at .82. The measurement model for the mothers born outside of NA shows that there is less stability in PA for these children as the standardized path coefficient between PA at Wave I and Wave II is lower at .47.

Patterns of association for the child characteristics, presented in Table 4.3, were similar across the two groups and were also in line with findings for the total sample. However, the sample type at Wave II approached significance, and the relationship differed for both groups. Specifically, children who belong to the clinical/at-risk sample tended to be more physically aggressive for those whose mothers were born in NA, while the opposite was true for those whose mothers were born outside NA. Maternal age at the birth of her child was significantly associated with Wave II PA for those mothers not born in NA, and the relationship is positive. The association between single parent families and children's PA was significant only for NA born mothers ( $\beta = .27$ ;  $p < .05$ ). The crime indicators were not significant for either group (although examining the value of the association,  $\beta = .23$ , suggests it is approaching significance for the Wave I for the mothers born outside of NA). This is likely due to the smaller sample sizes once the groups were separated, and the low variability for these indicators.

**Table 4.3. Latent Associations Between Children’s Physical Aggression and Risk Factors by Birth Place of Mother**

	Mothers born in N.A. (n=141)					Mothers born outside of N.A. (n=100)				
	Regression paths		Model Fit			Regression paths		Model fit		
	PA Wave I	PA Wave II	CFI	NNFI	RMSEA	PA Wave I	PA Wave II	CFI	NNFI	RMSEA
<b>Child characteristics</b>										
Gender (male)	.18 (.03)+	.20 (.04)*	.92	.95	.07 (.02-.11)	.17 (.03)	.29 (.09)*	1.00	1.00	.00 (.00-.09)
Age at Wave I	.16 (.03)	.09 (.01)	.96	.93	.06 (.00-.11)	.12 (.02)	-.04 (.00)	.94	.89	.07 (.00-.12)
Sample type <sup>a</sup>	.12 (.01)	.17 (.03)+	.95	.92	.06 (.02-.11)	-.13 (.02)	-.19 (.04)+	.90	.82	.09 (.03-.13)
Siblings	.22 (.05)*	.34 (.12)***	.94	.89	.08 (.04-.12)	.17 (.03)+	.32 (.10)**	.97	.94	.05 (.00-.10)
<b>Maternal characteristics</b>										
Age at birth of child	-.02 (.00)	.01 (.01)	.95	.92	.07 (.02-.11)	.16 (.03)	.26 (.07)*	.99	.98	.00 (.00-.09)
Education (≤ high school)	.06 (.00)	-.03 (.00)	.96	.93	.06 (.00-.10)	-.09 (.01)	.14 (.02)	.94	.90	.06 (.00-.12)
<b>Family social adversity</b>										
Family income	-.07 (.00)	-.16 (.02)	.94	.89	.08 (.03-.11)	-.11 (.01)	.06 (.00)	.97	.95	.05 (.00-.10)
Social assistance (ever)	.18 (.03)+	.09 (.01)	.95	.92	.07 (.02-.11)	.11 (.01)	.15 (.02)	.94	.90	.06 (.00-.11)
Social status (Hollingshead)	-.09 (.01)	-.14 (.02)	.96	.92	.06 (.01-.11)	-.00 (.00)	.06 (.00)	.93	.88	.07 (.00-.12)
Single parent family	.27 (.07)*	.19 (.04)+	.92	.86	.09 (.05-.13)	-.12 (.01)	-.13 (.02)	.99	.98	.03 (.00-.09)
<b>Reported offending indicators</b>										
Variety of maternal delinquency	.09 (.01)	.07 (.00)	.96	.93	.06 (.00-.10)	.12 (.02)	.07 (.01)	.91	.84	.08 (.02-.13)
Onset of maternal offending <sup>b</sup>	-.12 (.01)	-.06 (.00)	.95	.92	.07 (.01-.11)	-.10 (.01)	.01 (.00)	.92	.87	.07 (.00-.12)
Offending at Wave I	.13 (.02)	.04 (.00)	.93	.88	.08 (.04-.12)	.16 (.03)	.23 (.05)	.94	.89	.07 (.00-.12)
Maternal arrest history	-.05 (.00)	-.11 (.01)	.95	.92	.07 (.02-.11)	.06 (.02)	.15 (.00)	.98	.97	.04 (.00-.10)
Partners/fathers' arrest history	.11 (.01)	.16 (.03)	.94	.90	.08 (.04-.11)	.06 (.00)	.09 (.01)	.97	.95	.06 (.00-.10)
<b>Parenting practices</b>										
Positive parenting scale	-.06 (.00)	-.20 (.04)*	.95	.91	.07 (.00-.11)	-.41 (.17)***	-.19 (.04)+	.98	.96	.04 (.00-.10)
Negative parenting scale	.23 (.05)*	.29 (.08)**	.89	.81	.10 (.07-.15)	.31 (.10)**	.16 (.03)	.92	.87	.07 (.00-.13)
<b>Maternal psychological symptoms (BSI)</b>										
Obsessive compulsive	.26 (.07)**	.22 (.05)**	.93	.88	.09 (.05-.12)	.17 (.03)+	.16 (.03)	.94	.89	.07 (.00-.12)
Depression	.06 (.00)	.11 (.01)	.92	.86	.09 (.05-.12)	.37 (.14)**	.21 (.04)+	.95	.97	.05 (.00-.10)
Anxiety	.22 (.05)*	.13 (.02)	.93	.88	.08 (.04-.12)	.19 (.04)+	.17 (.03)	.96	.92	.06 (.00-.11)
Hostility	.29 (.09)***	.22 (.05)**	.92	.86	.09 (.06-.13)	.47 (.22)***	.20 (.04)+	.95	.91	.06 (.00-.11)
Global Severity Index	.27 (.07)**	.21 (.05)*	.90	.82	.10 (.07-.14)	.30 (.09)**	.23 (.05)	.94	.89	.07 (.00-.12)

<sup>a</sup> Dummy variables were created for the sampling strategy, the reference group is the community control sample. <sup>b</sup> Age at Wave I interview was used for mothers with no age of onset. Note. All of the factors were tested in separate models (see Figure 4.1, Model 1). The standardized regression path is reported for each risk factor and the added explained variance is presented in parentheses. 90% confidence intervals for RMSEA are in parentheses. Robust fit indices and significance tests reported because of small sample size. +p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001.

