

**FINDING THE POSITIVE IN A HOSTILE WORLD: RELATIONSHIPS
BETWEEN ASPECTS OF SOCIAL INFORMATION PROCESSING,
PROSOCIAL BEHAVIOUR, AND AGGRESSIVE BEHAVIOUR, IN CHILDREN
WITH ADHD AND DISRUPTIVE BEHAVIOUR**

by

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DEDICATION

I dedicate this dissertation and all of the work that I've done over the past many years to my parents, Al and Jean Andrade. My parents have been a solid foundation that has allowed me to build my character and abilities; enabling me to persevere with my work and the many changes I've encountered. The path to completion has been long and challenging. Over these many years I've had many great experiences, developed much of my conception of life, and developed as a person. Throughout the journey I've always felt secure that I had the backing of my entire family. In addition to my parents, I would also like to thank my brother, sister, brother-in-law, sister-in-law, and extended family for providing me with a tremendous amount of support over the years. Whether the support was financial or emotional, the secure base provided by my family has always given me confidence that my lofty dreams and goals are possible. Because of my family I have not only been able to attain my PhD but also enjoy and treasure the entire journey. I've learned that life is truly not the destination but the many moments that comprise the journey. Thanks to everyone that has been part of my journey so far; I still have a long way to go.

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ABSTRACT

Three studies were conducted to investigate relationships between unique social information processing (SIP) abilities, aggressive behaviour, prosocial behaviour, and Attention-Deficit/Hyperactivity Disorder (ADHD). In study one a questionnaire containing twenty vignettes comprising a variety of social situations was developed and validated through expert panel review and adult classification. Five categories of social vignette were developed and validated containing situations where peer intention and situation outcome were clearly positive, clearly negative, ambiguous, or mixed (i.e., ambiguous peer intention with negative or positive situational outcome). In study two and three, vignettes were read to 68 children; 21 of which had ADHD and aggression, 18 had ADHD-only, and 29 children were controls. Vignettes were followed by a series of questions assessing the cue encoding, interpretation, and response generation steps of Crick and Dodge, 1994 SIP model. Child responses were coded for positive, negative, or neutral cue detection, peer intention attribution, situational outcome attribution, and response generation. Responses were compared between groups and used to predict specific forms of aggression (i.e., reactive and proactive) and prosocial behaviour (i.e., adult and peer preferred). Results of study two and three showed that groups of children differed in most SIP abilities with children in the ADHD groups typically demonstrating biased processing. Control children tended to detect more positive and neutral cues, attribute less negative and positive intent, focus more on situational outcome, and generate more positive responses compared to either ADHD group. Differences between the ADHD-only and ADHD-aggression groups were mixed, suggesting similarity in information processing in some areas and differences in others. Behaviourally, children with ADHD-aggression demonstrated the least adult and peer preferred prosocial behaviour, followed by the ADHD-only and control groups. Additionally, children that focussed on the intention of peers in the vignettes had associated higher levels of reactive and proactive aggression, and less adult and peer preferred prosocial behaviour. Conversely, an outcome focus was associated with less aggression and more prosocial behaviour. Results of the series of studies support a growing body of research emphasising the relationship between SIP with both the aggression and prosocial spectrums of behaviour. Results also support the need for clear delineation of SIP and behaviour connections that are situation specific.

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CHAPTER 1

INTRODUCTION

Overview

The relationship between social cognitive abilities and children's social adjustment has received increased attention in recent years (Dodge, 1980; Huesmann, 1998; Simon, 1972). This focus has grown in parallel with knowledge linking cognitive processes and behavioural outcomes. Preliminary studies undertaken in the 1970's and 1980's began to document the links between children's thought processes, behaviours and social functioning (Lochman, 1987; Simon, 1972). Since then, researchers have sought to better understand the relationship between social cognitive variables and social functioning in a variety of populations in order to gain a better understanding of developmentally typical and atypical patterns of thought and behaviour.

Evaluation of links between children's social information processing (SIP) abilities and social adjustment have lead researchers to identify a number of social cognitive deficits that partially account for behavioural disturbances (Dodge & Feldman, 1990; Dodge et al., 2003; Dodge & Pettit, 2003; Huesmann, 1998). It is evident that children's perception of the world and themselves impact their behaviour. SIP models have been useful for understanding the contribution of thought processes to a wide variety of social behaviours including peer relationships, social incompetence, aggressive behaviour and to a limited extent adaptive social behaviour (i.e., prosocial behaviour) (Kupersmidt, Coie, & Dodge, 1990; Lochman & Dodge, 1994; Nelson & Crick, 1999).

Better understanding of the processes underlying children's social cognitive abilities has provided insight into the probable proximal causes of social adjustment

problems (Crick & Dodge, 1994; Dodge & Pettit, 2003; Rubin & Krasnor, 1986).

Childhood social maladjustment and aggression are associated with significant short- and long-term mental health risk. In the short-term, aggressive and socially incompetent behaviour is associated with elevated risk for peer rejection, academic failure and family discord (Farmer Jr, Bierman, & Group, 2002; Milich & Landau, 1984; Rubin & Clark, 1983; Schwartz et al., 1998).

In the long-term, social maladjustment and aggression contribute to greater risk of adulthood mental health and adjustment concerns (Criss, Pettit, Bates, Dodge, & Lapp, 2002; Kupersmidt et al., 1990). In contrast, a growing body of research has highlighted the importance of appropriate social functioning on children's short- and long-term adjustment (Bagwell, Schmidt, Newcomb, & Bukowski, 2001; Bukowski & Hoza, 1989; Hodges, Boivin, Vitaro, & Bukowski, 1999).

The present set of studies was designed to more thoroughly investigate the SIP abilities and social behaviour of children with different degrees of aggressive and disruptive behaviour. The research had three components: First, a measure to investigate children's SIP abilities in situations with different degrees of negative and positive information was developed. Second, the relationship between SIP and level of disruptive and aggressive behaviour was investigated. Third, the relationship between SIP and prosocial behaviour was investigated.

Origin of Social Information Processing Deficits

Descriptions of knowledge structures that guide behaviour have formed the base of cognitive psychology since its inception numerous years ago (Bowlby, 1969). Early researchers such as Bowlby (1969) described "early working models", or mental representations that infants have of the world around them, that guide their behaviour toward their caregiver and form the basis for early relationships. For

example, children that develop strong connected bonds with caregivers are more likely to develop a secure and adaptive conception of relationships. In contrast infants that are maltreated or insecurely attached to caregivers may develop angry and mistrustful representations of relationships possibly contributing to social maladjustment and dissatisfaction. These early knowledge structures guide the infants' future behaviour (Ainsworth, 1979).

Since Bowlby's initial description much research has described patterns of thought and behaviour termed "attachment" that guide the early parent-child interaction and form the basis of children's early representation of relationships (Ainsworth, 1979). Other researchers have described equivalent mental structures that guide children's and adult's learning and behaviour specifically with regard to relationships (Baldwin, 1992). These cognitive structures or "relationship schemas" are hypothesised to form throughout development (Baldwin, 1992). Relationship schemas are theorized to guide processing of social information, guide the storage and retrieval of social information, and form the basis from which potential actions or behaviours are chosen (Baldwin, 1992; Huesmann, 1998). Researchers have described knowledge structures, termed social scripts, that guide the mental representation of information and action within specified social situations (Huesmann, 1998). For example, a child who is presented with a confrontation from a peer may search their memory for related interactions or related social scripts that may be applicable to the current situation.

In a comprehensive review of both biological and psychosocial factors contributing to aggressive behaviour, Dodge and Petit (2003) noted that deficient SIP likely develops from a series of additive life events that gradually shape a child's mental representation of the world. Early harsh and negative interactions with parents

and peers might result in the amplification of social cognitive deficiencies. Consistent negative interactions with parents and peers, coupled with the gradual alteration of the child's environment (i.e., towards an environment emphasising negative behaviour), lead to a self-fulfilling prophecy whereby aggressive behaviour results from biased social cognitive processes and biased environmental factors (Dodge & Tomlin, 1987).

Social Information Processing and Social Behaviour

The complex cognitive processes that are proposed to contribute to aggressive and socially incompetent behaviour go beyond simple reinforcement or simple cause and effect (Bijttebier, Vasey, & Braet, 2003; McFadyen-Ketchum & Dodge, 1998). Social cognitive models typically describe multiple aspects of information processing, and relate these to observed behaviours (Crick & Dodge, 1994; Huesmann, 1998; Rubin & Krasnor, 1986). Crick and Dodge (1994) have proposed a comprehensive model of social information processing that takes into account past experience and knowledge, aspects of the social environment (i.e., peer interaction), and incorporates multiple interrelated processing steps (see Figure 1). The model is a reformulated version of earlier work done by Dodge (1986) with an emphasis on the interaction between 'online' processing (i.e., continuous and current information processing), previous knowledge, memories, and social schema. The model involves six steps (1) Encoding of external and internal cues, (2) Interpretation of attributions in relation to self and others, (3) Clarification of goal states, (4) Accessing or generating a response, (5) Deciding on a response, and (6) Enacting the chosen response. All of these steps occur in conjunction with a 'data-base' of stored memories that guide all processes. Each step occurs in a specific social context (i.e., based on the nature of the social interaction). Therefore, information that is processed in one environment (e.g., the school yard) may be different than that processed in another (e.g., home) both because

of differing available social information and because of differing situational cue saliency. Acquired knowledge is stored as memories, acquired rules, social schemas and social knowledge in the person's cognitive database.

The model is dynamic and as such steps are actively interacting with adjacent steps and with stored social knowledge (Bijttebier et al., 2003). This social processing model theorizes that during and following a peer action, information is abstracted from the social situation. These social cues represent the first form of information entering the SIP cycle. Information cues are then interpreted and inferences are drawn as to the cause of the original social behaviour. Following interpretation, responses are generated, selected and enacted. Each of these information-processing steps contributes to social behaviour. For example, a child that consistently interprets ambiguous social situations as hostile is much more likely to represent social situations as negative and maintain a behavioural repertoire stocked with retaliatory responses. The child may then be more likely to respond aggressively to a perceived social threat. As such, the information processed by the child serves as a mediator between early life events, behavioural dysfunction and environmental discord (Dodge & Pettit, 2003).

The specificity of the model has a number of advantages. First, specificity allows integration between current social information and social context with past relationship knowledge, memories, and other stored cognitions (Dodge, 1993; Dodge & Pettit, 2003). This integration is important given the problematic social histories and maladaptive functioning of many children with socially incompetent behaviour (Dodge, Pettit, Bates, & Valente, 1995; Snyder & Patterson, 1995). Second, the model provides a specific and testable description of each processing step and the social and cognitive structures that result in the completion of the step (Crick & Dodge, 1994).

For example, during the interpretation step it is hypothesised that attributions of causality, along with previous social knowledge, contribute to information processing. As such, the dynamic nature of information processing is highlighted. Finally, the model can be applied to understand how children process many forms of social information (i.e., processing of both negative and positive information). Although the model has typically been applied solely to understand how children process negative social information, the model may be equally applicable to understanding how children process other types of social information (Crick, 1996; Nelson & Crick, 1999).

The information processing sequence in Crick and Dodge's (1994) model is initiated by peer behaviour and ends with behavioural enactment. Characteristic deficits at steps in the information processing cycle have been related to socially incompetent behaviour and to subsequent social dysfunction (Dodge et al., 1995; Dodge & Price, 1994). The model has been effectively used to describe the social cognitions and socially incompetent behaviour in groups of school aged children, incarcerated youth and to a limited extent children with specific psychopathology (Dodge, 1993; Dodge & Frame, 1982; Lochman & Dodge, 1994). Of particular interest in previous research has been the impact of deficient SIP on aggressive behaviour and peer relationships (Dodge et al., 2003; Gifford-Smith & Brownell, 2003; Kupersmidt et al., 1990). This body of research relating peer rejection with SIP variables are by far the most common investigations linking Crick and Dodge's (1994) model with social dysfunction.

