

**IDENTIFICATION AND OPERATIONALIZATION
OF THE MAJOR RISK FACTORS FOR
ANTISOCIAL AND DELINQUENT BEHAVIOUR
AMONG CHILDREN AND YOUTH**

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by

David M. Day & Sonya G. Wanklyn

Ryerson University
Toronto, Ontario

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La présente publication est aussi disponible en français. Elle s'intitule : Détermination et définition des principaux facteurs de risque du comportement antisocial et délinquant chez les enfants et les jeunes.



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Executive Summary

The objective of this report was to conduct a thorough review of the literature to identify the major risk factors for the onset and maintenance of antisocial and delinquent behaviour in children and adolescents. To facilitate clear communication of the major findings from the literature, this report includes definitions of relevant terms, including risk factors, correlates, markers, distal and proximal risk factors, and protective and promotive factors. The nature of the risk factor research (RFR) paradigm was described to provide a context for the vast and extensive literature. As well, some of the process models describing the purported relations between risk factors and outcomes were presented, including mediator and moderator variables, developmental pathways, causal chains and cascade models. Lastly, where data are available, gender-specific risk factors for antisocial and delinquent behaviour were highlighted.

Some cautionary remarks about the literature are warranted. First, the wide variability in the quality of the research limits interpretation of study findings. Second, numerous published studies came from a few large-scale longitudinal research studies, including the Seattle Social Development Project (SSDP), the UK-based Cambridge Study in Delinquent Development (CSDD) and the Pittsburgh Youth Study (PYS). These studies tended to promote their own theoretical perspectives and conceptual and operational definitions of variables, including risk factors and outcomes, and involve repeated statistical analyses on the same samples of individuals. As a result, the overall literature was somewhat skewed in favour of their theoretical models and findings. At the same time, these extensive and seminal research programs were highly valuable in shaping our understanding of influences on antisocial and delinquent behaviour and, collectively, their contributions to the field are enormous.

Results of the literature review indicated that the major risk factors fall into five life domains: (1) individual; (2) family; (3) peer; (4) school; and (5) community/neighbourhood. The following risk factors were identified in multiple studies, and/or showed robust effect sizes in meta-analyses, as indicating strong influences. For each of these risk factors, measures were suggested from the existing literature to operationalize and assess the relevant construct.

Individual

- demographic characteristics, including age, race/ethnicity and gender
- aggression, particularly early onset aggressive behaviour
- antisocial beliefs, attitudes and behaviours, including early onset antisocial behaviour and conduct problems, and psychopathy/callous-unemotional traits
- impulsivity
- low intelligence, particularly verbal IQ (VIQ)

Family

- antisocial/criminal family members, including parents and siblings
- parent-child separation, which may be either permanent or temporary, resulting from family disruptions, including out-of-home placement (such as in foster care or other residential or institutional care)
- parental conflict, including witnessing domestic violence
- poor family management practices, including lack of parental monitoring and supervision, harsh, inconsistent and/or lax discipline, and low parental support

- positive attachment as a protective factor
- child maltreatment, including physical, sexual and emotional abuse, and physical and emotional neglect
- large sibship, that is, four or more children in a family
- low family socioeconomic status

Peer

- antisocial/delinquent peer associations
- gang membership
- peer rejection

School

- poor academic performance
- poor school attendance, including suspension, expulsion, truancy and dropping out
- low school bonding

Community/neighbourhood

- community disadvantage
- community safety/violence

Female-specific risk factors

- mental health
- intimate relationships



Introduction

Development, in fact, may be viewed best as a set of multiple developmental trajectories, and our task as developmentalists is to discover how the interplay between different trajectories of children and adults accounts for outcomes (Parke, Ornstein, Riesner & Zahn-Waxler, 1994, p. 47).

What are the factors that put children and youth at increased risk for antisocial and delinquent behaviour? There is an inherent value in asking this question in terms of predicting and preventing more serious problems later in life, much like asking, “what are the factors that put an individual at increased risk for heart attack or stroke?” It is an ambitious question, however, and the answers are not always simple or straightforward. What is a risk factor? How do you assess the strength of the association between a risk factor and an outcome? How do you know if a risk factor is a cause of the outcome? These are some questions that are addressed in the first part of this report. In doing so, we hope to provide a context from which to make sense of RFR findings and provide a balanced review of the “vast and messy” literature.

The primary objective of this report was to conduct a comprehensive review of the literature on risk factors for antisocial and delinquent behaviour in children and youth, and to identify the major risk factors associated with these outcomes. Risk factors are identified for three age groups (6-11 years, 12-17 years and 18-24 years) and for males and females, with detailed information on how they are defined and measured or operationalized for investigation or research purposes. Considering the risk factors for different ages is essential because, as Herrenkohl, Maguin, Hill, Hawkins, Abbott and Catalano (2000, p. 178) stated, “Understanding what risk factors are most salient during different periods of development is important for designing preventive interventions that are age appropriate.” Finally, we provide examples of prototypical questions for measuring the major risk factors. These are taken from existing measurement instruments described in the literature, as well as measures developed for several large-scale research projects, including the Pittsburgh Youth Study (PYS), the Denver Youth Survey (DYS) and, in Canada, the National Longitudinal Survey of Children and Youth (NLSCY).

This report takes as an assumption that adversity experienced by children and youth places them at risk for a range of maladaptive outcomes, including antisocial and delinquent behaviour. Note that the concept of risk is understood as probabilistic rather than deterministic, based on the available evidence (Derzon, 2007; Kazdin, Kraemer, Kessler, Kupfer & Offord, 1997; Lösel, 2002). This evidence is derived primarily from correlational studies rather than experimental studies, which means certain limitations and qualifications with regard to the interpretation of the research findings and the role of a given risk factor in bringing about an outcome.

As a last point, it should be noted that, although Canadian data are certainly well represented in the literature, many of the findings on risk factors for antisocial and delinquent behaviour in children and youth are based on samples from the United States and the United Kingdom. As a result, some of this research may not fully describe the Canadian environment or even be relevant to Canadian youth. For example, some studies report that a critical risk factor for later delinquency is a first court contact with the justice system before age 12 (Cottle, Lee & Heilbrun, 2001; United States Public Health Service, 2001). This reflects the diversity in the minimum age of criminal responsibility around the world, where it is 7 years, for example, in many US states (such as New York), 10 years in the United Kingdom and 12 years in Canada. It is also evident from this review that a good number of published studies come out of a select few, very productive research groups, including the Seattle Social Development Project (SSDP), the UK-based Cambridge Study in Delinquent Development (CSDD), and the PYS. As a result, findings from these studies, including a focus on particular risk factors, dominate the literature. As well, it is an understatement to say that much of the research on correlates and causes of antisocial and delinquent behaviour has been conducted on males. Therefore, there is an unfortunate paucity of high-quality research on risk factors for conduct problem behaviour in females. This limitation poses a significant challenge for identifying risk factors for delinquency among females with the same degree of certainty and specificity as for males.

1.0 The Risk Factor Literature

Prediction and prevention of crime is predicated on understanding the causes of crime. Considerable efforts over the past 60 years in both theory and research have contributed greatly to elucidating these causes. However, as in understanding any human behaviour, taking account of the causes of crime is an extraordinarily complex task. The complexity lies, in part, in the many factors that may influence the onset, course and desistance of the behaviour within individuals. This characteristic of development is referred to as the *equifinality* phenomenon (Cicchetti & Rogosch, 1996).

Second, a comprehensive explanation of the causes of crime must consider the dynamic interplay of myriad factors across various domains operating at multiple levels, including: (1) the individual level (e.g., biological, cognitive, emotional variables); (2) immediate systems level (e.g., family, peer, school and neighbourhood variables); and (3) cultural and societal level (e.g., poverty, racism, mass media portrayals of criminality, and societal tolerance for alcohol and drug use) (Repucci, Fried & Schmidt, 2002). This adds another layer of complexity to the issue.

Third, as Richters (1997) observed in his critique of the state of research in the field of developmental psychopathology, the overly mechanistic and reductionistic research methodologies and strategies used to test predictions derived from the extant “heuristically rich” (McMillan, Hastings, Salter & Skuse, 2008, p. 883) developmental theories lack the necessary sophistication to fully capture the complexity of human functioning as it unfolds over time, and so remain inadequate. Finally, in seeking answers to questions about causation, the issue of establishing *causality* is fraught with its own challenges. Without the use of experimental manipulations, in which examining the causes of crime is often not possible due to practical and ethical constraints, students of criminal behaviour are left to draw conclusions based mostly on correlational findings, which leave room for multiple interpretations (Case & Haines, 2009; Derzon, 2007). An exception to this would be the use of randomized control trials (RCTs) to investigate the impact of a theory-based and empirically driven early intervention or prevention program for crime reduction. However, these types of studies are rare in the literature (McMillan et al., 2008).

1.1 Risk factor research (RFR) paradigm

So where do we begin and how do we proceed to make sense of the literature on risk factors for antisocial and delinquent behaviour? For those of us who grapple with questions about the causes of crime (i.e., researchers, theoreticians, practitioners, policymakers), our work has been greatly aided by the emergence of the risk factor research (RFR) paradigm. RFR is concerned with the study of antecedent variables that are associated with maladaptive outcomes, such as crime, and with describing the purported causal mechanisms by which risk factors lead to particular outcomes (Kazdin et al., 1997).

Without ascribing to any particular theory, RFR has been grounded in various broad-based theoretical models, including developmental and life course (DLC) (Farrington, 2003a, 2005), ecological systems (Bronfenbrenner, 1979) and biopsychosocial (Mash & Wolfe, 2010). The heuristic value of the RFR approach has been in providing an organizational framework within which to conceptualize, model, investigate and explain the complex interplay of risk factors from a developmental perspective. This approach holds promise for providing a fuller understanding of the risk factor-outcome relationships as well as the potential influence of early intervention and prevention programs on modifying a trajectory or pathway.

With respect to the study of antisocial and criminal behaviour, influential studies that have followed the RFR paradigm include Sheldon and Eleanor Glueck’s investigations in the 1930s of 500 delinquents and 500 non-delinquents (Glueck & Glueck, 1940, 1950), the Philadelphia birth cohort studies by Marvin Wolfgang and his colleagues (Tracy, Wolfgang & Figlio, 1990; Wolfgang, Figlio & Sellin, 1972), the CSDD (Farrington & West, 1990; Piquero, Farrington & Blumstein, 2007), and the more recent PYS (Loeber, Farrington, Stouthamer-Loeber & Van Kammen, 1998), the DYS (Huizinga, Wylie Weiher, Espiritu &

Esbensen, 2003) and the Rochester Youth Development Study (Thornberry, Lizotte, Krohn, Smith & Porter, 2003) (collectively funded as the *Causes and Correlates Studies* in 1986 by the US Office of Juvenile Justice and Delinquency Prevention), the SSDP (Hawkins, Smith, Hill, Kosterman, Catalano & Abbott, 2003) and the Montreal Longitudinal and Experimental Study (Nagin & Tremblay, 1999; Tremblay, 2001). Two key findings from these longitudinal and experimental studies are that: (1) an early age of onset portends a lengthy criminal career, characterized by a wide range of antisocial behaviour, including more serious and violent offences; and (2) a small proportion of offenders (between 5-10%) account for a disproportionate number of criminal charges, arrests and convictions (about 60-70%).

The RFR paradigm is not without controversy, as not everyone is so enamoured by the findings generated by the RFR literature. Critics argue that the case for addressing the problems of crime through prevention and early intervention by targeting putative risk factors has been grossly overstated (Case & Haines, 2009). Moreover, RFR runs the risk of oversimplifying complex relations as it must rely on fuzzy definitions, imprecise measurement of risk and outcome variables, and imperfect research methodologies (McMillan et al., 2008).

2.0 Risk Factors

A second assumption underlying this report can be summed up in a quote from Repucci and colleagues (2002, p. 12):

Understanding the risk factors and the developmental trajectories that lead to violence, help to determine the most effective strategies and the most appropriate time for prevention and intervention efforts. Intervention planning should be theory driven and informed by the study of risk factors for violence to ensure that one, but preferably multiple, risk factors are targeted.

To this we add that the key to effective prevention and intervention is not to target the *most* factors but to target the *right* factors and the *right* individuals, and also to know *how* and *why*.

What types of risk factors are there? Are risk factors causal factors? How do risk factors influence the onset, course and desistance of antisocial and delinquent behaviour, that is, what are the mechanisms by which risk factors exert their influence? How do we identify risk factors? What extant models or theories are available to better understand the impact of risk factors? These questions are central to the task at hand. Many of these issues have been described and discussed in the literature and solutions have been proposed (e.g., McMillan et al., 2008; Richters, 1997).

2.1 What is a risk factor and how are risk factors defined?

A variable is identified as a **risk factor** if it occurred before the onset of the outcome and it shows a significant association with the outcome (see Table 1). Kazdin and colleagues (1997) referred to a risk factor, generally, as an antecedent condition that increases the likelihood of a maladaptive outcome. Some key elements of a risk factor are that: (1) the risk factor temporally precedes the outcome; (2) the presence of the risk factor puts an individual at increased risk for a maladaptive outcome compared with a randomly selected individual from a general population; and (3) the relation between a risk factor and an outcome is understood as probabilistic, not deterministic. Note that a risk factor does not have to be a cause of the outcome.

The term risk factor has been used inconsistently in the literature (Murray, Farrington & Eisner, 2009) and some have called for a standard definition to be adopted to avoid miscommunication and confusion. There have also been demands for the use of different terms that more accurately reflect the nature of the relationship between the independent and dependent variables (Kazdin et al. 1997; Kraemer Kazdin, Offord, Kessler, Jensen & Kupfer, 1997; Kraemer, Stice, Kazdin, Offord & Kupfer, 2001). In this case, the

independent variable is the risk factor or antecedent (e.g., childhood maltreatment) and the dependent variable is the outcome or consequence (e.g., antisocial behaviour); that is, the independent variable acts on, influences, or brings about the dependent variable.

There are many different definitions of a risk factor used, for example, in the public health and developmental psychopathology literatures, and some are more comprehensive than others. The following are some broad definitions:

Factors that increase a child's vulnerability or likelihood that he or she will develop difficulties in situations of stress, even minor stress (Grizenko, & Fisher, 1992, p. 711);

A characteristic, experience, or event that, if present, is associated with an increase in the probability (risk) of a particular outcome over the base rate of the outcome in the general (unexposed) population (Kazdin et al., 1997, p. 377);

Those characteristics, variables, or hazards that, if present for a given individual, make it more likely that this individual rather than someone selected from the general population will develop a disorder (Mrazek & Haggerty, 1994, p. 127);

Those factors that, if present, increase the likelihood of a child developing an emotional or behavioural disorder in comparison with a randomly selected child from the general population (Garmezy, 1983, cited in Rae-Grant, Thomas, Offord & Boyle, 1989, p. 262).

With respect to criminal behaviour, Farrington (2007, p. 605) provides a useful definition:

Risk factors are prior factors that increase the risk of occurrence of the onset, frequency, persistence, or duration of offending.

Note that not all these definitions refer to a temporal precedence of the risk factor to the outcome, an element Kraemer and colleagues (1997) hold as *crucial* to the definition, and none refers to causality, which is not crucial to the definition.

Kraemer and colleagues (1997; see also Kazdin et al. 1997) make an important distinction between a risk factor and a **correlate**. A correlate refers to a variable that shows a significant association with the outcome but for which a temporal precedence has not been established. Although correlational findings raise questions about directionality and causality, identifying correlates is an essential first step in the search for risk factors and a good deal of the research on risk factors has been focused on identifying correlates (Derzon, 2007). As Derzon (2010, p. 265) stated, "The foundational evidence for establishing the possibility of a causal relationship is in the Pearson product moment correlation. The correlation provides a sensitive index of the linear relation between two variables."

Studies that use a cross-sectional design – where the data are gathered at a single point in time and where there is ambiguity about the temporal precedence of the variables – yield correlational findings. In this case, it is not known whether the risk factor came before the outcome, after the outcome (as a *consequence* of the outcome), or concurrently with the outcome, perhaps coincidental to the outcome. As Kraemer, Lowe and Kupfer (2005, p. 16) noted, "That key distinction between a correlate and a risk factor, the temporal precedence of the factor, relates to what is perhaps the most common mistake in research: calling a factor, shown only to be a correlate, a risk factor." Prospective longitudinal data (see Section 2.5.1) are required to unequivocally establish temporal precedence. However, in some cross-sectional studies temporal precedence may be established by the wording of questionnaire items in which participants are asked to report on events that occurred *prior* to the onset of the outcome of interest.