Overall, mothers born outside of NA reported almost no delinquency (11 % reported one or more offenses in the past year; Mean variety of juvenile delinquency = 0.7), while mothers born in NA tended to report greater participation in delinquency (26% reported one or more offenses in the past year; Mean variety of juvenile delinquency = 2.4). It should be noted that ethnicity of the children and mothers are not included in Table 4.3 since they are highly associated with place of birth and would therefore be redundant. Neither indicator was significant.

Several differences between mothers born in and outside of NA emerged for parenting practices and psychological symptoms. For NA born mothers, a lack of positive parenting was associated with children's PA at Wave II ( $\beta = -.20$ ;  $p < .05$ ) but not at Wave I, while the association between children's PA at Wave I and positive parenting for mothers born outside NA was quite high ( $\beta = -.41$ ;  $p < .001$ ), explaining 17 % of the variance. The presence of negative parenting was associated with children's PA at both Waves I and II for mothers' born in NA, but only at Wave I for those mothers born outside of NA. Differences between the two groups were also found regarding psychological symptoms. Notably, for mothers born outside NA, not only was Hostility ( $\beta = .47$ ;  $p < .001$ ) strongly associated with children's PA at Wave I, but symptoms of Depression ( $\beta = .37$ ;  $p < .01$ ) were also statistically significant, although Depression was not significant for the total sample. Hostility was also significant for mothers born in NA, and the association was with children's PA at both Waves I and II. Obsessive compulsive symptoms were significantly associated with children's PA for NA born mothers only. As with the full sample, analyses were also completed using indicators reflecting 'positive' cases of the psychological dimensions, which suggests clinical levels of disorders (not presented in Table 4.3 due to space constraints). Results showed that for mothers born in NA, clinical levels of anxiety ( $\beta = .22$ ;  $p < .05$ ) and obsessive compulsive ( $\beta = .22$ ;  $p < .05$ ) symptoms were associated with children's PA at Wave I, and obsessive compulsive approached significance with children's PA at Wave II ( $\beta = .18$ ;  $p < .10$ ). Ever having been diagnosed with a psychiatric disorder also approached significance with children's PA at Wave I for the NA born moms ( $\beta = .20$ ;  $p < .10$ ). On the other hand, clinical levels of psychological symptoms were not statistically significant for the mothers born outside of NA, although hostility approached significance with



children's PA at Wave I ( $\beta = .23$ ;  $p < .10$ ). None of the psychiatric diagnoses or treatment indicators were significant for mothers born outside of NA.

## **4.6. Discussion**

The current study examined the persistence of physical aggression in preschool age children over a one-year time frame, and a number of potential correlates influencing aggression during this important developmental period. Children's physical aggression was relatively stable in the period before school entry, which is in line with studies on aggression during infancy (e.g., Tremblay et al., 2004) and mid-childhood (e.g., Broidy et al., 2003). Several correlates were linked to preschool-age aggression including parenting practices, mothers' mental health, and maternal history of delinquency and current offending. Moreover, several important and, somewhat unexpected cultural differences emerged between mothers born in North America and those who were born elsewhere.

### **4.6.1. *Correlates of Physical Aggression in Early Childhood***

Consistent with much of the current literature on the developmental origins of physical aggression, numerous sociodemographic, socioeconomic, parenting, familial offending and mental health risk correlates were predictors of children's physical aggression in preschool age children (e.g., Côté et al., 2006; Côté et al., 2007; NIHCD, 2004; Tremblay et al., 2004). Importantly, these predictors were informative of physical aggression in the short-term period when most children learn skills to inhibit aggressive impulses. In line with the findings from this study, children characterized by high physical aggression trajectories in early childhood were most likely (a) to be males and (b) to have siblings (e.g., Côté et al., 2006; Huijbregts et al., 2008; NICHD, 2004; Tremblay et al., 1999). On the other hand, while low income has been consistently found to be an important predictor of children's membership in high physical aggression trajectories (e.g., Côté et al., 2006; NIHCD, 2004; Tremblay et al., 2004), this seemed to be less important in the short term. In the current study, income and social status were not related to children's physical aggression. Two indicators of socioeconomic status (i.e., social assistance and single parent family) were linked to aggression in this study,

but these indicators were not as important as other factors (i.e. ethnicity, maternal mental health). Similarly, low maternal education in this study was not associated with preschoolers' short term physical aggression, while it was important in trajectory studies of children's aggression (e.g., Côté et al., 2006; NIHCD, 2004;). Taken together, these findings suggest that larger structural factors such as socioeconomic status are linked with longer-term patterns of persistent aggressive development, while more proximal contextual factors might be more relevant in the short term.

Studies on trajectories of physical aggression in early childhood have found that highly physically aggressive children are more likely to have received harsh and coercive parenting (e.g., Côté et al., 2006; Huijbregts, Séguin, Zoccolillo, Boivin, & Tremblay, 2007; Tremblay et al., 2004; Vitaro et al., 2006). A similar relationship was uncovered in the current study; negative parenting was linked to the higher levels of physical aggression in the short-term. At the same time, a lack of positive parenting was also predictive of children's physical aggression. In the study of Côté and colleagues (2006) positive parenting did not impact the development of physical aggression trajectories between the ages of two and eleven. One possibility is that while over the course of childhood, negative parenting is generally associated with higher levels of physical aggression; positive parenting can impact aggressive behaviour specifically during the preschool years. Therefore, the lack of positive parenting can be detrimental during these early years when children are learning alternatives to aggressive behaviour. Moreover, although positive and negative parenting practices are likely negatively associated, this does not necessarily mean that parents who display certain negative parenting practices are equivocally deficient in positive parenting. In a previous study, even mothers displaying some of the most negative parenting characteristics routinely also show certain positive parenting practices (Tzoumakis, et al., 2013). Therefore, this seems to suggest that certain forms of positive parenting act as promotive factors (i.e., factors associated with a decreased probability of later antisocial behaviour or delinquency); for instance, involvement in family activities is considered a promotive factor against delinquency in older children (Farrington, Loeber, Jolliffe, & Pardini, 2008). The qualitative nature of positive and negative parenting styles needs to be investigated further, considering that while correcting or improving negative parenting practices in the context of intervention is clearly important, focusing on and encouraging positive

parenting (e.g., play time, positive feedback) could be particularly beneficial among children exhibiting aggressive and other behaviour problems, who are likely to be to be disciplined frequently, and receive negative feedback regularly.

