

Self and peer perceptions of childhood behaviour in the prediction of adult outcomes

Alexa Martin-Storey

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By: **Alexa Martin-Storey**

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Signed by the final examining committee:

\_\_\_\_\_Chair  
Dr. L. Dyer

\_\_\_\_\_External Examiner  
Dr. M. Brendgen

\_\_\_\_\_External to Program  
Dr. S. Hebblethwaite

\_\_\_\_\_Examiner  
Dr. W. Bukowski

\_\_\_\_\_Examiner  
Dr. M. Ellenbogen

\_\_\_\_\_Thesis Supervisor  
Dr. L. Serbin

Approved by \_\_\_\_\_  
Dr. A. Chapman, Graduate Program Director

October 18, 2010

\_\_\_\_\_  
Dr. B. Lewis, Dean, Faculty of Arts and Science

## Abstract

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Alexa Martin-Storey Ph.D  
Concordia University, 2010

Previous investigations of the longitudinal outcomes of childhood aggression, social withdrawal and likeability have relied on the reports of a single observer, or combined the results of several observers in the prediction of adult outcomes. By comparing self and peer perceptions of childhood behaviour, the present studies proposed to clarify the nature of the relation between childhood behaviours and adult outcomes. Four questions were examined being (1) how were childhood behaviour patterns related to adult outcomes; (2) how did self and peer perceptions compare in the prediction of adult outcomes; (3) was the relation between self and peer perspectives additive in the prediction of these outcomes; and (4) did concordance between self and peer perspectives predict adult outcomes? Data from the Concordia Risk Project were employed to determine the socioeconomic, personality, and substance abuse outcomes. Both self and peer perceptions of childhood behaviour were associated with adult outcomes, although generally, self perceptions as opposed to peer perceptions of childhood behaviours were more strongly associated with adult outcomes in women. Including both self and peer perceptions did not have an additive effect in the prediction of adult outcomes, although there was some support for the importance of concordance in education and income outcomes. The findings suggest that self and peer perceptions of childhood behaviour each provide some unique information. Future research examining the adult outcomes of childhood behaviours may wish to consider both the gender and the behaviour being examined in designing prospective, longitudinal studies.

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## Contributions of the Authors

Alexa Martin-Storey developed the research questions, designed, performed, and interpreted the statistical analyses, and wrote and edited all chapters included in the current thesis. Drs. Lisa Serbin, Dale Stack and Alex Schwartzman provided commentary on these manuscripts. As well, Drs. Schwartzman and Jane Ledingham were responsible for the original design and data collection. Finally, Drs. Schwartzman, Serbin, Stack and Hodgins designed the wave of data collection from which the outcomes examined in this thesis were drawn

## General Introduction

Aggression, likeability and social withdrawal influence diverse developmental outcomes across the lifecourse (Caprara, Barbaranelli, Pastorelli, Bandura & Zimbardo, 2000; Caspi, Bem & Elder, 1989; Huesmann, Dubow, & Boxer, 2009; Serbin et al., 1998). However, the literature examining the effects of these behaviour patterns has assessed behaviour using either a single rater (i.e., parent or teacher) or a single type of rater (i.e. peers). Aggression, social withdrawal and likeability show moderate correlations across observers (Ledingham, Younger, Schwartzman, & Bergeron, 1982), and these correlations are comparable to other findings that suggest moderate agreement between different observers of childhood behaviour (Epstein, Renk, Duhig, Bosco & Phares, 2004; Grietens et al., 2004). Beyond measurement error, differences across raters have been suggested to reflect meaningful differences and suggest the valuable and unique information provided by different individuals regarding children's behaviours. The current thesis addressed the nature of the information garnered by self and other perceptions of childhood behaviour by examining how these two perceptions predicted adult outcomes. Specifically, self and peer perceptions of aggression, social withdrawal and likeability were examined as they relate to years of education, income, parent status, adult personality and adult substance abuse and dependence outcomes.

A number of concepts required clarification prior to the examination of the relation between self and peer perceptions of childhood behaviour and adult outcomes. The following includes a brief discussion of the nature of the continuity of behaviour, and definitions of aggression, social withdrawal and likeability. Finally, previous research on

the differences between multiple observations of childhood behaviour was reviewed, and the general questions addressed by all three studies were outlined.

### *Continuity of behaviour*

Heterotypic and homotypic continuity and interactional and cumulative continuity are two sets of terms commonly used to describe the continuation of behaviour across time. These terms can cover a broad number of mechanisms, and provide a framework for understanding why and how childhood behaviours are associated with adult outcomes. Homotypic and heterotypic continuity refer to the similarity between the childhood behaviour and the outcome the behaviour it is thought to predict. These terms are frequently employed in developmental psychopathology to understand the relation between childhood disorders and adult psychopathology (e.g. Ferdinand, Dieleman, Ormel & Verhulst, 2007; Shankman, Lewinsohn, Klein, Small, Seeley & Altman, 2009). Homotypic continuity describes behaviours in childhood that predict similar patterns of behaviours in adulthood. For example, childhood shyness predicts adolescent and adult social anxiety outcomes; presumably because these behaviour patterns share similar underlying processes that persist across time (Prior, Smart, Sanson & Oberklaid, 2000). Heterotypic continuity describes situations in which childhood behaviours predict less conceptually related adult outcomes. The processes underlying these pathways are frequently more complicated. For example, the relation between childhood aggression and adolescent depressive symptoms has been suggested to reflect heterotypic continuity, as disruptive behaviour in childhood leads to peer rejection and lower levels of academic achievement, negatively influencing self concept and increasing the likelihood of

depressed affect. Thus, childhood aggression is associated with adolescent depressive symptoms, but not because the two are associated with the same underlying processes.

Distinguishing between heterotypic and homotypic behaviours is clouded by changes in the nature of behaviours across development. The nature of aggressive or socially withdrawn behaviour changes as children age (Hartup, 2005). For example, the relation between defiance and disobedience in childhood, and violent crime in adulthood suggests homotypic continuity, despite the fact they these represent distinctly different behaviours (Loeber, Lacourse & Homish, 2005), and highlights the difficulty in establishing the nature of behavioural continuity.

Cumulative and interactional continuity are terms used to conceptualize the pathways by which childhood behaviours influence adult outcomes (Caspi, et al., 1989). The concept of cumulative continuity is derived directly from lifecourse developmental theory suggesting that childhood behaviours influence the individual's success in navigating key developmental milestones. Timing in reaching these milestones influences the individual's subsequent opportunities, and has a cascading effect across the lifecourse. For example, an individual showing high levels of social withdrawal may be hampered in an interactive classroom setting, which in turn diminishes academic achievement, limiting their future options regarding employment.

Interactional continuity describes how childhood behaviour patterns influence adult outcomes as a reflection of the stability of the interaction patterns used by the individual to negotiate their environment. An individual who behaves aggressively in response to frustration, and is reinforced by the outcomes of this behaviour, may use physical force when interacting with peers in childhood, and may later resort to similar

strategies with marital conflict in adulthood. When discussing the longitudinal outcomes of childhood aggression, social withdrawal and likeability, cumulative and interactional continuity provides a theoretical framework for understanding how these behaviours influence adult outcomes, while homotypic and heterotypic processes describe the behaviours they predict.

### *Aggression*

Childhood aggression is the behaviour most commonly examined in the prediction of longitudinal outcomes (Asendorpf, Denissen & van Aken, 2008; Cairns, Cairns, Xie, Leung, & Hearne, 1998; Huesmann, Eron, Lefkowitz & Walder, 1984). Definitions of aggression vary (Hartup, 2005), but developmental research on aggression generally focuses on behaviours in which the child physically or psychologically harms another individual. The Pupil Evaluation Inventory (PEI: Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976) was used to assess aggression in the current study and it assesses a number of facets of aggression including physical aggression (i.e. those who say they can beat others up), as well as psychological aggression (i.e. those who try to get others in trouble).

There are substantive individual differences regarding both level and trajectory of aggression across childhood. For most children, levels of aggressive behaviour are highest in early childhood, and decline across development (Broidy et al., 2003; Tremblay & Nagin, 2005). Of particular interest are the factors associated with the persistence of high levels of aggression; temperament variables such as high levels of behavioural activation and low levels of behavioural inhibition have been suggested as precursors to problematic levels of aggression (Hay, 2005, p. 122). These temperament

factors may be somewhat genetically determined, but interact with environmental factors such as harsh parenting, chaotic and unpredictable environments and negative neighbourhood characteristics to produce individuals that are high in aggressive behaviour (Conduct problems prevention research group, 1992; Dodge, 2009; Hart & Marmorstein, 2009). Aggressive patterns of behaviour are further perpetuated by their functionality in adverse family environments, as well as via the cognitive biases they engender (Dodge, 2006). The detrimental influence of aggressive behaviour in childhood has been associated with a variety of negative adult outcomes such as fewer years of education (Brooks & Newcomb, 1995; Huesmann et al., 2009; Kokko, Bergman, Pulkkinen, 2003), lower levels of adult income (Huesmann et al., 2009; Kokko & Pulkkinen, 2000; Odgers, 2008), higher levels of Neuroticism, lower levels of Agreeableness, Openness to Experience, and Conscientiousness (Caspi et al., 2003; Asendorpf et al., 2008), and higher levels of substance abuse and dependence in adulthood (Ensminger, Juon & Fothergill, 2002; Dubow, Boxer & Huesmann, 2008).

### *Social withdrawal*

Social withdrawal and other constructs associated with acting in, such as shyness and behavioural inhibition have also been used to predict longitudinal outcomes (Asendorpf et al., 2008; Caspi et al., 1989; Ensminger et al., 2002). The construct examined in the current study was referred to as social withdrawal, commonly defined as behaviours characterized by solitary activity, and particularly, the absence of play with peers (Rubin & Asendorpf, 1993). Social withdrawal shows some stability across development, especially for children with high levels of social withdrawal (Eggum et al., 2009; Rubin, Hymel & Mills, 1989, Rubin, Coplan & Bowker, 2009). Problematic

patterns of social withdrawal are frequently preceded by high levels of behavioural inhibition (Degnan, Henderson, Fox, & Rubin, 2008). Behavioural inhibition may be partially genetic (Fox et al., 2005), and interacts with environmental factors such as overprotective parenting practices to produce higher rates of socially withdrawn behaviour (Rubin et al., 2009).

The interaction between temperament and the environment is one of the most commonly identified pathways to socially withdrawn behaviour, but may not capture the full spectrum of children who engage primarily in solitary activities. There are multiple facets of socially withdrawn behaviour, including social withdrawal arising from social anxiety, social withdrawal arising from peer rejection and social withdrawal arising from preference for solitary activities (Bowker, Bukowski, Zargapour, & Hoza, 1998; Coplan, Prakash, O'Neil, & Armer, 2004; Rubin & Mills, 1988, Younger & Daniels, 1992). The outcomes associated with these subtypes of social withdrawal vary, and are considerably influenced by child age and cultural context. Some research in China, a culture in which emotionally reserved behaviour is considered to be more desirable, the levels of peer acceptance for socially withdrawn children are higher (Chen, Rubin, Li & Li, 1999), and socially withdrawn children show more positive outcomes. This could be anticipated to change the impact of social withdrawal on patterns of childhood development. The PEI assesses multiple facets of childhood social withdrawal including preference for solitary play (i.e. those who prefer to play by themselves), social anxiousness (i.e. those who are too timid to make friends easily) and social rejection (i.e. those who are picked last).

Compared with aggression, social withdrawal has been less consistently linked with longitudinal outcomes. There is some evidence that suggests social withdrawal may

predict educational outcomes, although this relation is frequently mediated or moderated by other variables (Barriga, Doran, Newell, Morrison, Barbetti, & Robbins, 2002; Kerr, Lambert & Bem, 1996; Kokko et al., 2003; Rapport, Denney, Chung & Hustace, 2001). Higher levels of social withdrawal and related constructs such as behavioural inhibition are also associated with lower levels of adult socioeconomic status (Caspi, et al., 1989; Dennissen, Asendorpf, & van Aken, 2008; Gest, 1997). Social withdrawal may also act as a protective factor regarding substance use outcomes, particularly in males (Dubow et al., 2008; Engels, Vermulst, Dubas, Bot & Gerris, 2005; Fothergill & Ensminger, 2006). While no research has examined the relation between childhood social withdrawal and adult personality factors, behavioural inhibition and overcontrol have been associated with lower levels of Agreeableness in adulthood (Caspi et al., 2003).

### *Likeability*

While aggression and social withdrawal are staples of the prospective longitudinal literature, likeability and other variables pertaining to social competences have received significantly less attention. Likeability is different from aggression and social withdrawal in that it reflects an individual's success in their social milieu, rather than then a more specifically designated set of behaviours (Schwartzman et al., 2009). The likeability construct investigated in the PEI includes prosociality (i.e. those who always help others), social acceptance (i.e those who are liked by everybody) and social competence (i.e. those who always know what is happening). There are a number of reasons why childhood likeability would be anticipated to influence the individual across the lifespan. Constructs such as prosociality and empathy show continuity at least across childhood (Eisenberg et al., 1999). This continuity over time has been suggested to reflect genetics

(Zahn-Waxler, Robinson & Emde, 1992), temperamental factors in processes such as emotion regulation (Denham et al., 2003), and the consistency of positive parenting strategies associated with the development of prosocial behaviours (Hastings, Utendale & Sullivan, 2007).

Previous research has linked likeability with better adult health outcomes (Temcheff et al., 2010). Additionally, other longitudinal research has associated constructs related to likeability such as prosociality, agreeableness, popularity and peer acceptance to improved educational outcomes (Pitkannen, Kokko, Lyyra & Pulkkinen, 2008; Risi, Gerhardstein, & Kitsner, 2003; Kokko & Pulkkinen, 2000; Caprara, et al., 2000). There is also some evidence for a relation between being well liked in childhood and indicators of economic wellbeing (Pulkkinen, Nyyrän, & Kokko, 2002; Zettergren, Begman, & Wamby, 2006; Kokko & Pulkkinen, 2000). While not as substantial as the research supporting the longitudinal impact of aggression and social withdrawal, these findings support the examination of likeability in the prediction of adult outcomes.

#### *Self and other perception*

Prospective longitudinal research on the outcomes of aggression, social withdrawal, and to a lesser extent, likeability has traditionally relied on a single perspective in determining childhood behaviour. However, there is an increasing emphasis on combining multiple perspectives when examining childhood behaviour (Karp et al., 2004), as inclusion of multiple perspectives increases predictability and replicability of findings (Kim, Deater-Deckard, Mullineaux, & Allen, 2010).