Kraemer and colleagues (1997) and Kazdin and colleagues (1997) further distinguish between a risk factor and a **causal risk factor**. A causal risk factor is a risk factor that has been empirically shown to produce an outcome. In other words, alteration of the risk factor alters the likelihood, nature, or severity of the

outcome. Establishing that a variable is a causal risk factor is the final step in identifying a risk factor, and provides important clues about targets for intervention and prevention. As Kraemer and colleagues (2005, p. 16) noted, “Causal risk factors are the ‘gold’ of risk estimation – they can be used both to identify those of high risk of the outcome and to provide the bases for interventions to prevent the outcome.” The next task, then, becomes to identify the causal processes or mechanisms that explain the causal relation between the risk factor and the outcome.

As a final point, fuzzy definitions also pose a problem with respect to the specific predictor variables. Terms may be used inconsistently or idiosyncratically by researchers and theoreticians without clear operational definitions of their meaning. For example, the term “ineffective parenting” could refer to either poor monitoring or supervision or to harsh and punitive discipline techniques (or both), both of which may account for shared yet unique variance in antisocial behaviour. “Family transitions/family breakdown” could either refer to marital separation and divorce (family breakdown) or to frequent moves or frequent changes in a child’s living (or school) arrangements, such as frequently moving between parents. Ideally, across researchers common terms would be used to refer to particular risk factors. However, no standards exist at this time, making this impractical. Currently, we are left to muddle through the literature, praising the researchers who provide good conceptual and operational definitions of their variables. Finally, Case and Haines (2009) are quite critical of the RFR literature with the view that any definition and measurement of a risk factor will inherently be a reductionistic oversimplification of a potentially complex and dynamic experience, attitude, behaviour, or process. They state that, although measurement error is a limitation in all areas of psychology, the issues are magnified in RFR, where there is a tendency to dichotomize both predictor and outcome variables.

2.2 Types of risk factors

There are different types of risk factors, including the ones noted above (see Table 1). Some risk factors are **internal** to the person; some are **external** or outside the person. In this regard, risk factors are said to fall into five life domains: (1) individual; (2) family; (3) peer; (4) school; and (5) community or neighbourhood (Loeber & Farrington, 2000). Some risk factors appear close in time to the event or onset of the behaviour; some appear distant in time to the event. The former are called **proximal risk factors**; the latter are called **distal risk factors**. According to Sampson (2001; see also Lösel & Bender, 2003), the relation between distal and proximal variables is thought to involve a mediational effect, such that the impact of a distal variable on an outcome is not so much “‘called forth’ from the distant past” (p. vi) as much as mediated by proximal influences. In this regard, distal and proximal risk factors operate as part of complex developmental causal chains to influence outcomes (see Section 2.3). Lastly, risk factors may either be **static**, that is, unchangeable, or **dynamic**, that is, malleable or amenable to change. Intervention or prevention programs will target dynamic risk factors and so this is a useful distinction to make. For example, one of the most robust dynamic risk factors for antisocial behaviour (Latimer, Kleinknecht, Hung & Gabor, 2003), which has also been called a causal risk factor (Kazdin et al., 1997), is harsh and punitive parental discipline practices.

Kraemer and colleagues (1997, 2001; see also Kazdin et al., 1997) developed a useful typology of risk factors and their variants. The aim is to describe the various types of *relationships* that different types of risk factors can have with the outcome variables. Kraemer and her colleagues distinguish between correlates, risk factors and causal risk factors (as noted above), as well as between variable risk factors, markers (fixed or variable), proxies and surrogates. This typology is useful because it: (1) provides greater clarity in using terms and concepts and (2) reduces confusion in describing and interpreting study findings. At the same time, the typology is rarely used in the RFR.

A **variable risk factor** is a factor that can be shown to change on its own (i.e., spontaneously) or when targeted by an intervention, such as by a parenting management training program. A **fixed marker** is a risk factor that cannot be shown to change, such as gender, race, ethnicity and genetic influences.

Sometimes a fixed marker will be called a static risk factor (e.g., Latimer et al., 2003), though this can be misleading if the factor has no causal relation to the outcome. As well, Latimer and colleagues refer to child maltreatment as a static factor, as if it cannot be changed. However, this assumes that the intervention or prevention program occurs later in the individual's life, after the maltreatment has occurred. If the program is offered sufficiently early in the individual's life (i.e., before the maltreatment occurs), the risk for child maltreatment may be significantly decreased.

More generally, Kazdin and colleagues (1997) used the term **marker** to describe a variable that has a relation to the outcome but is not considered a causal factor. For example, baldness is a marker for coronary disease in males, although changing baldness is not thought to change the risk for coronary disease. Yet, as Kazdin and colleagues noted, understanding what makes baldness a marker may uncover some important mechanisms that may suggest a causal relation. This mechanism, then, may be a focus for a treatment program.

In the risk factor literature, fixed markers have been shown to be important predictors for antisocial and delinquent behaviour. For example, a number of studies have shown that male gender increases the risk for antisocial and criminal activity (e.g., Herrenkohl et al., 2000; Kosterman, Graham, Hawkins, Catalano & Herrenkohl, 2001; Lipsey & Derzon, 1998; Wiesner & Silbereisen, 2003). Aboriginal status has also been found to be predictive of high rate delinquency in studies in Canada (Yessine & Bonta, 2009) and Australia (Livingston, Stewart, Allard & Ogilvie, 2008; Marshall, 2006). Kosterman and colleagues (2001) found that African-American racial status predicted violence. Lastly, a further biological fixed marker, low resting heart rate, has been shown to predict delinquency (Raine, 1993; 2002). It is thought that low resting heart rate predisposes an individual to aggression and violence.

Kraemer and colleagues (2001) defined a **proxy risk factor** as a variable that shows an association with a strong risk factor for an outcome, but may itself have no connection to the outcome. The proxy variable may *appear* to be a risk factor for an outcome but only by its association with the putative risk factor. For example, parental physical abuse may be a proxy risk factor for ADHD (as an outcome) but only because it is a component of poor parenting behaviour, as a broader, more global, risk factor. At the same time, Kraemer and colleagues (2001) go on to note that proxy risk factors *are* risk factors, which “may ultimately prove to be incidental to the causal processes, but then are often useful as indicators of profitable directions for the search for causal factors (by substitution, aggregation, or disaggregation)” (p. 851). At this time, the proxy variable may need to be put aside “once the risk factor for which they are a proxy is identified” (p. 851), such as by testing for a mediating effect of the risk factor on an outcome.

Finally, it should be noted that, in testing causal models, risk factors may also become outcome variables if they are assessed at different points in development. For example, early antisocial behaviour is an outcome of prior risk factors (perhaps child maltreatment, ineffective parenting, neurological injury, poor emotional regulation, or high emotional reactivity), but it also becomes an important risk factor for delinquency in adolescence. Early sexual behaviour may also be either an outcome or a risk factor, depending on its temporal status within the causal chain.

2.3 Linking risk factors to outcomes through developmental pathways

Risk factors are thought to exert their influence either directly, by affecting the outcome itself, or indirectly, by affecting subsequent risk factors leading to the outcome through a causal chain. In this regard, risk factors are understood as “a *process concept*” (Kazdin et al., 1997, italics in original). A third key assumption underlying this report states that:

Risk factors early in life can be linked to a temporally distant outcome through a developmental chain that results from maladaptation at an early stage (McMillan et al., 2008, p. 883).

The notion of developmental chains, also referred to as paths, pathways or causal chains, is integral to the study of risk factors and is closely tied to the role of theory. According to Kazdin and colleagues (1997, p. 398, italics in original), “The term *path* refers to a sequence of characteristics, events, experiences and behaviours, that define successive steps or stages by which the outcome becomes manifest. The research task is to identify how one moves through those steps resulting in some outcome, such as delinquency in adolescence.”

Theory provides a roadmap for those pathways. Theory also provides an outline of the relevant variables comprising the pathway and the purported direction of effects among the variables, in a sense, ordering the expected trail of events from risk factors to outcomes. Finally, theory provides an explanation for the underlying causal mechanisms of the risk factors. In other words, theory *explains* the relationship between risk factors and outcomes. The developmental model of antisocial behaviour proposed by Patterson, DeBaryshe and Ramsay (1989) provides a good illustration. Farrington (2007) emphasized the need to develop causal mechanisms linking risk factors and offending. Understanding the developmental pathways and the causal mechanisms underlying antisocial and delinquent behaviour could facilitate the development of effective early intervention and prevention programs, as well as more effective criminal justice policies and programs with regard to incarceration, treatment and rehabilitation.

Finally, consistent with the equifinality principle, theoreticians and researchers should be mindful of the need to consider multiple routes to antisocial and delinquent behaviour, as described by Loeber and Hay (1997). As well, causal mechanisms should reflect the notion that different sets of risk factors will be associated with different subtypes of delinquents (Kazdin et al., 1997), for example, life-course persistent and adolescence-limited (Moffitt, 1993), and that different risk factors will be associated with the onset, course, maintenance (i.e., persistence) and desistance of the delinquent behaviour (Kazdin et al., 1997).

2.4 How do risk factors operate?

Describing the process by which risk factors lead to outcomes (i.e., opening up the “developmental black box” to describe what is going on *inside* the child) is not a simple matter. Theoreticians and researchers tend to rely on metaphors to depict these hard-to-describe, complex and complicated causal mechanisms to tell the core story of development (Shonkoff & Bales, 2011). Metaphors are, however, by their very nature, approximations of the sequence of events and are inherently imprecise in their ability to describe these abstract processes. Examples of such metaphors to describe developmental concepts are causal chains, pathways, trajectories, scaffolding, brain plasticity and brain architecture.

The current metaphor of choice to describe the relations between past events and future outcomes in developmental psychology and developmental psychopathology is **cascade models** (Masten & Cicchetti, 2010). Indeed, in 2010, two issues (August and November) of the journal *Development and Psychopathology* were dedicated to studies on cascade models on a range of topics, including social competence, substance use, and internalizing and externalizing problems, and covered a broad range of ages, from preschool to adolescence. Cascade models are described by Dodge, Malone, Lansford, Miller, Pettit and Bates (2009) as multistage, dynamic, transactional and incremental. Cascade models highlight two important points. First, person-level analyses are vital to understanding the effects of risk factors, alongside variable-level analyses. Second, the effects of risk factors tend to be cumulative; that is, the effects build upon one another to cumulate over time, impacting the individual in ever-increasing ways across multiple domains. This was well illustrated in the study by Dodge and colleagues (2009), which showed how exposure to a risk factor in one domain (e.g., poor parenting) increased the likelihood of substance use in a subsequent stage of development in the presence of a risk factor in a second domain (e.g., early problem behaviours), which further increased the likelihood of substance use in a subsequent stage of development in the presence of a risk factor in a third domain (e.g., poor peer relations), and so forth.

As described in the risk factor literature, some of the mechanisms by which risk factors exert their influence are through: (1) **mediating effects**, (i.e., the influence of a risk factor on an outcome is partially or entirely accounted for by a third variable); (2) **moderating effects** (i.e., not all children exposed to a risk factor develop the outcome or that the same risk factor can lead to different outcomes, such as with gender effects); and (3) **dose effects**. With regard to moderating effects, although most of the findings reported in Section 3.0 are the result of main effects, some of the most interesting effects are due to the complex and dynamic interactions among risk factors. However, these types of relations are difficult to study, difficult to predict – or are simply ignored by researchers – and so are rare in the literature.

With regard to dose effects, there is ample evidence to suggest that the more risk factors an individual is exposed to, the greater the likelihood he or she will experience a maladaptive outcome (Hawkins, Herrenkohl, Farrington, Brewer, Catalano, Harachi & Cothorn, 2000; Herrenkohl et al., 2000; Kazdin et al., 1997). However, true as this may be (i.e., piling on the risk factors will certainly overwhelm and undermine a person's ability to cope), there is a certain imprecision to this effect as it fails to identify any one (or more) critical risk factor to target for intervention. What it does suggest is that multifaceted programs will be more effective than single-faceted ones. It also raises the point that risk factors tend to co-occur or cluster within individuals (Cauuffman, 2008; Farrington, 2007). For example, exposure to domestic violence is often associated with physical neglect, and exposure to harsh and punitive corporal punishment. This tendency creates a notoriously difficult challenge for researchers: they must disentangle the unique effects of one risk factor from the effects of another (see the discussion above about proxy risk factors). This is often identified as an area for further investigation in many RFR studies.

2.4.1 Are risk factors experienced early in life the most detrimental over the long term?

The answer appears to be 'yes.' Some research suggests that risk factors experienced early in life, for example, during the prenatal and perinatal periods of development, confer the most detrimental effects over the life span (Lussier, Healey, Tzoumakis, Deslauriers-Varin & Corrado, 2010). These risk factors include maternal substance use and birth complications, but also include abuse and neglect experienced in the first five years of life (Osofsky & Lieberman, 2011). Tackett (2010) noted that problems experienced early in life may result in general rather than specific risks for the individual, consistent with the phenomenon of *multifinality* (Cicchetti & Rogosch, 1996). This would support the finding by Leschied, Chiodo, Nowicki and Rodger (2008) that, in general, adolescent risk factors (e.g., academic performance, peer relations) tend to be stronger predictors of adolescent and adult criminal offending than childhood risk factors (e.g., aggression measured at age 5). The implication of this is that prevention should begin as early as possible and that effective programs could yield positive effects across multiple areas of a person's life (Farrington, 2007). The policy implication is that the expected benefits of early intervention programs to promote optimal growth and development would be broader than a reduction in crime, for example, in terms of social competence, emotional and behavioural self-regulation, and school readiness. Programs designed specifically to address crime may focus on more proximal variables, such as school transitions, precocious substance use and early delinquent peer associations.

2.5 How are risk factors identified?

The quality of measurement (reliability, validity and sensitivity) for risk factors and outcomes plays a major role in the ability to identify risk factors and measure their potency (Kraemer et al., 1997, p. 9 of 12).

2.5.1 Research designs

The CSDD is an example of a **prospective longitudinal** study of a sample of 411 young males from the United Kingdom. Study participants were followed, beginning in 1961, from age 8 to the present. Over this period, extensive and detailed information was gathered about their individual behaviour and

functioning, family lives, peer relations, school achievement and neighbourhood characteristics. Information was also collected about their criminal involvement, employment experiences and health outcomes. These outcome data were gathered using both self-reports and official records. The aim of the CSDD is to identify factors that appear early in the lives of the individuals that are associated with criminal activity (and other outcomes) later on. Through these associations, risk factors for antisocial and delinquent behaviour, as well as persistent and chronic criminal offending, are identified. Key findings from the CSDD include the identification of the following predictors at ages 8-10 of later offending: antisocial behaviour in childhood, hyperactivity-impulsivity-attention deficit, low intelligence and poor school achievement, family criminality, family poverty and poor parenting (Farrington, 2003b).

In a **retrospective longitudinal** study, early risk factors and criminal activity are gathered by looking back into the lives of a sample of individuals to identify early risk factors for later criminality retrospectively. The study by Ward, Day, Bevc, Sun, Rosenthal and Duchesne (2010) is an example of a retrospective longitudinal study. Although prospective longitudinal studies (short-term or long-term) are the preferred methodology, each has its advantages and disadvantages. Both provide valuable information about developmental variables that predict outcomes. The key advantage of a prospective longitudinal study is that a timeline can clearly be established, which, as Kazdin and colleagues (1997, p. 385) noted, increases the “the strength of inferences drawn from risk factor research.”

Cross-sectional designs are commonly used in the risk factor literature. In a cross-sectional study, data are gathered from study participants at a single point in time. Cross-sectional designs lead to correlational findings. A limitation of this methodology is that the precise timeline can sometimes be difficult to establish. However, these study designs will often incorporate a longitudinal perspective into the data in the wording of items on the study questionnaires to establish the temporal precedence of the risk factors. Lastly, to address some of the limitations of both the longitudinal and cross-sectional research designs, researchers may use an **accelerated longitudinal design** (also known as a **cross-sequential design**) in which several age cohorts are followed over the same time period. The PYS used such a design. In this study, three cohorts of children were followed up: (1) a younger group, who were 5-6 years of age at the start of the study; (2) a middle group, who were 8-9 years of age at the start of the study; and (3) an older group, who were 11-12 years of age at the start of the study.