A few studies have identified a link between maternal antisocial behaviour or conduct disorder in adolescence with their offspring's aggression or behavioural problems in early childhood (e.g., Hay et al., 2011; Huijbregts et al., 2008; Jaffee et al., 2006; Tremblay et al., 2004). In the current study, maternal early involvement in juvenile delinquency predicted a higher level of physical aggression in their children. In addition, their continued adult offending behaviour enhanced this trend, suggesting that, persistent maternal antisociality has important negative influences on the family as a whole. While this should not be taken necessarily as a surprise, the role of females and mothers in the intergenerational transmission of antisocial behaviour and criminality has been underestimated in criminology. Clearly, given the important and often central role of females in parenting, closer attention should be paid to the developmental course of female delinquency. Delinquency and crime for females will have unique impacts on women's adult situations. For example, one possibility is that adolescent antisocial involvement makes females more vulnerable in adulthood, particularly to mental health problems (e.g., Corneau & Lanctôt, 2004; Moffitt, 2001; Pajer, 1998), which in turn likely also influence their children's behaviour through parenting practices from very early on. While the general lack of knowledge on the development of female delinquency and offending, in addition to the underestimation of its damage over the life-course has been raised by others (see Lanctôt et al., 2004; Kratzer & Hodgins, 1999), the current study further underlines the importance of focusing on the long-term consequences of female delinquency and offending. Importantly, it is clear that the impact of female delinquency is not limited to adolescence and individual adolescent experiences, but cascades into adult caregiving contexts and subsequently children's behavioural development.

Taken one step further, the influence of maternal delinquency and offending therefore likely has clinical relevance as well. While it is typical to discuss maternal mental health in a clinical context when seeking treatment for children's behaviour problems, it is far less common is to discuss their prior antisocial behaviour. This is important because a key focus of interventions with families of children exhibiting behavioural problems is parent-child interaction, as well as maternal mental health (for a

review, Webster-Stratton, & Taylor, 2001). The link between past and present antisocial behaviours of mothers (such as shoplifting, drunk driving, and even violence) may be considered of secondary importance in the clinical context, yet can also often be a source of stress for mothers, which in turn can impact their home lives and environments. Therefore, the impact of maternal antisocial behaviour on mental health needs to be given much more consideration, especially in terms of the relevance for child behavioural development.

#### **4.6.2. Cultural Differences**

Perhaps most interestingly, maternal place of birth was one of the strongest predictors of children's physical aggression in the current study. The role of culture and immigration has surprisingly been neglected in the developmental criminology literature. Most studies examining the development of physical aggression in the early years to date are either based primarily on Caucasian children, or, do not necessarily focus on ethnic and cultural differences related to the development of physical aggression (e.g., NICHD, 2004; Tremblay et al., 2004). Importantly, the current study is ethnically diverse and consists of a large number of first generation immigrants. Approximately half of the mothers in this study were born outside of North America, and almost all of the children were born in Canada (93 %). In the current study, the children whose mothers were born in North America (native born) tended to be more physically aggressive while children of mothers who were born elsewhere (i.e., mostly Asian and South Asian countries) were less likely to be physically aggressive. Children of native-born mothers also showed more persistence and stability in their physical aggression after the one-year follow-up in comparison to those whose mothers were immigrants. While the children of native-born mothers may follow a more typical trajectory of aggression, it is possible that physical aggression for children of immigrant mothers is somewhat delayed, and emerges slightly later, perhaps after exposure to regular schooling.

On the other hand, these findings might be due to the 'healthy immigrant effect' extending to second-generation Canadian-born children. Interestingly, research on delinquency and offending with adolescents and young adults shows that this protective effect of immigration is highest for first generation immigrants (e.g., Bui, 2009; Sampson, Morenoff, & Raudenbush, 2005), and that second generation immigrants tend to catch

up to the levels of delinquency of their native-born peers (Bersani, 2012). Research on European youth similarly indicates that second generation immigrants tend to report higher rates of antisocial behaviour compared to native born youth, although the protective effect of first generation immigration is not as consistent, especially for newer waves of immigration in some countries (e.g., Engbersen, van der Leun, & Jan de Boom, 2007; Martens, 1997; Vazsonyi & Killias, 2001). The current study focused on very young children; therefore, it is possible that this protective effect for the second generation children in the current study is specific to childhood, and that as the acculturation process continues, they will reach similar levels of antisocial behaviour to children born to Canadian parents by adolescence. However, research on Asian immigrants suggests that Chinese and Japanese migrants to the U.S. do not have high crime rates, and potentially adjust more readily to immigration than other groups (Tonry, 1997). Therefore, the process of antisocial development may be quite different for some groups of Asian immigrants, including the ones in the current study. This line of research needs to be further explored, especially in the context of early childhood behavioural development.

Unfortunately, few studies have specifically examined physical aggression and behavioural problems of children of immigrant parents during the early childhood years. Research from the Netherlands comparing Dutch children to the children of immigrants from Turkey suggests that there are no differences between the groups for delinquent behaviour, but rather the Turkish children struggled with more anxiety and depression (Bengi-Arslan, Verhulst, van der Ende, & Erol, 1997). In line with our findings, a Canadian study shows that children of Canadian born parents tend to have higher levels of behavioural problems compared to both first generation and second-generation immigrant children (Beiser et al., 2002). Interestingly, the authors found that poverty was a strong predictor of behavioural problems for the first generation immigrant children, while parents' family dynamics (i.e., ineffective parenting, single parenting, parental depression) were more important for the second generation immigrant children and the children of native born parents. In other words, the risk factors linked to behavioural problems for the first generation immigrant children were different, but tended to be similar for the other two groups. These studies did not, however, isolate

the early childhood period, or focus on a specific behavioural outcome such as physical aggression, but rather used broader developmental periods and behaviours.