Multiple explanations have been invoked to explain the only moderate correlations between multiple reporters of the same child's behaviours (Achenbach,

McConaughy, & Howell 1987; Grietens et al., 2004; Van der Valk, van den Oord, & Boomsma, 2001). Initially, this difference was thought to represent measurement error, but there has been increasing recognition that this moderate relation represents meaningful differences in observer perspective (Kerr, Lunkenheimer & Olson, 2007; Van der Valk, et al., 2001). Models accounting for observer differences fit data on children's behaviour problems better than error models (Van der Valk et al., 2001) and these differences between observers show stability over time (Bartels, Boomsma, Hudziak, van Beijsterveldt, & van den Oord, 2007).

The role of context in differentially shaping children's behaviour has been repeatedly suggested as a source of variance between observers (Epstein et al., 2004; Grietens et al., 2004). Individuals who observe the child in similar contexts (i.e. mothers and fathers or peers and teachers) tend to show higher agreement regarding children's behaviours (Achenbach et al., 1987; Greener, 2000; Junttila, Voeten, Kaukiainen, & Vauras, 2006; Pakaslahti & Keltikangas-Jarvinen, 2000). Further, differences in parent and teacher reports of childhood behaviour has been linked to differences in observations of children's behaviour across context, in that these differences in perception were associated with observable differences in the child's behaviour across context (De Los Reyes, Henry, Tolan, & Wakchlag, 2009).

The behaviour being assessed also influences agreement between observers. Ledingham and colleagues (1982), also using the Concordia Longitudinal Risk Project sample that was employed in the current study, reported that more noticeable or higher amplitude behaviours such as aggression show higher levels of inter-observer agreement compared with less noticeable behaviours such as social withdrawal. Other research also

supports greater inter-rater agreement for more visible behaviours (Malloy, Yaras, Montvilo, & Sugarman, 1996), with greater agreement between observers regarding direct versus indirect aggression (Pakaslahti & Keltikangas-Jarvinen, 2000), and externalizing compared with internalizing behaviours (Glaser, Kronsoble & Forkner, 1997).

Another factor that has been associated with agreement between observers is the kind of information available to the informant (Kraemer et al., 2003). Self and peer perspectives both have unique advantages and disadvantages in terms of the prediction of childhood behaviour. Children's self reports can be extremely valuable as children perceive their own behaviour in a wide variety of contexts and have a unique understanding of the emotional processes and the purposes behind their actions (Pakaslahti, & Keltikangas-Jarvinen, 2000). The clinical literature suggests that self perceptions may be particularly important regarding children's internalizing behaviours that are less visible to outside observers (Hope, Adams, Reynolds, Powers, Perez, & Kelley, 1999). However, a child's self perceptions are limited by several factors. A child's self perceptions are limited by development, and improve as they age (Malloy et al., 1996). Children's self perceptions may also be hampered by social desirability, as children frequently overestimate their positive behaviour, and underestimate their negative behaviour (Eisenberg & Mussen, 1989; Greener, 2000).

Peer perceptions provide important information, as peers are uniquely situated to assess a child's social forays. As well, peer perceptions are frequently aggregated, which may act to correct individual biases (Warden & MacKinnon, 2003). While peer perceptions provide a valuable and potentially less biased source of information

compared with self perceptions, there are disadvantages of using this method in assessing childhood behaviour. Peers may have little insight regarding the internal processes behind actions. However, the importance of this insight may vary as a function of the behaviour, as research into aggression suggests that understanding the motivation behind aggressive behaviour does not improve prediction of outcomes (Hartup, 2005). Reports from same age peers may also be limited by the age of the rater.

Differences between self and other perceptions of behaviour have also been suggested as a meaningful source of information, although competing viewpoints have been offered regarding the meaning of these differences. One body of literature suggests that self enhancement, or rating oneself as better than one is rated by others predicts a number of positive outcomes including positive mood, effective coping, greater adaptation and resilience (Marshall & Brown, 2008; Taylor & Brown, 1988). Moreover, research indicates that most people hold this slightly exaggerated view of their own competence. Findings regarding the positive benefits of self enhancement pair with research associating depressive symptoms and a perception of oneself as less competent than one is perceived by others (Holm-Denoma, Otamendi & Joiner, 2008).

An opposing body of literature suggests that self-enhancement has been largely associated with positive outcomes because this literature relies on self-report (Colvin, Block & Funder, 1995; Colvin & Griffo, 2008). Further, some research associates self-enhancement with a number of negative psychological outcomes including narcissism and hostility (Colvin et al., 1995; Colvin & Griffo, 2008). During childhood and adolescence, self-enhancement or positive illusory biases are associated with lowered academic achievement, higher rates of attention deficit and hyperactivity disorder, and

conduct disorder (Brendgen, Vitaro, Turgeon, Poulin, & Wanner, 2004; Cole, Martin, Peeke, Seroczynski, & Fier, 1999; Hymel, Bowker, & Woody, 1993). This relation is thought to occur because having an enhanced self regard acts as a buffer against negative, but potentially informative feedback regarding undesirable behaviours. Further, certain types of self criticism, such as defensive pessimism allows the individual to accurately adjust their behaviours and make realistic adjustments contributing to self-improvement (Norem, 2008).

It is possible that the benefits of self enhancement and self criticism vary regarding the domain, the valence and level of self enhancement being examined. Self enhancement is not a stable attribute of the individual, and varies across characteristics being examined (Dubois & Silverthorn, 2004). Authors arguing for the positive nature of self enhancement typically focus on self concept variables (Marshall & Brown, 2008), while research on behaviour problems suggests that accuracy is associated with the most ideal outcomes (Dubois & Silverthorn, 2004). The level of self enhancement is also associated with the impact on overall functioning, with extreme self enhancement being damaging to the individual (Marshall & Brown, 2008). Finally, the direction of self enhancement may also play a role in the outcomes of self enhancement. Gresham and colleagues (2000) examined the relation between positive and negative illusory biases in children and found that both children whose self ratings were higher than the ratings by their peers, and children who agreed with their peers regarding negative assessment of their own behaviour showed the lowest levels of functioning regarding their social and behavioural competences.

*The current thesis*

The current thesis examines the relation between childhood behavioural patterns and adult socioeconomic, personality and substance abuse and dependence outcomes by examining how self and peer perceptions were associated with these outcomes. Comparing the relation between self and peer perspectives of childhood behaviours and adult outcomes should shed light on both (1) the nature of self and peer perceptions of childhood behaviour and (2) the relation between childhood behaviour and longitudinal outcomes. Previous research using the Concordia Longitudinal Risk Project has illustrated that self and peer perceptions of aggression, social withdrawal and likeability are moderately correlated during childhood, although more easily observable behaviours such as aggression showed greater concordance than less observable behaviours such as social withdrawal (Ledingham et al. 1982). Due to this previous research, the relation between self and peer perceptions at the initial assessment was not the focus of the current project.

The current thesis relied exclusively on data drawn from the Concordia Longitudinal Risk Project, a study employing a prospective longitudinal design in the prediction of adult outcomes. This project was initiated in schools located in working class areas of Montreal between 1976-1978, where 4109 children in grades 1, 4 and 7 (modal ages 7, 10 and 13) participated in a behavioural screen. This screen involved each child nominating up to four boys and four girls in each classroom on items describing aggressive, socially withdrawn and likeable behaviour. At this time, children also completed self reports of these same items. This was done using the Pupil Evaluation Inventory (Pekarik et al., 1976), which can be seen in Appendix I. This questionnaire includes 35 items, 20 assessing aggression (e.g. those who start a fight over nothing,

those who give dirty looks), 9 assessing social withdrawal (e.g. those who are always picked last, those who often don't want to play) and 4 assessing likeability (e.g. those who are liked by everyone, those who are your best friend). The 195 most aggressive, the 214 most withdrawn and 228 most socially withdrawn and aggressive children as well as a comparison sample of 1,137 children for a total of 1,774 were included in the final sample. Their aggression, social withdrawal and likeability scores were standardized across gender and classroom, and these scores were used in the analyses of all three studies.

These individuals were contacted again between 1999 and 2003, and completed a number of measures to examine their psychological and physical functioning. They also completed clinical interviews with trained clinical psychologists, and provided demographics information during a phone interview. The current sample was considered an at risk sample both because of neighbourhood schools from which the initial sample was drawn, their higher levels of problem behaviour, as well as the high levels of drop out, poverty and social assistance usage seen in the sample during adulthood.

Four questions were examined in all three studies; (1) how were childhood behaviour patterns related to adult outcomes; (2) how did self and peer perceptions compare in the prediction of adult outcomes; (3) was the relation between self and peer perspectives additive in the prediction of these outcomes; and (4) did the concordance between self and peer perspectives predict adult outcomes? First, it was anticipated that the results would support previous findings linking childhood behaviour to adult outcomes. In examining the relation between these childhood behaviours and adult outcomes, it was anticipated that some of these relations may potentially be mediated by

more proximal variables such as years of education and levels of income, and that the presence of mediation would be tested when relevant. It was anticipated that self and peer perspectives would be differentially associated with adult outcomes, depending on both the outcome and the behaviour in question. Aggression and likeability are behaviours that are extremely salient to the peer group, thus it was anticipated that peer ratings of these behaviours would be more closely associated with longitudinal outcomes. First, social withdrawal is more reflective of internal states, and thus self perceptions were anticipated to be more closely associated with longitudinal outcomes. Second, it was assumed that combining self and peer perspectives would improve the ability to predict longitudinal outcomes. Third, it was anticipated that agreement between observers would be associated with greater predictability of longitudinal outcomes. Finally, self enhancement was expected to be associated with better socioeconomic outcomes, due to the positive outcomes associated with mild self enhancement.

Three distinct types of outcomes were used to examine the relation between self and peer perceptions of childhood behaviours. These were demographics type outcomes (years of education, adult income and parent status), adult personality outcomes (drawn from the five-factor model of personality) and adult substance abuse and dependence outcomes. These three types of outcomes were selected for two reasons; (1) they were derived from a previous literature linking them with childhood behaviours (Asendorpf, Denissen & van Aken, 2008; Brook & Newcomb, 1995; Caspi et al., 2003; Cox, Macpherson & Enns, 2005; Dubow et al., 2008; Fothergill, Ensminger, Green, Crum, Robertson & Juon, 2008; Huesmann et al., 2009; Moffitt, Caspi, Harrington, & Milne, 2002), and (2) they all are linked to lifecourse outcomes regarding health and adult well-

being (Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), suggesting the importance of improving the understanding of their developmental antecedents.

The first study examined the relation between childhood behaviours and education, income and parent status variables thought to be important in determining quality of life for the individual and their families. Comparing self and peer perspectives of aggression, social withdrawal and likeability as they predicted adult education, income and parent status was anticipated to both clarify the use of multiple reports of childhood behaviour in the construction of longitudinal studies and examine the role of childhood self enhancement in predicting adult outcomes. The pathways between childhood behaviour and adult outcomes were not addressed as these pathways have been examined extensively in previous papers (e.g. Serbin et al., in press).

The second study focused on the relation between childhood behaviour variables and adult personality. Childhood behaviour patterns such as aggression, social withdrawal and likeability have also been considered as potential developmental precursors for the adult five-factor model of personality (Asendorpf et al., 2008; Caspi et al., 2003). However, previous research has suggested that the small effect sizes relating childhood behaviours and adult personality outcomes may reflect the use of parent or teacher perceptions to assess behaviours in childhood, and self perceptions to assess personality in adulthood (Pesonen et al., 2006). The second study focused on the relation between childhood aggression, social withdrawal and likeability and adult personality factors. This study expanded on previous work by including both self and peer perceptions of childhood behaviours.

The third study focused on the relation between childhood behaviours and substance abuse and dependence in adulthood. Childhood aggression, social withdrawal and likeability have been previously examined as possible predictors of substance abuse outcomes in adolescence and adulthood (Ensminger et al., 2002; Dubow et al., 2008; Moffitt et al., 2002). Aggression is generally associated with higher rates of substance abuse and dependence (Ensminger et al., 2002; Fothergill & Ensminger, 2006), but social withdrawal and likeability have been differentially associated with these behaviours (Caspi, Moffitt, Newman & Silva, 1998; Cox et al., 2005; Moffitt et al., 2007; Engels, Vermulst, Dubas, Bot & Gerris, 2005; Fothergill & Ensminger, 2006; Martin et al., 2002; Dubow et al., 2008; Zettergren et al., 2006). This study was designed to assess if comparing self and peer perceptions of these factors would improve understanding of the processes involved.

Study 1: Comparing self and peer perceptions of childhood behaviour in the prediction of  
years of education, adult income and parent status

Alexa Martin-Storey, Lisa A. Serbin, Dale M. Stack, Sheilagh Hodgins, Jane E.

Ledingham & Alex E. Schwartzman

## Abstract

Longitudinal research indicates that childhood behaviour patterns characterized by high levels of aggression, social withdrawal and low levels of likeability predict negative adult outcomes, however no previous research has compared different perceptions of childhood behaviour in the prediction of this outcome. Data from an ongoing longitudinal study of at-risk individuals (N=567) was employed to illuminate how peer and self perceptions of childhood behaviour related to years of education, adult family income and parent status. Peer reports of the high visibility behaviours of likeability and aggression, while self reports of the low visibility behaviour of social withdrawal were anticipated to be most strongly associated with adult outcomes. Modest levels of self-enhancement regarding behaviour variables were expected to be associated with ameliorated educational and economic outcomes. Support for the hypotheses varied by outcome measure. Self reported behaviours were associated with education and income, but primarily for women. Peer reported behaviours were more frequently related to education and income outcomes for men, and were exclusively associated with peer rated behaviours. Self-enhancement regarding likeability was positively associated with improved income and education outcomes, while similarity between self and peer perceptions of social withdrawal was associated with ameliorated education and adult income outcomes. These results suggest that the benefits of employing either self or peer perceptions of childhood behaviour in predicting adult outcomes varies according to both the behaviour being examined and the gender of the target participant.