As a final point, it is common practice in RFR to dichotomize the risk factors and the outcome variables for analysis. This method provides statistics that are meaningful and easy for many audiences to understand, including policymakers and practitioners who might not be familiar with interpreting statistical results (Farrington & Loeber, 2000). However, critics of dichotomization argue that it oversimplifies the measurement of highly complex variables and leads to incorrect interpretations of complex statistical relations (Case & Haines, 2009).

2.5.2 Measures of association

The strength of association between a risk factor and an outcome may be determined using various statistics. These include a correlation coefficient for continuous variables, and an odds ratio, a risk ratio, kappa, phi and gamma for categorical variables (Derzon, 2010; Kraemer et al., 1997), alongside reporting of 95% (or 99%) confidence intervals (CIs). The stronger the association, the stronger the observed relation between the risk factor and the outcome. Replication of findings across studies with different methods, measures and samples provides greater confidence in the strength of the effect of a given risk factor to predict the outcome. In Section 3.0, we review the major risk factors that have been shown, across multiple studies, to be associated with antisocial and delinquent behaviour outcomes.

An **odds ratio** (OR) is a commonly used statistic reported in the risk factor literature. An OR is a measure of the strength of association when the outcome variable is categorical (e.g., dichotomous). Within the context of risk for violence, for example, Hawkins and colleagues (2000) succinctly defined an OR as

“the odds of violence in the group with a particular risk factor divided by the odds of violence in the group without the risk factor (...) For example, an odds of 2 indicates a doubling of risk” (p. 2) (note that it is *not* interpreted as *twice as likely to occur*). Hence, an OR greater than 1 indicates an *increase* in the likelihood of a particular outcome for every one-unit increase in the risk factor. An OR less than 1 (e.g., OR = .36) indicates a decrease in the likelihood of a particular outcome for every one-unit increase in the risk factor. Because ORs are only estimates, based, for example, on sample size, researchers will also report the 95% CI alongside the OR to indicate the degree of reliability of the estimate; generally speaking, the smaller the CI, the greater the reliability of the estimate.

Another way to assess the importance of risk factors is through the use of **meta-analyses**. Meta-analyses of the literature are valuable because they are able to summarize findings across a number of studies to yield an overall effect size (ES), a standardized summary statistic of the strength of association between a risk factor and an outcome. A strong effect size of, say, .80 (Cohen, 1988) allows the researcher to feel more confident about the relation between a risk factor and an outcome, and also to consider the generalizability of the relationship (Derzon, 2007). Meta-analyses also help identify moderators of good and poor outcomes, which might not be possible in a single study. Examples of meta-analyses of criminal behaviour are those conducted by Lipsey and Derzon (1998) and Leschied and colleagues (2008). Finally, the comment by Kraemer and colleagues (1997) is worth restating: the quality of measurement of the predictor and outcome variables influences the degree of confidence in a study’s findings.

Finally, another way to identify risk factors, especially causal risk factors, is to examine the variables targeted by early intervention and crime prevention programs that have been shown to be effective. Parent management programs that target harsh and abusive parenting behaviours and discipline techniques, and improve the quality of the parent-child relationship, have been shown to reduce the risk of antisocial and delinquent activity in at-risk children. In one recent review of 55 studies, the average weighted ES was found to be .35 (95% CI [0.26, 0.44]), indicating a mild to moderate degree of effectiveness (Piquero, Farrington, Welsh, Tremblay & Jennings, 2009). Such reviews are invaluable in this regard (e.g., Greenwood, 2008; Farrington, 2007). Recent research suggests that programs that target children’s social-cognitive skills may also be promising points of departure for identifying critical causal risk factors (Dodge, 2011).

2.6 At risk for what?

For this report, risk factors are identified for **antisocial** and **delinquent behaviour** as the outcome variables. Antisocial behaviour is a broad term generally referring to a wide range of conduct problems in children. These behaviours may be categorized in two dimensions (Frick, Lahey, Loeber, Tannenbaum, Van Horn, Christ, Hart & Hanson, 1993): (1) **overt versus covert** (e.g., fighting or bullying vs. firesetting, truancy or precocious substance use) and (2) **destructive versus nondestructive** (e.g., property damage vs. lying or rule violations). Delinquency refers to a wide range of behaviours in adolescence that may lead to criminal charges, arrest, or adjudication (Kazdin et al., 1997). Both types of behaviours involve violations of the rights of others and may involve violations of legal codes. The RFR literature covers all these outcomes, including violent and nonviolent behaviours, serious disobedience, major rule violations, and so forth. Studies on risk factors leading to sexually violent behaviours tend not to be included in the general delinquency literature, but are generally reported in specialized RFR studies (e.g., Lussier, LeClerc, Cale & Proulx, 2007; McMillan et al., 2008). As Kazdin and colleagues (1997) noted, the way an outcome is conceptually and operationally defined and, when it is measured (e.g., early, middle or late childhood, or early, middle or late adolescence), can contribute greatly to whether a particular antecedent variable is identified as a risk factor. For example, a different set of risk factors will be associated with the onset of the behaviour in middle childhood as those associated with the maintenance of the behaviour in middle adolescence.

2.7 What about protective and promotive factors?

An abundance of research now shows that the presence of risk factors in an individual's life increases the likelihood of a maladaptive outcome, like criminality. However, not all children exposed to risk factors experience adverse outcomes. Some are able to rise above adversity and avoid falling off a normative developmental track. The influence of risk factors is offset by the presence of **protective factors**.

Case study: Glen and Troy Metropolit are two brothers whose lives have taken very different paths. As brothers, they were raised by a single mother (both have different biological fathers), in poverty, in Toronto's economically disadvantaged Regent Park neighbourhood. Both had been shuffled in and out of foster homes over their childhood. Today, at age 37, Glen is a veteran NHL hockey player, currently with the Montreal Canadiens. Troy, age 34, is a federal inmate, serving a 16-year prison sentence for his part in the 2000 abduction and robbery of Toronto lawyer Schuyler M. "Skip" Sigel and his wife, Lynn. Troy is also awaiting trial for the 2003 murder of a fellow inmate at the Millhaven prison in Bath, Ontario. Despite sharing the same environment growing up, exposed to many of the same risk factors, they have lived very different lives. As a boy, Glen was kept busy with hockey: his passion, his escape, his outlet. He has said that he always believed in himself. Troy "was not as athletic, or as engaged, or as fortunate" (Dupont, 2008, p. 1). Troy's biological father had himself done stints in prison, mostly for breaking and entering.

Protective factors are defined as "influences that modify, ameliorate, or alter people's responses to some environmental hazard that predisposes to a maladaptive outcome" (Rutter, 1985, p. 600; see also Rae-Grant et al., 1989). Protective factors act as a buffer to decrease the likelihood of a maladaptive outcome in the presence of a risk factor. In other words, if a risk factor represents a deficit in a person's life, a protective factor represents a strength. There is some controversy in the literature about what constitutes a protective factor and whether it functions only in the presence of a risk factor (Lösel & Bender, 2003). As well, protective factors have been described as simply the absence or inverse of risk factors without supporting evidence for this proposition. A study by Stouthamer-Loeber, Loeber, Farrington, Zhang, van Kammen and Maguin (1993) was the first to examine the relationship between risk factors and protective factors as opposite poles of a continuum.

Stouthamer-Loeber and colleagues (1993) found that a protective factor was *not* simply the absence or opposite pole of a risk factor, at least not for all protective factors. On one hand, some variables were found to function *only* as risk factors. These included, for example, the young age of a mother at birth (i.e., < 18 years), neighbourhood crime and antisocial attitudes. In other words, they provide no protective function in their absence or opposite pole (e.g., average age of mother at birth, low crime neighbourhood, non-antisocial attitudes). On the other hand, some variables were found to function as *both* protective factors, when present in their positive form, and risk factors, when present in their negative form. These variables included, for example, trustworthiness, manipulateness, ability to feel guilt, peer delinquency and academic achievement. No variable was identified as *only* a protective factor. Today, the term protective factors is applied to resiliency variables that function in the presence of risk factors as moderators (i.e., as an interaction effect). Variables that are associated with a low probability of antisocial and delinquent behaviour, even in the absence of risk factors, are called **promotive factors** (Stouthamer-Loeber, Loeber, Wei, Farrington & Wilkström, 2002).

The implication of the Stouthamer-Loeber and colleagues (1993) findings is that early intervention and prevention programs that target risk factors that also have a promotive effect are most likely to be effective. This is consistent with a public health approach to crime reduction, which would both *prevent* crime by reducing risk factors and *promote* healthy development and well-being by strengthening promotive factors. However, further research is needed to identify risk/promotive factors and protective factors in general, as well as the role of protective and promotive factors in mitigating the effects of the risk factors (Stouthamer-Loeber et al., 2002).

Moreover, although the research is not consistent, the nature and quantity of risk and promotive factors in an individual's life may change over time. This information could potentially help inform the development of prevention and intervention programs. A study by van der Put, van der Laan, Stams, Deković and Hoeve (2011) found that, among their sample of 13,613 male and female juvenile offenders in the United States, younger adolescents (i.e., 12- to 13-year-olds) had more risk factors and fewer promotive factors, while older adolescents (i.e., 16- to 17-year-olds) had equal numbers of risk and promotive factors. This would suggest that specific interventions should be targeted toward younger cohorts involved in the justice system who may be particularly susceptible to the effects of risk factors. These youths may be at a critical developmental juncture and run the greatest risk of being further derailed from a normative developmental path and becoming “deep-end kids” in the justice system. Interventions with older adolescents may capitalize on their personal and social assets and build on their strengths, as they have passed the peak age of offending on the age-crime curve (Farrington, 1986a) and are approaching the period of emerging adulthood (Arnett, 2000; 2007). At the same time, based on data from the three age cohorts of the PYS, Loeber, Farrington, Stouthamer-Loeber and White (2008) reported that exposure to promotive factors tended to decrease with age, while exposure to risk factors tended to increase with age. However, it may depend on when these variables are assessed (e.g., late childhood, early adolescence, late adolescence) and what exactly is being counted, as different researchers may consider different variables as having risk and promotive effects at different ages.

2.8 Identifying children at risk and key issues in risk assessment: Whom to target?

A challenge for any early intervention or prevention program is to identify accurately the children at risk for a maladaptive outcome, such as antisocial and delinquent behaviour, and to target the particular risk factors that are critical for program effectiveness. The challenge arises from the inevitable fact that some children identified as high risk will not experience the maladaptive outcome despite not having been given the program (called *false positives*) and some children who are not identified will experience the maladaptive outcome (called *false negatives*). For example, Herrenkohl and colleagues (2000) reported that 13-18% of children from the SSDP predicted to be nonviolent were violent at age 18. As Offord (1987) clearly indicated, the issue is one of important trade-offs between the **sensitivity** and **specificity** of the screening procedure. Sensitivity refers to the proportion of children correctly identified by the screening procedures and specificity is the proportion of children not at risk correctly identified as such (Furlong, Bates & Smith, 2001). These elements are inversely related such that a rise in one is accompanied by a drop in the other (Offord, 1987).

Offord further noted that “if the sensitivity of the screening procedure is low, then, the majority of true positives will not be identified by the screen. If, on the other hand, the specificity is low, the majority of the true negatives will not be identified by the screen” (Offord, 1987, pp. 13-14). As a result, it is important to “balance the beneficial and possible harmful effects (through labeling) of the intervention in children who have been correctly and incorrectly classified as being at risk” (Offord, 1987, p. 14). There are many highly technical issues associated with these considerations that are beyond the scope of this report (for further discussion see Derzon, 2001; Furlong et al., 2001). In light of these factors, a **multiple-setting-multiple-informant** approach (Lösel, 2002) and a **multiple-gating** screening procedure (Charlebois, LeBlanc, Gagnon & Larivee, 1994), such as the two-gate procedure based on teacher and parent ratings of behaviour problems used in the Fast Track program (Conduct Problems Prevention Research Group, 2011), or the three-gate mechanism implemented by the PYS, may be worthy of further consideration.

3.0 Major Risk Factors for Antisocial and Delinquent Behaviour

In this section, we present the major risk factors for antisocial and delinquent behaviour in children and youth. Risk factors are identified through a review of the extant literature that includes both published articles and unpublished research reports and studies available on websites (often government websites),

frequently referred to as the “grey” literature. Our reporting of the strength of the relationships between specific risk factors and outcomes is limited by the points noted above about definitional, methodological, empirical, statistical and epistemological issues. Presentation of the risk factors is organized into five domains: (1) individual; (2) family; (3) peer; (4) school; and (5) community/neighbourhood. Within each domain, the key risk factors identified in the literature are presented along with supporting evidence for the strength of their relation to antisocial and delinquent behaviours. Where available, effect sizes also are reported.

Strong evidence now demonstrates a robust association between about 10-15 risk factors and antisocial and delinquent behaviour (e.g., early antisocial behaviour, deviant peer associations, harsh and punitive discipline practices, poor academic achievement). Somewhat weaker evidence supports the association of another 10 risk factors (e.g., family/marital conflict, psychopathic traits). Lastly, further evidence suggests that some risk factors show a limited association with the outcomes (e.g., peer victimization, low self-esteem), though insufficient or inconsistent research may preclude making more conclusive statements.

3.1 Individual domain

A host of individual factors have received attention in the literature with respect to their association with delinquency (Andrews & Bonta, 1998; Case & Haines, 2009; Farrington, 2009; Leschied et al., 2008). Major risk factors within the individual domain include: (1) demographic characteristics; (2) aggression; (3) antisocial beliefs, attitudes and behaviours; (4) impulsivity; and (5) low intelligence (Farrington, Loeber, Jolliffe & Pardini, 2008; Huizinga et al., 2003; Loeber, Green & Lahey, 2003; Piquero et al., 2007; White, Loeber & Farrington, 2008).

3.1.1 Demographic characteristics

Age: Age is considered an important correlate of delinquency as, following the classic age-crime curve, the prevalence of offending increases in early adolescence and peaks in middle adolescence, followed by a steady decline thereafter (Loeber, Stouthamer-Loeber, Van Kammen & Farrington, 1991; McCord, Widom & Crowell, 2001; Nagin, Farrington & Moffitt, 1995).

Race and ethnicity: Race also has been repeatedly associated with delinquency and, in particular, being black is correlated with an increased risk for delinquency (e.g., Leiber & Johnson, 2008). For example, Lynam Miller, Vachon, Loeber and Stouthamer-Loeber (2009) found that being non-white predicted arrests and convictions. These data were drawn from the PYS sample, comprising 338 boys assessed at age 13. Parker and Morton (2009) reported that youths with an early onset of delinquency were more likely to be black than youths with an official arrest at age 15 or older when controlling for SES, verbal intelligence and disinhibition. Lastly, indigenous (i.e., Aboriginal status) has been identified as a risk factor for delinquency in studies conducted in Canada (Yessine & Bonta, 2009) and Australia (Livingston et al., 2008; Marshall, 2006). At the same time, given that it is an immutable characteristic, race/ethnicity may better be conceptualized as a fixed marker rather than as a risk factor.

Gender: Another demographic variable that is considered a risk factor for delinquency is gender. The risk for delinquency and later adult offending is higher among males than females, and this has been confirmed using both official records and self-reports (Bor, Najman, O’Callaghan, Williams & Anstey, 2001; Cottle et al., 2001; Dodge, Coie & Lynam, 2006; Lipsey & Derzon, 1998; Moffitt, 1993; Shader, 2003; Sprott & Doob, 2003). However, there is some indication that this association may vary depending on the type of offence. For instance, boys have been shown to account for a disproportionate number of violent and sexual offences, while engaging in a similar number of property and drug-trafficking crimes as their female counterparts (Latimer et al., 2003). There has been some debate on whether gender is a risk factor or a marker for delinquency (e.g., Hawkins, Laub & Lauritsen, 1998; Kraemer et al., 1997). However, the United

States Public Health Service (2001) suggests being male increases risk beyond that accounted for by other known risk factors. Nonetheless, gender is treated here as a fixed marker rather than as a risk factor, according to the definitions described earlier in this report.

3.1.2 Aggression¹

Aggression is one of the most consistently documented dynamic risk factors for offending (Bor et al., 2001; Farrington, 1989; Laub & Lauritsen, 1993; McGee, Wickes, Corcoran, Bor & Najman, 2011). Aggression is considered to be a highly stable characteristic, with correlations over time of between .21 (Derzon, 2001) and .63 (Olweus, 1979). If a child is still aggressive at age 8, there is a high likelihood the behaviour will persist into adolescence and beyond (Kazdin, 1995). Aggression has been operationally defined as behaviour that harms or is intended to harm another person (Coie & Dodge, 1998). This risk factor has been measured in a variety of ways across studies, including teacher or parent ratings, self-reports and official records, such as school documentation, where concordance between multiple measuring techniques is ideal (Farrington, 2009). However, many aggressive acts may not be witnessed by teachers or others (e.g., Craig, Pepler & Atlas, 2000), thus supporting the notion that aggression may best be assessed by self-reports. Various forms of aggression have been distinguished (e.g., verbal vs. physical aggression), but among them, school bullying is the most clearly conceptualized and well researched (Smith, Pepler & Rigby, 2004).