The current study found several differences in the correlates of aggression between children of North American born mothers and those whose mothers were born elsewhere. Parenting practices influenced the children differently depending on their mothers' place of birth. A lack of positive parenting for immigrant mothers had a more detrimental effect on their children's aggression compared to native born mothers, especially early on (Wave 1). As expected, negative parenting practices had a detrimental effect on children for both groups, however, the influence of negative parenting continued to be important after the one year follow-up for children of native born mothers only. Moreover, the influence of psychological symptoms seemed to have a differential impact depending on mothers' birthplace. For immigrant mothers, initial levels of depression and hostility affected their children's behaviour. On the other hand, depression was not important for the native born mothers, but rather symptoms of anxiety and obsessive compulsive behaviour were influential of their children's aggression.

Overall, these findings suggest two different culturally specific pathways towards children's physical aggression. First, for native-born mothers, their children's aggression is likely to occur in the context of social adversity, single parent families, and negative parenting practices. In this context, mothers with a history of delinquency and antisocial behaviour could be experiencing higher levels of anxiety and other serious mental health issues. Second, for immigrant mothers, the development of their children's physical aggression is more likely to occur in the context of maternal depression, hostility, and a lack of positive parenting practices. One possibility is that for some of these mothers, isolation and other stressors associated with the immigration experience play a key role on these outcomes. Importantly, for these mothers in particular, depression and other mental health difficulties may be subclinical considering that neither a history of psychiatric diagnoses or clinical levels of symptoms appeared to be present. Conversely, and possibly more likely, this also may tend to suggest these mothers are simply not accessing mental services as frequently as mothers born in NA. This may be particularly pertinent since research on mental health service access in Canada has shown that service use is lowest among Asian and South Asian immigrants (Tiwari &

Wang, 2008), the largest ethnic groups in the current study. Considering that health care, including mental health services, is publicly funded in Canada, the reasons for low service use are unclear, but this may suggest that lack of awareness and/or cultural beliefs play a role.

An alternative explanation may lie in the research surrounding the 'healthy immigrant' effect that demonstrates immigrants typically report the lowest rates of mental health issues. More specifically, this was demonstrated to especially be the case for those who arrived in Canada recently, as well as for immigrants from Asia (Ali, 2002). Unfortunately, in the current study, information on how recent immigration occurred was not available. However, the findings clearly demonstrate that while children of immigrants are overall less likely to be aggressive, perhaps reflecting the healthy immigrant effect, among those families with physically aggressive children maternal depression and isolation may be unique contributing factors. Therefore, encouraging the use of public mental health services among this population, and developing community outreach programs to target these women should be seriously considered. When considering increasing globalization, more research should consider mothers' culture of origin, and how risk factors for aggression and delinquency operate in a differential manner for those who are experiencing motherhood in a new country and cultural context.

#### **4.6.3. Limitations**

The sample size in the current study was sufficient to conduct a series of structural equations models including one correlate at a time. However, this unfortunately precluded analyses that could have potentially examined multiple correlates in the model. Also, the information in the current study was obtained via interviews with the mothers. While it would have been ideal to have more than one informant for children's aggressive behaviour, this is not uncommon in research with children of preschool age and this approach has been shown to be reliable (e.g., Kerr et al., 2007). Information about siblings' aggression was not available at the time of the study. Future studies should examine aggressive behaviour and the associated developmental correlates across siblings within the same family. Importantly, considering the unique and multicultural context of where the study took place, the

findings should be interpreted with caution as they reflect Canadian families and may not be generalizable to other populations. This is a particularly pertinent issue regarding the cultural differences that were uncovered. Nonetheless, it underscores that cultural origin and immigration should be explored further in other populations. Finally, longer follow-up periods will be required to examine what occurs in subsequent developmental stages, especially after school entry for these children. Having a third wave of data will also be useful to better determine the impact and the direction of certain maternal factors on children's aggression, especially when the indicators were measured simultaneously (e.g., Wave I psychological symptoms and parenting). These data were not available at the time of analysis, and the third wave of data collection is currently underway.

## **4.7. Conclusion**

The current study focused on children's physical aggression during early childhood, examined a number of correlates potentially influencing aggression during this period, and importantly, identified cultural differences in these correlates. This developmental period is critical because those children who persist in high levels of physical aggression after this point are the ones at risk for later delinquency and offending (e.g., Broidy et al., 2003). However, it is also important because early childhood interventions are effective at preventing these long-term consequences. This study showed that maternal mental health, juvenile delinquency, and current offending could influence children's aggression as early as the preschool years. Moreover, the study examined cultural differences, a neglected aspect of prior longitudinal studies as well as studies on intergenerational transmission of antisocial behaviour and aggression, and found that culturally divergent correlates of physical aggression. The cultural differences identified are important for policymakers and clinicians to consider, particularly regarding program development and implementation. Parent training programs in particular have been found to be effective and have long-term preventative effects on antisocial behaviour and delinquency (e.g., Piquero et al., 2009), but these programs would need to be tailored to different cultural practices. For instance, a focus on encouraging the use of positive parenting practices during the early childhood years among mothers from different cultural contexts could be useful. The current study underlines the importance of cultural awareness in the context of intervention, since



there may be culturally based differences in the development of children's aggression, as well as the factors influencing it. This study raises several questions concerning the experience of immigration and how this may influence children's behavioural development, parenting practices, and maternal mental health. Comparative and qualitative studies of immigrant mothers to identify mental health needs and differences in parenting would be useful to clarify some of these questions. Future studies will examine how these cultural differences influence physical aggression over a longer follow-up period, particularly after school entry.