The relation between behavioural patterns in childhood such as aggression, social withdrawal and likeability and a wide variety of adult outcomes including academic achievement (Brook & Newcomb, 1995; Cox, Macpherson & Enns, 2005; Huesmann, Dubox & Bower, 2009), adult socioeconomic status (Kokko & Pulkkinen, 2000; Odgers et al., 2008) and to a lesser extent, parent status (Kerr, Lambert & Bem 1996; Caspi, Bem & Elder, 1989) has prompted a considerable body of work examining the ramifications of these behaviour patterns across the lifespan. However, this relation has frequently been established based on the perceptions of a single informant (i.e. Pulkkinen, Nygren, & Kokko, 2002; Zettergren, Bergman, & Wångby, 2006), or in the case of peer reports, a single type of informant in the assessment of childhood behaviours (i.e. Huesmann et al., 2009). In the cases in which multiple informants have been used, the perceptions of these informants has either been combined (i.e. Friedman et al., 1995), or used to verify diagnostic criteria (i.e. Odgers et al., 2008). Given that self and other perceptions have been shown to contribute independently to accuracy in predicting behaviours (Vazire & Mehl, 2008), comparing self and peer perspectives in the prediction of adult outcomes has both methodological and theoretical implications regarding the nature of this relation across the lifecourse.

Childhood behaviours have been associated with a number of outcomes directly or indirectly related to adult socioeconomic status (SES). Educational attainment plays a key role in determining subsequent socioeconomic status in adulthood, and is strongly associated with childhood behavioural variables. High rates of childhood aggression are associated with lower verbal achievement scores, greater school maladjustment, lower levels of academic orientation, overall lower academic attainment and ultimately, fewer

years of education (Brooks & Newcomb, 1995; Huesmann et al., 2009; Kokko, Bergman, Pulikinnen, 2003). Some research has linked social withdrawal and associated constructs such as behavioural inhibition and timidity with negative academic performance, although this relation is frequently mediated or moderated by variables such as aggression, ethnicity and attention problems (Barriga, Doran, Newell, Morrison, Barbetti, & Robbins, 2002; Kerr, et al., 1996; Kokko, et al., 2003; Rapport, Denney, Chung & Hustace, 2001; Risi, Gerhardstein, & Kistner, 2003; Serbin et al., 1998). Constructs associated with likeability such as prosociality, agreeableness, popularity and peer acceptance have also been linked protectively to educational achievement, school maladjustment and years of education (Pitkannen, Kokko, Lyyra & Pulkkinen, 2008; Risi et al., 2002; Kokko & Pulkkinen, 2000; Caprara, et al., 2000).

Multiple indices of adult income and work history have also been prospectively associated with childhood behaviours. High rates of childhood aggression have been associated with lower occupational prestige, needing work, long-term unemployment and lower income (Huesmann et al., 2009; Kokko & Pulkkinen, 2000; Newcomb et al., 1995; Odgers et al., 2008). Social withdrawal may be associated with lower adult income, with some research indicating that shy males have lower levels of occupational achievement and have less stable careers (Caspi, Elder & Bem, 1989). Related constructs like behavioural inhibition are also related to work history associated with income such as later entry into the workforce (Dennissen, Asendorpf, & van Aken, 2008; Gest, 1997). Being well liked was also associated with more adaptive socioeconomic outcomes in adulthood including stability of career (Pulkinen, Nyyrän & Kokko, 2002), occupational

status in women (Zettergren et al., 2006), and lowered rates of unemployment (Kokko & Pulkkinen, 2000).

There is a limited literature linking childhood behavioural variables to factors associated with parent status. Social withdrawal and shyness have been associated with greater latency to parenthood in men, but not in women (Caspi, Bem & Elder, 1988; Kerr, et al., 1996). Childhood aggression has been linked with early parent status (Serbin et al., 1998; Xie, Cairns & Cairns, 2001), but not overall likelihood of having children. Prospective studies of personality and parent status in adulthood indicate that higher sociability, nurturance, affiliation, lower levels of autonomy in men and women, and men's higher activity are all associated with higher likelihood of parent status (Jokela, Kivimäki, Elovainio, & Keltikangas-Jarvinen, 2009; Miller, 1992). While much of the research on predicting status has focused on SES variables (Kokko, Pulkkinen & Mesiäinen, 2009), these studies provide considerable rationale for the examination of childhood behaviours as they relate to parent status outcomes.

While multiple perceptions of childhood behaviours have not been examined in the prediction of longitudinal adult outcomes, there has been some research comparing self and other perceptions of behaviour in childhood. Research confirms a moderate correlation between self and peer perception of behaviours such as aggression, social withdrawal and likeability (Ledingham, Younger, Schwartzman, & Bergeron, 1982). While initially associated with error, the moderate correlation between multiple observers of childhood behaviour may in fact reflect differences in childhood behaviour across context (de los Reyes & Kazdin, 2005; Epstein, Renk, Duhig, Bosco & Phares, 2004; Grietnes et al., 2004).

The differences in self and other observations of childhood behaviour, and the ability of these two perceptions to predict adult outcomes may vary with the behaviour being examined. Peer reports of aggression may be anticipated to be most closely associated with adult outcomes, as this behaviour is salient to the peer group, and shows higher concordance between observers compared to other variables (Ledingham et al., 1982). Further, children with high levels of aggression show distorted self perceptions, which may lower the longitudinal predictive ability of self perceptions (Hymel, Bowker & Woody, 1993). The peer group may also have a more accurate assessment of likeability based on the social component of this behaviour. However, self perception of likeability may also be associated with longitudinal outcomes as socially accepted children show higher levels of agreement compared to peers regarding self evaluations compared with less socially accepted children (Kistner, David & Repper, 2007). Finally, self perceptions of social withdrawal should be more predictive of adult outcomes as lower visibility variables such as social withdrawal show lower concordance between observers (Ledingham et al., 1982) and socially withdrawn children can more accurately report their own competencies than can others (Hymel et al., 1992).

One particularly informative assessment of comparison of self and peer perceptions is the assessment of discrepancies in these two observations (Assor, Tzelgov, Thein, Ilardi, & Connell, 1990). Self enhancement, or rating oneself as better than others, is normative in childhood (Harter, 1985), and is generally associated with higher functioning in a variety of domains (Assor et al., 1990; Belmore & Cillessen, 2003; Kistner et al., 2007; McElhaney, Antonishak & Allen, 2008). However, findings vary as to whether this relates to all self-enhancement, or only to modest self enhancement

(Assor et al., 1985). Further, some research associates extreme self enhancement with lower functioning and higher rates of behaviour problems (Brendgen, Vitaro, Turgeon, Poulin, & Wanner, 2004; Gresham, Lane, MacMillan Bocian & Ward, 2000; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; Hymel et al., 1993). Conversely, self criticism, or rating oneself as less competent than others, has been associated with the development of childhood depression (McGrath & Repetti, 2002; Hoffman, Cole, Martin, Tram & Seroczynski, 2000). Together, these findings suggest that either accuracy in self-ratings, or slight self-enhancement would be associated with the most positive functioning, and subsequent positive longitudinal outcomes.

Gender may also influence the predictive ability of self and other perceptions of childhood behaviour as self perception varies by gender (Feingold, 1994; Beyer, 2002; Pallier, 2003). Additionally a significant body of research finds gender differences regarding the relation between childhood behaviours and longitudinal outcomes (Caspi, Bem & Elder, 1989; Pulkkinen et al., 2002), supporting an examination by gender when linking childhood behaviours with adult outcomes.

In the present study, self and peer perceptions of childhood behaviours were examined as they predict years of education, adult income and parent status. Three questions were examined: (1) How do self and peer perceptions of childhood aggression, social withdrawal and likeability relate to years of education, adult income and parent status, and are self or peer perceptions more closely associated with these outcomes? (2) Are self and peer perceptions additive in the prediction of adult outcomes? and (3) Does discrepancy between self and peer perceptions of childhood behaviours relate to adult outcomes? It was anticipated that: (1) peer ratings of aggression would be associated with

adult outcomes, that self and peer ratings of social withdrawal and likeability would both be associated with adult outcomes and that self ratings of social withdrawal would be associated with adult outcomes, even when other contextual factors were controlled for; (2) the inclusion of both self and peer ratings would improve the prediction of adult outcomes and; (3) modest discrepancy between self and peer perceptions in the direction of self enhancement (higher self ratings of likeability, lower self ratings of aggression and social withdrawal) would be associated with more years of education and higher adult income.

These three questions were examined using data from the Concordia Longitudinal Risk Project (Concordia Project: Schwartzman et al., 1985), a longitudinal dataset consisting of Francophone youth, in grades 1, 4 and 7 from working class-area schools in Montreal. Previous research with this sample has examined the pathways between peer rated aggression and social withdrawal and several adult outcomes, including factors that contribute to child-rearing environment, such as parental education and family income, (Serbin et al., in press). The current study sought to expand on previous findings from the Concordia Project by incorporating self perceptions of childhood behaviour as predictors of longitudinal outcomes, as well as examining the role of likeability in a sample that included both parents and non-parents.

## Method

### *Participants*

The 567 (325 female) participants in the current study were drawn from an ongoing longitudinal project examining the influence of childhood aggression, social withdrawal and likeability across the life course. The participants were recruited from

schools in primarily francophone, working class areas of Montreal in 1976-77 when they were in grades 1, 4 and 7. Of the 4,109 children who participated in the behavioural screening, 1,774 were selected to participate in the longitudinal project. The participants in the current study were drawn from a representative sub-sample of 693 individuals, who had completed the demographic data required (descriptives in Table 1). Of the participants, 394 reported having one or more child. The majority of the sample (N=392) were either married or cohabitating, with 58 describing themselves as divorced or separated, 116 describing themselves as single and one participant describing themselves as widowed.

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Insert Table 1 about here

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### *Measures*

A French translation of the *Pupil Evaluation Inventory* (PEI: Pekarik, Prinz, Liebert, Weintraub & Neale, 1976) was used to assess peer and self nominations of aggression, social withdrawal and likeability. The PEI is a 35 item measure with 20 items assessing aggression including items such as “Those who start a fight over nothing”, 10 items assessing social withdrawal including items such as “Those who are too shy to make friends easily” and 5 items assessing likeability including items such as “Those who are liked by everyone”. For the peer report version of the PEI, students were asked to nominate up to four children in each class who matched each item. Nominations were done by gender, with children nominating up to 4 girls and 4 boys who fit each item. For the self-evaluation component, children were asked if the description in the

question applied to them or not, and the number of agreements was summed up for each of the three behavioural scales. Previous research has demonstrated that peer nominations on the PEI represent a valid and reliable method of rating children's behaviour (Lyons, Serbin & Marchessault, 1988). The PEI demonstrates very high inter-rater reliability and internal consistency and moderate to high concurrent validity in comparison with quantitative observations. The means, ranges and standard deviations for self and peer ratings from the PEI for men and women can be seen in Table 1. Correlations between self and peer ratings on the PEI can be seen in Table 2 for men and women, and ranged between  $r=.34$  and  $r=.59$ .

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Insert Table 2 about here

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*Demographics Questionnaires* Participants were asked a series of demographics questions regarding their household income, years of education, number of children and relationship status. Parent status was dichotomized because it did not have a normative distribution, and thus individuals were classified as either not having children or having one or more children.

*Family of Origin Socioeconomic Status* Socioeconomic status for the participant's childhood family was established using a questionnaire designed to assess household prestige and social standing. Values were assigned to occupations according to the amount of associated prestige (Rossi, Sampson, Bose, Jasso & Passel, 1974). Occupations associated with greater prestige (i.e. physician or lawyer) were assigned higher values than occupations associated with lower prestige (i.e. chambermaid or

factory worker). Participants were asked to select the occupation from a list that most closely resembled their parents' occupations during their childhood. Participants were assigned the prestige score based on their parent's occupation that ranked highest, which in most cases was the father.

### *Procedure*

Participants from the Concordia Project were contacted via telephone to consent to participate in the current wave of data collection, as had occurred at 3-5 year intervals since the inception of the project. Those who agreed provided demographic information regarding their years of education, their adult incomes, their number of children and their relationship status.

## Results

### *Missing Data*

Of the 693 individuals who were selected for the representative sub-sample used in the current study, 567 individuals had provided the demographics variables required for the current analyses. Little's Missing Completely at Random test assessed the patterns in the missing data according to self and peer perceptions of childhood aggression, social withdrawal and likeability, years of education, adult income, mental health status and family of origin socioeconomic status. Results were non-significant (Little's MCAR  $\chi^2(42) = 56.22$ ,  $DF=59$ ,  $Sig=.58$ ) indicating that the participants were missing at random. List-wise deletion was used to control for missing data.

A series of correlations were performed to examine the relation between self and peer perceptions of aggression, social withdrawal and likeability and the adult outcomes of years of education, adult income and parent status. These correlations are found for

men and women in Table 2. Subsequently, three step regressions were carried out to examine (1) the relation between childhood behaviours and years of education and adult income once family of origin SES and age were controlled for and (2) if adding self and peer ratings improved predictability of adult outcomes. Self perceptions of aggression, social withdrawal and likeability were added in the first step, peer perceptions of aggression, social withdrawal and likeability were added in the second step, and appropriate demographic variables were controlled for in the third step.

Higher levels of peer reported aggression were correlated with fewer years of education for both men and women. Additionally, higher self-reported aggression was associated with fewer years of education for women. Higher peer ratings of aggression were related to fewer years of education for men even when childhood SES and age were controlled for (See Table 3). Higher self reported social withdrawal was correlated with fewer years of education for women, and continued to be associated when age and childhood SES were controlled for. Finally, higher levels of peer reported likeability were correlated with more years of education in men and women, and continued to be associated even when demographic variables were controlled for. Higher levels of self-reported likeability were also associated with more years of education for women, even after the inclusion of demographic variables.

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Insert Table 3 about here

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Higher peer-rated social withdrawal was correlated with lower adult income for both men and women, and remained significantly related to income in men once

demographics variables were controlled for (see Table 4). Higher self-rated social withdrawal was significantly correlated to lower income in women, although men's results showed a similar directionality. This finding was not significant when other behaviours were included in the analyses. Higher peer rated likeability was correlated with higher adult income for men and women. Higher self rated likeability was also correlated with higher adult income in women. Follow up analyses suggested that years of education mediated between self perception of likeability and adult income in women, using Baron and Kenny's (1986) four criteria for mediation, with the Sobel test supporting the significance of the mediation ( $z=2.09$ ,  $sd=565.46$ ,  $p<.05$ ). Higher peer rater likeability was associated with higher adult income in men. Adult income was not correlated with peer or self rated aggression.