Bullying has been found to be associated with antisocial and delinquent behaviour (Farrington, 1993; Olweus, 1993). Bullying involves either direct or indirect aggression where there is a power differential between the bully and the victim; the power element is central to bullying (Olweus, 1993). Using a Canadian sample of children and youth, Debra Pepler and her colleagues reported that bullying behaviour is associated with later violence in intimate partner relationships, including sexually harassing behaviours (Connolly, Pepler, Craig & Taradash, 2000; Pepler, Craig, Connolly, Yuile & McMaster, 2006).

Using data from the NLSCY, Latimer and colleagues (2003) examined the correlates of delinquency in a sample of 4,293 Canadian youths. In this nationally representative study, aggression emerged as one of five core factors associated with delinquency. Moreover, this result was consistent across gender and multiple forms of delinquency (i.e., general delinquency, property offending and violent offending). The continuity of aggressive behaviours in later violent offending has been underscored by several authors (e.g., Loeber, 1996). Farrington (1995) reported that approximately 50% of boys adjudicated delinquent for violence between the ages of 10-16 were convicted of a violent offence by age 24. This is in stark contrast to juveniles not adjudicated delinquent for a violent crime, of whom only 8% committed a violent offence by age 24.

Early aggressive behaviour: When the aggressive behaviour begins at an early age, aggression may confer a particularly salient risk in childhood, as early aggression is associated with more serious and chronic offending later on (Thornberry, Hulzinga & Loeber, 1995; Tolan & Thomas, 1995). In fact, aggression is described as the “best social behaviour characteristic to predict delinquent behaviour before age 13” (Tremblay & LeMarquand, 2001, pp. 141). For example, aggressive behaviour demonstrated at age 5 was found to be the strongest predictor of antisocial behaviour at age 14 (Bor et al., 2001). **Gender differences** suggest that the literature is less conclusive on the association between aggression and delinquency for females. Although similar results have been reported for males and females in some studies (e.g., Latimer et al., 2003), others only identify aggression as a risk factor for delinquency in males (Hawkins et al., 2000; Shader, 2003). Gender differences in adolescence may partially account for this, since aggression

¹ Aggression may refer either to a behaviour or a trait (i.e., aggressivity). Within the literature, this risk factor is viewed as a behaviour and measured with rating scales such as the Child Behavior Checklist (CBCL; Achenbach, 2005). However, aggression scales may overlap with delinquent outcomes and researchers should address this issue by removing common items from their measures of aggression and delinquency. It would be of interest to measure aggressivity as a trait in children (e.g., hostility, anger-proneness) as a risk factor for later delinquency.

decreases more rapidly for females during this period than for their male counterparts (Fontaine, Carbonneau, Barker, Vitaro, Hebert, Cote & Tremblay, 2008).

3.1.3 Antisocial beliefs, attitudes and behaviours

Antisocial attitudes and beliefs: Endorsing antisocial attitudes and beliefs predicts delinquency (Andrews & Bonta, 1998; Hanson & Morton-Bourgon, 2005; Herrenkohl et al., 2000; Shader, 2003; Wong, Slotboom & Bijleveld, 2010). This relationship appears stronger with respect to adolescents than to children under the age of 11 (United States Public Health Service, 2001) and stronger for males than females (Williams, 1994). This risk factor has been operationally defined in a number of ways, frequently including one or more of the following characteristics: dishonesty, rule-breaking behaviour, favourable attitude towards violence and hostility towards police (e.g., Hawkins, Herrenkohl, Farrington, Brewer, Catalano, & Harachi, 1998). In other studies, antisocial attitudes and beliefs are defined to include substance use, impulsivity and psychopathy (e.g., Hanson & Morton-Bourgon, 2005).

Psychopathy/callous-unemotional traits: Psychopathy, a risk factor related to antisocial attitudes and behaviours, has received much attention as a predictor/correlate of criminal offending (Corrado, Vincent, Hart & Cohen, 2004; Decoene & Bijttebier, 2008; Edens, Skeem, Cruise & Cauffman, 2001; Frick, Cornell, Barry, Bodin & Dane, 2003; Gretton, Hare & Catchpole, 2004; Hare, 2003; Lynam et al., 2009; Rowe, 2002; Salekin, 2008; Vincent, Vitacco, Grisso & Corrado, 2003). Psychopathy is a multidimensional construct including such factors as callousness/unemotionality, need for stimulation, lying, manipulation, lack of remorse or empathy and antisocial behaviour problems (e.g., Hare, 2003). For instance, psychopathy scores measured in adolescence (ages 12-18) predicted violent recidivism in a 10-year follow-up of a sample of boys (Harris, Rice & Cormier, 1991). Similar results have been reported for the link between psychopathy (measured between the ages of 9-18) and both general and violent recidivism 4 years later (Salekin, 2008).

Research with adults has found psychopathy to be the best predictor for violent recidivism (e.g., Hare, 2003). Whereas many of these studies were conducted with correctional samples, Vaughn, Litschge, DeLisi, Beaver and McMillen (2008) found psychopathy at age 16 to be associated with offending, controlling for demographic factors, substance abuse, childhood trauma, family support, delinquent peer associations and neighbourhood disorder. Contrary to these results, Edens and Cahill (2007) found that psychopathy did not predict recidivism in a 10-year follow-up study of 13- to 17-year-old males in juvenile detention. The authors suggest that these results might be partially explained by the ethnic composition of the sample (75% non-Caucasian). Support for race as a potential moderator of this link can be found in a meta-analysis of psychopathy and violent recidivism in an adolescent male sample (Edens, Campbell & Weir, 2007). In this study, the relationship between violent recidivism and psychopathy increased positively as a function of race, whereby psychopathy was a stronger predictor of recidivism among samples with a larger proportion of Caucasian participants.

Offending: General offending, including burglary, grand theft and conviction for a felony, is a predictor of later delinquency and adult criminal behaviour (Gatti, Tremblay & Vitaro, 2009; Hawkins et al., 2000; Shader, 2003). In fact, one of the most powerful early risk factors for delinquency is involvement in general offences before age 12, with effect sizes as strong as .38 (Cottle et al., 2001; United States Public Health Service, 2001). Both official and self-report data have demonstrated that an early onset of offending puts individuals at greater risk for an increased number of offences compared with late-onset offenders (Farrington, Loeber, Elliott, Hawkins, Kandel, Klein and Tremblay, 1990; Farrington, Jolliffe, Hawkins, Catalano, Hill & Kosterman, 2003; Krohn, Thornberry, Rivera & LeBlanc, 2001; Piquero et al., 2007; Tolan & Thomas, 1995). The predictive power of general offending on antisocial behaviour appears to lessen after the age of 11, possibly because children below this age are not likely to engage in any form of illegal behaviour (e.g., Hawkins et al., 2000). The meta-analysis by Lipsey & Derzon (1998) suggested that prior offending is one of the strongest predictors of later offending, particularly when the former occurs in middle childhood.

Antisocial behaviour and conduct problems: Antisocial behaviour and conduct problems are considered a risk factor for delinquency (Shader, 2003; Vermeiren, Schwab-Stone, Ruchkin, De Clippele & Deboutte, 2002). Caution is warranted, though, as any overlap in the measures of conduct problems and delinquency (e.g., stealing, physical aggression) would lead to inflated correlations. In general, conduct problems have been identified as a predictor for criminal behaviour in multiple longitudinal cohort studies (Fergusson, Horwood & Ridder, 2005; Sourander, Elonheimo, Niemelä, Nuutila, Helenius, Sillanmäki & Almqvist, 2006). As defined across the literature, antisocial behaviour and conduct problems comprise a large variety of behaviours in various dimensions (see Section 2.6 above), including criminal offending variables (e.g., stealing, destruction of property, selling drugs), substance use (e.g., cigarettes and alcohol before legal age), sexual behaviours (e.g., early age of onset for sexual intercourse) and aggression (Hawkins et al., 2000). Case and Haines (2007) reported *antisocial behaviour and attitudes* to be one of the strongest risk factors for delinquency across gender, type of offending and age group (one-year intervals from 11-17 years). This factor consisted of having positive attitudes towards smoking and alcohol consumption and hanging around the streets, as well as having antisocial, drug-using, or criminal peers. Given the strength of the relationship between delinquency and having antisocial peers, it is plausible that delinquent peer associations in this variable accounted for a substantial portion of the effect.

Substance use: Substance use has been implicated as a risk factor for delinquency and criminal behaviour (Armstrong, Hine, Hacking, Armaos, Jones, Klessinger & France, 2005; Case & Haines, 2007; Cottle et al., 2001; Fraser & Seddon, 2003; Hammersley, Marsland & Reid, 2003; Komro, Williams, Forster, Perry, Farbaksh & Stigler, 1999; Lipsey & Derzon, 1998; McKeown, Jackson & Vaois, 1998; Putnis, 2003; Roe-Sepowitz & Krysik, 2008; Shader, 2003; Wilson, Rojas, Haapanen, Duxbury & Steiner, 2001), as well as being associated with an increase in the frequency of offending and length of criminal career (e.g., Parker & Auerhahn, 1998; Putnis, 2003). Although substance use is associated with criminal behaviour across the life span, it may be particularly predictive of adolescent delinquency when measured before the age of 12, that is, in the precocious use of substances (e.g., Hawkins et al., 2000). Where substance use and experimentation during adolescence is more normative, substance use before age 12 is atypical (Fagan, 1993). Identified as a major public health concern due to its negative consequences and frequency of use among normative adolescent populations (Johnston, O'Malley, Bachman & Schulenberg, 2005; Rohde, Lewinsohn, Kahler, Seeley & Brown, 2001), substance use, abuse and dependence occur at substantially higher rates among incarcerated youths. According to the Substance Abuse and Mental Health Services Administration's (2005) national survey, approximately 9% of youth between the ages of 12-17 met the Diagnostic and Statistical Manual of Mental Disorders' (DSM-IV) criteria for drug or alcohol abuse or dependence. In contrast, nearly 40% of incarcerated youths are estimated to have a substance abuse disorder (Golzari, Hunt & Anoshiravani, 2006). **Gender differences** suggest that substance-using females may be at a greater risk for increased delinquent behaviour than their male counterparts (Putnis, 2003). This was demonstrated in a sample of 447 youths between the ages of 11-19 who were admitted to detention centres in South Australia.

3.1.4 Impulsivity

Impulsivity has consistently predicted delinquent and criminal behaviour, and has been identified as a crucial risk factor for problem behaviour in children under the age of 12 (Bacon, Paternoster & Brame, 2009; Brennan, Mednick & Mednick, 1993; Fagan, Van Horn, Hawkins & Arthur, 2007; Farrington & Coid, 2003; Hawkins, Herrekohl et al., 1998; Klinteberg, Andersson, Magnusson & Sattin, 1993; Latimer et al., 2003; Lipsey & Derzon, 1998; Parker & Morton, 2009; Pratt, Cullen, Blevins, Daigle & Unnever, 2002; Raine, Moffitt, Caspi, Loeber, Stouthamer-Loeber & Lynam, 2005; Silverthorn, Frick & Reynolds, 2001; Taylor, Iacono & McGue, 2000; White, Moffitt, Caspi, Bartusch, Needles & Stouthamer-Loeber, 1994; Wong et al., 2010). Impulsivity among youth puts them at a higher likelihood of arrest and conviction relative to those with low impulsivity (e.g., Beaver, DeLisi, Mears & Stewart, 2009). In fact, Gottfredson and Hirshi's (1990) General Theory of Crime posits impulsivity to be a key component of criminal propensity, which is assumed to be stable throughout the life-course. However, there is little consistency

between the operational definitions applied to impulsivity by researchers. As stated by Farrington (2009), “Unfortunately, there are a bewildering number of constructs referring to a poor ability to control behaviour” (p. 694). Some of these include impulsiveness, reacting to stimuli without forethought, low self-control, lack of perseverance, inability to delay gratification, hyperactivity, inattention, restlessness, sensation-seeking and risk-taking behaviours (e.g., Carroll, Hemingway, Bower, Ashman, Houghton & Durkin, 2006; Farrington, 2009; Moeller, Barrat, Schmitz & Swann, 2001).

Impulsivity has been associated with delinquency across studies regardless of the age at which it is measured. For example, impulsivity at ages 10 and 14 has been reported to more than double the odds of committing a violent act at age 18 (Herrenkohl et al., 2000). When present at age 16, impulsivity continued to predict violent behaviour, though the association was slightly decreased (OR = 1.9). Risk-taking at ages 14 and 16 more than tripled the likelihood for violence at age 18.

In the prospective-longitudinal study in Dunedin, New Zealand, child temperament observed at age 3 was associated with antisocial behaviour; specifically, being undercontrolled (i.e., restless, impulsive and with poor attention) predicted delinquency and convictions between the ages of 18-21. Case and Haines (2007) reported on risk factors for different offending forms (lifetime violent, lifetime property, and active [i.e., over past year] offending) in a sample of 3,088 Welsh secondary school students, aged 11-16 years. Impulsivity was found to be the second most influential risk factor for each form of offending for the sample as a whole, for each age group (broken down into yearly intervals), and for both males and females when analyzed separately. Finally, boys with concentration difficulties and motor restlessness at age 13 were found to be five times as likely to be arrested by age 26 as boys without these difficulties (Klinterberg et al., 1993).

3.1.5 Low intelligence

Low intelligence, and particularly low verbal intelligence (VIQ), have been identified as risk factors for delinquency and criminal behaviour (Cottle et al., 2001; Farrington, 1995; Frize, Kenny & Lennings, 2008; Hawkins et al., 2000; Lipsey & Derzon, 1998; Parker & Morton, 2009; Raine et al., 2005; Shader, 2003; Taylor et al., 2000; White, Bates & Buyske, 2001; Wong et al., 2010). Meta-analyses have generated small but consistent effects (e.g., ES of $-.14$ for Full Scale IQ score and $-.11$ for VIQ) (Cottle et al., 2001), and this relationship has been supported for intelligence measured in childhood, adolescence and adulthood. For instance, a measure of low IQ at age 3 predicted offending up to age 30, even after controlling for socioeconomic status (Stattin & Klackenber-Larsson, 1993); non-offenders had an average IQ of 101, whereas individuals with four or more offences had an average IQ of 88. In an epidemiological study of more than 400 13-year-old twins, both parent and teacher reports of low child IQ predicted conduct problems independent of parental IQ and social class (Goodman, Simonoff & Stevenson, 1995). This relationship was partially mediated by lower educational achievement. Intellectual disability (i.e., IQ < 70) and performance IQ (PIQ) have also been assessed in relation to delinquency; however, results have been varied (e.g., Cottle et al., 2001; Frize et al., 2008).

Lynam and colleagues (2009) reported VIQ measured at age 13 to be one of the five (out of 16) variables that had a unique correlation with arrests between 18-26 years of age. In fact, of all the predictor variables used, VIQ had the strongest correlation with both arrests and convictions up to age 26. Low VIQ suggests evidence for left hemispheric dysfunction, and may be associated with deficits in behavioural and emotional self-regulation and other communication problems, which may be associated with disruptive behaviours (Moffitt, 1993). Mash and Wolfe (2010, p. 162) noted that “verbal and language deficits may contribute to conduct problems by interfering with the development of self-control, emotion regulation, or the labeling of emotions in others, which may lead to a lack of empathy.”

Ethnic status and racial differences in the link between IQ and delinquency have been noted with respect to the onset of criminal behaviour. In investigating offending onset, low VIQ was found to be significantly

lower among black adolescents with an early onset of offending in comparison to black adolescents with an onset of offending after age 14 (Parker & Morton, 2009). There were no significant differences between intelligence and onset of offending when considering Caucasian adolescents. Taylor and colleagues (2000) also reported lower VIQ in early-onset delinquents compared with late-onset and non-delinquents in black youths only. Other studies have reported the link between low IQ and delinquency to be strongest for those with low social class (e.g., Hogg & Wolf, 1983), and this may also be related to ethnic status and race.