## **Chapter 5.**

### **Conclusion**

Research on the intergenerational transmission of antisocial behaviour has focused primarily on males, and the primacy of the criminal behaviour of their fathers. This is not necessarily surprising given the gender gap in crime, but neglecting the role of mothers in this process results in a limited overall understanding of the intergenerational transmission of antisocial behaviour. Therefore, the aim of the current dissertation was to fill an important gap in the research literature by examining the role of mothers in the intergenerational transmission of aggression and antisocial behaviour. Importantly, this involved a multidisciplinary and integrative theoretical approach. This was achieved through the application of a life-course framework that investigated key transitions and turning points for offending behaviour that are unique to women (i.e., pregnancy and motherhood). The integration of female delinquency research, and critically, the adverse adult outcomes experienced female delinquents served as the starting point to shed additional light on the underlying process of the intergenerational transmission of antisocial behaviour. Despite the fact that female involvement in crime is less prevalent, less frequent, less persistent, and generally less serious in nature compared to males (e.g., Moffitt et al., 2001; Steffensmeier, & Streifel, 1991), the current dissertation points to the fact that this does not necessarily mean that these women are entirely free of the consequences when they are adults and mothers. Some of these women are experiencing adult difficulties on different domains, including social disadvantage, risky prenatal behaviour, and continued participation in antisocial behaviour. Furthermore, these consequences carry over into the lives of their children.

The findings from the current dissertation regarding the adult outcomes of female delinquents paint a picture of a vulnerable group of women experiencing difficulties across multiple domains that potentially impact their children. Research from the medical and health sciences documenting the negative impact of prenatal exposure to

toxic substances on child development was incorporated into Study I of the dissertation. Importantly, many of the risk factors for women who continue to use substances during pregnancy are markedly similar to those experienced by female juvenile delinquents as adults. The findings from Study I of this dissertation (see Chapter 2, herein) confirmed this link: women with a history of juvenile delinquency were more likely to have received social assistance, used alcohol and cigarettes during pregnancy, and subsequently had more physically aggressive children.

Study II of the dissertation (see Chapter 3, herein) built on these findings by further examining the motherhood experiences and parenting practices of these women. More specifically, Study II considered how prior delinquency and adult offending behaviour influenced parenting patterns. The findings suggested that mothers' current adult offending rather than past delinquency was linked to more negative parenting practices suggesting that parenting is more influenced by proximal rather than historical factors. Moreover, maternal mental health problems were also linked to maternal parenting difficulties in this study. Importantly, the findings also suggested that mothers who display negative parenting practices also rely on a number of positive ones, which can therefore provide an important avenue and target for intervention efforts.

Finally, Study III (Chapter 4) incorporated a prospective longitudinal component that included a short-term follow up that examined physical aggression in the children of these mothers. Here, the focus was on the link between maternal delinquency, adult offending, and persistent aggressive behaviours in their children. The findings indicated that maternal delinquency, subsequent adult offending, adverse mental health outcomes and negative parenting practices of the mothers contributed to the persistence of physical aggression in their children in early childhood. Importantly, the findings underlined several cultural differences in the development of aggression because the combination and contribution of these factors to children's physical aggression were culturally specific. For instance, a lack of positive parenting and maternal depression contributed to the physical aggression of the children of immigrant mothers, while negative parenting and anxiety were more relevant for the children of mothers born in North America. Taken together, the findings from the current dissertation have identified processes that explain, in part, maternal related influences on the intergenerational

transmission of antisocial behaviour. As such, these findings have important theoretical, methodological, empirical, policy and treatment-related implications.

## **5.1. Theoretical Implications**

The current dissertation demonstrated that integrating research from various disciplines is necessary in the study of complex processes that involve multiple aspects of people lives, such as the intergenerational transmission of behaviour. It also underscores the need to move beyond ideology and arbitrary divisions between disciplines that have contributed to fragmentation in research on female delinquency and offending. Importantly, the study of female delinquency is moving towards expanding its lens, and integrating different theoretical frameworks in criminology (e.g., Goldweber et al., 2009; Lanctôt & Le Blanc, 2002). Findings from the three studies of the current dissertation suggest that merging the literature and incorporating research from other disciplines, such health sciences, can help to understand unravel different aspects and consequences of female delinquent involvement. Future research should continue along these lines and integrate knowledge from other fields such as developmental psychology, nursing, and social work, as well as consider advances in medical sciences and genetics. However, as the current dissertation demonstrates, it is important that this is accomplished without losing sight of the specific lives of females, and their unique life experiences. Gender differences exist in terms of delinquent and criminal involvement and adult outcomes of delinquency, and need to be accounted for in research on females.

Critically, life-course criminologists have neglected the study of female turning points, especially pregnancy. Major life events such as pregnancy and motherhood carry much potential to act as agents of change in the course of female offending. Understanding how such turning points are relevant for females and what it takes for a sustained behaviour change will not only help to propel theoretical development in terms of female delinquency, but contribute to better life outcomes for at-risk women. In its current form, life-course theory does not sufficiently explain or consider the particularities of female delinquency and offending. However, this is also a function of the structure and timing of existing longitudinal studies. Many of the longitudinal studies including

females have been abbreviated and followed women to early adulthood (for a review, Goldweber et al., 2009). As female participants of these important cohort studies (e.g., Hipwell et al., 2002; Moffitt et al., 2001) age and reach late adulthood, it will be possible to develop more female-focused, life-course theories.

The impact of cultural differences and immigration has also been largely neglected in longitudinal and life-course studies. While immigration seems to have some form of protective effect from crime, at least at first (e.g., Bersani, 2013), few studies have examined how this influences females in particular. How the protective effect of immigration operates in general is still unclear, and the findings from the current dissertation demonstrate the need to further examine how it influences motherhood experiences in the context of the intergenerational transmission of antisocial behaviour. It is vitally important that life-course and developmental theories of crime seek to explain these mechanisms, and how they apply to subpopulations such as females and immigrants.