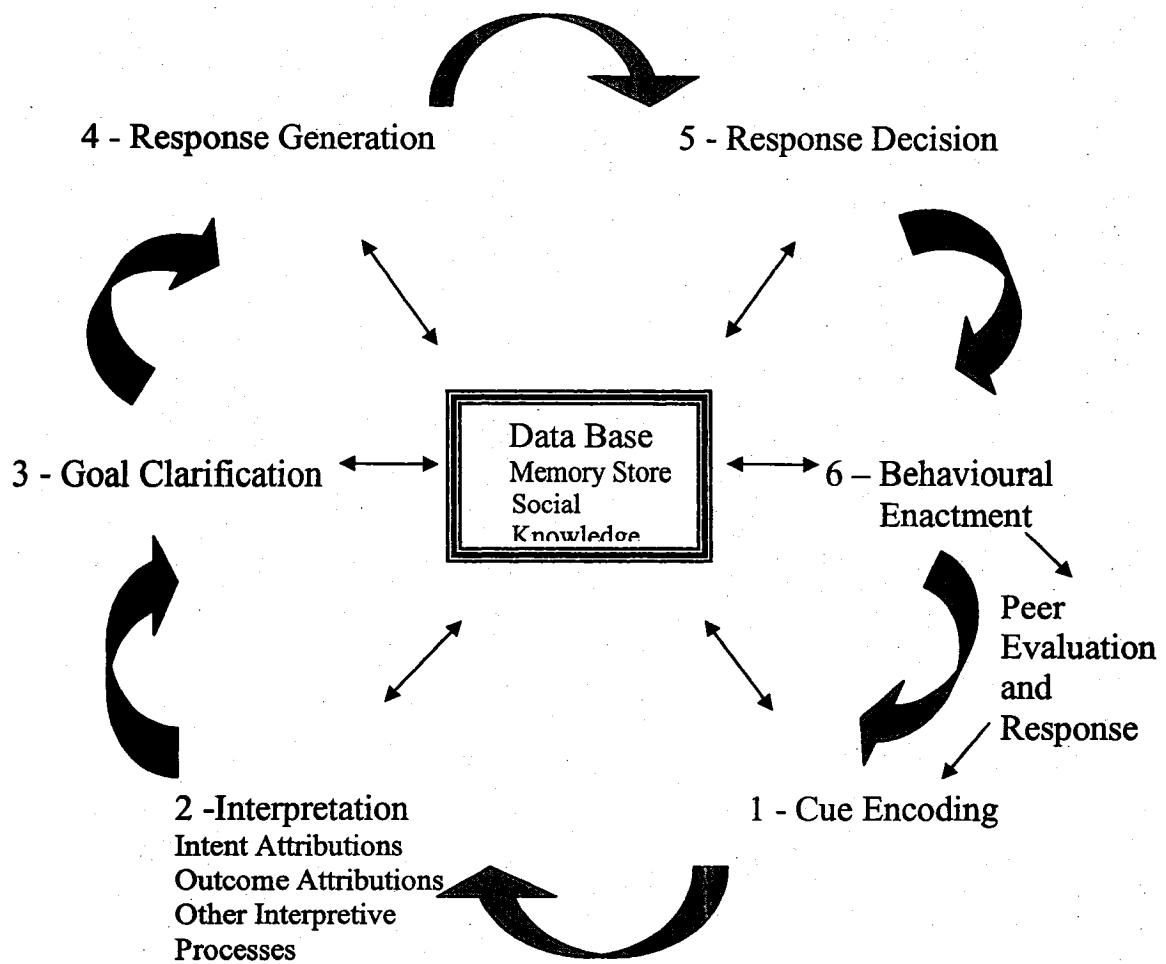


Figure 1. Social information processing cycle adapted from Crick and Dodge, 1994

Social Information Processing and Disruptive Social Behaviour

Social Information Processing and Aggressive Behaviour

Chronic childhood disruptive and aggressive behaviour problems account for a majority of referrals to mental health centres. Estimates of behavioural difficulties among school aged children range from 0.5 to 6 percent of the population (Halfon & Newacheck, 1999). Although these base rates seem small, the severity of the deficits and negative impact on society are profound. For example, one child with conduct difficulties may be: (1) disruptive at school, and contribute to an impaired learning environment for classmates, (2) demonstrate aggressive behaviour, and contribute to bullying and victimization of classmates, (3) violate societal rules, by stealing or vandalism, and (4) contribute to family discord and elevated family stress. As such, behaviour difficulties represent a considerable challenge to a large proportion of society.

Researchers have long noted that aggressive behaviour is not uniform. A number of methods of distinguishing among types of aggression have been proposed, but one important distinction is between aggressive behaviour that is a retaliatory response to provocation and aggression that has a predetermined purpose (Feshbach, 1964; Hartup, 1974). More recently, researchers have further elucidated this distinction using the concepts of reactive aggression and proactive aggression. Reactive aggression has been defined as angry, impulsive and reflexive aggression, whereas proactive aggression has been defined as planned and purposeful aggression (Coie, Dodge, Terry, & Wright, 1991; Dodge & Coie, 1987; Vitaro, Brendgen, & Barker, 2006).

Dodge (1991) has speculated that reactive and proactive aggression are associated with different SIP deficits (Dodge, 1991; Dodge & Frame, 1982). Particularly, deficits in

the interpretation stage of information processing have been associated with reactive aggression (Dodge, Pettit, McClaskey, & Brown, 1986). In contrast, deficits in the response access and response generation stages of processing have been associated with proactive aggression (Dodge, 1991). For example, reactively aggressive children may misinterpret non-threatening social information as threatening (often referred to as a hostile attribution bias) and subsequently generate and enact responses that are defensive and aggressive (Crick & Dodge, 1996; Dodge & Newman, 1981; Dodge et al., 1995). Defensive responding may lead to a self-fulfilling prophecy whereby aggressive behaviour results in additional negative peer encounters and affirmation of the hostile bias (Dodge & Pettit, 2003). However, proactively aggressive children may show response access/generation biases as a result of being exposed to aggressive models. Subsequently they may have a social database that contains many aggressive response sets, and view aggressive responses as effective and socially acceptable.

Information processing differences between reactively and proactively aggressive children seem likely given the unique behavioural and mental health correlates of each subtype of aggression. Although reactive and proactive aggression are each associated with negative adjustment in childhood, they are unique in a number of ways. First, each form of aggression is associated with social status differences (Coie et al., 1991; Day, Bream, & Pal, ; Price & Dodge, 1989). Children with elevated levels of reactive aggression are typically rejected, have poor peer relationships and are at risk of peer victimization (Schwartz et al., 1998; Volling, Mackinnon-Lewis, Rabiner, & Baradaran, 1993). In contrast, proactively aggressive children are typically viewed as dominant and may be classified by some children as popular and by others as rejected (i.e.,

controversial status) (Day et al., 1991). Although, these findings vary with children's age, reactively aggressive children typically are viewed as less socially competent (Price & Dodge, 1989) and demonstrate more impoverished social skills compared to proactively aggressive children (Perry, Perry, & Rasmussen, 1986; Price & Dodge, 1989).

Second, reactive and proactive aggression are associated with some distinct developmental outcomes (Dodge & Pettit, 2003; Huesmann, 1998; Pope & Bierman, 1999). Compared to proactively aggressive children, children with reactive aggressive behaviour are more often rated by teachers and students as unhappy (Day et al., 1991). However, proactively aggression in childhood is more highly associated with mental health and social difficulties in adulthood compared with reactive aggression (Crick, 1996; Dodge & Price, 1994).

Given the demonstrated relationship between information processing variables and aggressive behaviour, and the social cost of aggressive behaviour, additional investigation of information processing and aggression links seems warranted for a number of reasons. First, as described earlier, attribution biases are hypothesized to be specifically related to reactive aggression whereas response generation has been hypothesized to be specifically related to proactive aggression. Further research would help clarify whether these hypotheses are justified. Second, understanding differences in the underlying social cognitive processes that contribute to each form of aggression could indicate specific information processing skills to target in intervention in order to reduce aggression (Crick, 1996; Dodge & Price, 1994). For example, targeting encoding and interpretation deficits of reactively aggressive children and response generation deficits in proactively aggressive children might be most efficacious. Better understanding the

cognitive contributions to aggressive behaviour may assist development of targeted interventions. Third, specific information processing deficits may illuminate factors related to individual differences in the degree of aggressive behaviour. For example, reactively aggressive children with pervasive processing deficits may demonstrate more severe aggressive behaviour than reactively aggressive children with less pervasive, more specific processing deficits.

Social Information processing and ADHD

In contrast to the wealth of research relating SIP deficits with aggressive and socially incompetent behaviour, few studies have investigated the relationship between ADHD and SIP deficits. This is surprising for a number of reasons. First, the characteristic symptoms of ADHD – inattention, impulsivity, and hyperactivity - parallel those demonstrated by many aggressive and socially incompetent children (Milich & Dodge, 1984; Milich et al., 1982). For example, impulsivity, which is a defining characteristic of ADHD (American Psychiatric Association, 1994) is also a defining characteristic of reactive aggression (Atkins, Osborne, Bennett, Hess, & Halperin, 2001; Dodge, Harnish, Lochman, Bates, & Pettit, 1997; Waschbusch et al., 2002; Waschbusch, Willoughby, & Pelham, 1998). Similarly, inattention has been associated with social incompetence in a number of studies (Andrade, Waschbusch, & King, 2005; Farmer Jr et al., 2002).

Second, the symptoms of ADHD are likely to impair children's ability to accurately assess social situations. Dodge and colleagues have argued that attention is required to adequately evaluate a social situation (Crick & Dodge, 1994; Dodge, Pettit, McClasky, & Brown, 1986; Dodge & Newman, 1981). Given that inattention is a core

deficit of ADHD, children with ADHD may have an impaired ability to attend to social cues. Similarly, inattention, hyperactivity, and impulsivity may impair the generation, selection, and enactment of social responses (see Figure 1).

Third, in addition to diagnostic symptomatology, a majority of children with ADHD have associated deficits in social behaviour that parallel those of aggressive children (Landau, Milich, & Diener, 1998; Milich et al., 1982). Much research has shown that children with ADHD tend to be actively rejected by their peers. This has been found using laboratory based measures of social functioning and using measures gathered from the natural peer group (Hodgens, Cole, & Boldizar, 2000; Milich & Dodge, 1984). In fact, a number of studies have shown that children with ADHD become unpopular with peers within a few minutes of first meeting them (Hinshaw, Zupan, Simmel, Nigg, & Melnick, 1997; Pelham & Bender, 1982). Social incompetence and marginalization contribute to a pattern whereby children with ADHD are exposed to hostile peer interactions and experience less adaptive social interactions.

A fourth reason that the paucity of research linking ADHD and SIP deficits is surprising is that many children with aggressive behaviour also have ADHD. Some studies have estimated that as many as 90% of conduct problem children have ADHD (Pliszka, Carlson, & Swanson, 1999). Other reviews have provided evidence of social differences between aggressive children with and without ADHD (Hinshaw, 1987; Waschbusch, 2002). It is likely that many of the aggressive/conduct problem children in past research had ADHD; however, ADHD diagnosis was not described or taken into account. Neglecting the impact of ADHD ignores associated attention, social learning

history, and family functioning differences that have been shown to impact SIP (Dodge et al., 1997).

Finally, it may be important to take ADHD into account when examining SIP because the limited research that has included diagnostic distinctions has shown some evidence for important differences in SIP between aggressive children with and without ADHD (Hinshaw, 1987; Waschbusch, 2002). Schippell and colleagues (2003) investigated the first two stages of SIP in children with attention difficulties and found that children who selectively focused on hostile social information also showed suppressed attention to specific salient social cues (Schippell, Vasey, Caravens-Brown, & Bretveld, 2003). As such, attention deficits were associated with multiple types of SIP deficits. Other studies have supported the finding that overall, deficits in attention appear to contribute to a diminished ability to encode social cues and subsequently generate responses (Matthys, Cuperus, & Van Engeland, 1999; Milich & Dodge, 1984). Although some studies have found relationships between SIP variables and aggressive behaviour for children with ADHD, this research is still in its infancy (Murphy, Pelham, & Lang, 1992). A more thorough examination of the multiple potential relationships between SIP and ADHD is lacking (Murphy, Pelham et al. 1992). More research is needed to clarify the specific SIP deficits of children with ADHD and aggression and the multiple aspects of SIP that may be impacted. For example, no research has examined positive information processing abilities (i.e., children's ability to process positive social information) or the relation between specific SIP abilities and prosocial behaviour in children with aggression and ADHD.

Social Information Processing and Prosocial Behaviour

SIP deficits impact peer relationships, vary by type of aggression, and contribute to longstanding behaviour problems. Previous investigations have typically delineated connections between information processing deficits and maladaptive behaviour. However SIP theory may also be useful in understanding adaptive behaviour, despite the fact that past research has mainly been limited to examining the role of SIP in aggressive and socially incompetent behaviour.

Investigation of associations between SIP, prosocial behaviour, and social adjustment is an area in need of additional research for a number of reasons (Crick & Dodge, 1994). First, a growing body of research has begun to describe the contribution of positive and negative information processing mechanisms to children's adaptive social adjustment and prosocial behaviour (Nelson & Crick, 1999). Some limited evidence indicates that prosocial behaviour may be an important correlate of social adjustment in a manner that differs from aggression (Crick, 1996; Greener & Crick, 1999). For example, aggression negatively impacts social adjustment (i.e., high aggression is associated with poor adjustment), whereas prosocial behaviour may positively impact adjustment (i.e., high prosocial behaviour may be associated with better adjustment). Additionally, children who are aggressive also typically lack prosocial skills (Crick, 1996). This combination may place children at particular risk for short- and long-term adjustment and social difficulties (Andrade & Tannock, 2006; Bagwell, Schmidt et al., 2001; Crick, 1996; Hodges et al., 1999).

This research is based on the assumption that positive and negative SIP are unique constructs rather than opposite ends of the same construct. This assumption follows from the observation that a lack of negative behaviour is not the same as the presence of positive behaviour, and that a lack of positive behaviour does not imply the presence of negative behaviour. Consider, for example, four children on a playground. One child reacts aggressively to mild provocation but also compliments, shares with, and cooperates with peers. The second child also reacts aggressively to mild provocation, but does not share, compliment or cooperate with peers. The third child shares, compliments and cooperates but does not react negatively to provocation, and the final child neither shares nor reacts negatively. Conceptually, these four children may have very different experiences on the playground in terms of making friends, participating in group activities, interacting with adult supervisors and so on. These examples, then, demonstrate that at least theoretically positive and negative behaviour are not simply different aspects of the same construct, but are instead somewhat distinct aspects of behaviour. Based on this, it is logical to hypothesize that children's ability to process social information will be similarly distinct when presented with positive and negative social information. However, little or no research has yet examined this hypothesis.

Second, investigating the association between SIP and prosocial behaviour will provide additional insights into the 'social knowledge database' of aggressive children. Just as aggressive behaviour and knowledge is more prevalent in children with socially incompetent behaviour as compared to other children, positive social knowledge and behaviour may be less prevalent. Without adequate prosocial information in the child's 'social knowledge database' it is unlikely that aggressive children will consistently act in

a prosocial manner. However this possibility remains speculative because little research has examined it. Instead, the SIP model proposed by Crick and Dodge has been mainly used to investigate hostile behaviour patterns.

A third important reason for examining SIP and prosocial behaviour associations is that the limited extant research suggests that children's behaviour is significantly associated with how they process positive social information. In particular, non-aggressive children that effectively process positive social information are able to develop a positive relationship schema, are not primed to negative cognitions, and are able to interact effectively with their peers. However, the same is not true for aggressive children who may not be effectively processing positive social information and subsequently not appropriately interacting with peers (Coie, Dodge, & Kupersmidt, 1990; Janssens & Dekovic, 1997; Rodkin, Farmer, Pearl, & Van Acker, 2000). Thus, positive information processing biases appear to be related to prosocial behaviour just as negative information processing biases are related to hostile behaviour (Cassidy, Kirsh, Scolton, & Parke, 1996). However, these associations have not been clearly established. Further research is needed to better understand this pattern.