3.2 Family domain

Over 80 years of research has contributed to the identification of family dynamics as a key determinant of delinquency (e.g., Glueck & Glueck, 1934; McCord, 1979; Piquero et al., 2009; van der Laan, Veenstra, Bogaerts, Verhulst & Ormel, 2010). Particularly relevant types of risk factors within the family domain include: (1) antisocial/criminal family members; (2) parent-child separation; (3) parental conflict; (4) poor family management practices (e.g., harsh and punitive discipline techniques, poor parental monitoring and supervision); (5) child maltreatment; (6) large sibship; and (7) low family socioeconomic status (Derzon, 2010; Farrington, 2009; Hawkins et al., 2000; Herrenkohl et al., 2000; Hogue, Dubas, Eichelsheim, van der Laan, Smeenk & Gerris, 2009; Loeber & Farrington, 2000). Clearly, a lack of affective ties between children and youth and significant others, especially parents and other primary caregivers, is associated with delinquency (Chung, Hill, Hawkins, Gilchrist & Nagin, 2002).

3.2.1 Antisocial/criminal family members

It has been established for a long time that both criminal parents and delinquent siblings are related to youth offending (Farrington, 1979; Herrenkohl et al., 2000). As reported in the CSDD, offending tends to be concentrated in a small number of families. In this particular research, 6% of 400 families were responsible for about half of all criminal convictions. This includes mother, father, son and daughter convictions (Farrington, Barnes & Lambert, 1996). Symptoms of conduct disorder also tend to cluster within families, as demonstrated in the Ontario Child Health Study (Szatmari, Boyle & Offord, 1993). However, there is some indication that parents are the most important kin with respect to predicting criminality. Farrington, Jolliffe, Loeber, Stouthamer-Loeber and Kalb (2001) reported that arrests of the father predicted delinquency in males independent of all other family members. There have been mixed results regarding the additive risk parental incarceration has on delinquency (Murray & Farrington, 2005; Murray, Janson & Farrington, 2007). Some explanations for the concentration of offending and antisocial behaviour in families include intergenerational continuity of risk factor exposure; genetic mechanisms; assortative mating; and family members influencing one another (i.e., mediation effects through other risk factors such as poor parental supervision and police bias against criminal families) (Farrington, 2009; Farrington et al., 2001). As well, criminal family members may be a more salient risk factor for adolescents aged 12-17, whereas an incarcerated parent may be a more salient risk factor for preteens (Fergusson, Horwood & Nagin, 2000).

Antisocial parents/parental criminality: There is little doubt that antisocial parents tend to have antisocial children (Lipsey & Derzon, 1998), an effect that has been documented with various operational definitions given to 'antisocial parent' and 'parental criminality.' Several studies have examined parental antisocial personality disorder as it relates to antisocial behaviour in children (e.g., Cohen, Brook, Cohen, Velez & Garcia, 1990) and others have assessed parental criminality based on arrests and convictions (e.g., Murray & Farrington, 2005).

Research has consistently demonstrated that parental antisocial behaviour and criminality predicts child delinquency (Cohen et al., 1990; Derzon, 2010; Frick Kamphaus, Lahey, Loeber, Christ & Hanson, 1992; Loeber & Farrington, 2000; Loeber, Green, Keenan & Lahey, 1995; Loeber et al., 1998; Shader, 2003). This includes multiple longitudinal research projects, such as the prospective PYS (Loeber et al., 1998) and the Dunedin cohort study (Odgers, Milne, Caspi, Crump, Poulton & Moffitt, 2007). The effect of parental

criminality on antisocial behaviours has also been replicated with young adults. Baker and Mednick (1984) compared violent crime arrest rates in samples of men (ages 18-23) with and without criminal fathers, and found men with criminal fathers to be 3.8 times more likely to have committed violent offences. Interestingly, some evidence suggests that antisocial conduct is learned in criminal families, rather than occurring as the result of a biological predisposition (Moffitt, 1987).

Parental use of illicit substances has also been found to be related to children's antisocial behaviour. In one study of 1,252 participants from the Minnesota Twin Family Study, Marmorstein, Iacono and McGue (2009) found that young people with alcohol and drug-dependent parents had about two to three times the odds of developing an externalizing disorder by late adolescence compared with young people who did not have alcohol and drug-dependent parents. Such effects may be the result of both genetic and environmental (e.g., being reared by a drug-dependent father) risk influences (Haber, Bucholz, Jacob, Grant, Scherrer, Sartor Duncan & Heath, 2010).

Delinquent siblings: Having a delinquent sibling has been identified as a risk factor for criminal behaviour (e.g., Farrington, 1989; Farrington & Painter, 2004). This effect has been observed in both males and females (Wong et al., 2010), though the effect may be stronger for females (Williams, 1994). Furthermore, sibling delinquency appears to have a stronger negative impact during adolescence, rather than earlier in the youth's development (Maguin, Hawkins, Catalano, Hill, Abbott & Herrenkohl, 1995). In their longitudinal study, Herrenkohl and colleagues (2000) found that sibling delinquency at age 16 more than doubled the odds of offending at age 18. Yet this relationship was not significant for sibling delinquency measured at ages 10-14.

3.2.2 Parent-child separation

Many studies have demonstrated that parent-child separations (also referred to as disrupted families) are predictive of delinquent and criminal behaviour (Baron, 2003; Baron & Hartnagel, 1998; Bender, Thompson, McManus, Lantry & Flynn, 2007; Demuth & Brown, 2004; Jonson-Reid & Barth, 2000; Kierkus & Baer, 2002; Lynam et al., 2009; McCord et al., 2001; Rebellon, 2002; Ryan, Hong, Herz & Hernandez, 2010; Ryan, Marshall, Herz & Hernandez, 2008; Ryan & Testa, 2004; Sampson & Laub, 1994; Ward et al., 2010). The literature includes several meta-analyses that have yielded small but significant effect sizes ranging from .18 to .07 (Cottle et al., 2001; Derzon, 2010). Though a wide range of definitions have been applied to this category, it can broadly be operationalized as *any permanent or temporary separation from a biological parent as a youth, typically before the age of 16* (e.g., Farrington, 1992a; United States Public Health Service, 2001). Subcategories of parent-child separation frequently studied include broken homes (i.e., parents divorced or separated); single parent households; foster care, group homes and other alternative care placements; and being homeless.

In an investigation of the relationship between family structure and delinquency, Kierkus and Hewitt (2009) compared adolescents living in a non-traditional home (i.e., single parent, single parent + stepparent, single parent + other relative) with those living with both biological parents. Living in a non-traditional home was related to increased odds of each type of delinquent behaviour measured, remaining virtually unchanged with control variables (e.g., SES, family size, age). Furthermore, separation from parents before the age of 10 has been shown to predict convictions up to the age of 32, independent of other factors such as family income and poor school achievement (Farrington, 1993).

When examining the influence of parent-child separation on criminal behaviour and delinquency, it is important to consider that separation may be due to a plethora of additional stressors aside from parental conflict, child maltreatment and reduced economic circumstances (Farrington, 2009). For instance, youth residing in an intact home with high conflict can show similar levels of delinquency as youth from broken homes (e.g., Hass, Farrington, Killias & Sattar, 2004). Furthermore, when considering living in an intact versus broken home as a child, differences in delinquency and adult criminal behaviour are often reduced when controlling for SES (Crockett, Eggebeen & Hawkins, 1993; Hay, Forston, Hollist, Alzheimer & Schaible, 2006).

3.2.3 Parental conflict

Exposure to parental conflict, including domestic violence, predicts delinquency and criminal behaviour. Although not as extensively studied as some of the other family domain risk factors with respect to delinquent youth and young adult offending, studies have demonstrated that exposure to parental conflict is a risk factor for delinquency (Buehler, Anthony, Krishnakumar, Stone, Gerard & Pemberton, 1997; Derzon, 2010; Henry, Caspi, Moffitt & Silva, 1996; Jenkins & Smith, 1991; Loeber et al., 1998; West & Farrington, 1973). Furthermore, witnessing father-initiated intimate violence has been found to be predictive of male and female offending, even when controlling for the potential influence of other risk factors such as family income, parental physical punishment and parental criminality (Fergusson & Horwood, 1998). Research suggests parental conflict may be particularly important in adolescence. In a prospective study of risk for youth violence using data from the SSDP, potential risk factors for violence at age 18 were measured at ages 10, 14 and 16. Although family conflict was insignificant at age 10 (odds ratio of 1.05), its strength as a predictor for violence increased through adolescence (odds ratios for ages 14 and 16 were 1.61 and 2.16, respectively) (Herrenkohl et al., 2000). There is some indication that **gender differences** may also exist in the relationship between parental conflict and delinquency, with a stronger association for females than males (Kosterman et al., 2001).

3.2.4 Poor family management practices

Poor family management is associated with an increase in serious delinquency in childhood and adolescence, as well as later adult criminal behaviour (e.g., Elliott, Huizinga & Ageton, 1985; Fagan et al., 2007; Hawkins, Herrenkohl et al., 1998; McCord, Widom & Crowell, 2001; Roitberg & Menard, 1995; Wasserman & Seracini, 2001). Meta-analytic reviews have shown poor family management practices to be a risk factor with small to moderate effect sizes (Derzon, 2010; Hoeve et al., 2009). However, wide variation is evident in the measurement of family management practices across studies. For instance, *poor family management* comprises poor supervision, inconsistent rules and harsh discipline in the SSDP (Herrenkohl et al., 2000), and items such as lack of clarity about rules in the family and poor monitoring by parents in analyses by the International Youth Development Study (Herrenkohl, McMorris, Catalano, Abbott, Hemphill & Toumbourou, 2007). Similarly, a report prepared by the United States Public Health Service (2001) broadly described *poor family relations* as consisting of: punitive and inconsistent discipline; low parental involvement, supervision and warmth; negative attitudes toward child; poor parent-child relations; poor parenting practices; and harsh child discipline.

The term *poor relationship with family* has also been used and defined in terms of unclear rules, lack of interest, lack of consultation, inconsistent discipline, lack of supervision and poor relationship (Case & Haines, 2007). Finally, in a meta-analysis by Cottle and colleagues (2001), *family problems* had the fourth largest effect size (.28), yet this factor was not clearly defined. Overall, there appears to be much confusion in the literature surrounding the conceptual and operational definition of *poor family management practices* as well as its subcategories. Commonly researched components of poor family management as risk factors for delinquency are: (1) poor monitoring and supervision; (2) harsh, inconsistent, or lax discipline; and (3) low parental support.

Poor parental monitoring and supervision: Poor parental monitoring and supervision is perhaps the strongest and most replicable of the family management factors as a predictor of delinquency (Smith & Stern, 1997; Farrington, 2009) for both males and females (Fagan et al., 2007; Latimer et al., 2003). Empirical studies have consistently shown this relationship, wherein youths are less likely to engage in delinquent behaviour the more highly they are monitored by their parents (e.g., Chesney-Lind, 1987; Derzon, 2010). Parental monitoring, including parental knowledge, active monitoring by parents, or child disclosure, has been strongly linked to criminal behaviour across age groups in the expected directions (effect sizes ranging from .23 to -0.31) (Hoeve et al., 2009). Furthermore, both maternal and paternal monitoring have been negatively correlated with delinquency (Cota-Robles & Gamble, 2006).

This relationship, however, may not hold true in some circumstances. For instance, increased parental control and perceived lack of parental supervision has been associated with increased criminal behaviour in early adulthood (Scholte, 1999). Latimer and colleagues (2003) also found discrepant associations between parental monitoring and delinquency. In their analysis of the NLSCY data, monitoring was positively correlated with drug-trafficking, negatively correlated with violent and sexual offending, and not correlated with general offending and property offending. It is worthy of note that studies examining delinquent peer associations have found that poor parental supervision increases the likelihood of developing delinquent peer associations (Aseltine, 1995; Ingram, Patchin, Huebner, McCluskey & Bynum, 2007; Sampson & Laub, 1993; Warr, 2005). In this regard, the association between delinquent peer associations and delinquent behaviour may be moderated by poor parental monitoring, such that young people with delinquent peer associations may be more likely to commit crimes in the presence of poor parental monitoring as opposed to good parental monitoring. In other words, parental monitoring moderates the relationship between delinquent peer associations and delinquent behaviour.

Harsh, inconsistent and/or lax discipline: Inappropriate discipline, which includes lax or permissive parenting (e.g., inadequate limit-setting), inconsistent parenting and/or harsh parenting (including physical punishment), has been identified as a risk factor for delinquency (e.g., Haapasalo & Pokela, 1999; Hawkins, Herrenkohl et al., 1998; Loeber et al., 1998; Patterson et al., 1989). Derzon (2010) identified discipline (comprising consistent versus inconsistent discipline, paternal punitive method of discipline, frequency of “smacking” or spanking) as a predictor of both criminal and violent behaviour.

Some authors have investigated different types of parenting styles and found authoritarian parenting to be one of the most important risk factors for violent offending (Farrington, 1991; 1994), though effect sizes vary across studies (Loeber & Stouthamer-Loeber, 1986). Authoritarian parenting refers to coercive, firm and restrictive disciplinary techniques, such as harsh punishment and affection withdrawal (Baumrind, 1971), and can overlap with low parental support and high parental control and monitoring.

Low parental support: One of the key dimensions used to assess the quality of child-rearing behaviours is parental support, also referred to as parental warmth, low parental empathy, acceptance-rejection and responsiveness (Hoeve et al., 2009). This factor consists of parental behaviours that encourage the child to feel accepted, comfortable and approved (Rollins & Thomas, 1979). Some have argued that parental support falls into a one-dimensional continuum (e.g., Ten Haaf, Janssens & Gerris, 1994) and can be defined using a range of behavioural aspects of support, such as acceptance, nurturance, warmth, hostility and rejection. For example, a meta-analysis of 22 studies on low parental support found this factor to be predictive of criminal behaviour (Derzon, 2010). This risk factor was labelled *warmth and relationship* and comprised the following: accepting versus rejecting parent; child’s identification with parent; closeness to parents; conflict in relationship with father; mother shows little or no warmth to child; much conflict between parent and child; and paternal rejection of child. For example, Rothbaum and Weisz (1994) found parental reinforcement and responsiveness to be related to antisocial behaviour in children. Moreover, the presence of cruel, passive, or neglectful parental attitudes, inconsistent or harsh discipline, or poor supervision measured at age 8 roughly doubled the risk of subsequent juvenile delinquency (West & Farrington, 1973). Lastly, maternal depression has been shown to undermine effective parenting behaviour (Kim-Cohen, Moffitt, Taylor, Pawlby & Caspi, 2005) and parental self-efficacy (Weaver, Shaw, Dishion & Wilson, 2008), leading to an increased risk for antisocial behaviour in children. Overall, supportive parenting behaviours are negatively linked to delinquency and recidivism (Barnes & Farrell, 1992; Juang & Silbereisen, 1999; Scholte, 1999; Wong et al., 2010).

Gender differences have been reported across studies, although inconsistently. For example, whereas parental nurturance has been negatively correlated with delinquency in males but not in females (Latimer et al., 2003), poor emotional family ties have been more strongly linked to delinquency in females than males (Heimer & DeCoster, 1999). There is some indication that the link between parental support and delinquency may be more pronounced in same-sex parent-child pairs. A longitudinal analysis of parental

support identified female delinquency as related to poor maternal support but not to paternal support. Likewise, male delinquency was not associated with low maternal support (Landsheer & Van Dijkum, 2005). In perhaps the most comprehensive review of delinquency and parental support and control, Hoeve and colleagues (2009) found parental support to be strongly linked to delinquent behaviour in both males and females. When considering the influence of gender, the link between poor parental support and delinquent behaviour was strongest for mothers and daughters and fathers and sons. Furthermore, paternal supportive behaviour had a stronger relation to delinquency than maternal supportive behaviours.

Attachment: Comparatively less research has been conducted on the association between attachment and delinquency, yet results suggest parental attachment is a possible protective factor (Cernkovich & Giordano, 1987; Sampson & Laub, 1994). For example, mother-adolescent attachment has been linked to a reduced risk for delinquency, particularly for males (Cota-Robles & Gamble, 2006). However, definitions of attachment have varied. Furthermore, if parents are antisocial, parental attachment can actually increase delinquency (Hawkins, Herrenkohl et al., 1998).