## **5.2. Methodological Implications**

The sample used in this dissertation is very diverse and differs from other longitudinal samples of females. The Vancouver Longitudinal Study is based on a general population sample of mothers and their children, and at-risk neighbourhoods were oversampled in order to include a wide range of families in terms of social adversity. Unlike many samples that recruited female offenders from highly specialized populations such as prisons, juvenile institutions, halfway houses, service and treatment centres, (e.g., Giordano et al., 2002; Michalsen, 2011; Uggen & Kruttschnitt, 1998), the Vancouver Longitudinal Study is not a sample of adjudicated delinquents or offenders. Due to the low prevalence of female offending, many researchers have had to sample from these specialized populations in order to recruit large enough samples of women. While these specialized samples are informative of more serious, frequent, and persistent offenders, they represent a small proportion of high-risk females, and importantly, include very high rates of substance use and mental illness (e.g., Giordano et al., 2002; Lanctôt, 2010). Moreover, they only represent females who have been apprehended for their criminal acts. As such, these samples are not necessarily

representative of the average female, or the average mother in the general population. In the Vancouver Longitudinal Study, maternal delinquency was self-reported, and measured using the MASPAC (Manual on the measurement of adolescent social and personal adaptation in Quebec), an instrument that has been validated with a number of populations (Le Blanc et al., 1996). Considering that this dissertation is not based on an adjudicated or significantly disadvantaged sample of marginalized women (i.e., more than half are university educated and have an annual family income of over \$75,000), a surprisingly high proportion of women (over half) reported participating in some form of delinquency. Therefore, the methodology used (sampling technique and instrument) appears to be a viable way to capture female offending, even among women from the general population. Future researchers should therefore consider such strategies as well as developing other, unique ways of capturing diverse samples females involved in delinquency.

Another interesting methodological implication that emerged from the current dissertation involves the way in which patterns of parenting practices were studied. Most studies on physical aggression in early childhood use separate scales of parenting, representing negative or positive parenting for example, and examine the links with children's behaviour (e.g., NICHD, 2004; Tremblay et al., 2004), all of which are quite useful to identify overall trends and relationships. However, considering that parenting practices are not always clear-cut or dichotomous, the current dissertation applied an approach to better account for individual-level variability in mothers' parenting. More specifically, by applying latent class analysis to patterns of both positive and negative parenting, this allowed for the consideration of the fact that positive parenting and negative parenting are not mutually exclusive, and together impact the unfolding child development in unique ways. Employing an analytical strategy that identifies individuals who display similar patterns of characteristics or behaviours is important for multifaceted constructs such a parenting, because it more accurately reflects reality. Future research examining these types of constructs (e.g., parenting practices, attitudes) should apply methodological techniques that consider the reality of individual variability.

## **5.3. Empirical Implications**

### **5.3.1. *Maternal Delinquency, Adult Life Outcomes, and Children***

Congruent with other longitudinal studies, the current dissertation demonstrated that a considerable proportion of mothers who reported delinquent behaviours in adolescence continued in adulthood (e.g., Elliot, 1994; Tracy & Kempf Leonard, 1996). Although over half of the mothers reported past delinquent behaviour, just over one fifth were actively offending as adults (e.g., drunk driving, drug use, shoplifting, throwing objects at people). Importantly, this suggests that a number of these women, drawn from the general population, did not leave their antisocial behaviour in adolescence. At the same time, considering that this was not an adjudicated sample, and official contact with police was quite low (10 %), it is unlikely that many of these women could be considered chronic and serious (i.e. life-course persistent) offenders (e.g., Moffitt, 1993; Moffitt et al., 2001). The vast majority of the women in this dissertation are more likely adolescent-limited type offenders, of whom a small proportion as adults continued to participate in risky and socially deviant activities that often do not result in official police contact. Nonetheless, investigating the group that is active in adulthood while they are also balancing their parenting responsibilities should be seriously considered. In a study on male offenders, Nagin and colleagues (1995) found that while adolescent-limited offenders were rarely officially convicted as adults, this did not mean they were fully 'reformed'; they continued to drink heavily and use drugs, get into fights, and reported some delinquent involvement. Considering the impact of continued antisocial involvement on parenting and children's aggression, it would be useful to better understand the life events, circumstances, and situations that result in women's continued involvement in antisocial lifestyles.

In line with the growing body of research on the adult outcomes of juvenile delinquency, this dissertation also found that women with a history of delinquency were more vulnerable as adults, and were engaging in risky behaviour during pregnancy. Although it is relatively well established that there are enduring consequences to female involvement in adolescent antisocial behaviour, less is known about the reasons behind these adult outcomes. Future research needs to address why so many of these women are more at risk as adults, and why their outcomes are sometimes worse than for males.

In particular, research needs to further examine the negative adult outcomes that impact pregnancy and motherhood experiences, since the findings from this dissertation suggest these contribute to the intergenerational transmission of antisocial behaviour. One aspect that was not examined in the current dissertation was the quality and nature of the intimate relationships of these mothers. Studies of adult outcomes of female delinquents suggest that they are often not in healthy and satisfying intimate relationships, and that they also are more likely to experience intimate partner violence, both as victims and perpetrators (e.g., Lanctôt et al., 2007; Moffitt et al., 2001). This is particularly important considering that research on assortative mating suggests that individuals do not randomly select their partners, but rather tend to choose those with whom they have similar traits, including antisocial ones (e.g., Krueger, Moffitt, Caspi, Bleske & Silva, 1998; Quinton, Pickles, Maughan, & Rutter, 1993; Taylor, McGue, & Iacono, 2000). The partners these women choose and potential difficulties in their relationships are likely to have negative effects on caregiving environments and children's behaviour. This could therefore present another potential underlying mechanism for the intergenerational transmission of antisocial behaviour.

One of the most consistent empirical findings across the three studies of the current dissertation is that maternal juvenile delinquency was linked to children's physical aggression. This historical factor of the mothers maintained its importance years later, and was connected to behavioural development of their children early on in life. While this relationship has been established for males, the criminological literature connecting behaviour between generations among females had been far more limited (e.g., Loeber & Stouthamer-Loeber, 1986; van de Rakt et al., 2008). Therefore, the current findings add to this body of research and indicate that the intergenerational transmission of antisocial behaviour is also influenced through mother and child relationships, and importantly, the consequences emerge at the earliest developmental periods in children. While this early childhood period is critical because those who persist after school entry are at risk for later delinquency, the children in the current sample are still very young. As such, it is unclear at this time if these children will be among those whose aggression persists into late-childhood, or if they will become involved in delinquent behaviour as they reach adolescence. Future research is needed to examine the continuity of behaviour among children of female delinquents grown up.