Fifth, it is well established that negative information processing biases are associated with harsh parenting (Criss et al., 2002; Dodge et al., 1995; Johnston & Mash, 2001). The same type of parenting may also lead to deviant positive information processing in that harsh parents are less likely to provide positive attention and reinforcement (Johnston & Mash, 2001; Wentzel & McNamara, 1999). Thus, there are theoretically sound reasons why positive information processing may be impaired in aggressive kids.

A sixth reason for examining positive information processing is that children encounter numerous social situations during their daily routine, including situations that include both negative and positive information. That is, it is likely that even the most impaired child will experience a mix of negative interaction with peers and some positive interactions with peers. Thus, when considering the role of information processing in the 'real world' it may be important to consider children's ability to process situations that include both positive and negative social information (i.e., a more ecologically valid approach).

Finally, understanding the positive processing abilities of children with and without aggression may inform intervention. Current cognitive-behavioural intervention with children demonstrating aggressive behaviours have had mixed success, with some studies supporting their effectiveness and other studies failing to support them (Hundert et al., 1999; Mytton, DiGuseppi, Gough, Taylor, & Logan, 2002; Pelham & Waschbusch, 1999; Pfiffner, Calzada, & McBurnett, 2000). The goal of these interventions is often to limit negative behaviour and facilitate prosocial and adaptive behaviour by intervening at a cognitive and/or behavioural level. It is possible that by not having a clear understanding of aggressive children's positive information processing abilities these interventions have overestimated aggressive children's prosocial competencies. Better understanding the degree to which children with aggressive behaviour are able to process prosocial information may facilitate more targeted and effective intervention. For example, if cue encoding is found to be the primary deficit related to prosocial behaviours, whereas response generation is the primary deficit related

to aggressive behaviour, then treatments to facilitate prosocial behaviour could be targeted differently than treatments to limit aggressive behaviour.

Current Investigation

The current investigation is a series of studies designed to better understand the SIP abilities of children with and without aggressive behaviour and ADHD. Specifically, children's ability to encode social cues, interpret information from social situations, and generate social responses was compared with adult reported social behaviour. The series of studies adds to existing research in a number of ways. First, positive and negative information processing and behaviour were evaluated together to assess the role of both aspects of information processing on social behaviour. This is important given the paucity of research examining both of these information processing aspects together. Second, social scenarios were broken down not only according to situational outcome (i.e., the result of the peer action) but also according to potential peer intent (i.e., the potential reason behind the peer's action). Previous research has primarily investigated SIP in scenarios that have ambiguous peer intent but have a negative outcome. Examination of scenarios that systematically vary intent and outcome may provide important information about the relative impact of the two factors in children's social processing. Third, developmental psychopathology, specifically ADHD and aggression, were taken into account and analysed as primary variables. This is important given the pervasive impact of ADHD on affected children's lives, including cognitive functioning. Finally, specific aspects of information processing (see Figure 1) were related to specific subtypes of aggressive and prosocial behaviour.

More specifically, three studies were conducted. The first study was designed to develop and evaluate a questionnaire to assess children's positive and negative SIP abilities while systematically varying the impact of peer intention and situational outcome. The questionnaire contained social vignettes with the following characteristics (or valences): (1) Clearly positive, (2) clearly negative, (3) ambiguous, (4) ambiguous-positive (Ambiguous intent with positive outcome), and (5) ambiguous-negative (ambiguous intent with negative outcome). The questionnaire was used in studies two and three. It was hypothesised that judges would be able to differentiate between positive, negative, and ambiguous social information, and that judges would also be able to differentiate between intention and outcome information in vignettes.

The second study was designed to evaluate the association between SIP abilities and ADHD and aggression in children. This was accomplished in two steps. First, SIP abilities of non-aggressive children with ADHD (ADHD-only), aggressive children with ADHD (ADHD-aggression) and typically developing children without ADHD or aggression (controls) were compared. Second, information-processing abilities were related to subtypes of aggressive behaviour. It was hypothesised that children with ADHD-only and ADHD-aggression would each differ significantly from the control group, with children with ADHD-aggression showing the largest difference. It was also hypothesized that intent and outcome attributions would be significantly associated with reactive aggression whereas response generation abilities would be significantly associated with proactive aggression. Additionally, negative information-processing abilities were hypothesised to be more highly associated with aggressive behaviour compared with positive information processing abilities.

The third study was designed to evaluate the association between SIP abilities and prosocial behaviour. This was accomplished in two steps. First, prosocial behaviour of ADHD-only, ADHD-aggression, and control children were compared to establish the existence of differences. Second, SIP abilities were used to predict subtypes of prosocial behaviour. It was hypothesised that children with ADHD-only and ADHD-aggression would each differ significantly from the control group, with the ADHD-aggression group showing the largest difference (i.e., least prosocial behaviour). Additionally, it was hypothesized that positive information processing abilities would be more highly associated with prosocial behaviour than negative information processing abilities.

CHAPTER 2

STUDY 1:

DEVELOPMENT OF A NOVEL SOCIAL INFORMATION PROCESSING

QUESTIONNAIRE

Introduction

The abilities that underlie SIP and behavioural enactment form the basis of social competence (Dodge et al., 1986). To function appropriately in social situations, children must be able to understand others' intentions and effectively interpret a variety of complex situational variables including social context and available social information (Dodge & Price, 1994). Accuracy with aspects of information processing, such as intent attribution, likely mediate adaptive social functioning while inaccurate processing mediates incompetent social functioning (Dodge et al., 2003; Dodge et al., 1995; Schwartz, Dodge, Petit, & Bates, 2000; Zelli, Dodge, Lochman, Laird, & Conduct Problems Prevention Research Group, 1999). For example, a child that is able to accurately process information from a social encounter would more likely act in an appropriate manner and engender adaptive peer relationships. A child that inaccurately processes available social information would more likely act incompetently.

Children encounter numerous social situations that contain diverse and complex social information. To successfully navigate their social worlds children must perceive and accurately differentiate this diverse information (Hubbard, Dodge, Cillessen, Coie, & Schwartz, 2001). At the most basic level, children must distinguish between social information that varies in valence (i.e., whether the information is positive, negative, or ambiguous). For example, as part of their everyday lives, children are exposed to

information that is positive (e.g., being asked to play), negative (e.g., being teased in a mean way by a peer) and ambiguous (e.g., being bumped from behind while waiting in line). Children must abstract from each social situation what is relevant information and what is not; the information they deem relevant will enter their information-processing framework and ultimately impact their behaviour (Bijttebier et al., 2003; Crick & Dodge, 1994). Abstracting greater degrees of negative information compared with positive social information may impact social behaviour differently than vice versa, suggesting that it is important to better understand the impact of each valence of information (Crick, 1996; Crick & Dodge, 1994; Jenson, Olympia, Farley, & Clark, 2004).

Other components of social situations that may impact children's SIP are the perceived intent of the peer in the situation and outcome of the situation. These components are likely important for a few reasons. Firstly, children must be able to differentiate and integrate both intent and outcome information. Intent information is interpreted from a peer's inferred motivation for undertaking an action, while outcome information refers to the result of a social exchange (Dodge & Frame, 1982; Dodge & Price, 1994). This differentiation is important given that intent information may differ in valence from that of outcome information. Additionally, previous research has described that aggressive children are strongly impacted by salient negative social information (Dodge & Tomlin, 1987). A focus on prominent outcome information has been related to social dysfunction (Dodge & Tomlin, 1987; Milich & Dodge, 1984). This evidence suggests that the outcome of a social situation is an important influence on children's social processing.

Secondly, whether and how children interpret their peers' intentions in social encounters seems to have a substantial impact on social processing and social behaviour (Dodge & Frame, 1982; Dodge et al., 1986; Zelli et al., 1999). Understanding others' intentions contributes to the formation of beliefs about why the behaviour occurred (e.g., potential situational explanations) and what purpose the behaviour served (e.g., potential peer motivation) (Dodge, Murphy, & Buchsbaum, 1984; Zelli et al., 1999). How children interpret intention in social situations influences their ultimate reaction. For example, a child that interprets a peer's behaviour as hostile may be more likely to act aggressively towards that peer. If this interpretation of hostility is inaccurate it might contribute to dysfunctional behaviour. Much research has linked biased processing with social incompetence (Dodge et al., 2003; Dodge & Pettit, 2003). In particular, in situations where their peers' intent is ambiguous and the outcome of the situation is negative, aggressive children have been shown to be prone to hostile attribution biases (Dodge et al., 1986). These studies provide evidence that peer intent (as perceived by the child) is an important aspect of social situations.

Thus, valence, intent, and outcome of social situations can influence children's social processing. Theoretically, these aspects of social situations are (at least partially) distinct and can be combined in various ways. For instance, social outcome and perceived peer intent could each be positive, negative or ambiguous. Therefore, nine combinations of intent and outcome are possible: (1) Positive intent-Positive outcome, (2) Positive intent-Negative outcome, (3) Positive intent-Ambiguous outcome, (4) Negative intent-Negative outcome, (5) Negative intent-Positive outcome, (6) Negative intent-Ambiguous outcome, (7) Ambiguous intent-Ambiguous outcome, (8) Ambiguous intent-

Positive outcome, and (9) Ambiguous intent-Negative outcome. Despite the variety of possible combinations of peer intention and situation outcome, the bulk of SIP research has explored just one of these nine possibilities - social scenarios that have ambiguous peer intent with a negative outcome. This emphasis is partly based on the belief that a negative situational outcome contributes to a negative and inaccurate perception of intent (Dodge, 1980). In fact, much research has supported this theory, showing that aggressive children often make negative intent attributions in ambiguous situations that have a negative outcome (Dodge, 1980; Dodge & Frame, 1982; Steinberg & Dodge, 1983). Additionally, distinctions between positive and negative processing have been well documented in the childhood emotion (Denham, 1986), attribution (Nolen-Hoekema & Girgus, 1994), and personality research literatures (Dweck & Leggett, 1988).

Although research emphasizing information processing in situations with ambiguous intent and negative outcome has been informative, additional exploration of information processing in social contexts with other combinations of valence of intent and outcome may also be important for a number of reasons. First, simultaneously manipulating the intent and outcome of situations will help clarify the relation between information processing and all potential aspects of social situations. For example, it may be that children who have an information processing style that focuses on situational outcome exhibit a different pattern of behaviour than children with an information processing style that focuses on the intent in the situation. There is currently no research to evaluate this possibility.

Second, exploring a variety of potential valence of peer intent and outcome would more clearly elucidate differences in SIP abilities that occur in all social environments to

which children are exposed. For example, it is well established that at least some types of aggressive children tend to misinterpret peer intention when the peer's intention is ambiguous and the outcome is clearly *negative*, but these same children may also misinterpret intention in situations where the peer's intention is ambiguous and the outcome is clearly *positive*. Likewise, there may be differences across children in how they interpret situations where the peer's intent is not ambiguous but is instead clearly positive or clearly negative. Examining these possibilities are essential because specific information processing deficits may uniquely contribute to social behaviour difficulties.

Importantly, the few studies that have examined children's ability to process different types of social information suggest that processing positive information is at least partially distinct from processing negative social information. First, Nelson and Crick (1999) examined the uniqueness of prosocial (i.e., positive) and antisocial (i.e., negative) situational evaluations. Results showed that participants could be classified into distinct groups based on their evaluations of social situations: (1) Prosocial adolescents classified situations as more positive, (2) aggressive adolescents classified situations as more hostile, and (3) average adolescents classified situations as more neutral. Given these findings, distinct positive and negative information processing patterns seem likely.

Second, Eisenberg (1995) highlighted empirical and theoretical evidence that the ability to process prosocial information and enact positive behaviour appears to develop on a unique trajectory, independent of the development of antisocial and negative behaviour. Distinct stages in prosocial development were described. Her review suggested that empathetic responding emerges around 12 months of age when infants

begin to share objects with parents and peers. By the second year of life sharing and helping behaviour becomes clearly evident. Children's ability to prosocially react to other's emotional distress also emerges around 12 months with toddlers at this age responding prosocially to about 1/3 of distressing events. The trend towards increasing manifestation of prosocial behaviour continues through childhood and adolescence. All of these behaviours develop in coordination with children's perspective taking and other social cognitive abilities. Thus it is likely that the ability to process positive social information may develop in parallel with prosocial behavioural expression.

Finally, evidence supporting the distinction between positive and negative SIP comes from a longitudinal study of a large group of third to sixth grade students (Crick, 1996). Prosocial behaviour contributed unique information to the prediction of social adjustment beyond that predicted by overt aggression (i.e., aggression and prosocial behaviour were somewhat independent). Specifically, teacher and peer ratings of prosocial behaviour in grade three significantly predicted peer acceptance and a decreased rate of rejection in grade six beyond that predicted by aggression. Crick (1996) highlighted the importance of prosocial behaviour as distinct from aversive behaviour and as such the unique aspects of positive and negative behaviour. Given the demonstrated link between information processing and social behaviour it is also possible that this behavioural distinction extends to cognitive areas.

Each of these points provides empirical and theoretical support for the developmental and behavioural differences between positive and negative functioning. Positive information, and prosocial action, do not appear to be linear derivatives of negative functioning, nor are they the absence of negative functioning. Positive and

negative social information, and aspects of social cognition and behaviour, appear to be distinct both practically and theoretically.

Although some research has investigated the distinction between positive and negative information processing and differentiated between the impact of intention and outcome of social situations, these distinctions have not been systematically studied. One reason for this gap in the research is the lack of a psychometrically sound measure of both positive and negative aspects of information processing with consideration of both intent and outcome. The present study was designed to address this need by developing a measure to investigate children's SIP abilities in situations with different degrees of negative and positive information, and by including situations that systematically vary intent and outcome.