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Insert Table 4 about here

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The correlations for parent status indicated that higher peer rated social withdrawal in men and higher peer rated likeability in women was associated with a lower likelihood of having children. Binary logistic regressions, with the same steps used in the multiple regressions, were carried out to examine the relation between childhood behavioural variables and parenting status. The results of these binary logistic regressions can be seen in Table 5. For men, higher peer rated social withdrawal was associated with lower likelihood of parent status, and childhood behaviour variables accounted for 13% of the total variance. Neither self nor peer rated social withdrawal was associated with parent status in women. Women with higher levels of peer rated likeability were less

likely to have children in the current sample. In order to assess the role of age at child bearing in the relation between likeability and parent status an ANOVA compared non parents with women who had children early in life (between the ages of 15 and 25) and women who had children after age 25. This ANOVA was significant ( $F(2, 387)=3.83, p<.05$ ), with women who had become mothers below age 25 showing lower levels of likeability than both women who had become mothers after age 25 and non parents.

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Insert Table 5 about here

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It was hypothesized that including both self and peer perceptions of childhood behaviours would increase predictability of adult outcomes in the current study. However, examining the change coefficients when self and peer perceptions were added together failed to support this hypothesis. The only exception to this was the case of women's years of education, where both self and peer perceptions of childhood behaviour significantly explained more of the variance in the equation. Agreement between raters was also anticipated to increase predictability of the outcomes. An interaction term between self and peer ratings of childhood behaviour was added to the end of each of the regressions, but failed to significantly relate to adult outcomes.

Multiple regressions were carried out to examine linear and quadratic relation between differences in self and peer perceptions of childhood behavioural patterns and adult outcomes. These differences were computed by subtracting peer perceptions from self perceptions, and the quadratic was calculated by squaring these differences. The results of these regressions can be seen in Table 6. For each of these regressions, family

of origin SES and age of participant were controlled for in the first step, the difference between self and peer perception of behaviours was included in the second step, and the quadratic difference was included in the third step.

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Insert Table 6 about here

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The linear difference in self and peer perception of social withdrawal was significant for women, with self enhancement of social withdrawal relating to more years of education. However, the quadratic difference was also negatively related to years of education in women, with smaller disparities between self and peer perceptions of social withdrawal being associated with more years of education. The quadratic difference was significant in predicting adult income, in that lower disparity between self and peer ratings were associated with higher adult incomes for both men and women.

The quadratic difference between self and peer perception of likeability was positively related to years of education in women. Specifically, having higher self perception relative to peer perception, or self enhancement, was associated with more years of education in women. The findings for adult income were similar, with self enhancement of likeability being associated with greater adult income in women. The findings for men were non-significant, but in the same direction. There were no quadratic or linear effects for aggression, and there were no significant findings regarding the difference between peer and self perceptions of childhood behaviour and parent status.

## Discussion

Comparing self and peer perceptions of childhood aggression, social withdrawal and likeability differentially related to years of education, income and parent status and suggested some of the pathways by which these childhood behaviours predict adult outcomes. Higher peer perceptions of aggression were related to fewer years of education for men and women, and higher self perceptions of aggression were related to fewer years of education in women, supporting previous research linking aggression and academic achievement (Brook & Newcomb, Huesmann et al., 2009; Kokko, et al., 2003), and supporting the importance of peer perceptions. Higher self perceptions of social withdrawal were associated with fewer years of education in women, supporting a modest relation between higher social withdrawal and lower academic achievement (Risi, Gerhardstein, & Kistner, 2003; Serbin et al., 1998). While higher levels of self-perceived likeability were significantly associated with more years of education in both men and women, peer perceptions of likeability were more strongly associated with this outcome, findings that may reflect previous research associating academic achievement with peer acceptance (Vannatta, Gartstein, Zeller & Noll, 2009). The relation between childhood behaviour and years of education supported the majority of the hypotheses regarding the relation between these variables.

Peer rated social withdrawal was associated with lower adult income for men and women, while women's self-rated social withdrawal was associated with lower adult income. However, only peer perceptions of social withdrawal in men continued to be significantly associated with adult income once more proximal factors were controlled for. This finding suggests a stronger relation between social withdrawal and adult income

for men than women as indicated in previous research (Caspi et al., 1989). Peer rated likeability was associated with higher adult income for men and women and self perceptions of likeability were associated with higher adult income in women, although this relation was mediated via years of education. Neither self nor peer rated aggression was associated with lower adult income, which was surprising. This may have occurred for several reasons. Many of the earlier studies have linked childhood aggression with more severe markers of low adult SES such as length of time spent unemployed, living in poverty and occupational status (Kokko & Pulkkinen, 2000; Newcomb et al., 1995; Serbin et al., in press). High levels of childhood aggression may be associated with indicators of low adult income, rather than variation of adult income across a continuum.

Few studies have looked at behavioural predictors of parent status. Behavioural variables were associated differently with parent status for men and women. For men, lower adult income and higher rates of childhood social withdrawal both reduced the likelihood of parent status. Other research has also associated social withdrawal and shyness (Caspi et al., 1989, Kerr et al., 1996) and lower activity (Jokela et al., 2009) with greater latency to parenthood in men, but not women. These findings may reflect the agentic role proscribed to men by gender roles during courtship, which may be inhibited by socially withdrawn styles of interaction.

For women, lower age, fewer years of education and higher levels of likeability were all associated with a reduced likelihood of becoming parents, supporting previous research linking women's SES and the likelihood of having children (Kokko, et al., 2009). However, the results for likeability were surprising in light of previous research associating sociability with increased likelihood of parent status (Jokela et al., 2009).

However, further analyses suggested that higher likeability was associated with lower likelihood of early entry into parenthood, but not from parenthood in general. The average age was 33 in the current study, thus it is possible that there are both men and women who will eventually have children, but may not have had their first child at this point in data collection.

Self perceptions of childhood social withdrawal and likeability were associated with years of education and adult income, but only in women. First, it is possible that boy's behaviour is more salient for the peer group compared with girls' behaviour. Boys' behaviours and social status may be based on more easily observed attributes such as engaging in athletic activities, being funny and engaging in risk behaviour (Closson, 2008). Further, their behaviour may be more salient to the peer group. It is also possible that girls are more perceptive of their own behaviour. Girls' friendships show higher levels of intimacy and may provide girls with better information with which to assess their own behaviours (Underwood, 2007).

The findings indicated that agreement between self and peer perceptions were not associated with increased predictability for any of the adult outcome variables examined, with the exception of women's years of education. This may have occurred due to peer and self perceptions of childhood behaviours accounting for overlapping variance regarding longitudinal outcomes. Further, there were few variables for which self and peer ratings were both significantly associated with longitudinal outcomes, reducing the likelihood of the two factors contributing additively to longitudinal outcomes.

The relation between discrepancies in self and peer ratings and adult outcomes varied depending on the behavioural variable being examined. For social withdrawal,

women accurately perceiving their own levels of social withdrawal had more years of education. Greater accuracy in perceptions of social withdrawal was associated with higher adult income in both men and women. Conversely, self enhancement of likeability was associated with more years of education and higher income in women. Social withdrawal is characterized by solitary behaviour (Rubin & Asendorpf, 1993), and the impact of this behaviour on peer relations varies depending on age of the individual, and the cultural context (Rubin & Mills, 1988; Rubin & Asendorpf, 1993). While higher levels of social withdrawal increased the likelihood of some detrimental outcomes, self-awareness of social withdrawal, or even over-estimation of social withdrawal may aide in selecting optimal educational and employment environments. Conversely, it is also possible that children lower in social withdrawal are more accurate in their assessment of this behaviour.

In comparison, the likeability construct used in the current study assessed aspects such as social acceptance and prosociality, which may be more bound to self-concept. It has been suggested that the benefit of self-enhancement may be specific to global self-construct variables (Taylor, Lerner & Sage, 2003). While accurately perceiving one's level of social withdrawal may provide useful feedback regarding individual ability, accurately perceiving oneself as dislikeable may simply reflect low self esteem, and a maladaptive level of self-criticism.

The present study provided a unique opportunity to assess the relation between self and peer perspectives on childhood behaviour as they relate to adult outcomes. There are few longitudinal datasets that have the benefit of multiple observations during the initial assessment of childhood behaviour, and this is the first instance in which

differences in these perspectives have been related to longitudinal outcomes. However, there are limitations inherent in working with longitudinal data sets, most notably being attrition of participants over time. The current findings require replication in other samples that contain both self and peer perceptions of childhood behaviours.

Self perceptions are frequently compared for accuracy against peer perceptions, but only in the case in which individuals are asked about how their peers perceive them, or research on meta-perception, is the term accuracy truly appropriate (Bellmore & Cillessen, 2003). The assessment of self perception in the current study asked participants to describe themselves, and other research has noted the potential difficulties in assuming the peer ratings are the true indicators of the individual's behaviour (Greshame et al., 2006). Future research may further elucidate the relation between differences in self and other perceptions of childhood behaviour and longitudinal outcomes by incorporating children's meta perceptions into the analyses.

Both self and peer perceptions of aggression, social withdrawal and likeability were related to the adult outcomes examined in the present study. Comparing the predictive nature of these two perspectives on childhood behaviour offers some insight into how childhood behaviours influence adult outcomes, and suggests gender differences regarding the predictive ability of self perceptions. Further, these findings provide valuable information for future studies examining the relation between childhood behavioural variables and adult outcomes.

Study 2: Self and peer perceptions of childhood aggression, social withdrawal and likeability predict adult personality factors: A 30-year prospective longitudinal study

Alexa Martin-Storey, Lisa A. Serbin, Dale M. Stack, Jane E. Ledingham & Alex E.

Schwartzman

## Abstract

Childhood aggression and social withdrawal have been associated with Five Factor models of personality in adulthood. The present study sought to replicate and expand previous findings by comparing self and peer perceptions of childhood aggression, social withdrawal and likeability in the prediction of adult personality. The participants (N=607) were drawn from an ongoing longitudinal project of at-risk Francophone youth started in 1976-1977 in Montreal, Quebec. Self and peer perceptions of childhood aggression, social withdrawal and likeability were associated with adult personality traits. In addition, concordance between self and peer perceptions were associated with higher adult ratings of Conscientiousness for aggression and likeability. The current findings support the use of both self and peer perceptions in the prediction of adult personality.

Key words: self and peer perceptions, five factor model of personality, aggression, social withdrawal and likeability

Personality traits from the five-factor model (FFM: Neuroticism, Extraversion, Openness to Experience, Agreeableness and Conscientiousness) have been consistently associated with longitudinal health, family structure and socioeconomic outcomes (Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). The traits outlined by the FFM are thought to have a biological basis, and show some continuity across the lifecourse (McCrae & Costa, 2008). An emerging literature suggests that these traits are predicted by childhood temperament and behaviour patterns (Caspi & Silva, 1995; Cramer & Tracy, 2005; Pesonen, Rääkkönen, Keskivaara, & Keltikangas-Järvinen., 2003), and that the extensive developmental literature on emotion regulation, temperament, positive and negative affect, and patterns of childhood behaviour will provide insight into the origins of factors in the FFM of personality (Caspi, Roberts & Shiner, 2005; Rothbart, 2007; Rothbart, Ahadi & Evans, 2000).

Much of the literature examining the longitudinal outcomes of childhood behaviour has focused on undercontrolled behaviours (such as aggression) and overcontrolled behaviours (such as shyness or social withdrawal) (Asendorpf, Denissen & van Aken, 2008). Two previous studies have linked these behaviour patterns in childhood and FFM personality outcomes in adulthood (Caspi et al., 2003; Asendorpf et al., 2008). Children with high levels of aggression showed lower levels of Agreeableness, Conscientiousness, and Openness to Experience, and higher levels of Neuroticism in adulthood compared to children with low levels of aggression (Caspi et al., 2003; Asendorpf et al., 2008). Children with high levels of behavioural inhibition had lower levels of Agreeableness and showed general continuity of inhibited behaviour (Caspi et al., 2003; Asendorpf et al., 2008). These findings suggest a relation between childhood

aggression and behavioural inhibition and adult personality. Childhood likeability has not been examined as a predictor of adult personality. However, constructs associated with likeability, such as sociability and agreeableness, have demonstrated continuity over the lifespan (Cramer & Tracy, 2005; Hampson & Goldberg, 2006; Martin & Friedman, 2000) suggesting that childhood likeability may relate to adult personality outcomes.

The modest correlations found between childhood behaviour and adult personality has been suggested to occur as a result of comparing different perspectives of childhood behaviour (Pesonen et al., 2006). Previous research examining the longitudinal outcomes of childhood personality traditionally relates parent or teacher reports in childhood to self-reports in adulthood (e.g. Asendorpf, et al., 2008; Caspi et al., 2003; Hampson & Goldberg, 2006; Pesonen et al., 2003). This suggests incorporating self perception of childhood behaviour to improve the prediction of adult personality outcomes (Caspi et al., 2005).

Comparing contemporaneous perspectives of childhood behaviour such as aggression, social withdrawal and likeability yields moderate correlations (Ledingham, Younger, Schwartzman, & Bergeron, 1982), reflecting the contextual nature of children's behaviour (Epstein, Renk, Duhig, Bosco & Phares, 2004; Grietens et al 2004; Vazire & Mehl, 2008). Within the adult personality literature, the difference between self and other perspectives are thought to represent the difference between identity and reputation perspectives of personality (Roberts & Wood, 2006, p. 16). While the individual may have a unique perspective regarding the motivations of their own behaviours, some research suggests that outsider perspectives offer the only truly accurate perception of the

personality. The present study offered a unique opportunity to examine how self and peer perceptions compare in the prediction of longitudinal personality outcomes.

Previous research has established a modest continuity between aggression and social withdrawal in childhood and the FFM in adulthood. The current study sought to expand this literature by (1) replicating the relation between the childhood aggression and social withdrawal, and adult personality found in previous research, while exploring the relation between likeability and the FFM in an at-risk francophone sample, (2) comparing self and peer perceptions of childhood behaviour as they predict factors on the self-reported FFM, and ascertaining if these relations remained significant once gender and socioeconomic status variables were controlled for and (3) examining if concordance between self and peer perceptions of childhood behaviour is associated with the increased prediction of adult personality. It was anticipated that (1) higher aggression in childhood would be associated with higher Neuroticism, and lower Agreeableness, Conscientiousness and Openness to Experience, higher social withdrawal in childhood would be associated with lower Agreeableness and higher likeability would be associated with higher Agreeableness and Conscientiousness, and lower Neuroticism, (2) self perceptions rather than peer perceptions of childhood behaviour would be more strongly associated with the adult personality as assessed by self report, and that these relations would remain significant once gender and socioeconomic factors were controlled for and (3) concordance between self and peer perceptions would be associated with a stronger relation between childhood behaviour and adult personality variables, and that using both self and peer perspectives would increase the amount of variance accounted for in adult personality factors.