3.2.5 Child maltreatment

Child maltreatment has been implicated in the etiology of delinquency, whereby a history of emotional or physical neglect, or physical, sexual or emotional abuse, have been reported to increase the likelihood of antisocial and delinquent behaviour (Bender, 2010; Bergen, Martin, Richardson, Allison & Roeger, 2004; Chang, Chen & Brownson, 2003; Crooks, Scott, Wolfe, Chiodo & Killip, 2007; Malinosky-Rummell & Hansen, 1993; Ryan & Testa, 2004; Scudder, Blount, Heide, Silverman, 1993; Stewart, Dennison & Waterson, 2002; Swanston, Parkinson, O'Toole, Plunkett, Shrimpton & Oates, 2003; Verrecchia, Fetzer, Lemmon & Austin, 2010; Zingraff, Leiter, Myers & Johnsen, 1993). This effect has been consistently documented in meta-analyses, with larger effect sizes reported for nonviolent versus violent behaviour (e.g., ES = .21 and .10, respectively) (Derzon, 2010). Youth may be at an increased risk for delinquency when multiple forms of maltreatment are experienced (Cuevas, Finkelhor, Ormrod & Turner, 2009; Ford, Elhai, Connor & Frueh, 2010).

Regarding the age at which maltreatment is experienced, accumulating evidence suggests that a late onset of maltreatment may be particularly detrimental as a risk factor for delinquency. Investigating maltreatment duration and frequency, Thornberry, Ireland and Smith (2001) found that maltreatment affected such outcomes as delinquency and violence among youths with a history of persistent (childhood and adolescence) or adolescence-only maltreatment, but not youths who experienced maltreatment in childhood only. Adolescent maltreatment has been reported to increase the odds of early adulthood offending, even when controlling for the effects of demographic, family and other risk factors (Smith, Ireland & Thornberry, 2005). In fact, adolescence-onset maltreatment has been identified as one of the strongest contributors to youth incarceration (Jonson-Reid & Barth, 2000).

Gender differences suggest that child maltreatment may have a larger negative influence on female, compared with male, offending (e.g., Hubbard & Pratt, 2002; Rivera & Widom, 1990). Research on incarcerated women and delinquent girls consistently shows that females experience higher rates and longer durations of abuse and neglect, and this is true of both community comparisons of non-offending females (Moffitt, Caspi, Rutter & Silva, 2001) and samples of delinquent or incarcerated males (McClellan, Farabee & Crouch, 1997; Miller, Trapani, Fejes-Mendoza, Eggleston & Dwiggin, 1995). Furthermore, a Canadian study conducted by Latimer and colleagues (2003) found that victimization (being threatened or physically attacked) accounted for the third largest variation in general offending among more than 30,000 youths. Yet, when gender-specific analyses were run, this variable was significant only for females. Parents' threatening to hit or actually hitting children was also unique to females. A qualitative comparison of maltreatment and offending found that more than half of females identified victimization as an influence on their offending, compared with two-fifths of males believing that their maltreatment led to troubles with offending (Belknap & Holsinger, 2006).

Physical neglect may be the most criminogenic form of childhood maltreatment. Most studies investigating the relative impact of subtypes of childhood maltreatment show neglect as producing the strongest effects on delinquency and incarceration (e.g., Jonson-Reid & Barth, 2000; Smith, Ireland & Thornberry, 2005; Verrecchia et al., 2010). This association with criminal behaviour may be partially explained by poor parental supervision, in that children who experience neglect are less likely to receive appropriate parental supervision and monitoring than children who do not experience neglect (e.g., Lemmon, 1999).

3.2.6 Large sibship

Some research has found that being from families with four or more children increases the risk of delinquency (Derzon, 2010; Farrington & Loeber, 1999; Newson, Newson & Adams, 1993; Wasserman & Seracini, 2001). In one study, the percentage of delinquent boys in the English National Survey of Health and Development decreased from 24% when families consisted of four or more children to 9% for families with one child (Wadsworth, 1979). Farrington (1979, 1992b) also found large sibship predicted both juvenile and adult convictions. After analyzing the possible influence of various other risk factors, such as poor supervision, parent-child separation, parental criminality and socioeconomic deprivation, Brownfield and Sorenson (1994) concluded that the most plausible association between large sibship and delinquency was through delinquent siblings.

3.2.7 Low socioeconomic status (SES)

“It is clear that antisocial children disproportionately come from low SES families” (Farrington, 2009, p. 701). One of the most extensively examined variables in the relationship between family risk factors and criminal behaviour is family SES. Derzon (2010) analyzed the link between SES and criminal behaviour after identifying 533 reports of this relationship across 46 independent samples. A total of 133,525 people contributed to an overall effect size of .17. Despite a handful of studies that have not found economic disadvantage to be associated with delinquency (White et al., 2001; Wilkström & Loeber, 2000), coming from a low SES family is considered a risk factor for delinquency (Hay et al., 2006; Kierkus & Hewitt, 2009; Latimer et al., 2003; Lipsey & Derzon, 1998; Parker & Morton, 2009; Raine et al., 2005). **Gender differences** have been reported with respect to this relationship; family SES appears to be more strongly associated with female offending (Farrington & Painter, 2004; Latimer et al., 2003). Across studies, family SES can refer to family income, type of housing, parents’ education, or occupational prestige. However, Farrington (1992a; 1992b; 2009) identified low family income and poor housing as superior measurement indices for predicting juvenile and adult offending.

Although family SES is typically measured in conjunction with juvenile offending, further in their development, their own socioeconomic deprivation may be related to their criminal behaviours (Farrington, 2009). For example, Farrington, (1986b) found job instability at age 18 to be the strongest independent predictor of convictions between 21–25 years of age. This may also contribute to non-significant findings for delinquency in samples of late-adolescents and young adults where SES was measured in terms of the family rather than the individual (e.g., Fergusson, Swain-Campbell & Horwood, 2004). Similarly, it has been argued that low SES has a greater effect on the maintenance – rather than the onset – of offending due to the fact that those living in poverty have fewer opportunities for successful prosocial transitions into adult roles (Elliot, 1994).

3.3 Peer domain

As youth proceed through adolescence into young adulthood, the influence of their parents and families becomes augmented (some might say supplanted) by the influence of the young person’s peers and peer group (DiLalla, Bell & Long, 2009; Ingram et al., 2007). The major factors within the peer domain are: (1) antisocial/delinquent peer associations; (2) gang membership; and (3) peer rejection (Herrenkohl, Guo,

Kosterman, Hawkins, Catalano & Smith, 2001; Shader, 2003; Thornberry & Krohn, 2003; United States Public Health Service, 2001; van Lier & Koot, 2008). Delinquent siblings has also been captured within this category by several reviewers (e.g., Loeber & Farrington, 2000), as discussed in the previous section on the family domain.

3.3.1 Antisocial/delinquent peer associations

Association with antisocial peers has been identified as an important risk factor for delinquency (Andrews & Bonta, 1998; Bender, 2010; Fagan et al., 2007; Loeber & Farrington, 1998; Maguin et al., 1995; McCord et al., 2001; Piquero, Gover, MacDonald & Piquero, 2005; Scholte, 1999). Conversely, spending time with peers disapproving of antisocial behaviours may be a protective factor for later delinquency and adult offending (Elliot, 1994). Association with antisocial peers consists of having close friends who engage in antisocial behaviours, such as stealing and getting into fights (Fagan et al., 2007). Delinquent behaviour within antisocial peer groups may be attempts to gain respect, popularity, or avoid ridicule (Ness, 2004; Warr, 2002). The process by which antisocial peer groups reinforce delinquent behaviour is referred to as *deviancy training* (Dishion & Piehler, 2007). Deviancy training was observed in an interesting study by Tom Dishion and his colleagues (Dishion, Spracklen, Andrews & Patterson, 1996). In this study, 186 pairs of boys (one of whom was a high-risk youth interacting with a friend) were brought into a research laboratory and asked to interact in several problem-solving tasks. Their interactions were videotaped by the researchers and subsequently coded to assess both normative and rule-breaking talk during the task. The boys' reactions during the interactions and their discussions were coded as either positive (i.e., characterized by laughter) or negative (i.e., characterized by pauses in the conversation). Finally, the boys were followed up two years later for criminal behaviour based on both self-report and police records. The results indicated that boy pairs who were subsequently found to have a criminal record (i.e., both boys had been arrested) had spent more time discussing deviant topics and less time discussing normative topics than pairs in which neither boy or only one boy had an arrest; pairs when both boys had been arrested also showed more approval for deviant topics (through laughter). Dishion and colleagues (1996) concluded that the types of social interaction that reinforce the rule-breaking discussions that they observed in their study (i.e., providing approval and acceptance for antisocial values and attitudes) are indications of the deviancy training that takes place within delinquent peer groups on the streets.

The effects of delinquent peer association may be particularly acute for individuals aged 12-17 (Lipsey & Derzon, 1998). There is some indication that delinquent peers have less influence earlier in development, such as during childhood (Hawkins et al., 2000; Moffitt, 1993). Fleming and colleagues (Fleming, Catalano, Haggerty & Abbott, 2010) offer an example of disparate results by age at time of association with delinquent peers. In this longitudinal study of 1,040 students enrolled in public schools, having delinquent peers (as defined by peer engagement in fights, alcohol use and a variety of other negative behaviours) in grade 5 was not associated with committing a crime by age 19. Yet, reporting delinquent peer association between grades 9 and 12 was significantly related to crime in the expected direction. For adolescents, a review of the literature on risk factors (Hawkins, Herrenkohl et al., 1998) identified peer antisocial behaviour to be the strongest predictor of violence by age 14. Similarly, association with delinquent peers accounted for the second largest variation in general delinquency in a sample of more than 4,000 adolescents aged 12-15 (Latimer et al., 2003). An exception may be found in sexual offences, in that adolescent sex offenders appear to have significantly fewer delinquent peers compared with non-sexual offenders (Seto & Lalumière, 2010).

Gender differences suggest that, as with many studies of criminal behaviour, more research on the association between antisocial peers and delinquency has been conducted on males than on females. Whereas results for male youth demonstrate a consistent positive relationship between antisocial peers and delinquency, studies including female youth have yielded mixed results. In some instances, results have suggested that antisocial peers have a similar effect regardless of gender (Fergusson, Swain-Campbell & Horwood, 2002; Wong et al., 2010); other studies suggest a greater influence of antisocial peers on male delinquency (e.g., Fagan et al., 2007).

3.3.2 Gang membership

Although gang membership can overlap greatly with delinquent peer association, some research suggests that membership in a gang *amplifies* delinquency beyond the risk conferred by association with delinquent peers not affiliated with a gang (Battin, Hill, Abbott, Catalano & Hawkins, 1998; Thornberry, 1998). Additional studies have identified gang membership as a contributor to the risk for delinquency in general (Dishion, Véronneau & Myers, 2010; Shader, 2003). In a longitudinal study of violence, gang membership at ages 14 and 16 was reported to be a predictor of violence at age 18 for both male and female youth (Maguin et al., 1995). This finding was replicated in a later study using the same SSDP dataset, with gang membership at age 16 more than tripling the odds of later violence and gang membership at age 14 quadrupling the odds (Herrenkohl et al., 2000). No study describing potential gendered effects of gang membership on delinquency or gang membership before age 12 could be located.

3.3.3 Peer rejection

Peer rejection is a process whereby the child is actively rejected by his or her peers. This process is different from peer withdrawal, in which the experience tends to be more passive and asocial rather than antisocial. Whereas peer withdrawal is associated with shyness and subsequent (perhaps lifelong) feelings of loneliness, peer rejection tends to be associated with a range of maladaptive outcomes, including mental health problems and delinquency (van Lier & Koot, 2008). It is estimated that 5-10% of children experience chronic peer rejection (Boivin & Vitaro, 1995). Peer rejection may or may not be associated with peer victimization, which is defined here as the experience of being bullied (overtly through physical aggression or covertly through relational aggression) by one's peers. The pathway from peer rejection to delinquency appears to be linked to early aggressive behaviour, which puts the child onto a protracted pathway characterized by transactional experiences of further peer rejection, victimization and a stable-high rate of aggressive behaviour. As such, peer rejection does not cause aggression; rather, aggression causes peer rejection and peer rejection maintains the aggressive behaviour. That is, early aggression is a risk factor for later peer rejection, which then becomes a risk factor for later delinquent behaviour. It is thought that the causal link between peer rejection and delinquency is through: (a) development of biased social information processing and hostile attribution errors and (b) a lack of opportunity to both develop prosocial behaviour and "unlearn" aggressive social behaviour (van Lier & Koot, 2008). Note that peer rejection may also be correlated with other individual, academic, or environmental risk factors, such as impulsiveness, ADHD, learning problems and poor academic achievement, and low SES. Lastly, there is also some evidence that younger children are more susceptible to the adverse effects of peer rejection than older children.

3.4 School domain

Within the school domain, the following risk factors have been found to be associated with antisocial and delinquent behaviour: (1) poor academic performance; (2) poor school attendance (i.e., suspension, expulsion, truancy and dropping out); and (3) low school bonding (e.g., Loeber et al., 2008; Loeber, Slot & Stouthamer-Loeber, 2008; Valois, MacDonald, Bretous & Fischer, 2002).

3.4.1 Poor academic performance

Poor academic performance (also referred to as poor academic achievement) is related to delinquency and criminal convictions (Blum, Ireland & Blum, 2003; Chang et al., 2003; Crosnoe, Erickson & Dornbusch, 2002; Fagan et al., 2007; Herrenkohl et al., 2000; Herrenkohl et al., 2001; Resnick, Ireland & Borowsky, 2004; Zingraff, Leiter, Johnsen & Myers, 1994). Although the effects are small, poor academic performance has consistently predicted later delinquent behaviours (e.g., Denno, 1990; Farrington, 1989; Maguin & Loeber, 1996; McCord et al., 2001; United States Public Health Service, 2001). This risk factor appears

to begin to exert a stronger effect in early adolescence (Hawkins et al., 2000). For example, Herrenkohl and colleagues (2000) found low academic performance, measured at ages 10, 14 and 16, to be a significant risk factor for violent behaviours at age 18, with the odds of being violent increasing with age (ORs of .65, 2.5 and 2.7, respectively). As such, academic failure has been identified as a risk factor for delinquent behaviour that is perhaps more relevant for those aged 12 and older (Latimer et al., 2003; Maguin et al., 1995; Shader, 2003). Academic performance is typically measured by self-reported grades or teacher-reported performance across various domains, such as reading, language and mathematics (e.g., Fleming et al., 2010; Herrenkohl et al., 2007).

At the same time, the relationship between academic performance and antisocial and delinquent behaviour may belie a complex causal chain from distal to more proximal risk factors. For example, McGee and colleagues (2011, p. 4) noted that the relationship between poor performance at school as an adolescent and delinquent behaviour “may be a result of cumulative difficulties associated with early childhood aggression.”

In an examination of the effects of family, school and temperament factors in preadolescence on adolescent delinquency, academic performance was found to be both a protective and risk factor for serious delinquent behaviour. Low performance was negatively associated with non-delinquent group membership (van der Laan et al., 2010). Analyzing SSDP data, Kosterman and colleagues (2001) reported early school achievement, measured at age 10, to best predict adult persistent violence, along with male gender and antisocial influences (also measured at age 10). This factor was operationalized as the average of reading, math and language subjects from the California Achievement Test. Violence has also been observed to increase with greater learning difficulties (Blum et al., 2003). **Gender differences** suggest that poor academic performance may be a stronger risk factor for females, but results have been mixed (e.g., Hawkins et al., 2000; Wong et al., 2010). The NLSCY found a unique correlation between repeating a grade and female delinquency, the second strongest predictor after negative school behaviour (Latimer et al., 2003).

3.4.2 Poor school attendance

Research generally supports the hypothesis that poor school attendance (i.e., suspension, expulsion, truancy and dropping out) is a risk factor for delinquency (Chang et al., 2003; Hawkins et al., 2000; Lederman, Dakof, Larrea & Li, 2004; Lipsey & Derzon, 1998; McCord et al., 2001; Zhang, Katsiyannis, Barrett & Willson, 2007). This is commonly investigated by measuring the frequency of suspensions, expulsions and truancy, and/or a failure to complete high school. In Cycle III of the NLSCY, truancy and suspension accounted for the largest variation in general delinquency in 12- to 15-year-olds, self-reported for the 12 months preceding administration of the survey. Likewise, this variable accounted for the largest variation in drug trafficking, violent offending and male/female regressions of general delinquency (Latimer et al., 2003).