The vignettes included on the questionnaire, and a brief description of the characteristics of the vignettes, were as follows: (1) *Positive* - situations that contained only positive social information. These stories were designed to have a clearly positive outcome with the intention of the child in the story also positive; (2) *Negative* - situations that contained only negative social information. These stories were designed to have a clearly negative outcome with the intention of the child in the story also negative; (3) *Ambiguous* - situations that contained social information that was unclear or could be interpreted as positive or negative. These stories were designed to have an ambiguous or mixed positive and negative outcome with an unclear peer intention; (4) *Ambiguous-Positive* - situations that contained social information that was unclear and positive. These stories were designed to have a clearly positive outcome with an unclear peer intention; (5) *Ambiguous-Negative* - situations that contained social information that was

unclear and negative. These stories were designed to have a clearly negative outcome with an unclear peer intention. These five types of vignettes were selected because pilot work suggested that they had obvious associations with children's actual social experiences. In contrast, other possible combinations of intent and outcome (i.e., Positive Intent-Negative Outcome; Negative Intent-Positive Outcome; Positive Intent -Ambiguous Outcome and Negative Intent-Ambiguous Outcome) did not clearly map onto common social situations that children experience and were therefore not included.

The purpose of the study was to develop a series of vignettes that could assess peer intent uniquely from situational outcome, and examine the validity of the new measure. It was hypothesized that the validity of vignettes would be supported. More specifically, vignettes with valence of intent and outcome as described above would be validated.

Method

Procedure

Following earlier research (Dodge & Price, 1994), the vignettes were developed in three steps: (1) Vignette Construction; (2) Expert review; and (3) Vignette Validation. Each of these steps will be described next.

Vignette Construction

Vignettes comprised a variety of social situations involving peers participating in activities such as sports, game-play, sharing, co-operating, playground and school yard accidents and other common childhood social scenarios. Thirty-five vignettes were initially developed for examination with the following intended valences of intent and outcome: (1) Two Positive, defined as positive intent with positive outcome; (2) Two

negative, defined as negative intent with negative outcome; (3) Ten ambiguous, defined as ambiguous intent with ambiguous outcome; (4) Fourteen ambiguous-positive, defined as ambiguous intent with positive outcome; and (5) Seven ambiguous-negative, defined as ambiguous intent with negative outcome. Four of the ambiguous-negative vignettes were identical to those used in previous research (Dodge and Frame, 1982; Dodge and Price, 1994) and the remaining thirty-one vignettes were novel to this study. Different numbers of each type of vignette were developed for examination because Ambiguous and Ambiguous-positive vignettes were novel to this study and as such a larger number were developed to maximise the probability of obtaining valid vignettes.

Expert Review

Participants. Areas of specialization of the faculty within the department of Psychology at Dalhousie University were reviewed to determine level of expertise in developmental psychopathology. Four professors specializing in child development and developmental psychopathology were asked to participate in the panel. Participants were sent an email advising them of the research project and purpose of the panel review. All agreed to participate in the panel. All of the four panel members served as committee members for the primary author's PhD dissertation.

Method. Participants were given a questionnaire containing 35 vignettes and were asked to independently rate the intention of the child and the outcome of the situation. Participants were asked to consider intent and outcome as independent constructs and as such not let consideration of one influence the rating of the other. Forced choice ratings of intention and outcome as positive, negative, ambiguous (i.e., unclear whether positive

or negative) or mixed (i.e., containing both positive and negative information) for each vignette were obtained. See Appendix A for a shortened version of the questionnaire.

Vignette Validation

Participants. Valence of intention and outcome of vignettes was validated using ratings collected from a group of 14 graduate students. A mass email was sent out to approximately thirty-five graduate students in the Psychology and Neuroscience programs at Dalhousie University. Fourteen responses were received and respondents were subsequently invited to participate in the study. All participants who agreed to participate returned completed questionnaires. Participants were in their first to fifth year of a Clinical Psychology Ph.D. program or a Neuroscience Masters and Ph.D. program. All participants were naive to the purpose of the study.

Method. Participants were asked to complete and return an electronic version of the questionnaire that included only the vignettes that met criteria according to the expert panel review, as described below (see Appendix B for a sample questionnaire). Vignettes retained from the expert panel review were broken into two parts; the first part represented the intention of the child in the vignette and the second part represented the outcome of the vignette. Students were asked to rate the degree of positive and negative information represented by the intention and outcome of the vignette on a 5-point Likert scale anchored by 1 (very much positive) and 5 (very much negative).

Results

Overview

Two sets of analyses were computed. The first set of analyses used the expert review data and was designed to select a set of vignettes from those constructed by the

primary author. The second set of analyses was designed to examine the validity of the vignettes selected by the expert review.

Vignette Selection

Analysis of data from the expert panel review proceeded in four steps. First, panel member's ratings of intention (i.e., positive, negative and ambiguous) and outcome (i.e., positive, negative and ambiguous) were converted to counts (i.e., sorted into forced choice category separately for each vignette). Second, counts of each rating were summed across panel members for each of the 35 vignettes. Third, sums of each type of response for each vignette were converted to percentages. One hundred percent agreement was found for 22 vignettes on intention ratings and for 12 vignettes on outcome rating. Seventy-five percent agreement was obtained for nine vignettes on intention ratings and for ten vignettes on outcome ratings. Less than 75% agreement between panel members on intention ratings was found for four vignettes and outcome ratings for 13 vignettes. Intention and outcomes not meeting 75% agreement were dropped from further analysis. Fourth, vignettes with 75% or greater agreement on intention and outcome ratings were brought to a meeting of the panel for discussion. Valence of intention and outcome were considered separately. After discussion, 100% agreement was reached on all nine intention ratings and ten outcome ratings. However, wording of vignettes was modified in order to reach consensus. These wording changes were minor. For example, instead of the scenario taking place in the playground it was reworded to take place in the classroom.

These procedures resulted in the development of 38 vignettes, which included 12 selected from the initial review by questionnaire and 26 selected from the consensus

discussion during panel meeting (i.e., from consensus by panel members as to intention and outcome of vignette). Only vignettes with 100% agreement on both intention and outcome were retained for further evaluation.

Vignette Validation

Analysis of data from vignette validation proceeded in five steps. First, mean intention and outcome scores were computed by calculating the mean Likert rating for all participants for each vignette. Second, mean Likert ratings were classified into 3 categories: (a) Ratings between 4 and 5 (i.e., somewhat or very much negative) were classified as negative; (b) Ratings between 1 and 2 (i.e., somewhat or very much positive) were classified as positive; and (c) Ratings between 2.5 and 3.5 (i.e., ratings that approximated the middle of the continuum) were classified as ambiguous. Third, to test whether ambiguous intention and outcome ratings of ambiguous vignettes differed from the expected value of 3 (representing the middle of the Likert scale) a one-sample t-test was computed. Results showed that the average ambiguous intent ratings did not differ from that expected $t(41) = .31, p = .76$ (two tailed) nor did the average ambiguous outcome ratings $t(13) = .29, p = .78$ (two tailed). This planned comparison was only done for the ambiguous ratings because it was necessary to ensure that ratings did not differ from the middle of the continuum. Because positive ratings were inclusive of scores between 1 and 2 and negative ratings between 4 and 5 there was no need to investigate whether the score differed from the mid point of these ratings (i.e., scores falling between each range was sufficient). For example, for positive ratings, comparison of ratings to a middle rating of 1.5 would not add any additional information because 1.5 does not define any more or less positive value.

Fourth, 20 vignettes were selected based on the mean Likert scores of intention and outcome. Selected vignettes were those that contained intention and outcome valences that were most representative of the intended valences (i.e., most positive, negative or ambiguous). The selected vignettes represented the following combinations of intent and outcome (four of each): (1) Positive, defined as positive intent and positive outcome; (2) Negative, defined as negative intent and negative outcome; (3) Ambiguous, defined as ambiguous intent and ambiguous outcome; (4) Ambiguous-Positive, defined as ambiguous intent and positive outcome; (5) Ambiguous-Negative, defined as ambiguous intent and negative outcome.

Fifth, mean Likert scores for intention and outcome from the 20 selected vignettes were compared using two one-way ANOVA's with *a priori* valence of intention and outcome (positive, negative, ambiguous) as the grouping factor. These were calculated to compare valence of intention and outcome ratings to insure that scores were different and valence of scores did not overlap. Tukey Honestly Significant Difference (HSD) post-hoc tests were used to follow up significant ANOVAs. There was a significant effect of Valence for intent ratings, $F(2, 69) = 133.3, p < .001$. Tukey HSD post hoc tests showed significant differences between all valences of intent. Examination of means (see Table 1) showed that, as expected, scores on negative vignettes were the largest, followed by ambiguous vignettes and positive vignettes. Hence, vignettes designed to include a positive intent were rated as significantly more positive than other vignettes, vignettes designed to include a negative intention were rated as significantly more negative than other vignettes, and vignettes designed to include ambiguous intents were rated as significantly different than other vignettes, with scores falling between positive and

negative vignettes. There was also a significant effect of Valence for outcome ratings, $F(2, 69) = 414.0, p < .001$. Tukey HSD post hoc tests showed significant differences between all valences of outcome. Examination of means (see Table 1) showed means were in the expected directions: vignettes designed to include a positive outcome were rated as significantly more positive than other vignettes, vignettes designed to include a negative outcome were rated as significantly more negative than other vignettes, and vignettes designed to include an ambiguous outcome were rated as neither positive nor negative. The 20 selected vignettes were used as the social scenarios read to child participants in studies two and three. The final set of validated vignettes (male version) and associated SIP questions can be found in Appendix C.

Table 1.

Mean Ratings of Intention and Outcome by Valence

	Valence		
	Positive	Ambiguous	Negative
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
Intention Rating	1.73 (0.37)	3.02 (0.38)	4.03 (0.56)
Outcome Rating	1.40 (0.46)	3.04 (0.47)	4.53 (0.31)

Note. All means in the same row differed significantly ($p < .01$) in Tukey HSD tests. Anchors for scale are as follows, 1 = very much positive, 2 = somewhat positive, 3 = ambiguous, 4 = somewhat negative, 5 = very much negative.

Discussion

The purpose of this study was to develop and validate a measure of children's SIP abilities in situations with different degrees of negative and positive information, and with specific delineation of peer intent and situational outcome. The vignettes were intended to reflect five combinations of peer intent and situational outcome: (1) Positive intent and positive outcome, (2) Negative intent and negative outcome, (3) Ambiguous intent and ambiguous outcome, (4) Ambiguous intent and positive outcome and, (5) Ambiguous intent and negative outcome. It was hypothesised that vignettes representing all intended valences of intent and outcome would be developed and validated.

Supporting the hypothesis, vignettes representing the above five classifications were developed and the validity of vignettes were supported. Results showed the following: First, multiple social scenarios were generated that represented multiple valences of intention and outcome. Second, adults were able to accurately distinguish the intention of children and the outcome of situations. Third, adults were able to reliably classify intent and outcome information within situations as positive, negative or ambiguous.

The development of these vignettes adds to the existing research literature in a number of ways. First, vignettes that were developed contain multiple combinations of positive, negative and ambiguous social information. With little overlap, adults in this study were able to differentiate between valences of social information. Of particular note is the development and validation of vignettes that contain ambiguous and positive social information. This adds to existing literature describing distinctions between positive and negative social information and behaviour (Eisenberg & Fabes, 1998).

Second, vignettes developed in this study clearly differentiate between two specific aspects of social situations, namely the intention of peers and the outcome of the situation. Adults in this study were able to reliably classify intention separately from outcome. The distinction made between intention and outcome is important given that there is evidence that both types of social information appear to be processed by children and appear to subsequently influence their behaviour. For example, much research has described that inferring negative intent in situations with ambiguous intent contributes to hostile behaviour. Other research has described that a focus on negative outcome is also related to hostile behaviour. Although both of these pieces of information are important, vignettes developed in the present study will allow a more specific breakdown of the unique situational aspects that potentially contribute to social cognition and behaviour.

Third, the development of vignettes in this study that span numerous types of social situations will allow for investigation of the association between SIP and behaviour in situations containing different valences of social information (i.e., positive situations, negative situations, and ambiguous situations). Given the prevailing focus on negative information processing and the lack of focus on positive information processing this last point is important. Additionally, investigation of positive and negative information processing in the same study may contribute to the further understanding of how SIP and behaviour are associated.

Despite support for the hypotheses a number of cautions should be noted. First, the vignettes were validated using a relatively small group of adult raters. Although this protocol was equally or more rigorous than the protocol used to develop many other social cognitive measures, a larger validation sample may have been beneficial. Second,

previous research has demonstrated that different social situations contribute to different behavioural deficits. The present investigation developed vignettes that contained both peer entry and provocation situations. Development of vignettes with children participating in more types of social situations (e.g., competitive, cooperative and game based activities) would be informative. Finally, the vignettes were developed and validated using social situations that typically occur in suburban and rural centres. As such, these vignettes may not be as relevant for inner city or urban groups of children.

Future Directions

The present investigation is a first step towards developing more comprehensive and elaborate measures for assessing SIP in children. Future research that utilises a similar framework that includes multiple valences of social information with consideration of unique aspects of social situation with video recorded scenarios or experimentally manipulated social situations would be beneficial. Assessing the relationship between information processing in diverse social situations with behaviour would benefit from this thorough approach.

CHAPTER 3

STUDY 2:

ASSOCIATIONS BETWEEN UNIQUE ASPECTS OF SOCIAL INFORMATION
PROCESSING AND AGGRESSIVE BEHAVIOUR

Introduction

Numerous studies have described social knowledge structures that impact behavioural outcomes (Crick & Dodge, 1994; Crick & Werner, 1998; Hubbard et al., 2001). Characteristic deficits in specific information processing abilities have been related to general aggressive behaviour (Crick & Dodge, 1996), rejected peer status (Coie et al., 1990; Milich & Landau, 1984) and to a lesser extent diagnosed disruptive behaviour disorders and mental health concerns (Dodge, 1993; Dodge et al., 1995; Lochman & Dodge, 1994; Milich & Dodge, 1984; Waschbusch et al., 2002). Knowledge in this research area has grown dramatically in recent years, largely due to the contribution of information processing models that have provided a theoretical framework guiding much of the existing research (Crick & Dodge, 1994; Huesmann, 1998; Rubin & Krasnor, 1986).

Crick and Dodge (1994) delineated an information-processing model that involves a series of interrelated steps (see Figure 1). Of the six information processing steps described by Crick and Dodge (1994), the ability to abstract information from a social situation, interpret the intentions of others, and generate a response, have received considerable attention in terms of understanding aggression (Dodge & Frame, 1982; Dodge et al., 1984; Dodge & Newman, 1981). That is, impairments in these specific

information processing steps, and aggressive and hostile behaviour, seem to be especially highly related.