## Method

### *Participants*

The participants in the current sample were drawn from the Concordia Longitudinal Risk Project, (The Concordia Project: Schwartzman et al., 1985) an ongoing prospective longitudinal project examining the influence of childhood aggression, social withdrawal and likeability on outcomes across the lifecourse. Previous research with this sample has focused primarily on the relation between peer perceived childhood behaviours and socioeconomic, family structure and mental health outcomes (see Schwartzman et al., 2009; Temcheff et al., 2008; Serbin et al., 1998), and has not compared self and peer perceptions of behaviour or examined adult personality outcomes. Participants were recruited from francophone, working-class neighbourhood schools in Montreal when they were in grades 1, 4, or 7. The current sample consisted of a representative sub sample of individual in the Concordia Project who had been contacted between 1999-2001 to complete a number of measures relating to their adult functioning. Of this sub sample, 607 (361 women) had completed the personality and demographics measures required for the current analyses (for additional demographic information please see Table 7).

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Insert Table 7 about here

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### *Measures*

*Childhood Behaviour* A French translation of the *Pupil Evaluation Inventory* (Pekarik et al., 1976) was used to assess peer and self perceptions of aggression, social withdrawal

and likeability. The PEI is a 35 item measure with 20 items assessing aggression (e.g. Those who start a fight over nothing), 10 items assessing social withdrawal (e.g. Those who are too shy to make friends easily) and 4 items assessing likeability (e.g. Those who are liked by everyone). For the peer report version of the PEI, students nominated up to four children in each class whose behaviour matched each item. Nominations were made by gender, with children nominating up to 4 girls and 4 boys. A child's number of nominations was then summed up and standardized based on gender and classroom size. This measure demonstrates strong validity and reliability (Lyons, Serbin & Marchessault, 1988). For the self-evaluation component, children were asked if the same questions applied to them or not, and the number of agreements was summed up for each of the three behavioural scales. These scales were corrected for skew, and subsequently standardized across gender and classroom. The means, ranges and standard deviations for self and peer ratings from the PEI can be seen in Table 7.

*Adult Personality* A French translation of the Neuroticism Extraversion Openness Five Factor Inventory (NEO-FFI: Costa & McCrae, 1992) was used to assess adult personality in the current study. This widely used personality inventory assessed the five general personality traits of Neuroticism, Conscientiousness, and Openness to Experience, Agreeableness and Extraversion using a 60-item scale. The NEO-FFI is considered to be the most validated measure of the FFM, and has been used repeatedly in a wide variety of research contexts (John & Srivastava, 1999). Means, ranges and standard deviations for the NEO-FFI can be seen in Table 7.

### *Procedure*

Participants in the Concordia Project were recruited via telephone, where they were asked demographics questions concerning their age, years of education, family structure and income. Those that consented were sent a package of questionnaires, including the NEO-FFI, which on completion, were returned by mail. Those participants who returned their questionnaire package received financial remuneration.

### *Results*

The participants in the current study were drawn from a sample of 693 individuals who had been selected as a representative of the initial 1,774 participants in the Concordia Project. Of this sub sample, 607 had completed the NEO-FFI as well as the demographics questions and thus qualified for the current analyses. Missing data analyses including family of origin socioeconomic status, years of education, adult income, childhood behaviours and adult personality factors indicated that participants were missing at random ( $\chi^2=56.22$ ,  $DF=59$ ,  $Sig=.58$ ), and thus list-wise deletion (Little, 1988).

Correlations between self and peer perceptions of aggression, social withdrawal and likeability and adult self-rated personality can be seen in Table 8. Four step regressions were carried out to examine the relation between self and peer perceptions of childhood behaviour and adult personality. Self perceptions of the childhood behaviour (i.e. aggression, social withdrawal or likeability) were added in the first step, peer perception of childhood behaviour were added in the second step, gender was added in the third step and years of education and income were included in the fourth step. Interactions with gender and income were also calculated. There were no significant

interactions with adult income, however interactions with gender will be discussed when significant.

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Insert Table 8 about here

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Neuroticism was correlated with higher peer perceptions of aggression and self perceptions of social withdrawal and lower peer perceptions of likeability. When examined simultaneously using multiple regressions (see Table 9), self perceived social withdrawal was significant in the first, step, with peer perceived likeability being the only significant childhood behavioural predictor in the second and third step. Once socioeconomic variables were added, there were no significant childhood behaviour predictors of adult Neuroticism. Further analyses indicated that the relation between peer perceived likeability and adult neuroticism was mediated by years of education as the relation between these variables met Baron and Kenny's criteria for mediation (1986), with the Sobel test supporting the statistical significance ( $z=3.41$ ,  $SE = .17$ ,  $p < .001$ ).

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Insert Table 9 about here

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Extraversion was negatively correlated with peer perceived social withdrawal, and remained significantly negatively associated even after gender and socioeconomic factors were controlled for (see Table 9). In the final step, childhood aggression was also positively associated with adult Extraversion. There was also a significant interaction with gender. Women's Extraversion was the same across level of peer perceived childhood aggression, however, men's low peer perceived aggression was associated with

lower levels of adult extraversion compared to men with higher levels of peer perceived extraversion (Beta (gender x peer perceived aggression)=-.08,  $p<.05$ ,  $\Delta R^2=.01$ ,  $F(1, 596)=4.05$ ,  $p<.05$ ).

Agreeableness was negatively correlated with peer perceived childhood aggression, and positively correlated with peer perceived likeability. When the variables were examined simultaneously, self perceived aggression negatively predicted adult agreeableness until peer perceived likeability was included in the analyses (see Table 10). Peer perceived likeability remained a significant predictor until socioeconomic factors were controlled for. Further analyses indicated that income and years of education significantly mediated between peer perceived likeability and agreeableness, as in both cases criteria for mediation were met and the Sobel tests for education ( $z=2.54$ ,  $p<.01$ ) and income ( $z=2.24$ ,  $p<.01$ ) were significant.

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Insert Table 10 about here

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Conscientiousness was negatively correlated with self perceptions of social withdrawal and was positively correlated with self and peer perceptions of likeability. When examined simultaneously in the regression, the variable self perceptions of social withdrawal was significant in every step, even once gender and socioeconomic status were controlled for (See Table 10). Peer perceived likeability was more strongly associated with Conscientiousness than self perceived likeability when examined simultaneously, although neither was significant once socioeconomic variables were controlled for and the criteria for mediation were not met.

There were no significant correlations between childhood behaviours and adult Openness to Experience, nor were there any significant interactions with gender or socioeconomic status. For this reason no further analyses were performed with this personality trait as an outcome variable.

Including both self and peer perceptions of childhood behaviour was associated with increased predictability of Agreeableness. There were no other additive benefits for any of the other adult personality variables examined. In the case of both Neuroticism and Extraversion, the step containing only self perceptions was not significant, and in the case of Conscientiousness, the step including peer perceptions was not associated with a statistically significant change. Except in the case of Agreeableness, the current findings indicate that self and peer perceptions were not additive regarding the prediction of personality outcomes.

Interactions between self and peer perceptions of childhood behaviours were examined to investigate the relation between observer concordance and personality outcomes. This was investigated by adding an interaction term in the fifth step of the regression described above. The interaction between self and peer perceptions of both likeability (Beta=.20,  $p<.01$ ) and aggression (Beta=.16,  $p<.01$ ) significantly predicted adult Conscientiousness, and added to the model ( $\Delta R^2 = .03$ ,  $\Delta F(2, 595)=9.40^{**}$ ). As can be seen in Figure 1, individuals who had both low self and peer perceptions of aggression showed higher levels of Conscientiousness in adulthood (see Figure 1). Similarly, individuals who had both high self and peer perceptions of likeability in childhood had higher levels of adult Conscientiousness, while individuals who perceived themselves as

high on likeability, but were perceived by their peers as low on likeability had the lowest level of Conscientiousness (see Figure 2).

## Discussion

The current findings partially support previous research regarding the relation between childhood aggression, social withdrawal and adult personality outcomes. Higher levels of childhood aggression were associated with higher adult levels of Neuroticism, and lower levels of Agreeableness, reflecting previous findings (Caspi et al., 2003; Asendorpf et al., 2008; Laursen, Pulkkinen & Adams, 2002). However, this relation was not significant when other behaviour variables were included in the analyses, and the pattern of findings varied as to whether self or peer perceptions were more strongly associated with personality outcomes. There was a significant positive effect of aggression on Extraversion, but only after socioeconomic variables were controlled for. Interestingly, gender interacted with peer rated aggression in predicting Extraversion, with higher childhood aggression being associated with higher extraversion in men but not women. This is surprising, as much of the adult literature has associated higher concurrent aggression with lower Extraversion (Burton, Hafetz & Henninger, 2007; Sharpe & Desai, 2001). The current findings may reflect the lower level of acceptance regarding women's aggressive behaviour (Caspi, Bem & Elder, 1989).

Peer, but not self perceptions of social withdrawal were negatively associated with Extraversion, even when socioeconomic variables and gender were controlled for. This may suggest that the insight provided by peers is more closely linked to this socially driven personality outcome. Conversely, Agreeableness was not associated with social withdrawal, which may reflect differences in these two constructs. Extraversion is

associated with outgoingness, while Agreeableness is associated with quality of interpersonal relations. A shy child who is slow to warm may still be quite agreeable with greater familiarity, and the current findings may reflect the difference between the constructs of shyness and sociability (Schmidt & Fox, 1995). It was anticipated that social withdrawal would predict Agreeableness as previous research showed that behavioural inhibition predicted this personality outcomes (Caspi et al., 2003; Asendorpf et al., 2008). Behavioural inhibition is related to, but not the same as, social withdrawal, which may explain the difference in the present study. There was a weak relation between social withdrawal and Neuroticism, which was also seen in the previous longitudinal research (Asendorpf et al., 2008). Higher self perceived social withdrawal was also related to lower levels of Conscientiousness in adulthood, which remained significant even when socioeconomic variables and gender were controlled for. Conscientiousness may have been associated with self perception rather than peer perceptions due to the more internal nature of both this childhood behaviour pattern and adult personality factor. While it is unclear why social withdrawal predicted later Conscientiousness, previous research has suggested a relation between Conscientiousness and friendliness (Martin & Friedman, 2000), which may explain the findings of the current study.

Finally, peer perceived likeability was negatively associated with adult Neuroticism, and positively associated with Agreeableness and Conscientiousness, suggesting the importance of peer perceptions in this socially motivated outcome. Personality factors such as lower levels of Neuroticism and higher levels of Agreeableness and Conscientiousness have been associated with improved social

functioning (Raad & Perugini, 2002; John & Srivastava, 1999), as would be anticipated for childhood likeability. However, education and adult income mediated the relation between childhood likeability and adult Neuroticism and Agreeableness, suggesting that likeability may relate to adult personality via the socioeconomic context it engenders.

Concordance between self and peer ratings of likeability and aggression in childhood were associated with Conscientiousness in adulthood. Self and peer agreement on high levels of likeability and low levels of aggression were both predictive of higher levels of Conscientiousness in adulthood. The relation between self and peer concordance was unique to Conscientiousness, and may reflect the relation between Conscientiousness and honesty and modesty (John & Srivastava, 1999; Horn, Nelson & Brannick, 2004). Ultimately, higher levels of Conscientiousness in adulthood are associated with lower rates of risk behaviour and greater longevity (Friedman et al., 1995), highlighting the relevance of understanding the childhood predictors of this personality factor.

There was little support for the additive advantage of including both self and peer perceptions of childhood behaviour in predicting longitudinal outcomes. Except for Agreeableness, including both self and peer perceptions were not associated with an increase in the variance accounted for. However, comparing self and peer perceptions in the prediction of adult outcomes may provide some valuable insight regarding the continuity of these behaviours. Neither self nor peer perceptions of childhood behaviour were consistently more strongly associated with adult personality factors. While self perceptions were anticipated to be more strongly associated with adult outcomes due to same source bias, this was not consistently the case. This may have occurred for several reasons. Peer perception reflects an amalgamation of multiple perspectives, compared to

the single perspective provided by self perception. Single observer ratings, even when that single observer may have access to a wealth of information regarding the target, may be influenced by situational factors that bias individual responses, and the current findings may reflect the biases associated with relying on self reports of personality (Hostee, 1994). In addition, children may be limited in their ability to assess their own behaviour due to either low levels of self awareness or high levels of social desirability. Thus, while the child can access the great amount of information regarding their own behaviour across multiple contexts, their ability to accurately report this behaviour may be somewhat skewed. Finally, nearly thirty years passed between the assessment of childhood behaviour and adult personality outcomes. It is possible that the time elapsed eliminates the bias occurring from comparing rating from the same rater.

#### *Limitations and Future Directions*

There are few prospective longitudinal studies linking childhood behaviours to adult personality factors, and none that both compare both self and peer ratings while controlling for socioeconomic factors. There were still however, several limitations in the current study. First, effect sizes regarding the relation between childhood behavioural variables and adult measures of personality were small, which is consistent with research predicting adult outcomes from childhood behaviours (Caspi et al., 2003; Martin & Friedman, 2000). These small effect sizes likely reflect the substantive time interval between the two measurement points, and the fact that while aggression, social withdrawal and likeability may relate to the dimensions of the five-factor model, they represent different underlying constructs. Finally, as with all longitudinal studies, attrition

over time was a potential problem. While analyses indicated that these participants were missing at random, they may have differed on factors not assessed in the current study.

Both years of education and adult income were controlled for, to clarify the relation between childhood behaviours and adult personality. In many cases, these socioeconomic factors were associated with adult personality outcomes. However, the direction of these findings was not interpreted, as previous research has suggested that personality factors predict socioeconomic outcomes (Roberts et al., 2007). Future research should examine the relation between childhood behaviours and the interaction between SES factors and adult personality over time.

The current findings supported the previous literature linking childhood behaviour to the FFM of personality in adulthood, illuminating the potential developmental origins of these factors. Further, this was the first study to compare differences in self and peer perceptions of childhood behaviour to adult personality. For the most part, self and peer perceptions of childhood behaviour were associated with different longitudinal outcomes, reflecting the importance of using multiple perspectives in assessing children's behaviours, and suggesting some continuity in the relation between these variables across time.

Study 3: Self and peer perceptions of childhood aggression, social withdrawal and likeability predict adult substance abuse and dependence: A 30-year prospective longitudinal study

Alexa Martin-Storey, Lisa A. Serbin, Dale M. Stack, Jane E. Ledingham & Alex E. Schwartzman

## Abstract

**Aims:** While childhood behaviours such as aggression, social withdrawal and likeability are linked to substance abuse outcomes in adolescence and adulthood, the mechanisms for this relation are not yet well established. It was anticipated that examining how self and peer perceptions of childhood behaviours related to substance abuse outcomes would clarify the mechanisms of continuity.