Furthermore, truancy puts youth at risk for later adult offending (e.g., McCluskey, Bynum & Patchin, 2004). Farrington (1989) found that high truancy between the ages of 12-14 predicted later violent behaviour in adolescence. Dropping out of school before the age of 15 was also associated with a higher rate of delinquency as these youth aged. Youth in foster care are at an elevated risk for delinquency if they are suspended from school (Ryan, Testa & Zhai, 2008), and are more likely to have a chronic offending trajectory when not enrolled in school compared with their school-enrolled counterparts (Ryan, Hernandez & Herz, 2007). Conclusions regarding the independent effect of poor school attendance on delinquency should be drawn carefully as it may be related to other factors that predict antisocial behaviour, such as family conflict, low SES and school bonding (e.g., Hawkins et al., 2000).

3.4.3 Low school bonding

Low school bonding (also referred to as attachment or commitment to school) has been identified as a risk factor for delinquency among both males and females (Catalano & Hawkins, 1996; Frey, Ruchkin, Martin & Schwab-Stone, 2009; Kosterman et al., 2001; Williams, 1994; Zingraff et al., 1994). This factor corresponds to an amalgamation of items including: educational aspirations; positive regard for school, teachers, classes and academic performance; effort put forth and interest in school; and/or completion of assignments and extra work (e.g., Fleming et al., 2010; Kosterman et al., 2001).

The Raising Healthy Children Project followed 1,040 children in the first and second grade through grade 12 by means of family reports, teacher reports and self-reports. Fleming and colleagues (2010) reported that lower levels of school bonding between grades 5 to 8 and grades 9 to 12 were related to a greater likelihood of criminal behaviour at age 19. Low educational aspiration, measured at age 14 and 16 (but not at age 10), has been demonstrated to increase the risk of engaging in violent behaviour at age 18 (Herrenkohl et al., 2000; Maguin et al., 1995).

Similar results have been documented for low school commitment, increasing the odds of violent or serious delinquency at age 18 by 1.9 and 1.8 (measured at ages 14 and 16, respectively) (Herrenkohl et al., 2000). Moreover, strong connections to school may buffer youth against further involvement in delinquency. Subsequent formation of bonds after the onset of delinquency appears to promote desistance from crime in late adolescence (Chung et al., 2002). A **gender difference** has been found in that the link between offending and school bonding may be more salient for females than for males (Latimer et al., 2003; Hart, O'Toole, Price-Sharps & Shaffer, 2007), though no differences were found between males and females with respect to the relationship between school factors and delinquency when considering European studies only (Wong et al., 2010).

Construct overlap is particularly evident for this risk factor, as several authors have measured *poor school attachment* by including items related to repeating a grade, early withdrawal from school and skipping class (Herrenkohl et al., 2007; McCord et al., 2001; Thornberry, Lizotte, Krohn, Farnworth & Jang, 1991). Shader (2003) and Hawkins and colleagues (2000) reported *school attitude and performance* to be a risk factor for delinquency for youth aged 6-11 and 12-14.

3.5 Community/neighbourhood domain

Within the community/neighbourhood domain, two factors appear to influence antisocial and delinquent behaviour: (1) community disadvantage; and (2) community safety/violence (e.g., DeCoster, Heimer & Wittrock, 2006; Ingoldsby & Shaw, 2002; Lynam, Caspi, Moffitt, Wilkström, Loeber & Novack, 2000; Sampson, Raudenbush & Earls, 1997). Ascertaining the direct, indirect and moderated effects of community variables on delinquent behaviour, however, has been a challenge in the literature (Farrington, 2009; Rosario, Salzinger, Feldman & Ng-Mak, 2003). Many of the findings reported in the literature have been correlational in nature (Ingoldsby & Shaw, 2002) and there is a need for more fine-grained analyses to identify and test potential causal pathways, particularly within a developmental framework. Some suggested areas for further investigation are examining community variables related to ethnicity, gender, parenting behaviours and children's coping abilities (Ingoldsby & Shaw, 2002; Rosario et al., 2003). Moreover, it has been suggested that the effects of the community on child delinquency will be weak relative to other variables such as poor parenting behaviour or violence witnessed in the home or school, because of its more distal relation to the child. This is consistent with Bronfenbrenner's ecological model (Mrug & Windle, 2010). However, this assertion has not always held up in the literature (McCabe, Lucchini, Hough, Yeh & Hazen, 2005).

3.5.1 Community disadvantage

The community in which youth and young adults live is thought to influence criminal behaviour (e.g., Bursik & Grasmick, 1993; Loeber & Farrington, 2000; McCord et al., 2001; Osgood & Chambers, 2000; Thornberry et al., 1995; van der Merwe & Dawes, 2007). In particular, neighbourhood disadvantage (commonly referred to as community disadvantage) has been shown to have a small effect on delinquency for youth over the age of 11 ($ES = .17$) (United States Public Health Service, 2001). For example, DeCoster and colleagues (2006) reported that living in disadvantaged communities resulted in an increased likelihood of youth violence from grades 7 through 12. Similarly, discrepancies between African-American and Caucasian young adults (ages 18-25) in violence perpetration was explained by racial differences in exposure to risk factors, particularly living in disadvantaged neighbourhoods (Sampson, Morenoff & Raudenbush, 2005).

Neighbourhood disadvantage is a multidimensional construct, generally defined as some combination of the following community items: (1) proportion of population with incomes below the poverty line; (2) median household income; (3) adult unemployment rate; (4) male unemployment rate; (5) proportion of female-headed households; (6) racial composition or cultural heterogeneity; (7) residential stability; (8) immigration concentration; (9) proportion of households with public assistance income; and (10) neighbourhood rates of school dropout (e.g., Elliott, Wilson, Huizinga, Sampson, Elliott & Rankin, 1996; Morenoff, Sampson & Raudenbush, 2001; Peebles & Loeber, 1994; Piquero & Lawton, 2002; Sampson et al., 1997). Note that these characteristics refer to *structural* elements of the neighbourhood. More recently, researchers have begun to examine the influence of neighbourhood-level *social-process* elements, such as collective efficacy, on antisocial behaviour (Odgers, Moffitt, Tach, Sampson, Taylor, Matthews & Caspi, 2009; Sampson et al., 1997). Lastly, it has also been found that community disadvantage may interact with impulsivity to augment the adverse effects of the impulsivity. In other words, as noted in Section 2.4, the strength of a risk factor may be increased by its interaction with another risk variable. Though findings have been somewhat inconsistent (perhaps suggesting a role for other mediating and moderating variables), studies have shown that impulsive children growing up in relative privation tend to experience poorer outcomes than impulsive children growing up in relatively advantaged neighbourhoods (Lynam et al., 2000).

Although it has been consistently documented that offenders disproportionately live in disadvantaged neighbourhoods, it is difficult to determine the extent to which the neighbourhood, per se, influences criminal behaviour (Farrington, 2009). Furthermore, individual factors, parent characteristics and family processes may be considerably more predictive of antisocial behaviour than neighbourhood characteristics (McGee et al., 2011) and some authors have argued that community factors have only an indirect effect (e.g., Gottfredson, McNeil & Gottfredson, 1991). A study using structural equation modeling (SEM) has demonstrated that neighbourhood disadvantage exerts an effect on delinquency by way of family dysfunction and maternal depression, which leads to poor parenting practices and, ultimately, to poorer child outcomes (Kohen, Leventhal, Dahinter & McIntosh, 2008). Moreover, Tolan, Gorman-Smith and Henry (2003) reported that the relationship between community characteristics and violence tends to be mediated by family and peer risk factors (parenting practices, gang membership and peer violence). In addition, a study using Australian Bureau of Statistics census data, along with the Mater University Study of Pregnancy longitudinal data, found that neighbourhood disadvantage, measured at age 14, was not a significant predictor of antisocial behaviour. Finally, data from the PYS suggest that neighbourhood characteristics may have the greatest impact on crime for youth with greater protective factors. That is, boys identified as having a higher risk for delinquency were more likely to be serious offenders, regardless of the areas in which they lived, whereas those with high protective scores were more likely to engage in delinquent behaviour when they lived in a disadvantaged neighbourhood (Wilkström & Loeber, 2000).

3.5.2 Community safety/violence

Community safety/violence has been found to be associated with antisocial and delinquent behaviour (e.g., Mrug & Windle, 2010). For example, Zinzow, Ruggiero, Hanson, Smith, Saunders and Kilpatrick (2009) found that repeated incidents of witnessing community violence (e.g., muggings, threats with a weapon and beatings) placed youth at an increased risk of delinquency (OR = 2.96) in a population-based sample of 3,614 youth. Moreover, Ingoldsby & Shaw (2002) suggest that middle childhood may be a particularly vulnerable period for the negative influence of community safety factors on the onset of delinquency.

3.6 Risk factors for females

We conclude this discussion on major risk factors for antisocial and delinquent behaviour with comments and considerations of specific risk factors for females.

3.6.1 Mental health

Mental health problems may be especially relevant to females with respect to antisocial behaviour. Research consistently shows that female offenders suffer from higher levels of psychopathology than male offenders and females in the general population (Domalanta, Risser, Roberts & Risser, 2003; Golzari et al., 2006; Loeber & Keenan, 1994). This is particularly true of depressive symptomatology (Calhoun, 2001; Daigle, Cullen & Wright, 2007; Teplin, Abram, McClelland, Dulcan & Mericle, 2002). Moreover, studies have demonstrated that females with high levels of depressive symptoms are more likely to become delinquent (e.g., Daigle et al., 2007; Koons, Burrow, Morash & Bynum, 1997; Obeidallah & Earls, 1999). Delinquent females also are more likely to suffer from internalizing symptomatology and suicidal ideations than their male counterparts (e.g., Aalsma & Lapsley, 2001; Miller et al., 1995). McCabe, Lansing, Garland and Hough (2002) investigated sex differences with respect to psychopathology in a sample of 625 adjudicated delinquents who were, on average, 16 years of age. Results indicated that females were significantly more likely than males to meet DSM-IV diagnostic criteria for major depressive disorder, and females showed a general pattern of increased severity of psychological symptoms across disorders in comparison to males.

3.6.2 Intimate relationships

Romantic relationships have received some attention in the RFR literature, with studies demonstrating romantic relationships to be a unique risk factor for females (e.g., Agnew & Brezina, 1997; Cauffman, 2008; Haynie, 2003; Moffitt et al., 2001). For example, females self-reported delinquent behaviour was related to a high degree of antisocial encouragement from their current romantic partner (Cauffman, Farruggia & Goldweber, 2008). Furthermore, parental influence on delinquency may be reduced when adolescents are in an intimate relationship (Meeus, Branje & Overbeek, 2004).

For adult males, being married is associated with desistance from crime. This pattern is less common for females, and being in a romantic relationship may even reinforce antisocial behaviours (Cauffman, 2008; Sampson, Laub & Wimer, 2006). It is possible that the differential sampling of relationship partners accounts for some of the discrepancy between male and female offenders. Due to the greater criminal involvement of men, the probability that a male ex-offender will marry a prosocial female with no criminal history is far greater than the probability of a female offender becoming involved with a prosocial male (Sampson & Laub, 2005). Females are likely to draw romantic partners from different groups than men, based on varying offending and life experiences, especially when returning to high-crime neighbourhoods (Leverentz, 2006). Though men often marry women who provide a stake in conformity to social norms (Warr, 1998), women with a criminal history often have relationships with recovering drug-users or ex-offenders (Leverentz, 2006). As such, the intimate partners of female offenders may not provide the stability and influence necessary for an altered trajectory from crime.

4.0 Prototypical Questions for Measuring Risk Factors

We have drawn from various sources to identify prototypical items for each of the following major risk factors. These sources included the published literature as well as three large scale longitudinal studies, the PYS, DYS and NLSCY. With regard to the latter, a useful source for the NCPC project may be the large-scale, Ontario-based prevention and research project, Better Beginnings, Better Futures (BBBF). In particular, Appendix C (pp. 148-151) of the recent SRCD Monograph by Ray DeV. Peters and colleagues (Peters, Bradshaw, Petrunka, Nelson, Herry, Craig et al., 2010) provides a detailed list of the measured variables and their sources that were used for the BBBF project. Many of these came from the NLSCY. However, due to the lack of specific information about which particular items were used from the NLSCY to create the different scales, this document was *not* consulted in selecting items for the scales listed below. Presumably, this specific information could be provided by Ray Peters.

4.1 Individual domain

Risk factor: **Antisocial behaviour** (child report) (parent version also available)
 Scale: Self-report Antisocial Behavior Scale (SRA)
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 5-9 years
 No. of items: 32 items
 Sample items: *In the past six months...have you on purpose broken or damaged something belonging to your parents or other people in your family? Taken something from a store without paying for it? Hit, slapped, or shoved other kids or got into a physical fight with them?*

Risk factor: **Antisocial behaviour** (child report) (parent version also available)
 Scale: Self-report Delinquency Scale (SRD)
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 10-17 years
 No. of items: 32 items
 Sample items: *In the past six months...have you skipped classes or school without a good excuse? Carried a hidden weapon? Hit someone on purpose to hurt them?*

Risk factor: **Antisocial behaviour** (child report) (alternative scale)
 Source: NLSCY: Cycle 8: youth questionnaires (2008/2009) Book 2; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q3_V7-eng.pdf
 Age group: 12-17 years
 No. of items: select items from the NLSCY
 Sample items: *I steal at home; I get into many fights; I vandalize.*

Risk factor: **Substance use** (child report)
 Source: Centre for Addiction and Mental Health (2009). Ontario Student Drug Use and Health Survey (OSDUHS). Most recent version is available online at <http://www.camh.net/research/osdus.html>.
 Age group: 12-18 years
 No. of items: select items from the OSDUHS
 Sample items: *In the last 12 months, how often did you use...cannabis? Cocaine in the form of crack? MDMA or ecstasy?*

Risk factor: **Antisocial attitudes** (child report) (other scales for this construct, including parents' attitudes toward child's antisocial behaviours, are available from the PYS and DYS; Study Director: Dr. David Huizinga)
 Scale: Attitudes toward Delinquent Behavior

- Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 5-9 years
 No. of items: 12 items
 Sample items: *How wrong is it for someone your age to...skip school without an excuse? Take something from a store without paying for it? Hit an adult like his teacher or parent?*
- Risk factor: **Antisocial attitudes** (child report) (other scales for this construct are available from the PYS and DYS; Study Director: Dr. David Huizinga)
 Scale: Attitudes Toward Delinquent Behavior
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 10-17 years
 No. of items: 15 items
 Sample items: *How wrong is it for someone your age to...skip school without an excuse? Steal something worth \$50? Use a weapon, force, or strongarm methods to get money or things from people?*
- Risk factor: **Impulsiveness** (child report)
 Scale: The Barratt Impulsiveness Scale - 11th Version (BIS-11)
 Source: Patton, J. H., Stanford, M. S., & Barratt, E. S. (1995). Factor structure of the Barrett Impulsiveness Scale. *Journal of Clinical Psychology*, 51, 768-774.
 Age group: 12+ years
 No. of items: 30 items
 Sample items: *I plan tasks carefully; I am self-controlled; I am future oriented.*
- Risk factor: **Attention problems** (child and parent report) (ASEBA also measures **aggressive and delinquent behaviours**)
 Scale: Child Behavior Checklist (CBCL); Teacher-Report Form (TRF); Youth Self-Report (YSR)
 Source: Achenbach, R. (2005). Achenbach System of Empirically Based Assessment (ASEBA). In T. Grisso, G. Vincent, & D. Seagrave (Eds.), *Mental health screening and assessment for juvenile justice* (pp. 187-205). New York: Guilford.
 Age group: 6-18 years
 No. of items: 11 items (various across scales)
 Sample items: *Acts too young for his age; Can't sit still, restless, or hyperactive; Impulsive or acts without thinking.*
- Risk factor: **Callous-unemotional traits** (parent report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: generally up to 17 years
 No. of items: select items from the NLSCY
 Sample items: *How often would you say that this child...doesn't seem to feel guilty after misbehaving? Punishment doesn't change his behaviour? Is impulsive, acts without thinking? Has temper tantrums or hot temper?*
- Risk factor: **Psychopathy/callous-unemotional traits** (child and parent report)
 Scale: Antisocial Process Screening Device (parent, teacher and self-report versions available)
 Source: Frick, P. J., & Hare, R. (2001). *Antisocial Process Screening Device*. Toronto, Canada: Multi-Health Systems.
 Age group: 6-13 years
 No. of items: 20 items
 Sample items: *Lies easily and skilfully; Gets bored easily; Engages in risky or dangerous activities.*

Risk factor: **Child maltreatment** (child report)
 Scale: Child Trauma Scale (CTS)
 Source: Bernstein, D. P., Stein, J. A., Newcomb, M. D., Walker, E., Pogge, D., Ahluvalia, T., Zule, W. (2003). Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse and Neglect*, 27, 169-190.
 Age group: 12+ years
 No. of items: 28
 Sample items: *When I was growing up... I felt loved; I believe that I was physically abused; Someone molested me.*