The detection of relevant social information is a very important first step of the information processing cycle. Only cues that are attended to can subsequently be encoded and further processed (Crick & Dodge, 1994). Cue encoding deficits have been demonstrated in a number of studies with different populations of aggressive children (Dodge & Newman, 1981; Gouze, 1987; Matthys, Cuperus, & Van Engeland, 1999). Children with aggressive behaviour seem to miss important social cues at the expense of cues that are negative and threatening. Dodge and Tomlin (1997) found that aggressive children were less likely to attend to social cues relevant to a social encounter compared to non-aggressive peers. Aggressive children were more likely to draw on previous knowledge (i.e., memory and self schema) than utilize available situational social information when explaining their rationale for decisions. However, aggressive children in other studies were more likely to attend to negative social cues (Gouze, 1987) and more likely to demonstrate deficits in attention for relevant social information (Schippell et al., 2003).

The aforementioned cue encoding biases directly impact the second step of Crick and Dodge's (1994) information processing cycle, namely information interpretation (Dodge & Frame, 1982). Research has described a number of interpretation variables that impact social behaviour including, causal attributions, information valence (i.e., positive or negative), previous social knowledge, and situational variables. First, intent attribution has been related to behaviour. However, the contribution of intent attribution biases to aggressive behaviour appears to depend on the type of aggression demonstrated by the

child. As discussed earlier, researchers have differentiated between aggression that is hostile and retaliatory, termed reactive aggression, and aggression that is directed towards acquisition of a behavioural goal, termed proactive aggression (Coie et al., 1991; Crick & Dodge, 1996; Dodge, 1991; Dodge & Coie, 1987). Attribution biases and deficient processing at the interpretation stage of information processing has typically been associated with reactive aggression. It is hypothesized that attributing hostility to a peer's intentions will result in an elevated probability of a response that is defensive, impulsive and reactive (Hubbard et al., 2001). In fact, much research has supported the distinction between reactive and proactive aggression and potential underlying social cognitive correlates (Day et al., 1991; Price & Dodge, 1989; Schwartz et al., 1998).

Second, the manner in which different valences of social information are interpreted impacts social behaviour (Dodge et al., 1986). Because social situations vary greatly, each situation may provoke a unique interpretation and response. As such, the ability to accurately interpret the valence of information (i.e., either positive, negative, neutral, or ambiguous?) within the social situation might differentially impact behaviour (Dodge & Pettit, 2003; Dodge et al., 1986).

Third, previously acquired social knowledge appears to influence interpretation and behaviour. Lochman (1987) showed that aggressive children demonstrate biased attributions in dyadic play situations. Even when aggressive children demonstrated as much or more aggressive behaviour compared to their peer, they still perceived that their peer was being more aggressive towards them (Lochman, 1987). Aggressive children falsely attributed hostile intent to their peer possibly because aggressive children focused on presumed hostile peer intent that was similar to their previous experiences. However,

non-aggressive children were more likely to over-report their own aggressive behaviour possibly because they focused on the realistic facts of the situation (e.g., the aggressive social encounters). Utilizing a stored template of hostile information to make intention judgements may directly contribute to the incompetent behavioural responses.

Finally, Hubbard, Dodge and colleagues (2002) demonstrated that interpretation of situational variables accounted for a large proportion of the observed variance in social behaviour. In this study, aggressive boys demonstrated specific cognitive biases and relationship scripts that varied by social encounter. Although their individual general cognitions accounted for a large portion of their behaviour, interpretation of context variables specific to the interaction also contributed to the overall variance in behaviour. The investigators demonstrated through statistical modelling that dyadic relationship variables contributed significant variance to boys' SIP above actor and victim variation. The boys' SIP abilities and stored social knowledge interacted with aspects of the ongoing social situation to determine their behaviour. Although these studies provided evidence of the impact of situational information processing on behaviour, they did not clarify the specific aspects of the social situations that are most readily interpreted. For example, does focussing on intent or other aspects of the social situation (i.e., outcome information) contribute more to social behaviour? This further clarification is necessary given the complexity of each social situation.

After encoding and interpreting information, the child must begin to develop a response to the situation. The types of information encoded and interpreted impacts the types of responses generated and ultimately selected (Crick & Werner, 1998; Rubin & Krasnor, 1986). For example a child that attributes negative intent to another child's

actions may more likely access negative information from their memory database and generate a hostile response. In fact, Dodge (1980) found that after a hostile attribution is made, aggressive responses occur 70 percent of the time.

Crick and Dodge (1994) have described response generation as a dynamic process. According to their model, children confronted with a social situation utilize information abstracted from the situation (i.e., social cues, intent attribution, situational assessment) in combination with information present in their SIP database to generate and select a response. As a result, responses may be more or less novel depending on the child's familiarity with the situation. For example, if the situation is somewhat familiar then stored information can more readily be accessed and used in the construction of a response (Dodge & Pettit, 2003; Dodge & Tomlin, 1987). Given that aggressive children are more likely to interpret unclear social situations as hostile, it is not surprising that hostile interpretation combined with stored negative social information results in incompetent behaviour in multiple situations.

Behavioural responding is thus constrained by the child's ability to access or generate an appropriate response (Dodge, 1993; Rubin & Krasnor, 1986). Accessing and generating fewer competent responses, while at the same time accessing and generating numerous incompetent responses, leads to deviant behaviour (Dodge, 1993). Shure, Spivack and colleagues (1973 and 1980) were the first to describe deficits in response generation in aggressive children. These researchers found a negative correlation between the rate of aggressive behaviour and number of responses generated. Since then studies have described numerous response generation deficits that vary by social situation (Coie et al., 1991; Mize & Cox, 2001; Rubin & Krasnor, 1986). In situations that involve

the acquisition of an object, aggressive children tend to generate responses that are clearly coercive and manipulative (e.g., bribery). In friendship and peer group entry situations, aggressive children generate more coercive, strange and irrelevant responses. In response to peer provocation, aggressive children are more likely to generate hostile responses compared to their typically developing peer group. Overall aggressive children generate more hostile and socially incompetent responses, and fewer competent responses.

The inappropriate responses generated by aggressive children are not accounted for by social status difficulties. Deficits in response generation of aggressive children are more severe and pervasive than those found in children that are also rejected but not aggressive (Mize & Cox, 2001; Rabiner, Lenhart, & Lochman, 1990). Rabiner, Lenhart and Lochman (1990) showed that aggressive children generated more conflict-escalating responses to social situations both immediately and after a short delay. Additionally they were more likely to generate responses that relied on others skills, such as appealing to authority. This was in contrast to the group of children that were rejected but not aggressive who only demonstrated conflict-escalating responses immediately following a hypothetical provocation and were less likely to appeal to authority. Aggressive children seem to impulsively choose hostile responses, choose socially incompetent responses after deliberation, value hostile responses, and lack a repertoire of competent responses.

The value placed on aggressive responses appears to differ not only between aggressive and non-aggressive children but also between subtypes of aggressive children (Schwartz et al., 1998). That is, proactively aggressive children are typically more

assertive, dominant and more likely to value aggressive responses; whereas reactive aggressive children are less likely to positively evaluate aggressive responses.

Consideration of the available evidence highlights the contribution of deficits in cue encoding, interpretation, and response generation to aggressive behaviour. However, a number of questions about the information processing abilities of aggressive children remain unanswered. First, much previous research has focused on the impact of processing of negative social information and perceived hostility on aggressive behaviour. Although valuable, it may be important to consider the impact of processing of social information other than negative information on aggressive behaviour. For example, children's inability or deficiency in processing social information that is positive may directly contribute to information processing and behavioural deficits, beyond that predicted by hostile information processing. This may be likely given that negative and positive information differs substantially and thus is likely to be detected, interpreted and acted upon differently. Recent research has begun to differentiate between SIP mechanisms that differentially contribute to prosocial and antisocial behaviour (Crick, 1996; Janssens & Dekovic, 1997; Nelson & Crick, 1999), but further research is needed.

Second, although information-processing deficits have been related to aggression in previous studies, few studies have related specific aspects of processing with specific subtypes of aggression. For instance, research has delineated subtypes of aggression, namely reactive and proactive aggression, that are related to different aspects of information processing (i.e., interpretation and response decisions steps respectively) (Coie et al., 1991; Crick & Dodge, 1996; Day et al., 1991; Dodge & Coie, 1987).

However, little is known about the unique contribution of positive and negative information processing at each stage of information processing to these subtypes of aggression. It may be that reactive and proactive aggressive children process these forms of social information differently. The reported relationship between interpretation biases with reactive aggression, and response generation biases with proactive aggression, may differ with the valence of information (e.g., positive and negative) and type of situation.

A third gap in current knowledge is the consideration of social situations that contain different types of social information. Much research has focused on information processing in situations that have ambiguous peer intent with a negative situational outcome. Although information from this research has provided valuable insights into biased hostile information processing styles of aggressive children, very few studies have considered information processing in situations that vary peer intent and situational outcome. For example, assessing interpretation of intent and outcome in positive, negative, and ambiguous situations would provide a more complete picture of information processing. Because children encounter and react to numerous situations throughout the course of a day, understanding information processing in a number of potential situations is important.

Finally, much of the existing research has neglected the impact of ADHD on findings. Considering ADHD may be important because the characteristic symptoms of ADHD (i.e., inattention, hyperactivity and impulsivity) might underlie much of the SIP and behavioural deficits. ADHD symptomatology may be the unifying characteristic contributing to cue encoding, interpretation, and response generation deficits that contribute to peer problems, reactivity and social incompetence (Day et al., 1991).

Limited research has described cue encoding deficits in children with aggression also diagnosed with ADHD (Milich & Dodge, 1984). Patterns of encoding deficits found from children with ADHD appear to parallel those of reactively aggressive children (Matthys et al., 1999; Milich & Dodge, 1984). Children with ADHD with and without associated conduct problems are less efficient at detecting social cues compared to children without attention deficits (Milich & Dodge 1984; Matthys, Cuperus et al., 1999).

Additionally, evidence has linked biased interpretation of social information with ADHD (Milich & Dodge, 1984; Murphy et al., 1992). Although much more research needs to be done to clarify the impact of ADHD on attribution biases, these have been found in children with ADHD with and without associated disruptive behaviour. The presence of ADHD appears to impact the number and types of responses generated (Dodge et al., 1997; Matthys et al., 1999; Milich & Dodge, 1984; Murphy et al., 1992). Children with ADHD with and without comorbid conduct problem behaviour tend to generate more inappropriate social responses and fewer overall responses than kids without these disorders. These findings parallel those found in studies of children with reactive aggressive behaviour. Given that impulsivity is a key feature of both groups, it may be that children with ADHD represent a large proportion of the children classified as reactively aggressive; however this assertion has not been sufficiently clarified.

Present Investigation

The present study investigated the relationship between SIP, aggressive behaviour, and ADHD in situations varying in presumed intent and situational outcome. The study had two purposes. First, differences in cue detection, interpretation, and response generation, were compared between children with ADHD but not aggression

(ADHD-only), both ADHD and aggression (ADHD-aggression), and with neither ADHD nor aggression (controls). It was hypothesized that the ADHD-aggression and ADHD-only groups would differ from the control group on all information processing abilities, with the ADHD-aggression group showing the largest differences from controls. In addition it was hypothesised that information processing deficits expected for the ADHD-aggression and ADHD-only groups would be present for all valences of social information (i.e., positive, negative and ambiguous). Second, the contribution of children's ability to process specific types of information was examined in relation to their levels of reactive and proactive aggression. It was hypothesized that deficient SIP abilities would predict both reactive and proactive aggressive behaviour, with deficient SIP predicting more elevated levels of each type of aggressive behaviour. More specifically, cue encoding and interpretation deficits were expected to predict elevated reactive aggression and response generation deficits were expected to predict elevated proactive aggression.

General Methods - Studies 2 and 3

Participants

Participants were 68 children, including 48 boys and 20 girls, who ranged from 6 to 12 years of age ($M = 9.33$, $SD = 1.66$). Thirty-nine children were diagnosed with ADHD and 29 were typically developing children. The ADHD group was further subdivided into children with aggressive behaviour ($n = 21$) and those not aggressive ($n = 18$). Participant characteristics are summarized in Table 2.

The majority ($n = 31$) of children diagnosed with ADHD were recruited through a summer treatment program for children with disruptive behaviour disorders [see (Pelham,

Fabiano, Gnagy, Greiner, & Hoza, 2005) for a description]. The remaining eight children with ADHD were recruited through community advertisements (see Appendix D for sample poster). Recruitment of children with ADHD began in July 2003 and ended in November 2004. All children with ADHD met DSM-IV (American Psychiatric Association, 1994) criteria as determined by an assessment that included parent and teacher ratings on the Disruptive Behavior Disorders (DBD) Rating Scale (Masetti, Pelham, & Gnagy, 2005; Wright, Waschbusch, & Franklin, under review) and a structured diagnostic interview with parents on the Computerized Diagnostic Interview Schedule for Children (C-DISC; NIMH-DISC Editorial Board, 2000). Participants were classified as ADHD, ODD, or CD, if they met criteria on the DBD or C-DISC. The C-DISC consists of the DSM-IV descriptors for ADHD, Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), and a variety of associated mental and behavioural health concerns, along with probe questions regarding situational and severity factors. On the DBD, symptoms rated as “pretty much” or “very much” were considered as present and counted toward an ADHD, ODD and CD diagnosis. This classification procedure has been used in much previous research (Murphy et al., 1992; Waschbusch et al., 1998). ADHD participants were unmedicated at the time of their participation (i.e., off medication for at least 8 – 12 hours).

The ADHD group was divided into aggressive and non-aggressive using parent or teacher endorsement of three aggression items from the DBD rating scale (i.e., “physically cruel to people”, “initiates physical fights with people in the household”, and “initiates physical fights with other people”). Children rated as “pretty much” or “very much” on any of these aggression items by either parent or teacher were classified as

aggressive. No children in the control group met these criteria for aggression. Using a narrow definition of aggression that emphasizes physically aversive behaviour has been advocated (Tremblay, 2000) and this specific operationalization of aggression has been used successfully in other research (Pelham & Hoza, 1996; Waschbusch, 2004).