**Design & Measurement:** Participants (N=676) in an ongoing longitudinal project examining the relation between childhood aggression, social withdrawal and likeability and adult mental health outcomes completed the Structured Clinical Interview for the DSM IV regarding their history of substance abuse in mid-adulthood (mean age =34, SD=2).

**Findings:** Higher levels of aggression were associated with greater likelihood of drug and alcohol abuse and dependence, but only in women. Higher levels of peer perceived social withdrawal were protective regarding substance abuse and dependence outcomes in men, and continued to be protective for men even when proximal variables such as education and adult income were controlled for. Higher self perceptions of likeability were protective in women, although this relation was mediated by socioeconomic variables.

**Conclusions:** Findings suggest the complexity of the ramifications of childhood behaviours, and support the comparison of self and peer perceptions in the prediction of substance abuse and dependence outcomes.

## I. Introduction

Drug and alcohol abuse and dependence have numerous deleterious outcomes regarding the individual's health and basic social functioning, and they cost Canada upwards of 39.8 billion dollars every year in terms of loss of productivity, disability and premature death (Rehm, et al., 2007). The profound impact of drug and alcohol abuse and dependence on health and socio-emotional functioning across the lifespan emphasizes the importance of identifying childhood predictors of problematic substance use. Previous research has identified links between childhood behaviours such as aggression, social withdrawal, inhibition, shyness and problematic patterns of substance use in adolescence and adulthood (Dubow, Boxer & Huesmann, 2008; Fothergill, Ensminger, Green, Crum, Robertson & Juon, 2007; Moffitt, Caspi, Harrington, & Milne, 2002). The mechanisms that explain this relation are currently less well understood. The present study sought to examine the relation between childhood aggression, social withdrawal and likeability and adult drug and alcohol abuse and dependence, and in particular to clarify the nature of this relation for social withdrawal and likeability by comparing self and peer perceptions of these behaviour patterns in childhood.

### 1.2 Childhood behaviours and adult substance use outcomes

Previous research has not compared different observations of childhood behaviour in predicting adult substance abuse, as childhood behaviour has been assessed using either a single observer, or single type of observer (Ensminger, Juon, & Fothergill, 2002, Dubow et al., 2008; Caspi, et al., 1997). However, there is only a moderate correlation across observers of childhood behaviour, which can be attributed to both error and differences in child behaviour across context (De los Reyes & Kazdin, 2005; Epstein,

Renk, Duhig, Bosco & Phares, 2004; Grietens et al., 2004). Examining the relation between self and peer perceptions of the same childhood behaviours can clarify how childhood behaviours relate to adult outcomes, as it suggests how the context in which behaviours occur lead to adult outcomes.

### 1.3 Context and substance use outcomes

Social context is important for the development of substance abuse and dependence, as the role of the peer group in the initiation to substance abuse in adolescence has been well documented (Kirisci, Mezzich, Reynolds, Tarter & Aytacilar, 2009; Staton-Tindall, Duvall, Oser, Leukefeld & Webster, 2008). Higher rates of alcohol use in adolescence are associated with larger peer networks (Pearson, Sweeting, West, Young, West, & Turner, 2006) and individuals in deviant peer networks are particularly vulnerable to substance abuse outcomes in adulthood (Brook, Brook, Zhang & Cohen, 2009; Cornelius, Clark, Reynolds, Kirisci & Tarter, 2007). The relation between aggression, social withdrawal and likeability and adult substance abuse may reflect the impact of these behaviours on children's social functioning. Childhood social withdrawal and behavioural inhibition have been shown to decrease the likelihood of adult substance abuse (Dubow et al., 2008; Engels, Vermulst, Dubas, Bot & Gerris, 2005; Fothergill & Ensminger, 2006), suggesting that individuals whose behaviour patterns preclude the development of large social networks are less likely to engage in this behaviour. Similarly, behaviours such as cheerfulness and popularity that increase the size of social networks have been associated with increased likelihood of problematic substance abuse (Martin et al., 2002; Dubow et al., 2008). Multiple studies have linked childhood aggression to increased risk for alcohol abuse (Fothergill & Ensminger, 2006; Dubow et

al., 2008; Pitkanen, Kokko, Lyyra & Pulkkinen, 2008), cannabis and poly drug use (Brook & Newcomb, 1995; Ensminger et al., 2002), as this behaviour increases the likelihood of associating with delinquent peers that influence onset of problematic substance use (Dodge, Malone, Landsford, Miller, Pettit, & Bates, 2009).

Conversely, self-concept variables also relate to substance abuse and dependence. Need for self-enhancement, negative self-schemas and high levels of self-criticism have been suggested as a motivation for substance use during adolescence (Corte & Zucker, 2008; Holle & Ingram, 2008; Kaplan, 1978). From this perspective, the association between childhood behaviour and self-perception may explain the relation to substance abuse outcomes. Behavioural inhibition and social withdrawal have been linked to higher levels of negative affect and increased likelihood of mood disorder (Caspi et al., 1996; Cox, MacPherson & Enns, 2005; Moffitt et al., 2007). Substance abuse and dependence can be conceptualized as a maladaptive coping mechanism for this negative affect, and may explain why some studies have found constructs associated with social withdrawal such as behavioural inhibition and social anxiety to be predictive of substance abuse outcomes (Caspi et al., 1996; Book & Randall, 2002). Similarly, high levels of childhood aggression have been associated with increased risk of depressive symptoms and negative affect in adolescence and adulthood (Capaldi, 1992; Measelle, Stice & Hogansen, 2006), which may play a role in the relation between childhood aggression and later substance abuse. Finally, variables similar to likeability such as prosociality are associated with more positive self concept, which have been shown to decrease the likelihood of adult substance abuse (Zettergren, Bergmen & Wångby, 2006).

It has been well established that demographic variables such as fewer years of education and lower adult income are associated with substance abuse outcomes (Swendsen et al., 2009). Previous research indicates that childhood aggression may be associated with substance abuse via educational achievement (Englund, Egeland, Oliva & Collins, 2008), and a substantive body of work has associated high aggression and social withdrawal and low likeability with lower education and SES outcomes in adulthood (Huesmann, Dubow & Boxer, 2009; Risi, Gehardstein & Kirstner, 2003; Kokko, Bergmen & Pulkkinen, 2003). These findings support controlling for socioeconomic variables when examining the relation between childhood behaviour and substance abuse outcomes.

#### 1.4 The present study

Data from the Concordia Longitudinal Data Project (Concordia Project: Schwartzman, Ledingham & Serbin, 1985) were used to examine the relation between self and peer perspectives of childhood behaviours and adult substance abuse outcomes. Previous research with this sample has examined the relation between peer perceptions of childhood behaviour and more general mental health outcomes such as adult internalizing and externalizing but has not focused on specific substance abuse outcomes (see Schwartzman, Serbin, Stack, Hodgins & Ledingham, 2009).

The present study sought to (1) replicate previous findings linking childhood aggression, social withdrawal and likeability to drug and alcohol abuse and dependence in adulthood; (2) examine if using both self and peer perspectives of childhood behaviours increased the predictability of adult substance abuse and dependence outcomes and (3) illuminate the relation between childhood behavioural variables and

adult substance abuse and dependence outcomes by comparing the relation between self and peer perceptions.

It was anticipated that comparing self and peer perceptions would clarify the relation between childhood behaviour and adult substance abuse outcomes, particularly in the case of social withdrawal and likeability. Both self and peer perceptions of childhood aggression were expected to be associated with adult substance abuse and dependence outcomes. However, it was anticipated that peer perceptions of social withdrawal would be protective, while self perceptions would be either non-significant or would increase the later likelihood of substance abuse and dependence. Self perceptions of likeability were anticipated to be protective while peer perceptions would be either non-significant or detrimental. Finally, it was also anticipated that including both self and peer perspectives on childhood behaviour would increase the amount of variance accounted for regarding substance abuse outcomes. As considerable gender differences have been found regarding both rates of substance abuse (Swendsen et al., 2009), and pathways between childhood behaviours and adult substance abuse outcomes (Caspi et al., 1996; Dubow et al., 2008; Fothergill & Ensminger, 2006), all analyses in the current sample were done separately by gender.

## 2. Method

### 2.1 Sample

The participants in the current study were 676 (386 women) of the 693 individuals from the original Concordia Project who were selected to participate in a detailed follow up pertaining to their mental health and general functioning. These participants were a representative subsample of the 1,770 children recruited at time 1

(T1) when they were in grades, 1, 4 or 7 in 1976-1977, from working class, francophone schools in Montreal, Canada. During the wave of data used as T2 in this study, participants ranged in age from 28 and 40 (demographic data by gender can be seen in Table 1). Of the participants, 460 were either married or cohabitating, 69 were separated or divorced, 146 were single and 1 was widowed, with the majority (N=470) having one or more children.

## 2.2 Measures

Childhood behaviour: A French translation of the *Pupil Evaluation Inventory* (Pekarik et al., 1976) was used to assess peer and self perceptions of aggression, social withdrawal and likeability. The PEI is a 35 item measure with 20 items assessing aggression (e.g. Those who start fights over nothing), 10 items assessing social withdrawal (e.g. Those who are too shy to make friends easily) and 4 items assessing likeability (e.g. Those who are liked by everyone). Their responses were summed by scale, and standardized across age and classroom. The peer report scale of the PEI shows strong validity and reliability (Lyons, Serbin & Marchessault, 1988). For the self-evaluation component, children were asked if the same question applied to them or not. Their responses were summed by scale, and standardized for sex and classroom. The means, ranges and standard deviations for self and peer ratings from the PEI can be seen in Table 11.

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Insert Table 11 about here

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Substance abuse: History of drug and alcohol abuse and dependence were assessed using the Structured Clinical Interview for the DSM-IV (*SCID-II*; First, Spitzer, Gibbon, & William, 1997). The SCID-II is a structured interview commonly used to assess psychiatric functioning in both clinical and research settings. The alcohol and drug history of abuse and dependence scales pertains to the individual's history of problematic substance abuse across the lifespan. In the current sample, 65 (22.4%) men and 27 (7.0%) of women reported a lifetime history of alcohol abuse, and 39 (13.4%) men and 27 women (7.0%) of women reported a lifetime history of alcohol dependence (dependence precluding abuse). These prevalence rates are similar to those found in large-scale epidemiological studies (Hasin, Stinson, Ogburn & Grant. 2007). Thirty-three (11.4%) of men and 11 (2.8%) of women reported history of drug abuse, and 52 (18.3%) of men and 46 (11.9%) of women reported a history of drug dependence. For the purpose of analyses, history of alcohol or drug abuse and dependence was dichotomized to compare those with a history of abuse and dependence to those with no history of abuse and dependence.

### 2.3 Procedure

During the initial testing period at T1, peers nominated up to four boys and four girls per item on the PEI. Participants also completed the self-evaluation portion of the PEI at this time (For further detail please see Schwartzman et al., 1985). The participants in the current study were contacted by telephone to solicit participation at T2. Those who consented provided demographic information regarding their age, years of education and family income over the telephone. The participants in the current study were also

administered the SCID-II by someone with masters level training or above in the field of Clinical Psychology.

### 3. Results

#### 3.1 Missing data analyses

Of the 693 individuals who were selected for the representative sub-sample used in the current study, 676 individuals had completed the SCID-II and provided the demographics variables required for the current analyses. Little's Missing Completely at Random test assessed the patterns in the missing data according to self and peer perceptions of childhood aggression, social withdrawal and likeability, years of education, adult income, mental health status and family of origin socioeconomic status. Results were non-significant (Little's MCAR  $\chi^2(42)=40.80$ ,  $p=.52$ ) indicating that the participants were missing at random (Little, 1988). Accordingly, list-wise deletion was used to correct for missing data.

#### 3.2 Analyses

Correlations were performed to examine the relation between childhood behaviour patterns and lifetime history of drug and alcohol abuse and dependence and adult demographics details can be seen in Table 12. Subsequently, binary logistic regressions were then carried out to compare the relation between self and peer perceptions of childhood behaviours to substance abuse and dependence outcomes and to establish if childhood behaviours were associated with substance abuse outcomes over and above demographic factors. The first step in these regression added self perception of childhood behaviours, the second step added peer perception of childhood behaviours, and the third step controlled for years of education and adult family income.

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Insert Table 12 about here

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History of drug abuse and dependence was correlated with childhood behaviour (Table 12). For women, higher levels of peer and self perception of childhood aggression were associated with greater likelihood of a history of drug abuse and dependence, as was lower levels of likeability. When only self perceptions of childhood behaviour were included in the analyses, higher aggression and lower likeability continued to be associated with drug abuse and dependence outcomes (Table 13). However, once peer perceptions were included, only self perceived likeability was significantly associated with the outcome, and the step was not significant. This suggests that self and peer perceptions of aggression may have accounted for a similar portion of the variance regarding drug abuse and dependence outcomes. Finally, once demographic variables were included, none of the childhood behaviour variables were associated with history of drug abuse and dependence. Education was tested as a mediator in the relation between childhood self perception of likeability and adult drug abuse and dependence, with analyses indicating that the variables met all four steps of Baron and Kenny's (1986) criteria for mediation, with the Sobel test supporting the significance of the mediation ( $z=1.92$ ,  $SE=.03$ ,  $p<.05$ ). This suggests that the relation between childhood self perception of likeability and adult drug abuse and dependence outcomes in women may occur via the impact of likeability on years of education.

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Insert Table 13 about here

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For men, higher peer perception of childhood social withdrawal was associated with lower likelihood of history of drug abuse and dependence (Table 13), which remained significant even when other childhood behaviours and socioeconomic factors were controlled for. The model including both self and peer perceptions of childhood behaviour accounted for 7% of the variance, although there were no significant relations between self and peer perceptions of likeability or aggression and men's lifetime history of drug abuse and dependence. Women's social withdrawal was not significantly associated with substance abuse and dependence outcomes.