Risk factor: **Intelligence** (assessed from the child)
 Scale: A standardized IQ test, such as the WISC or the Raven's Progressive Matrices
 Source: e.g., Raven, J., Court, J., & Raven, J. (1979). *Manual for the Raven's Progressive Matrices and Vocabulary Scales*. Oxford Psychological Press.
 Age group: 6-24 years
 No. of items: varies with scale and subscale
 Sample items: ---

4.2 Family domain

Risk factor: **Family management** (parent report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: 6-7 years
 No. of items: select items from the NLSCY
 Sample items: *How often do you feel you are having problems managing this child in general? How often when you discipline this child, does he ignore the punishment? How often do you have to discipline this child repeatedly for the same thing? Please tell me how often you, as his parent, do each of the following when this child breaks the rules or does things that he is not supposed to... use physical punishment?*

Risk factor: **Family separation** (mix of parent/child report items)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: 6-24 years for parent report items; 18+ years for child report items
 No. of items: select items from the NLSCY
 Sample items: *Based on the information we collected about the relationships of the people living in this household, this child is not currently living with his birth/adoptive father/mother/parents. Is this for some other reason? Have you ever moved away from your parents or guardians?*

Risk factor: **Attachment to parents** (child report)
 Source: Chung, I. J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
 Age group: 10-12 years
 No. of items: 4 items
 Sample items: *Would you like to be the kind of person your mother/father is? Do you share your thoughts and feelings with your mother/father?*

Risk factor: **Family discord** (parent report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf

- Age group: 6-24 years
 No. of items: select items from the NLSCY
 Sample items: *We express feelings to each other. There are lots of bad feelings in our family. We don't get along well together.*
- Risk factor: **Parental support/closeness** (child report)
 Source: NLSCY: Cycle 8: Youth questionnaires (2008/2009) Book 2; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q3_V7-eng.pdf
- Age group: 14-17 years
 No. of items: select items from the NLSCY
 Sample items: *How well do you feel that your mother understands you? Overall, how would you describe your relationship with your mother? How much fairness do you receive from your father?*
- Risk factor: **Family violence** (parent report)
 Source: DYS (Study Director: Dr. David Huizinga)
 Age group: 7-17 years
 No. of items: 28 items
 Sample Items: *During the last year how many times has your spouse/partner (have you)...slapped you (your spouse or partner)?... choked you (your spouse or partner)?... threatened you (your spouse or partner) with a knife or gun?*
- Risk factor: **Family violence** (parent report) (alternative scale)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
- Age group: 6-24 years
 No. of items: select items from the NLSCY
 Sample Items: *How often does this child see adults or teenagers in your house physically fighting, hitting or trying to hurt others?*
- Risk factor: **Parental supervision and monitoring** (child and parent versions available)
 Source: DYS (Study Director: Dr. David Huizinga)
 Age group: 7-17 years
 No. of items: 6 items
 Sample items: *Do your parents talk with you about what you actually did during the day? Do your parents know **who** you are with when you are away from home? Do you know how to get in touch with your parents if they are not at home?*
- Risk factor: **Family criminality** (parent report)
 Source: MacDonald, J. M., Haviland, A., & Morral, A. R. (2009). Assessing the relationship between violent and nonviolent criminal activity among serious adolescent offenders. *Journal of Research in Crime and Delinquency*, 46, 553-580.
- Age group: 13-17 years
 Sample items: *Dichotomous (yes-no) items of whether any of the respondent's parents (mother or father, including stepparents), siblings (brothers and sisters), aunts or uncles, or any other relative had ever been in jail.*
- Risk factor: **Family criminal behaviour** (parent report) (alternative scale)
 Source: DYS (Study Director: Dr. David Huizinga)
 Age group: 6-24 years
 No. of items: 17 items
 Sample items: *In the past year, have you ever...stolen or tried to steal money or things worth more than \$50? Gone or tried to go into a building to steal something? Driven a car while you were drunk?*

Risk factor: **Parents' educational aspirations for child** (parent report) (see also NLSCY survey Book 1 for alternative items)
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 5-17 years
 No. of items: 2 items (selected from a scale of 30 items on life goals)
 Sample items: *How far would you **like** him to go in school? How far do you **think** he will go in school?*

Risk factor: **Maternal age at birth** (parent report)
 Source: (Report authors' suggested wording)
 Age group: 6-24 years
 Sample items: *What was your age in years when _____ was born? (use 17 years or below as the cutpoint)*

Risk factor: **Parent education level** (parent report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 No. of items: 1
 Age group: 6-24 years
 Sample item: *What is the highest grade or level of education you have attended or completed?*

Risk factor: **Household socioeconomic status (SES)** (parent report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: 6-24 years
 No. of items: select items from the NLSCY
 Sample items: *What was the total household income from all sources...? Has this child ever experienced being hungry because the family has run out of food or money to buy food?*

4.3 Peer domain

Risk factor: **Association with a delinquent or deviant peer group** (child report)
 Source: MacDonald, J. M., Haviland, A., & Morral, A. R. (2009). Assessing the relationship between violent and nonviolent criminal activity among serious adolescent offenders. *Journal of Research in Crime and Delinquency*, 46, 553-580.
 Age group: 13-17 years
 No. of items: 8 items
 Sample items: *How many, of all the people you regularly "hang out" with...were involved in illegal activities? Used drugs in the past year? Shouted, argued or got into fights?*

Risk factor: **Association with a delinquent or deviant peer group** (child report) (alternative scale)
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 5-17 years
 No. of items: 12 items
 Sample items: *During the last six months, have any of your friends...skipped school without an excuse? Taken some money at home that did not belong to them, like from their mother's purse? Used drugs?*

Risk factor: **Gang membership** (child report)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: 6-24 years
 No. of items: select items from the NLSCY
 Sample item: *In the past 12 months, were you part of a gang that broke the law by stealing, hurting someone, damaging property, etc.?*

4.4 School domain

- Risk factor: **Academic achievement** (child report)
 Source: Chung, I. J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
- Age group: 10-12 years
 No. of items: 2 items (plus researchers used scores on the California Achievement Test obtained from school records)
 Sample items: *How are your grades compared to the grades of most kids in your class? How well do you read compared to the other kids of your age?*
- Risk factor: **School commitment** (child report)
 Source: Chung, I. J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
- Age group: 10-12 years
 No. of items: 2 items (plus researchers used scores on the California Achievement Test obtained from school records)
 Sample items: *I do extra work on my own in class; When I have an assignment to do, I keep working on it until is it finished.*
- Risk factor: **School attachment** (child report)
 Source: Chung, I. J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
- Age group: 10-12 years
 No. of items: 4 items (plus researchers used scores on the California Achievement Test obtained from school records)
 Sample Items: *I like school; Most mornings I look forward to going to school; I like my teacher this year; I like my class this year.*
- Risk factor: **School attachment** (mix of parent/child report items) (alternative scale)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
- Age group: 6-17 years
 No. of items: select items from the NLSCY
 Sample items: *With regard to how this child feels about school, how often does he look forward to going to school? Since the beginning of this school year, have you been suspended from school? During the past month, have you cut or skipped class without permission?*
- Risk factor: **Child's educational aspirations** (child report)
 Source: PYS (Study Director: Dr. Rolf Loeber)
 Age group: 5-17 years
 No. of items: 1 item (selected from a scale of 30 items on life goals)
 Sample items: *How far would you like to go in school? How far do you think you will go in school? How important is it for you...to have a high school diploma? To have a college education?*

4.5 Community/neighbourhood domain

- Risk factor: **Availability of drugs** (child report)
 Source: Chung, I. J., Hill, K. G., Hawkins, J. D., Gilchrist, L. D., & Nagin, D. S. (2002). Childhood predictors of offense trajectories. *Journal of Research in Crime and Delinquency*, 39, 60-90.
 Age group: 10-12 years
 No. of items: 3 items
 Sample items: *Do you know anyone who has tried marijuana? Have you ever had a chance to try marijuana? If you had the money, and wanted to get marijuana, do you think you could get some?*
- Risk factor: **Neighbourhood safety** (parent report)
 Source: DYS (Study Director: Dr. David Huizinga)
 Age group: 7-17 years
 No. of items: 31 items
 Sample items: *Please tell me whether you think each is a problem in your neighborhood, the place you lived most of the last year...High unemployment? Gambling? Assaults and muggings?*
- Risk factor: **Neighbourhood safety** (parent report) (alternative scale)
 Source: NLSCY: Cycle 8: Parent, child and youth components (2008/2009) Book 1; available from http://www.statcan.gc.ca/imdb-bmdi/instrument/4450_Q2_V7-eng.pdf
 Age group: 6-24 years
 No. of items: select items from the NLSCY
 Sample items: *It is safe to walk alone in this neighbourhood after dark? It is safe for children to play outside during the day? There are safe parks, playgrounds and play spaces in this neighbourhood.*



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TABLE 1 – LIST OF TERMS PERTAINING TO RISK FACTORS AND OUTCOMES

<p>Correlate: A correlate is a variable that shows a significant association with the outcome but for which a temporal precedence has not been established.</p>
<p>Risk Factor: A risk factor is an antecedent condition that is associated with an increase in the likelihood of a maladaptive outcome.</p>
<p>Causal Risk Factor: A causal risk factor is a risk factor that has been empirically shown to produce an outcome. In other words, alteration of the risk factor alters the likelihood, nature, or severity of the outcome.</p>
<p>Internal and External Risk Factors: A risk factor may be internal to the person, such as temperament or intelligence, or external or outside the person, such as exposure to harsh and punitive parenting behaviour.</p>
<p>Proximal and Distal Risk Factors: A risk factor may appear either proximal, that is, close in time to the event or onset of the behaviour, such as experiencing a stressful life event shortly before committing a crime, or distal, that is, distant in time to the event, such as experiencing multiple foster care placements in early childhood.</p>
<p>Static/Dynamic Risk Factors: A risk factor may either be static, that is, unchangeable, such as being born with fetal alcohol effect (FAE), or dynamic, that is, malleable or amenable to change, such as using drugs to cope with stressful life events.</p>
<p>Marker: A marker refers to a variable that has a relation to the outcome but is not considered a causal factor (e.g., baldness in relation to coronary disease).</p>
<p>Proxy Risk Factor: A proxy risk factor is a variable that shows an association with a strong risk factor for an outcome but itself may not have a connection to the outcome (e.g., parental physical abuse as a proxy risk factor for poor parenting behaviour, which may lead to ADHD).</p>
<p>Protective Factor: A protective factor is an antecedent condition that is associated with a decrease in the likelihood of a maladaptive outcome.</p>
<p>Promotive Factor: A promotive factor is related to protective factors and is a variable that is associated with a low probability of antisocial and delinquent behaviour even in the absence of risk factors.</p>

TABLE 2 – RANKING OF RISK FACTORS FOR ROBUSTNESS AS PREDICTORS OF ANTISOCIAL AND DELINQUENT BEHAVIOUR

Highly predictive/reliably replicated or researched/based on meta-analyses
<ul style="list-style-type: none"> • Male gender • Early age of onset for aggressive and antisocial behaviour • Hyperactivity, attention deficit, impulsivity and risk-taking • Low (verbal) IQ • General offending (largely based on US studies of early involvement with the justice system) • Precocious substance use (especially in middle childhood) • Antisocial attitudes and beliefs • Parental criminality/delinquent siblings • Poor family management practices <ul style="list-style-type: none"> → Poor monitoring and supervision, discipline is severe and inconsistent, lack of parental involvement, support and nurturance • Separation from parents <ul style="list-style-type: none"> → Broken home, single parent household, alternative care, homelessness, other non-traditional families • Child maltreatment • Poor academic achievement <ul style="list-style-type: none"> → Truancy and dropping out (reflective of low commitment and regard for school) • Delinquent peers/gang membership • Economic disadvantage
Promising but limited research/confusion surrounding operational definitions across studies
<ul style="list-style-type: none"> • Low empathy (few studies, promising) • Exposure to TV violence (seen in children) • Race/ethnicity • Difficult temperament • Psychopathy/callous-unemotional traits • Low level of parent-child involvement/attachment • Family and marital conflict • Large sibship • Community disorganization and low neighbourhood attachment (few studies) • Availability of drugs in community (few studies) • Neighbourhood adults involved in crime (few studies) • Exposure to racial prejudice (few studies) • Urban vs. rural areas
Somewhat predictive/inconsistent across studies
<ul style="list-style-type: none"> • Psychosocial immaturity (few studies) • Low self-esteem (mixed results) • Parental attitudes favourable to antisocial/violent behaviour (insufficient research) • Parental substance use/parent psychopathology • Amount of time engaged in family activities • Low parental education • Low academic aspirations/lack of parental support for education • Exposure to community violence

TABLE 2 – RANKING OF RISK FACTORS FOR ROBUSTNESS AS PREDICTORS OF ANTISOCIAL AND DELINQUENT BEHAVIOUR (CONTINUED)

Not strong enough to identify those at risk

- Pregnancy and delivery complications
- Early pubertal maturation
- Low resting heart rate
- Medical/physical problems
- Internalizing disorders (e.g., anxiety and depression)
- Stressful family events
- Residential mobility/frequent moving
- Small number of friends
- Peer drug use
- Victimization by peers
- Frequent school transitions

TABLE 3 – RISK FACTORS BY DOMAIN FOR THREE AGE GROUPS

Domain	Ages 6-11	Ages 12-17	Ages 18-24
Individual	<ul style="list-style-type: none"> • Early aggressive behaviour • Age at first offence • General offending • Aggression • Precocious substance use • Impulsivity • Sex (male) • Early conduct problems • Low (verbal) IQ • Antisocial beliefs or attitudes • Race (non-white) • Callous-unemotional traits 	<ul style="list-style-type: none"> • General offending • Impulsivity¹ • Aggression • Age at first offence • Antisocial behaviour • Psychopathy/callous-unemotional traits • Antisocial beliefs or attitudes • Substance use • Low (verbal) IQ • Sex (male) • Race (non-white) 	<ul style="list-style-type: none"> • Psychopathy • Impulsivity • Substance use • Age at first offence • Antisocial attitudes and beliefs • Substance use/abuse/dependence • Sex (male) • Race (non-white)

¹ Some risk factors, such as impulsivity, aggression, and low verbal IQ, carry over developmental periods to result in cumulative risk effects (see also Table 9.1 in Loeber et al., 2008).

TABLE 3 – RISK FACTORS BY DOMAIN FOR THREE AGE GROUPS (CONTINUED)

Domain	Ages 6-11	Ages 12-17	Ages 18-24
Family	<ul style="list-style-type: none"> • Poor parental monitoring/supervision • Low family SES • Antisocial parents/parental criminality • Harsh, inconsistent, lax discipline • Low parental support/empathy • Parent-child separation/alternative care • Broken home/frequent moving • Childhood maltreatment • Parental substance use, abuse or dependence • Delinquent siblings • Large sibship • Teenage motherhood • Low parental education 	<ul style="list-style-type: none"> • Low parental support/empathy • Poor parental monitoring/supervision • Parental/family conflict • Childhood maltreatment • Harsh, inconsistent, lax discipline • Antisocial parents/parental criminality • Parent-child separation/alternative care • Delinquent siblings • Parent-child separation • Low family SES • Large sibship 	<ul style="list-style-type: none"> • Antisocial parents/parental criminality • Delinquent siblings • Large sibship • Parental/family conflict • Low parental support/empathy • Child maltreatment
School	<ul style="list-style-type: none"> • Poor academic performance • Suspension/expulsion/truancy • Low school bonding 	<ul style="list-style-type: none"> • Poor school attendance • Poor academic performance • Academic failure • Low school bonding and disengagement from school 	<ul style="list-style-type: none"> • Poor academic performance • Failure to complete high school
Peer	<ul style="list-style-type: none"> • Antisocial peers • Peer victimization 	<ul style="list-style-type: none"> • Antisocial peers • Gang membership • Peer substance use 	<ul style="list-style-type: none"> • Antisocial peers • Gang membership
Community / Environmental	<ul style="list-style-type: none"> • Neighbourhood disadvantage • Community violence/safety 	<ul style="list-style-type: none"> • Neighbourhood disadvantage • Neighbourhood gangs • Availability of drugs 	<ul style="list-style-type: none"> • Neighbourhood disadvantage • Neighbourhood gangs • Availability of drugs



FIGURE 1 – GENDER-SPECIFIC AND GENDER NON-SPECIFIC RISK FACTORS