Twenty-nine control children were recruited through parent response to posters, public service announcements on the radio, in the newspaper and through a university information service. Control children were screened for severe mental health problems using information obtained from the C-DISC and DBD. In addition, parents of control children were queried by interview to determine whether their children had ever received intervention for behavioural or learning difficulties; those who had were excluded from the study.

Table 2: Descriptive Statistics for Research Groups

	Control (<i>n</i> = 29) <i>M</i> (<i>SD</i>)	ADHD- only (<i>n</i> = 21) <i>M</i> (<i>SD</i>)	ADHD- Aggressive (<i>n</i> = 18) <i>M</i> (<i>SD</i>)	Total (<i>n</i> = 68) <i>M</i> (<i>SD</i>)
Age (years)	9.0 (1.9)	9.5 (1.6)	9.4 (1.7)	9.3 (1.8)
Male	18 (62%)	11 (61%)	19 (90%)	48 (71%)
Female	11 (38%)	7 (39%)	2 (10%)	20 (29%)
Socioeconomic Status ^d	52.0 (14.9)	48.3 (11.7)	46.8 (12.1)	49.4 (13.3)
C-DISC ^e Average number of symptoms endorsed by parent				
ADHD				
Inattentive			5.7 (3.3) _b	4.2 (3.4)
Hyperactive/Impulsive	1.5 (1.7) _a	6.9 (2.1) _b	6.0 (3.4) _b	3.7 (3.7)
ODD	0.4 (1.4) _a	6.5 (1.9) _b	5.5 (2.7) _c	3.1 (3.0)
CD	1.0 (1.3) _a	3.7 (2.8) _b	2.0 (2.4) _b	0.8 (1.6)
Parent and Teacher combined IOWA Connors rating scale scores ^f	0.1 (.31) _a	0.5 (.92) _a	1.6 (.86) _b	0.6 (.87)
Proactive Aggression	0.1 (.12) _a	0.4 (.46) _a	2.5 (.68) _c	1.4 (1.1)
Reactive Aggression	0.4 (.43) _a	1.6 (.69) _b		
Parent and Teacher combined Disruptive Behaviour Disorders scale scores ^g				
Inattention	0.3 (.39) _a	2.4 (.74) _b	2.6 (.53) _b	1.6 (1.2)
Hyperactive	0.4 (.37) _a	2.3 (.54) _b	2.4 (.54) _b	1.5 (1.1)
ODD	0.4 (.38) _a	1.8 (.71) _b	2.5 (.57) _c	1.4 (1.1)
CD	0.0 (.05) _a	0.3 (.19) _b	0.9 (.44) _c	0.4 (.47)
Number with a CD Diagnosis	0	1 (6%)	9 (43%)	10 (15%)
Number with an ODD Diagnosis	2 (7%)	11 (62%)	17 (81%)	30 (44%)

Note: Means within the Same row that do not share subscripts differ at $p < .05$ in the Tukey honestly significant difference comparison. d = Sociometric status obtained from the socio-economic index for occupations in Canada (Blishen, Carroll, & Moore, 1987), e = Children's Diagnostic Interview Schedule (NIMH – DISC Editorial Board, 2000), f = IOWA Connors rating scale (Pelham, Milich, & Murphy, 1989), g – Disruptive Behaviour Disorders Scale

Measures

Social Information Processing Questionnaire

Development and administration. The vignettes for the SIP questionnaire were developed in study one. Each vignette was accompanied by nine questions. A male and female version of the questionnaire was developed (see Appendix B for sample male questionnaire). Questions were partly derived from previous research, with additional questions added to assess child affect and investment in the hypothetical social situations (Crick & Ladd, 1990; Dodge, 1980; Dodge & Frame, 1982; Rubin & Krasnor, 1983). All vignettes and questions were read to children and repeated as necessary. An example series of questions following a vignette is as follows: 1) What happened in the story? 2) How mean do you think Sam was in the story? 3) How nice do you think Sam was in the story? 4) How could you tell whether this was a nice way to act or a mean way to act? 5) How would you feel if Sam did this to you? 6) How happy would you feel about Sam doing this? 7) How mad or upset would you feel about Sam doing this? 8) How much would you care if Sam did this to you? 9) What could you say or do if this happened to you? Questions 1, 4, 5 and 9 are open ended. Responses to questions 2, 3, 6, 7 and 8 were on a four point Likert scale that ranged from “not” to “very”. Descriptor words were substituted as necessary for individual questions. For example in question 2 the Likert scale ranged from “not mean” to “very mean” whereas in question 3 responses ranged from “not nice” to “very nice”. Children were read potential responses, taught how to use the likert scale, and provided with a card that served as a visual cue to assist in anchoring responses. Responses to question 1 (assessing cue detection), 4 (assessing interpretation) and 9 (assessing response generation) were used for this set of studies.

All responses were recorded verbatim during the interview and each interview was video recorded to verify accuracy of written content. Interviews were conducted by one Masters level Psychology student and one advanced undergraduate student. Responses to each question were subsequently coded by two advanced undergraduate students' naive to the study purpose and diagnostic status of participants.

Cue coding. Cues detected by participants were coded from responses to question one (i.e., what happened in the story?). Coders were provided with a pre-determined list of cues and asked to indicate the presence of cues. Coders were blind to cue valence (i.e., positive, negative or neutral). Total positive, negative and neutral cues detected by participants were derived from coder's classifications. Positive cues were pieces of information that most people would consider to be good or that they would want to happen (see Appendix E for coding instructions). For example, "Sam was smiling" and "Sam shared his gameboy" were considered positive pieces of information. Negative cues were pieces of information that most people would consider to be bad or something they would not want to happen to them. For example, "Sam shoved you" and "you fell in a mud puddle" were considered as negative pieces of information. Neutral cues were neither positive nor negative but provided general information. For example, "Sam walked up to me" and "Sam was painting" were considered neutral pieces of information.

Intent and Outcome coding. Intent and outcome attributions were derived from participant responses to question four (How could you tell whether this was a nice way to act or a mean way to act?). Intent attribution was coded if participants focused on the *reason* or the *purpose* for which the child in the vignette committed an action (see Appendix E for coding instructions). A response coded as an intent attribution *implied* a

thought process of the child in the vignette, however the thought process did not necessarily occur in the story. For example a participant response coded as intent was “Sam is mean because he doesn’t like me” or “Sam is mean because he’s mean to a lot of kids”. These responses refer to Sam’s thought processes that weren’t described in the story (i.e., Sam wanting to be mean to a lot of kids). Outcome attribution was coded if participants focused on the action in the story. For example outcome was coded if a participant responded “Sam was mean because *he shoved me*” or “Sam was nice because *he shared his gameboy with me*”. Intent and outcome attributions were coded as positive, negative or neutral. Positive intent and outcome responses were described to coders as responses that would typically be considered by most people to be good. Negative intent and outcome responses were those responses that would typically considered by most people to be bad. Neutral intent and outcome responses were those that would be typically considered by most people to be neither positive nor negative. For example a neutral intent attribution was coded if a participant responded, “Sam did that just because”.

Response Generation coding. Response generation was derived from participant answers to question nine (What could you say or do if this happened to you? Tell me as many ways as you can). Participants’ responses were coded as positive, negative or neutral (see Appendix E). Positive responses were those that would typically be considered a productive or good response. For example, asking a reasonable question or telling a teacher was considered positive. Negative responses were those that would typically be considered unproductive or not good. Examples coded as negative responses included fighting, yelling and aggression. Neutral responses were inactive responses or

irrelevant responses. Examples of neutral responses included, "I would look at him" or "I would think".

Scoring. Social processing measures were scored by counting the number of occurrences within each vignette, then summing these counts across relevant vignettes (e.g., positive intent, positive outcome; etc), separately for each type of SIP variable. These total scores were used in all subsequent analysis.

Internal Consistency. Chronbach's alpha was calculated on the total scores for each social information-processing variable measured by the child questionnaire. Each variable was found to be highly consistent. Consistency estimates were as follows: Cues Detected ($\alpha = .94$), Intent attributions ($\alpha = .81$), Outcome attributions ($\alpha = .83$), and Responses Generated ($\alpha = .93$).

Inter-rater Reliability. Two independent research assistants coded 50% of child responses on the SIP questionnaire plus an additional randomly selected 33% of the responses coded by the other individual. Pearson correlations were performed on the overlap for each social information-processing variable to determine level of inter-rater reliability. Significant positive correlations were found for total Cues Detected ($r = .97, p < .001$), total Intent attributions ($r = .64, p < .001$), total Outcome attributions ($r = .76, p < .001$), and total Responses generated ($r = .95, p < .001$) coded.

Validity of codes. Cue content within vignettes was determined using a three-step process. First, the primary investigator developed a list of cues contained within each vignette. Second, four individuals naive to the study classified each cue as positive, negative or neutral. Third, these classifications were reviewed and compared to the

investigators *a priori* judgments. Minimal discrepancies in classifications were found and these were resolved by discussion.

Aggression Rating Scale

Reactive and proactive aggression were measured using the Aggression Rating Scale (Dodge, 1991; Dodge & Coie, 1987). Items were Likert scales that ranged from 0 (“not at all”) to 3 (“very much”), including three items to measure reactive aggression (“when teased, strikes back”, “blames others in fights”, and “overreacts angrily to accidents”) and three items to measure proactive aggression (“uses physical force to dominate”, “gets others to gang up on peers”, and “threatens and bullies others”). All items were drawn verbatim from previous research (Dodge & Coie, 1987). The reactive aggression items were summed into a single reactive aggression score ($M = 1.36$, Cronbach’s Alpha = .94) and the proactive aggression items were summed into a single proactive aggression score ($M = .63$, Cronbach’s Alpha = .86).

Walker-McConnell Scale of Social Competence and School Adjustment (WMS)

The WMS is a 43-item rating of children’s social behaviours (Walker & McConnell, 1995). The WMS is positively worded and the questions target easily observable social and behavioural skills. Sample items include: “shows sympathy for others” and “shares laughter with peers”. All items are rated on a 5-point Likert scale ranging from 1 (“never”) to 5 (“frequently”). The WMS provides an assessment of children’s social behaviour in relation to teacher’s expectations and their social adjustment with peers. Wording to some questions on the WMS was altered slightly to suit parental ratings. For example, questions that referred to the classroom were reworded to represent home. Three subscales were derived from the WMS: (1) Teacher

(and Adult) preferred social behaviour; (2) peer preferred social behaviour; and (3) school (and home) adjustment behaviour. The Adult preferred social behaviour and peer preferred social behaviour scales were used in the present study. The WMS has been widely used in large-scale research projects (e.g., Second Step program) to identify treatment effects. Its validity and reliability have been well documented as described in the published manual (Walker & McConnell, 1995).

Procedure

Parents and teachers of participants recruited from the summer treatment program completed questionnaires, interviews, and consent forms prior to treatment, as part of the intake evaluation. Consent forms can be found in Appendix F. Participants were interviewed during the camp day in 40 to 60 minute one-on-one sessions with a research assistant. Children were asked for their verbal assent prior to testing. Frequent breaks were taken to reduce fatigue. Children were rewarded for completion of each vignette by a sticker of their choice and at the end of the activity by a small reward of their choice (e.g., sticker packet or toy).

Participants recruited from the community were tested at the Child Behaviour Program in the Department of Psychology at Dalhousie University. Participants and their parents were seen together for individual testing sessions lasting approximately 40 – 60 minutes. Two researchers met the participants and their parents. After parental consent and child assent was obtained, the parent and child were taken into separate testing rooms, where the parent completed the diagnostic interview and questionnaires with one researcher while the child completed the SIP questionnaire with another researcher. Children were advised that breaks could be taken and that termination at any point was

possible. Frequent breaks were taken. Children received stickers for completion of each vignette and received a prize (e.g., sticker book, toy etc.) after completing the entire task. Parents received \$15 for participation in the study to defray travel costs. Parents were asked to provide the child's classroom teacher with a packet of questionnaires in a lab addressed and stamped envelope. All parents agreed to the request and nine of 29 classroom teachers returned the completed packet.

Statistical Analysis. All statistical analyses were performed with SPSS 12.0.1 computer software. ANOVA's were performed with Type III sums of squares to adjust for sample size differences. All reported significance levels are two-tailed and alpha will be noted as appropriate.

Results

Descriptive Statistics

A 3 (Group: ADHD-only, ADHD-aggressive, Control) x 2 (Sex: male, female) chi square analysis was done to test whether the ratio of boys to girls differed between groups (see Table 2). Groups did not significantly differ in gender, $\chi^2(12) = 7.9, p = .79$. A one-way ANOVA was used to compare groups by age. The groups did not significantly differ in age $F(2,67) = .07, p = .94$. Finally, two 3 (Group) x 3 (Conduct Problems: None vs. ODD or CD) chi-square analysis was computed to test whether the rate of ODD and CD differed across groups. Results showed that the rate of ODD, $\chi^2(2) = 29.9, p < .05$ and CD, $\chi^2(2) = 19.5, p < .05$ differed significantly between groups with the ADHD-aggressive group having the most symptoms, followed by the ADHD-only, and Control groups (see Table 2 for descriptive statistics).

Analysis

Two sets of analyses were computed to investigate the relationship between SIP and aggression. The first set of analyses examined whether SIP abilities differed as a function of ADHD and aggression. The second set of analyses examined whether specific aspects of SIP predicted specific subtypes of aggressive behaviour.

Group Differences in Social Information Processing

A set of 3 (Group: ADHD-only vs. ADHD-aggressive vs. control) x 5 (Vignette: Positive vs. Negative vs. Ambiguous vs. Ambiguous-Positive vs. Ambiguous-Negative) x 3 (SIP variable: positive vs. negative vs. neutral) mixed factorial ANOVAs were computed, with Group as a between-subjects factor and Vignette and SIP as within-subjects factors. These analyses investigated differences in information processing between aggressive and non-aggressive children with and without ADHD. SIP variables (i.e., intent attribution, outcome attribution and response generation) were investigated in separate analyses. Significant effects were followed up using simple effects tests and Tukey Honestly Significant Difference (HSD) post hoc tests.