Lifetime history of alcohol abuse and dependence was also associated with childhood behaviour patterns. Higher peer perception of childhood aggression in women was associated with greater likelihood of a history of alcohol abuse and dependence, and self-perception of higher childhood aggression trended towards significance (see Table 12). Likeability was negatively correlated with history of alcohol abuse and dependence in women. When examined simultaneously, the only significant behavioural predictor was self perception of likeability, and the model accounted for 5% of the variance for this outcome. The relation between self perception of likability and adult alcohol abuse and dependence was no longer significant once demographics factors were controlled (see Table 14). Adult income was tested as a mediator in the relation between childhood self perception of likeability and adult alcohol abuse and dependence, as criteria for mediation were met, with the Sobel test being significant ( $z=2.02$ ,  $S.E.=.01$ ,  $p<.05$ ), suggesting that self perception of likeability may relate to alcohol abuse and dependence via adult income.

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Insert Table 14 about here

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In men, higher peer rated social withdrawal was associated with a lower likelihood of alcohol abuse in adulthood, which continued to be significant even when demographics variables were controlled for (See Table 14). When both self and peer perceptions of childhood behaviour were included, childhood behaviours accounted for 5% of the total variance. Social withdrawal was not associated with alcohol abuse and dependence in women, and no other childhood behaviours were associated with history of alcohol abuse and dependence in men.

There was no additive effect from combining self and peer perceptions of childhood behaviours in the amount of variance accounted for regarding lifetime history of substance abuse in either men or women. This finding indicates that the overall predictability of lifetime history of drug abuse and dependence were not improved by combining self and peer perceptions of childhood behaviours.

#### 4. Discussion

##### 4.1 Aggression

Childhood behaviour patterns were associated with substance abuse and dependence outcomes in adulthood. As anticipated, the nature of these relations varied according to gender and the behaviour pattern being examined. It was predicted that both self and peer perceptions of aggression would be associated with higher rates of both drug and alcohol abuse and dependence in men and women. Results indicated that self and peer perceptions of childhood aggression were associated with a history of drug

abuse and dependence. Peer perceptions of aggression were associated with a history of alcohol abuse and dependence in women, but not in men. Further, childhood aggression was no longer significantly associated with substance abuse and dependence outcomes once other childhood behaviours and adult socioeconomic measures were included in the analyses. This may support previous research implicating education and SES variables as mediating between childhood aggression and adult substance abuse outcomes (Englund et al., 2008).

Aggression predicted history of substance abuse and dependence for women but not men, which is somewhat surprising in light of the previous literature suggesting aggression increased the likelihood of substance abuse for both genders (Caspi, 1997; Dubow et al., 2008). It is possible that these findings can be explained by the observation that that aggression is both less common and less acceptable in girls than in boys (Archer, 2004; Card, Stucky, Sawalani & Little, 2008), and thus may precipitate more negative outcomes (Caspi, Bem & Elder, 1989). As well, genetic factors have been shown to play a larger role in men's histories of substance use, while women's substance use may be more influenced by non-shared environmental factors (Derringer, Krueger, McGue & Iacono, 2008; van den Bree, Johnson, Neale & Pickens, 1998), which may cause substance abuse and dependence to be more strongly associated with childhood aggression in women.

Although there was a relation between childhood aggression and substance abuse and dependence in women, it was overshadowed by other behavioural variables. Thus, for neither men nor women was the relation between childhood aggression and adult substance abuse very strong. These are not the first findings that failed to confirm a

relation between childhood aggression and adult substance abuse and dependence (Crum, Juon, Green, Robertson, Fothergill, & Ensminger, 2006). It is possible that while childhood aggression is associated with drug and alcohol use in adolescence, it is not strongly associated with the development of substance abuse and dependence. Second, over a third of the men in the current study reported histories of alcohol abuse and dependence, and nearly a third reported a history of drug abuse and dependence. The normalcy of these behaviours within the current sample may override the role of aggression in predicting substance abuse outcomes. Finally, previous research linking childhood aggression to drug and alcohol addiction has frequently focused only on dependence or extremely disruptive patterns of substance use, (e.g. Caspi et al., 1996; Dubow et al., 2008) while both abuse and dependence were included in the current analyses. Thus, aggression may only be associated with the most severe types of substance use problems.

#### 4.2 Social withdrawal

It was anticipated that peer perceptions of childhood social withdrawal would be protective regarding substance abuse and dependence outcomes, while self perceptions would be either non-significant or detrimental. Peer perceptions of social withdrawal were protective regarding substance abuse and dependence outcomes in men, while self perceptions were not significant for the entire sample, suggesting the important role of the peer context in the link between social withdrawal and substance abuse and dependence in men. Previous research has also suggested a stronger protective role of men's shyness regarding problematic substance use (Fothergill & Ensminger, 2006), although results have been inconsistent (Dubow et al., 2008; Ensminger et al., 2002). The

gender difference may have occurred because social withdrawal is less normative in boys and men and has been shown to have a greater impact on men's interpersonal outcomes (Caspi et al., 1989; Coplan, Gavinsky-Molina, Lagacé-Séguin, & Wichmann, 2001). High levels of social withdrawal are discordant with traditional male gender roles, with men who endorse these roles having higher rates problematic drinking behaviour (Nolen-Hoeksema, 2004). The current finding may also reflect gender differences regarding initiation into substance abuse, with boys being influenced earlier by the peer context (Kirisci et al., 2009), although other studies do not support this conclusion (Hüsler & Plancherel, 2006). While higher social withdrawal may be detrimental regarding outcomes such as adult income, a reduced social network may be protective regarding lifetime history of substance abuse and dependence.

#### 4.3 Likeability

Self perceptions of likeability lowered the likelihood of both drug and alcohol abuse and dependence in women. This partially supports previous findings suggesting the protective nature of prosociality constructs and reduced likelihood of substance abuse outcomes (Pulkkinen & Pitkänen, 1994). The role of self concept suggests a relation between higher self concept and lower rates of substance use. Further, these findings failed to support previous research linking childhood cheerfulness and popularity constructs to detrimental substance abuse outcomes. This disparity may also have been due to differences between the likeability construct examined in the current study and measures of popularity and sociability used in previous longitudinal research (Martin et al., 2002; Dubow et al., 2008). The relation between self perceptions of likeability and adult substance abuse and dependence was mediated by socioeconomic factors,

suggesting that the relation between this likeability and substance abuse and dependence outcomes reflects the impact of self perception on more proximal economic variables, rather than a longitudinal impact of negative self concept on subsequent adult substance abuse and dependence.

Including both self and peer perceptions of childhood aggression, social withdrawal or likeability did not increase the amount of variance accounted for regarding adult substance abuse and dependence outcomes. This may reflect the considerable time elapsed between the two assessment periods, and the limited amount of variance accounted for by childhood behaviour. However, including both self and peer perceptions suggests the ways in which childhood behaviour patterns influence adult substance abuse and dependence outcomes, and the present findings should not discourage the use of both types of assessment.

#### 4.4 Limitations and future directions

The current study provided a unique opportunity to compare the relation between self and peer perceptions of childhood aggression, social withdrawal and likeability as they relate to adult substance abuse and dependence outcomes. Few studies have prospectively examined the relation between childhood behaviours and adult substance abuse using non-clinical populations. However, it is important to note that self perception and peer relations are not independent of each other. Longitudinal studies examining these constructs suggest that negative peer relations can shape self concept over time (Bellmore & Cillessen, 2006). How self and peer perceptions of childhood behaviour relate to adult substance abuse and dependence outcomes may be clarified by future

research that includes a more dynamic understanding of how these constructs interact across adolescence and early adulthood.

As with all longitudinal studies, it is difficult to foresee at the start all the variables that may contribute to the developmental outcomes being examined. Neither self-concept nor peer status was directly assessed during childhood assessments, and inclusion of these variables during earlier assessment periods may have helped clarify the current findings. As well, age of onset and patterns of substance use during adolescence are important factors in the development of substance abuse and dependence and adulthood, and information concerning the developmental course of substance use may have clarified the differences regarding the role of aggression found in the current study.

While prospective longitudinal studies provide a unique opportunity to examine the course of childhood behavioural patterns, they also have some limitations. The effect sizes found in the current study were small but similar to those found in previous studies examining the relation between childhood behaviour patterns and adult substance abuse outcomes (e.g. Ensminger et al., 2002; Dubow et al, 2008). Given the immense impact of substance abuse and dependence on individual functioning, understanding even a small amount of variance may be useful in terms of unpacking the developmental trajectories that lead to these disorders. In addition, there was some attrition in the sample over time. While the data were shown to be missing at random based on the variables available, participants in the current study may have differed from those who did not participate on some factor that was not assessed.

## 5. Conclusions

The current study partially supported previous research regarding the relation between childhood aggression and social withdrawal and adult substance abuse and dependence. It also suggested that likeability may be protective regarding substance abuse and dependence outcomes in women. Comparing self and peer perceptions of these behaviour patterns provided some insight into how childhood behaviours, particularly social withdrawal and likeability, are associated with substance abuse and dependence outcomes. Future research may benefit from including both self and peer perceptions in the prediction of substance abuse and dependence.

## General Discussion

Childhood aggression, social withdrawal and likeability were associated with many of the adult outcomes examined in the current study. Four questions were raised in the general introduction being (1) how were childhood behaviour patterns related to adult outcomes; (2) how do self and peer perceptions compare in the prediction of adult outcomes; (3) was the relation between self and peer perspectives additive in the prediction of these outcomes; and (4) did the concordance between self and peer perspectives predict adult outcomes? These four questions are addressed in this section, as well as the general strengths and limitations that arose across all three studies.

### *Outcomes of childhood aggression, social withdrawal and likeability*

Childhood aggression, social withdrawal and likeability were associated with socioeconomic, personality and substance abuse outcomes. Higher levels of aggression were associated with fewer years of education, lower levels of Extraversion, and Agreeableness in the total sample. In women, higher levels of aggression were also associated with lower levels of adult income and higher levels of substance abuse. Furthermore, once more proximal variables were included in the analyses, the relation between childhood aggression and adult outcomes was generally reduced to non-significance. Previous research supports a direct relation between childhood aggression and adult behaviours reflective of aggression, such as a history of criminal activity (Huesmann, Dubow & Boxer, 2009; Huesmann, Eron & Dubow, 2002) or family violence (Temcheff et al., 2008), which are suggestive of homotypic continuity across time. None of the outcomes examined in the current study directly reflect aggressive behaviours. The present mediational findings may suggest that aggression influences

these adult outcomes via more proximal variables. It is also important to consider that childhood aggression was assessed nearly thirty years before most of the outcomes examined. While the current study design does not permit for the examination of trajectories of childhood aggression across time, the outcome most strongly related to aggression was years of education, the outcome temporally closest to the assessment of childhood behaviour. These findings may reflect the general reduction of aggressive behaviour across the lifespan (Tremblay & Nagin, 2005), and suggest further investigation is necessary regarding the impact of diminishing rates of aggression across time on longitudinal outcomes.

Childhood social withdrawal was also associated with lower levels of income, Extraversion and Conscientiousness and higher levels of Neuroticism. Social withdrawal was also associated with fewer years of education in women and lower likelihood of parent status, drug and alcohol abuse and dependence in men. While some of these outcomes, such as lower adult income and fewer years of education are negative, these findings also supported the protective nature of childhood social withdrawal in some instances. The protective role of social withdrawal and other related behavioural constructs have been supported in other studies examining substance abuse and harm avoidance outcomes (Caspi et al., 2003; Dubow et al., 2008; Ensminger et al., 2002), suggesting some advantages regarding this pattern of behaviour. Further, childhood social withdrawal continued to be significantly associated with a number of adult outcomes even after socioeconomic variables were controlled for. This suggests that socially withdrawn behaviour acted via both cumulative and interactional pathways in its association with longitudinal outcomes. However, as there were not adult assessments of

social withdrawal, it is not possible to determine conclusively if it is indeed interactional continuity that explains the relation between social withdrawals in childhood and adult outcomes.

Men's, but not women's, social withdrawal was uniquely associated with a number of adult outcomes, which may reflect the impact of gender roles. Previous research has suggested that social withdrawal may have more consequences for boys outcomes, due to the more agentic expectations regarding men's behaviour (Caspi et al., 1989). Indeed, some research suggests that even in childhood, social withdrawal has more negative social outcomes for boys compared to girls in childhood (Coplan, Gavinsky-Molina, Lagace-Seguin, & Wichmann, 2001), although support for this finding is inconsistent (Booth-Laforce & Oxford, 2008).

Finally, likeability was associated with higher levels of education, adult income, Agreeableness and Conscientiousness and lower levels of Neuroticism. In women it was also associated with lower likelihood of substance abuse and dependence and lower likelihood of early parent status. These findings support previous research illustrating that constructs associated with likeability were associated with positive longitudinal outcomes (Caprara et al., 2008; Risi et al., 2003). Findings suggesting negative longitudinal outcomes for social behaviours has largely focused on health outcomes, (e.g Martin & Friedman, 2002), or has focused on status-related designations of social behaviour such as popularity (e.g. Schwartz, Gorman, Nakamoto, & McKay, 2006). Likeability was frequently mediated by years of education or income suggesting the role of cumulative continuity in the prediction of adult outcomes. The academic environment is a context in which peer relations are particularly salient, and previous research suggests that positive

social relations are associated with better academic outcomes (Risi et al., 2003). The impact of likeability on academic achievement may explain why it is associated with outcomes across the lifecourse.

#### *Comparing self and peer perceptions*

Both self and peer perceptions of childhood aggression were hypothesized to be associated with adult outcomes. However, it was anticipated that peer perceptions would be more strongly associated with adult outcomes for aggression, as aggressive behaviour is extremely pertinent to peers, and children's self reports of aggression may be biased by a reluctance to report their own negative behaviour. This hypothesis was supported for a number of outcomes, and supports the use of peer reports in future research involving aggressive behaviour.

It was hypothesized that self perceptions of social withdrawal would be more strongly associated with adult outcomes due to previous research emphasizing the importance of self reports in the assessment of internalizing behaviours (Hope et al., 1999). Indeed, self reports of social withdrawal were associated with Neuroticism, Conscientiousness, and years of education in women. However Extraversion, as well as men's lower adult income, lower likelihood of parent status and lower likelihood of substance abuse and dependence were all associated with peer but not self perceptions of childhood social withdrawal. This may reflect how peers provide useful information regarding socially withdrawn behaviour.

Peer perceptions, compared with self perceptions, were expected to be more strongly associated with adult outcomes, as likeability reflects social competence and the ability to interact effectively with peers. Many of the findings supported this hypothesis,

as peer perceptions of childhood likeability were associated with more years of education, higher income, lower likelihood of parent status in women, lower Neuroticism, and higher Conscientiousness. However, self perceptions of likeability were uniquely protective regarding women's history of drug and alcohol abuse and dependence. Further, likeability was the only behaviour variable for which both self and peer perceptions were associated with adult outcomes, as was the case for women's years of education and income.