On a more positive note, not all of the adult outcomes of the women in this dissertation with a history of delinquency were negative. In particular, family incomes and education levels were relatively high in the sample and this was also the case for some of the mothers who reported juvenile offending. This suggests that for many of these women motherhood may be a part of a series of positive events such as getting educated, securing a job, and finding a partner. More research needs to be done along these lines to identify the positive turning points, life experiences and associated outcomes for these women. Qualitative research is extremely useful in this context because of the ability to uncover detailed insight into those experiences of women with positive adult outcomes. For some of these women, marrying pro-social partners, and wanting and planning pregnancy are key turning points away from prior antisocial lifestyles (Kreager et al., 2010; Giordano et al., 2011; Leverentz, 2006). These influences are likely to be part of a complex and dynamic process, and need to be better understood through future studies.

### ***5.3.2. The Impact of Cultural Differences: Ethnicity and Immigration***

Vancouver is a very ethnically and linguistically diverse city. According to the Canadian census (2006) data, 42 % of the population in Vancouver is part of a visible minority and there are over 200 ethnic groups. As such, the Vancouver Longitudinal study is based on a population sample that reflects this ethnic diversity. More specifically, just over half of the children were Caucasian, followed by Asian (19 %) and South Asian (9 %) children. There were also a number of other diverse ethnic groups and children of mixed ethnic background (15 %). Not surprisingly, important findings emerged from the current dissertation along these lines, the central one being that non-Caucasian children were less aggressive compared to Caucasian children. This was interesting because non-Caucasian mothers were more likely to report negative parenting practices. One explanation for this is that negative parenting practices do not influence all ethnic groups in the same way. For example, several American studies have suggested that physical punishment was not linked to behaviour problems in African-American children, and suggest that it is not as detrimental among certain ethnic groups (e.g., Deater-Deckard et al., 1996; Deater-Deckard & Dodge, 1997). While this

relationship is undoubtedly complex, the findings from the current dissertation suggested that it was a lack of positive parenting (as opposed to negative parenting) that was linked to aggression in non-Caucasian children. While it is clear that there are ethnic differences in maternal parenting practices, these seem to play a differential role on the development of children's physical aggression depending on context. Future research needs to examine this much further, and also incorporate the role of other aspects of parenting such as parenting attitudes, values, and beliefs. Ideally, research should take into account the individual ethnic groups, rather than regrouping them into broader categories. Although this can make statistical analyses challenging (i.e., sample size, power issues), doing so could help in understanding this relationship. In this context, qualitative research could be helpful to understand more about parenting approaches among different cultural groups.

While the Vancouver Longitudinal Study is ethnically heterogeneous, it is also diverse in that it includes a substantial proportion of first generation mothers and their second-generation children. This is an important feature of the research in the current dissertation considering immigration has been a largely overlooked aspect in criminology in general, and, in longitudinal studies and the examination of the intergenerational transmission of antisocial behaviour more specifically. Notably, over 40 % of the mothers in this sample were born outside of North America, providing some insight about the intergenerational processes of antisocial development within a comparative criminological framework perspective. Much of the existing research on immigration and crime in America suggest that there is a protective effect of immigration, especially for first generation immigrants, with second generation children catching up to their native born counterparts (e.g., Bersani, 2012). However, research on crime and immigration in Europe suggests that while this pattern held true for historical immigrant groups of the 1950's and 1960's, more recent waves of immigration influenced by globalization (e.g., especially asylum seekers/refugees) contribute to emerging crime among first generations (Engbersen, van der Leun, & Jan de Boom, 2007; Killias, 2009). It therefore seems clear that the link between immigration and crime is heavily dependent on geography and historical factors associated with different immigrant groups. For example, Tonry (1997) points out that both East and South Asian migrant groups (e.g., from China, Japan, Korea, Indian subcontinent) to the United States and England

generally have low crime rates in the both first and subsequent generations. However, it is unclear why certain Asian groups adjust to the experience of immigration better than others, and why their crime rates remain lower over subsequent generations. This was particularly important in the current dissertation because the findings also indicated that second generation children (mostly Asian and South Asian ethnicity) had lower levels of aggression in the preschool years. The reasons behind this are unclear, and this should be pursued in future research.

#### **5.4. Policy and Treatment Implications**

There are several important policy and treatment implications that emerge from the findings of current dissertation particularly in terms of effectively intervening with at-risk females and cultural minorities. Perhaps most importantly, the findings suggested that in spite of wide-spread educational prevention campaigns, a surprising number of women are still using substances while pregnant, especially alcohol (i.e., 27 % in the current research). Fortunately, there were few women who reported regular, persistent, and high-level substance use. Nonetheless, considering that numerous preventative information campaigns along these lines have been underway for several decades, the detrimental effects of prenatal substance use are essentially common knowledge. It therefore seems prudent to uncover more information about the reasons and situations under which women decide to continue moderate substance use while pregnant. Interestingly, in therapeutic contexts, when mothers reveal they used alcohol or drugs while pregnant, they often feel immense guilt and blame themselves for their children's behavioural problems. While addiction is obviously one explanation, future research should consider further exploring the situations that lead to substance use in this context, and especially consider the role of partners, peers, mental health, and other potential stressors. Future research with pregnant women should attempt to shed light on some of the precipitating factors to prenatal substance use patterns, severe or otherwise. In turn, the identification of precipitating factors may enhance current prevention efforts and intervention programs to reduce substance use during pregnancy.

Despite the fact that most of the women involved in the current research were no longer involved in adulthood offending, many of those with a history of juvenile

delinquency were still quite vulnerable as adults. Subsequently, risky life situations can contribute to the development of aggressive behaviour in their children. This underlines the importance of effectively intervening with girls, as the consequences of female juvenile delinquency can be far-reaching, and long lasting. Unfortunately, the effectiveness of treatment programs for female delinquents currently leaves much room for improvement (for a review, Hipwell & Loeber 2006). This is likely due, in part, to the fact that the majority of intervention programs for youth are created for boys and are not gender-sensitive (e.g., Cauffman, 2008). Adding to this, research has found that youth care workers, probation officers, and others involved in the justice system often dislike working with girls or are reluctant to do so (e.g., Baines & Alder, 1996; Gaarder, Rodriguez, & Zatz, 2004; Lanctôt, Ayotte, Turcotte, & Besnard, 2012). Specifically, these studies have suggested that youth care workers find that girls are more demanding, difficult, and more complex to treat. This undoubtedly poses additional challenges to the successful treatment of delinquent girls, and clearly highlights the need for programs that are not only specifically tailored for girls, but involve professionals who are also equipped and motivated to do so. Adding to the complexity is the fact that female youth involved in delinquency are not a homogeneous group, and therefore treatment approaches must address specific individual differences far beyond gender (Cauffman, 2008). Moretti, Jackson and Osbuth (2010) go further to suggest that beyond gender sensitivity, programs should also incorporate culturally sensitive treatment structure.