Intent Attribution. Significant main effects of Vignette $F(4, 260) = 16.8, p = .000$ and Intent $F(2, 130) = 64.8, p = .000$ were found. Significant two-way interactions between Vignette x Group $F(8, 260) = 3.7, p = .000$, Intent x Group $F(4, 130) = 3.4, p = .011$, and Intent x Vignette $F(8, 520) = 38.3, p = .000$ were found. The main effects and two way interactions were qualified by a significant three-way interaction between Group, Intent and Vignette $F(16, 520) = 4.5, p = .000$. The three-way interaction between Group, Vignette and Intent was the highest order interaction and as such was followed up by post hoc testing.

First, simple effects tests were used to decompose the three-way interaction by examining the Group x Vignette interaction at each level of Intent. These results showed a significant Group x Vignette interaction for Positive Intent $F(2, 67) = 8.7, p = .000$ and Negative Intent $F(2, 67) = 7.0, p < .002$ but not for Neutral Intent $F(2, 67) = 1.2, p = .32$.

Next, the significant Group x Vignette interactions for Positive and Negative Intent were further decomposed using simple effects tests of Group for each level of Vignette. These results for Positive Intent showed significant effects of Group for positive vignettes $F(2, 67) = 11.6, p = .000$, negative vignettes $F(2, 67) = 4.8, p = .012$, and ambiguous-positive vignettes $F(2, 67) = 5.0, p = .009$. Tukey HSD post hoc tests and examination of means (see Figure 2) showed: (1) in positive vignettes the ADHD-only and ADHD-agg groups attributed a significantly greater amount of positive intent to the peer in the vignette as compared to the Control group, (2) in negative vignettes the ADHD-only group attributed a significantly greater amount of positive intent compared to the ADHD-agg and Control groups, and (3) in ambiguous-positive vignettes the ADHD-only and ADHD-agg groups attributed significantly more positive intent compared to the Control group.

Similarly, the significant Group x Vignette interaction for Negative intent was further decomposed using simple effects tests of Group for each level of Vignette. The results showed significant effects of Group for negative vignettes $F(2, 67) = 18.0, p = .000$ and ambiguous vignettes $F(2, 67) = 3.2, p = .049$. Tukey HSD post hoc tests and analysis of means (see Figure 3) showed: (1) in negative vignettes the ADHD-only and ADHD-agg groups attributed significantly more negative intent compared to the Control group, and (2) in ambiguous vignettes the ADHD-only group attributed significantly

more negative intent compared to the Control group but the ADHD-agg group did not significantly differ from the Control group.

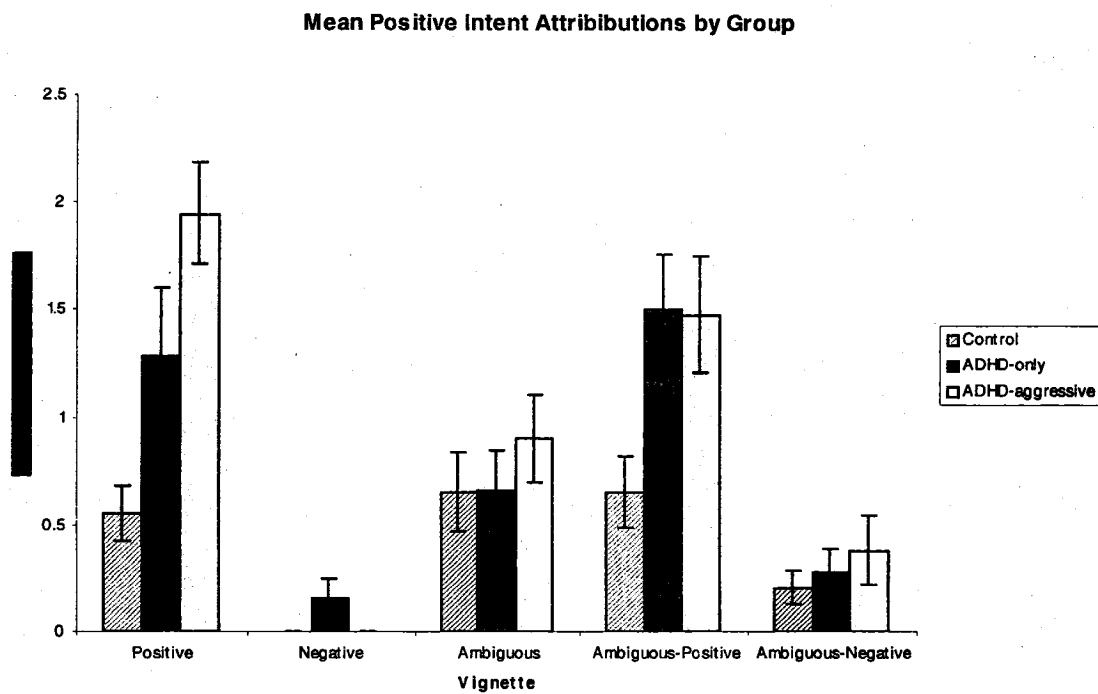


Figure 2. Mean positive intent attributions (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

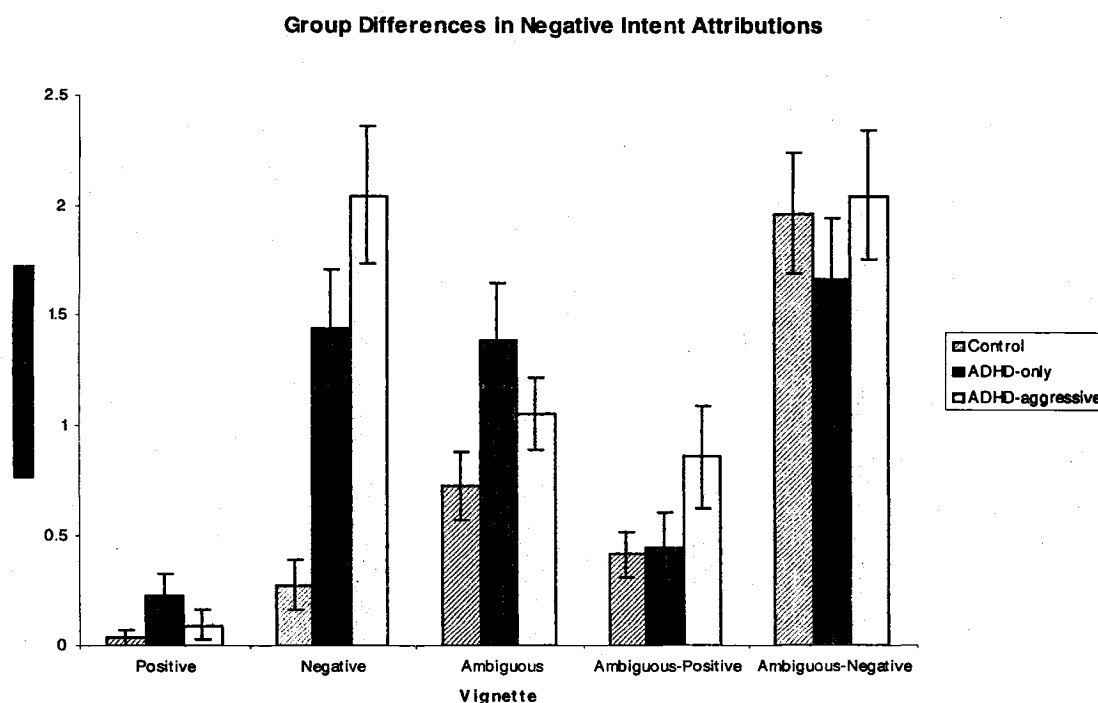


Figure 3. Mean negative intent attributions (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

Outcome Attribution. Significant main effects of Vignette $F(4, 260) = 24.9, p = .000$ and Outcome $F(2, 130) = 153.8, p = .000$ were found. Significant two-way interactions between Vignette x Group $F(8, 260) = 3.8, p = .000$, Outcome x Group $F(4, 130) = 5.8, p = .000$, and Vignette x Outcome $F(8, 520) = 125.9, p = .000$ were found. These main effects and interactions were qualified by a significant three-way interaction between Group, Vignette and Outcome $F(16, 520) = 6.5, p = .000$. Because the three-way interaction was the highest order significant interaction it was followed up by post hoc analysis.

First, simple effects tests were used to decompose the Group x Vignette x Outcome interaction by analysing the Group x Vignette interaction at each level of Outcome. Results showed significant Group x Vignette effects for Positive Outcome

attributions $F(2, 67) = 13.1, p = .000$ and Negative Outcome attributions $F(2, 67) = 6.6, p = .002$ but not for Neutral Outcome attributions $F(2, 67) = 2.2, p = 1.2$.

Next, the significant Group x Vignette interaction for Positive and Negative outcome was further decomposed using simple effects tests. For Positive outcomes there were significant effects of Group for positive $F(2, 67) = 15.5, p = .000$ and ambiguous-positive $F(2, 67) = 7.0, p = .002$ vignettes. Tukey HSD post hoc tests and analysis of means (see Figure 4) showed the same pattern for both of these types of vignettes: the Control group made significantly more positive outcome attributions compared to the ADHD-only and ADHD-agg groups.

Next, the significant Group x Vignette interaction for Negative outcome attributions was further decomposed using simple effects tests. Significant effects of Group were found for negative $F(2, 67) = 14.3, p = .000$ and ambiguous $F(2, 67) = 3.3, p = .044$ vignettes. Tukey HSD post hoc tests and analysis of means (see Figure 5) found that: (1) in negative vignettes the Control group made significantly more negative outcome attributions compared to the ADHD-only and ADHD-agg groups, and (2) in ambiguous situations the Control group made marginally significantly more negative outcome attributions compared to the ADHD-only group.

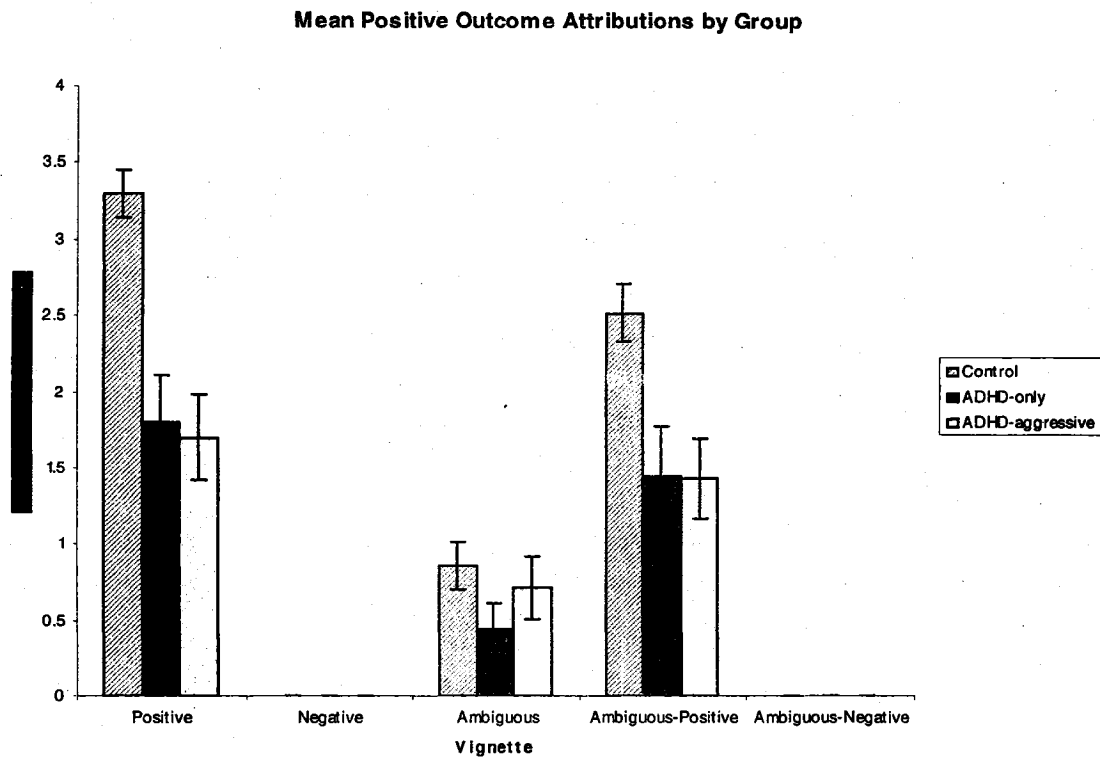


Figure 4. Mean positive outcome attributions (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

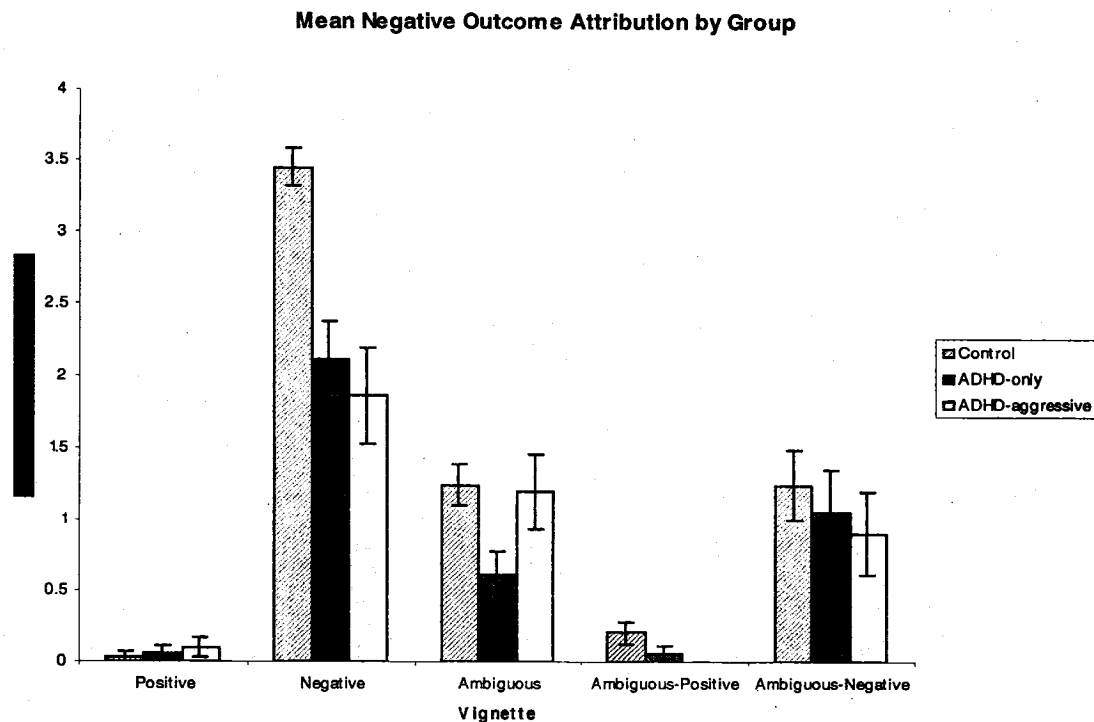


Figure 5. Mean negative outcome attributions (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

Response Generation. Significant main effects of vignette $F(4, 260) = 15.1, p = .000$ and response $F(2, 130) = 183.4, p = .000$ were found. Significant two-way interactions between Response x Group $F(4, 130) = 6.1, p = .000$ and Response x Vignette $F(8, 520) = 3.8, p = .000$ were found. These main effects and interactions were qualified by a significant three-way interaction between Group, Vignette and Response $F(16, 520) = 1.7, p = .036$. The three-way interaction was the highest order interaction therefore it was followed up by post hoc analysis (see Figure 6).