For aggression and likeability, girls', but not boys', self perceptions were associated with negative adult outcomes. There are several reasons why this gender difference may have occurred. First, girls may be more aware of their own behaviour patterns than boys are. Girls are more likely to interact in small groups whose members may be able either directly or indirectly to provide information concerning an individual's behaviour. Girls are also socially rewarded for engaging in interactions where this information can be exchanged, whereas boys are not (Boulton, 1999; Boulton, 2005). Girls' self concepts are more strongly associated with the observations of others, which suggests that they may be more attentive or receptive to information regarding their behaviours (Hergovich, Sirsch, & Felinger, 2004). Secondly, the gender difference regarding the importance of self perception in girls may reflect the fact that peer perceptions of boys' behaviours may be more accurate in capturing their behaviour. Boys' behaviours are more salient to peers, and thus may be more memorable and subject to more accurate recall by the peer group (Card, Stucky, Sawalani & Little, 2008; Closson, 2009). These two factors combined may explain the gender difference regarding the predictive nature of self reports of childhood behaviour for girls, but not boys.

However, correlations between self and other perceptions were not significantly different for boys compared with girls, and findings also suggest that for girls, self perceptions are more relevant to their longitudinal outcomes. Future research should assess the impact of girls' self perceptions on more proximal outcomes to see if the gender difference regarding the utility of self perceptions is apparent at earlier ages.

It was initially hoped that the results would clearly support the strength of self or peer perceptions in the prediction of adult outcomes, which could have been used as a guideline in the design of future longitudinal studies. For the most part, peer perceptions were more strongly associated with adult outcomes than self perceptions, which may suggest the important role of external perspectives on individual behaviour. In much of the adult personality literature, the perceptions of others are thought to be the most accurate representation of personality (Robert & Wood, 2006, p. 17). However, there were several situations in the current findings in which self perceptions were more strongly associated with adult outcomes. For example, women's history of substance abuse, and some personality outcomes were better predicted by self perceptions of childhood behaviour patterns. Thus, the merits of selecting self or peer nominations of childhood behaviours in the prediction of longitudinal outcomes may depend on both the outcome and the gender of the participant being examined.

#### *Additive effects of including self and peer perceptions*

It was anticipated that combining self and peer perspectives would account for more variance in adult outcomes as differences between observers regarding children's behaviour reflect differences in context (De Los Reyes & Kazdin, 2005; Epstein et al., 2004; Kramer et al., 2003; Grietnes et al., 2004), and previous research suggests

increased predictability and replicability resulting from combining multiple perspectives of childhood behaviour (Kim, Deater-Deckard, Mullineaux, & Allen, 2010). However, the present findings indicated little support for the additive effects of combining self and peer perceptions.

The absence of an additive effect may have occurred for several reasons. There were substantial methodological differences between the studies in the current thesis and the previous research examining concordance between observers. Most of the research using multiple observations of childhood behaviour focused on measures of childhood internalizing and externalizing, compared self, teacher and parent perceptions (with the emphasis on the later two observers) and examined how these multiple observations relate to much more proximal developmental outcomes (Kerr et al., 2007; Kim et al., 2010; De los Reyes et al., 2009). The current study did not assess childhood externalizing and internalizing behaviour problems, rather it used self and peer reports of childhood behaviour and examined longitudinal developmental outcomes. Further, within the current sample, childhood behaviours accounted for a small portion of the total variance regarding the adult outcomes examined, and thus may not be large enough to contribute independently in the prediction of longitudinal outcomes.

There were three exceptions for which including both self and peer perspectives on childhood behaviour increased the amount of variance accounted for, which were Agreeableness, Conscientiousness, and years of education in women. In all three of these cases, self and peer ratings of likeability were significant predictors of each of these outcomes. The current findings may reflect the different meanings of self perceived likeability versus likeability as perceived by other people. This finding requires

replication in other studies using alternate assessments of likeability, as the scale used in the current study contained only four items that can potentially be associated with numerous constructs. The additive nature of likeability in predicting longitudinal outcomes may be clarified by controlling for popularity, social acceptance and self-esteem.

#### *Self and peer agreement and adult outcomes*

Rater agreement regarding childhood behaviours was also anticipated to predict adult outcomes in the current thesis. Two different statistical techniques were used to assess the similarity between self and peer perceptions of childhood behaviour. The first involved interacting self and peer perceptions of childhood behaviour, and examining if these interactions predicted longitudinal outcomes. It was thought that agreement between self and other perspectives regarding childhood behaviours would be associated with greater predictive ability, as level of agreement would be highest in the most extreme cases of the behaviour. There were very few significant interactions between self and peer perceptions of childhood behaviour in the prediction of longitudinal outcomes. It is possible that few significant effects occurred as agreement between raters did not vary as a function of the magnitude of the reported behaviour.

It is also possible that agreement between self and peers reflects a particular construct, exemplified by adult Conscientiousness. Agreement between self and peers regarding the positive valence of aggression and likeability (i.e. low levels of aggression and high levels of likeability) was associated with higher levels of adult Conscientiousness. Given the relation between Conscientiousness and honesty, these findings may reflect the stability of veracity across time, which may explain the lack of

significance regarding self and peer agreement on childhood behaviour and later adult outcomes. Childhood honesty shows some consistency across situations (Burton, 1963; Casey & Burton, 1982), and is somewhat stable across early childhood (Aksan & Kochanska, 2005). Future studies may wish to examine the stability of veracity across the lifespan using a prospective, longitudinal design, particularly as it relates to later Conscientiousness.

The difference between self and peer perception was also anticipated to provide information regarding the effect of self enhancement in the prediction of longitudinal outcomes. It was expected that self enhancement would be associated with better adult outcomes. Findings suggest that the benefit of self enhancement varies both according to the childhood behaviour being examined and the adult outcome being predicted. Self enhancement of likeability was associated with more years of education and higher levels of income in women. Findings from men showed a similar direction that partially supports the advantages of self enhancement, regarding self concept variables (Marshall & Brown, 2008; Taylor & Brown, 1988).

Congruence between self and peer perception of social withdrawal was associated with positive adult outcomes including higher levels of income and higher levels of education in women, suggesting the importance of accuracy regarding level of social withdrawal. This may have occurred for several reasons. Self knowledge regarding level social withdrawal, for example, may be associated with the ability to select environments conducive to the individual's level of behaviour. This finding may also reflect the relation between both high levels of social withdrawal and poor interpretation of social information (Brunet, Mondloch & Schmidt, 2010; Melfsen & Florin, 2002), and may

reflect that individuals with high levels of social withdrawal lack the means to receive important information regarding their own behaviours. Some previous research suggested that accuracy is associated with lower levels of behaviour problems compared with either self enhancement or self criticism (Dubois & Silverthorn, 2004). Finally, individuals with both very high and very low levels of social withdrawal had adverse education and income outcomes, and also showed the lowest congruence between self and peer ratings. This was not the case for either aggression or likeability, and may explain the unique importance for congruence regarding social withdrawal. The relation between the size of differences between self and peer perceptions, and the magnitude of the rating of childhood behaviour emphasizes the difficulties inherent in using difference scores. Ultimately, difficulty in interpreting the meaning of difference scores suggests problems with their overall utility in comparing self and other perceptions.

#### *Limitations and future directions*

The data from the Concordia Project provided a unique opportunity to compare the relation between self and peer perceptions of childhood behaviour and multiple adult outcomes. There are numerous advantages in employing a prospective longitudinal design for examining the relation between childhood behaviours and adult outcomes, including the reduction of recall bias. Very few studies span the nearly 30 year period covered in the current study, and the findings provide some insight into the consequences of childhood behaviour patterns across time. However, the analyses performed in this thesis relied on correlations. While it may be possible to infer causal relations based on temporal sequencing, the correlational nature of the current data should make any causal

inferences extremely tentative, and the present findings require replication in other datasets before firm conclusions can be drawn.

The use of both self and peer perceptions of childhood behaviour was another strength of the current study. Previous literature examining the relation between childhood behaviour and adolescent and adult outcomes has relied either on a single observer of the initial childhood behaviour, or had not compared the observations of multiple individuals as a possible method of clarifying the mechanisms of continuity of childhood behaviour. Comparisons of multiple perspectives of childhood psychopathology suggest that agreement between observers ranges both across observer, and across the behaviour being examined (De Los Reyes & Kazdin, 2005; De Los Reyes et al., 2009; Dubois & Silverthorn, 2004). While childhood psychopathology was not the focus of the current thesis, the value of including multiple perspectives supports the design of the current studies.

While multiple observers were used to assess childhood behaviour in the current studies, all of the observers were children. There are considerable advantages to using child observations, as children may have access to information not readily available to adults. As well, many previous studies associating childhood behaviours with adult outcomes have focused on the reports of teachers, parents or trained research observers (Brook & Newcomb, 2003; Caspi et al., 2003; Ensminger et al., 2002; Huesmann et al., 2009). However, including adult perceptions of childhood behaviours may have helped to clarify some of the findings in the present studies. Adult observers offer some advantages by having a better ability to comprehend and evaluate behaviours, and in the case of teachers and researchers, greater scope from which to compare the behaviour of

the target child to other children. Further, much of the existing literature comparing different perspectives on childhood behaviour compares either teacher and parent, or parent and self perceptions (De Los Ryes & Kazdin 2005; Grietens et al., 2004). Incorporating the existing findings within the larger pre-existing literature may have been facilitated by inclusion of some adult observations of childhood behaviour, which were not available for the current sample. Future research examining the outcomes of childhood behaviour may wish to include adult ratings of childhood behaviour.

The current project measures childhood behaviour exclusively during the initial assessment period. While this is not uncommon in the prospective longitudinal study of childhood behaviour, many studies reassess the childhood behaviour in early adulthood or late adolescence (Caspi et al., 1996; Dubow et al., 2008). In the current study, interactional continuity could only be inferred in light of the lack of mediation from more proximal variables (Caspi et al., 1989). However, this relation may have been clarified by including assessments of behaviours across childhood and into adulthood. The changing nature of behaviours across the lifecourse makes it a challenge to measure constructs such as aggression, social withdrawal or likeability in childhood through adulthood. However, future research may wish to include some assessments of adult behaviour, despite the difficulties posed by developmental change.

Finally, much of the literature comparing self and other perceptions of childhood behaviour uses the term accuracy when comparing self perceptions to those of others. While reports of others, such as peers, may be less vulnerable to social desirability biases, they also draw on less information regarding the individual, and may be more vulnerable to other types of problems such as halo error (Roberts & Wood, 2006, p. 17). The

question of accuracy also relates to the concept of meta-perception. Meta-perception refers to the awareness of other's opinions, and asking a child how they believe others perceive them is a different question than asking them how they perceive themselves. Accuracy may be a better term for comparing meta-perceptions of the self to the perceptions of peers, rather than then the comparison of self and peer perceptions.

To summarize, there are multiple avenues that can be pursued by future research to clarify the findings of the current studies. In childhood, future studies may include meta perceptions of childhood behaviour, as well as at least one adult perception of childhood behaviour, in the prediction of adult outcomes. This would be useful in further interpreting the meaning of self perceptions, as well as providing a point of comparison for the other multiple-reporter literature. Subsequently, the mechanisms involved in relating childhood behaviours to adult outcomes may also be clarified by examining the relation between childhood behaviour patterns such as aggression, social withdrawal and likeability during childhood to adolescent personality and substance use patterns, such as age of onset and personality variables during adolescence. This would allow for a better understanding of the cumulative and interactional trajectories linking childhood behaviour with adult outcomes. As well, it would be interesting for future studies to include more direct assessments of aggression, social withdrawal and likeability in adulthood, from both self and other perspectives. This would allow for an examination of homotypic, as well as heterotypic outcomes of childhood behaviour patterns.

### *Conclusions*

The current findings replicated some of the previous research suggesting the importance of childhood aggression and social withdrawal in predicting adult outcomes,

and supported the inclusion of likeability or other measures of social competence in understanding how childhood behaviours predict longitudinal outcomes. These findings provide some evidence for the inclusion of both self and peer perceptions of childhood behaviours. While there were few instances illustrating an additive effect regarding the inclusion of both self and peer perceptions of childhood behaviour, self perceptions of behaviour offered unique information regarding adult outcomes, particularly for women. The next step would be to examine the relation between self and peer perceptions of childhood behaviour and the potential mediating outcomes in adolescence and early adulthood that would allow for the identification of the mechanisms by which self and peer perceptions provide different sources of information. The findings of the current thesis support the view that the continuity of childhood behaviour is a complex topic, and that comparing self and peer perspectives offers a unique opportunity to understand how these behaviours play out across time.

The current findings have multiple implications regarding the impact of childhood behaviours. While interventions regarding childhood aggression are primarily launched in order to reduce the negative concurrent consequences of these behaviour patterns, an added benefit of these interventions is that they influence problematic longitudinal outcomes. The current studies also highlight the importance of social withdrawal and likeability in predicting adult outcomes, two behaviours that are currently the focus of few behavioural interventions. As well, resources for the execution of interventions are frequently extremely limited. Understanding the way in which childhood behaviours impact longitudinal outcomes will allow for the early identification of children at risk for very serious problems in adulthood. Comparing self and peer perceptions of childhood

behaviours in the prediction of longitudinal outcomes may illuminate how these behaviour influence these outcomes. For example, in the case of girls, negative self perceptions of likeability were associated with drug and alcohol abuse and dependence. Ultimately, research allowing for a better understanding of the relation between childhood behaviour and adult outcomes improves the quality of interventions for these behaviour patterns.

## Tables

Table 1

*Descriptive variables for men and women for study 1*

	Men			Women		
	Mean	SD	Range	Mean	SD	Range
Demographic						
Variables						
Age	34.12	2.76	29.9-40.75	33.63	2.75	28.60-40.36
Years of education	12.55	2.48	7-21	12.69	2.69	5-20
Income	45717	27995	5885-145600	44260	29258	5885-145600
Social withdrawal						
Self Reported	1.13	1.43	.00-7.00	1.38	1.65	.00-8.00
Peer reported	1.05	.93	.00-5.21	1.03	.90	.04-5.21
Aggression						
Self reported	1.67	2.20	.00-11.00	1.49	2.60	.00-14.00
Peer reported	2.21	2.32	.00-13.33	2.17	2.74	.04-14.58
Likeability						
Self Reported	.80	.99	.00-4.00	.87	1.03	.00-4.00
Peer Reported	.58	.58	.00-3.90	.70	.72	.0-3.92