Along these lines, the findings from the dissertation also underline the need for culturally specific program development considering that culturally specific correlates of persistent aggression were uncovered. These are important findings because family-focused interventions, especially those involving parent training in the early childhood period, are among the most effective for the treatment of disruptive behaviours (e.g., Dishion & McMahon, 1998; Tremblay & Japel, 2003). Importantly, the positive effects of these early family-based interventions can also last until adolescence and potentially into adulthood (Piquero et al., 2009; Welsh et al., 2012). However, when intervening with these children and their families, programs need to be culturally sensitive. Especially those focused on parenting, since it seems that different aspects of parenting might not equally influence all cultural groups. In addition, the role of immigration in particular has

been an overlooked aspect in this context. The current dissertation suggests that there are culturally specific factors associated with both parenting and aggressive behaviour development. This is particularly relevant for countries such as Canada, Australia and New Zealand, which have some of the highest proportions (21 to 27 %) of immigrant populations worldwide (OECD, 2013). In sum, policy and treatment aimed at the prevention of aggression and violence needs to be both gender and culturally sensitive in order to improve effectiveness.

## **5.5. Directions for Future Research**

One important direction for research on the intergenerational transmission of antisocial behaviour is not only to focus on risk factors, but to also investigate protective factors and resilience. Some children from very vulnerable environments do not show behavioural problems and are successful as adults despite all being exposed to substantial adversity (e.g., Masten & Tellegen, 2012). More studies are exploring these more positive directions, particularly in the context of youth violence prevention. For instance, several protective factors have been identified, such as above-average intelligence, low impulsivity/easy temperament, enhanced anxiety, a close relationship to at least one parent, intensive parental supervision, sound academic achievement, living in non-deprived and nonviolent neighbourhoods (for a review, Lösel & Farrington, 2012). However, protective factors against the intergenerational transmission of antisocial behaviour are far less understood. Lizotte and colleagues (2013) have recently suggested that one way to break the link between parents' offending and their children's antisocial behaviour is through delayed childrearing. Exactly how delaying parenthood operates as a protective effect is less clear, but seems to be complex, and related to an accumulation of emotional and economic parental factors (e.g., mental health, education, employment) rather than any specific factor. From a primary prevention perspective, it seems that targeting family and parental factors to keep children from following in their parents' antisocial behaviour as early as possible seems to be a prudent course of action. Therefore, effective preventative efforts and treatment of female delinquency can potentially have wide-ranging benefits beyond the prevention of future delinquency and offending, by reducing the intergenerational transmission of aggression and antisocial behaviour.

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## Appendix A.

### Delinquency and Offending Items from the MASPAQ

Violent Items	Nonviolent Items
<ul style="list-style-type: none"><li>• Threaten to beat somebody up to force them to do things did not want to do</li><li>• Fist fight</li><li>• Threaten or abuse others to get what wanted</li><li>• Use a weapon in fight</li><li>• Beat up someone who did nothing to you</li><li>• Gang fight</li><li>• Use or threaten physical force to dominate</li><li>• Force someone to do sexual things that they did not agree to do</li><li>• Throw objects at people</li></ul>	<ul style="list-style-type: none"><li>• Shoplifting</li><li>• Sold drugs</li><li>• Vandalism</li><li>• Burglary</li><li>• Prostitution</li><li>• Theft of less than \$100</li><li>• Theft of more than \$100</li><li>• Arson</li><li>• Carry a weapon</li><li>• Take soft drugs</li><li>• Take hard drugs</li><li>• Run away</li><li>• Disorderly conduct</li><li>• Buy or sell stolen goods</li><li>• Motor vehicle theft</li><li>• Check or credit card fraud</li><li>• Drunk driving</li></ul>

## Appendix B.

### Correlations for Maternal Delinquency, Offending and Covariates

	Maternal juvenile delinquency	Maternal adult offending
<b>Maternal characteristics</b>		
Age at child's birth	-0.14*	-0.18**
Non-Caucasian Ethnicity	-0.26***	-0.10+
Born outside of North America	-0.41***	-0.21***
High school education or less	0.28***	0.28***
<b>Child characteristics</b>		
Age at interview	-0.11+	0.01
Male gender	-0.02	-0.05
Non-Caucasian Ethnicity	-0.16**	-0.10
Number of siblings	-0.04	-0.05
<b>Social adversity</b>		
Average family income	-0.13*	-0.20**
Social status (Hollingshead score)	-0.15*	-0.21***
Social assistance mother (ever)	0.28***	0.23***
Single parent family	0.12*	0.20**
<b>Reported offending indicators</b>		
Maternal current offending (past year)	0.33***	-
Maternal criminal history	0.43***	0.29***
Partners' criminal history	0.28***	0.27***
Age of onset of maternal delinquency	-0.69***	-0.30***
Variety of maternal delinquency	-	0.33***
<b>Mother's psychological symptoms (BSI)</b>		
Hostility T score	0.22**	0.25***
Anxiety T score	0.17**	0.21***
Depression T score	0.16**	0.24***
Global Severity Index T score	0.21**	0.22***
<b>Children's physical aggression</b>		
Sum (all 5 items)	0.20**	0.13*



	<b>Maternal juvenile delinquency</b>	<b>Maternal adult offending</b>
Take away	0.18**	0.10
Kick, bite, hit	0.30***	0.16**
Push, shove	0.15*	0.05
Throw	0.13*	0.07
Fight	0.04	0.11+

Note. Data is from Wave I of the Vancouver Longitudinal Study; N = 260 to 287 due to missing data.  
 +p < .10; \*p < .05; \*\*p < .01; \*\*\*p < .001