First, simple effects tests were used to decompose the Group x Vignette x Response interaction by first analyzing the Group x Vignette interaction at each level of Response. Results showed significant Group x Vignette effects for Positive $F(2, 67) =$

4.9, $p = .011$ and Neutral $F(2, 67) = 9.4, p = .000$ responses generated but unexpectedly not for Negative responses generated $F(2, 67) = 1.4, p = .245$.

Next, the significant Group x Vignette interaction for Positive and Neutral responses were further decomposed using simple effects tests. For Positive Responses, significant group differences were found in positive $F(2, 67) = 3.3, p = .042$, negative $F(2, 67) = 5.9, p = .004$, ambiguous $F(2, 67) = 4.0, p = .022$ and ambiguous-negative $F(2, 67) = 4.3, p = .017$ vignettes. Tukey HSD post hoc tests and analysis of means (see Figure 6) showed: (1) in positive, negative, ambiguous, and ambiguous-negative vignettes the Control group generated significantly more positive responses compared to the ADHD-only group, and (2) in negative vignettes the Controls also generated significantly more positive responses compared to the ADHD-agg group.

For Neutral Responses significant group differences were found in positive $F(2, 67) = 3.2, p = .046$, negative $F(2, 67) = 5.5, p = .006$, ambiguous $F(2, 67) = 8.7, p = .000$, ambiguous-positive $F(2, 67) = 3.6, p = .034$, and ambiguous-negative $F(2, 67) = 6.0, p = .004$ situations. Tukey HSD post hoc tests and analysis of means (see Figure 7) showed that: (1) in positive, ambiguous, and ambiguous-negative vignettes the ADHD-agg group generated significantly more Neutral Responses compared to the Control group, and (2) in negative and ambiguous-positive vignettes the ADHD-only group generated significantly more neutral responses compared to the Control group.

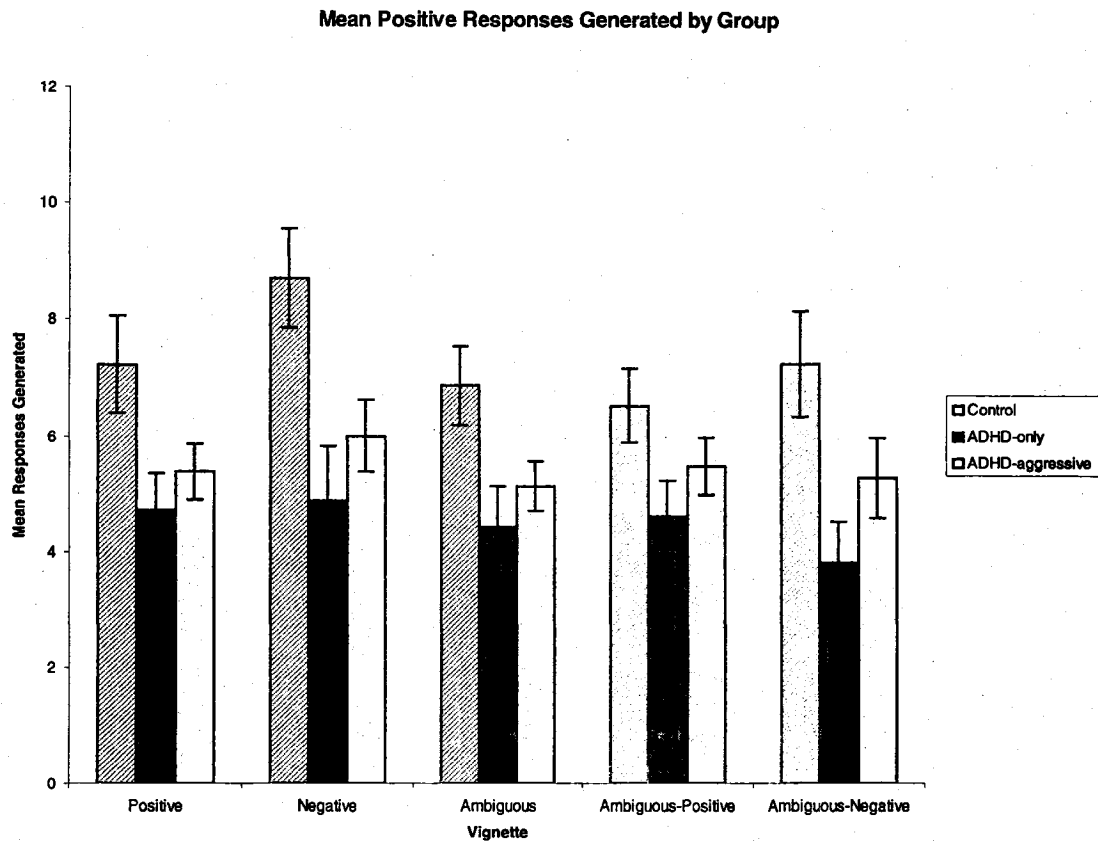


Figure 6. Mean positive responses generated (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

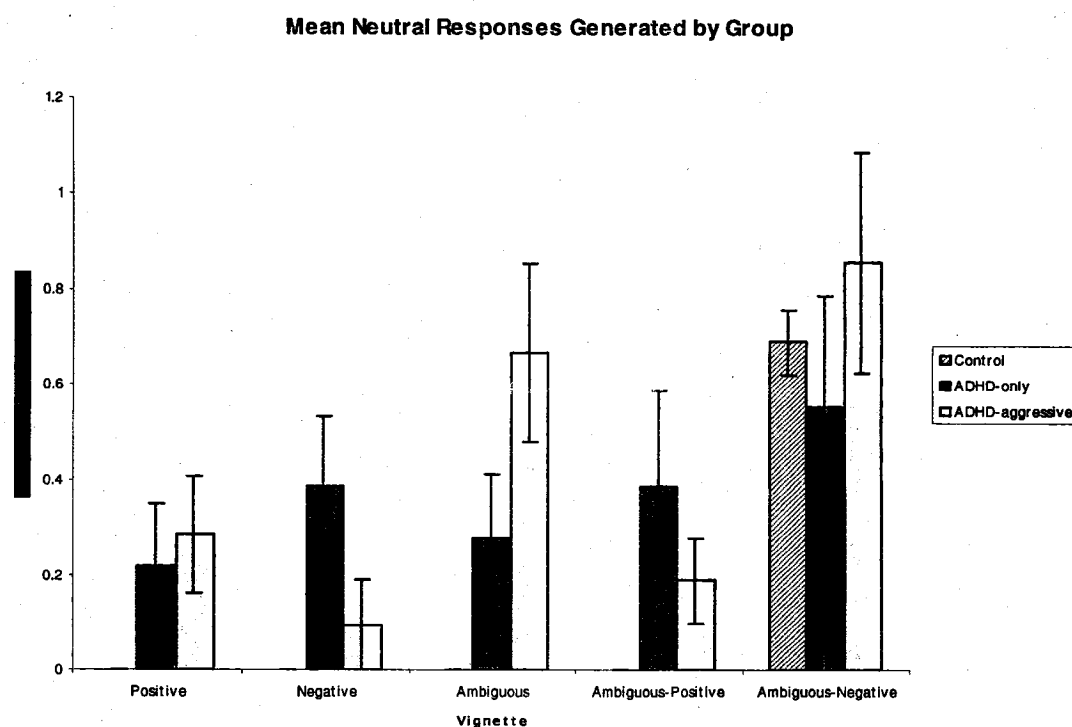


Figure 7. Mean neutral responses generated (+SE) displayed for Control ($n = 29$), ADHD-only ($n = 18$), and ADHD-aggressive ($n = 21$) groups by vignette type.

Cue detection

The vignettes were designed such that only certain cues were present in certain vignettes (e.g., there were no negative cues in positive vignettes). Because of this, children did not detect negative cues in positive situations, which was as expected. As such, Cues Detected and Vignette were not fully crossed precluding a single mixed-factor ANOVA as used in the above analysis. Instead Cue detection was examined using a series of 3 (Group: aggressive, ADHD-aggression, control) x 3 (Cues Detected: positive, negative, neutral) ANOVAs for situations that contained all cue types, or a 3 (Group: aggressive, ADHD-aggression, control) x 2 (Cues Detected: positive or negative, neutral)

ANOVA for situations that did not contain all cue types. Means and standard deviations for this analysis are summarized in Table 3.

Positive vignettes. There was a significant main effect of Group for Positive cues, $F(2, 67) = 5.4, p = .007$, and neutral cues, $F(2, 67) = 3.3, p = .042$. Tukey HSD post hoc tests and examination of means (see Table 3) showed the Control group detected significantly more positive cues than did the ADHD-only group and marginally more than the ADHD-agg group. The Control group also detected marginally more neutral cues than the ADHD-only group.

Negative vignettes. There was a significant main effect of Group for Positive cues detected $F(2, 67) = 4.4, p = .017$. Tukey HSD post hoc tests and examination of means (see Table 3) showed that the Control group detected a significantly greater amount of positive cues compared to the ADHD-agg group.

Ambiguous vignettes. There was a significant main effect of Group for Neutral cues detected $F(2, 67) = 5.4, p = .007$. Tukey HSD post hoc tests and examination of means (see Table 3) showed a significantly greater amount of neutral cues detected by the Control group compared to the ADHD-only group. The Control group detected marginally significantly more neutral cues compared to the ADHD-agg.

Ambiguous-positive vignettes. There was a significant main effect of Group for Negative cues detected $F(2, 67) = 4.2, p = .019$ and neutral cues detected $F(2, 67) = 5.9, p = .004$ between groups. Tukey HSD post hoc tests and examination of means (see Table 3) showed that the Control group detected a significantly greater amount of negative cues compared to the ADHD-only group. The Control group detected significantly more neutral cues compared to the ADHD-only and ADHD-agg groups.

Ambiguous-negative vignettes. There was a significant main effect of Group for Neutral cues detected $F(2, 67) = 3.3, p = .041$. Tukey HSD post hoc tests and examination of means (see Table 3) showed that the Control group detected marginally significantly more neutral cues compared to the ADHD-agg group (see Table 3).

Table 3: *Mean Cue Detection Comparison between Groups Differing in Aggression Rating and ADHD Diagnosis.*

	Ctrl		ADHD		ADHDa		Ctrl		ADHD		ADHDa		Ctrl		ADHD		ADHDa	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Pos	—	—	—	—	—	—	7.3 _a	2.0	5.6 _b	1.9	6.1 _{ab}	1.7	4.3 _a	1.8	3.0 _b	1.9	3.3 _{ab}	1.7
Neg	7.5 _a	2.0	6.6 _a	2.2	7.2 _a	1.9	1.1 _a	.84	.67 _{ab}	.84	.43 _b	.60	1.4 _a	1.1	.89 _a	.83	1.3 _a	.96
Arb	4.3 _a	2.4	2.4 _a	1.9	3.0 _a	1.8	5.7 _a	1.9	5.1 _a	1.6	5.6 _a	1.7	5.7 _a	1.9	5.1 _b	1.6	5.6 _{ab}	1.7
Arb- Pos	4.2 _a	1.1	3.2 _b	1.4	3.9 _{ab}	.94	4.0 _a	1.1	3.4 _a	.78	3.7 _a	1.0	4.0	2.3 _a	2.2 _b	1.6	2.4 _b	1.9
Arb- Neg	9.9 _a	2.4	8.9 _a	2.4	9.0 _a	2.6	.86 _a	.58	.72 _a	.57	.71 _a	.64	3.6 _a	1.7	2.5 _a	1.6	2.7 _b	1.4

Note. Means within the same row (within each valence type) that do not share a subscript differ ($p < .05$). Comparisons between groups were made for each cue type. Group comparisons were not done between cue types.

Social Information Processing Variables Predicting Specific Subtypes of Aggression

The second series of analysis investigated the association between SIP and specific forms of aggression. Two types of analyses were used as recommended by Tabachnick and Fidell (2001). First, simple correlations were calculated to investigate the relationship between SIP variables and reactive and proactive aggression, independent of other variables. Second, a series of linear regressions were used to investigate the unique contribution of SIP variables to reactive and proactive aggressive behaviour. Positive, negative, and neutral cues detected, intent attributions, outcome attributions, and responses generated were used to predict reactive and proactive aggression. Vignette type was held constant in each of these analyses to determine if information processing differentially predicted aggressive behaviour as a function of situation type. Because of multiple calculations a conservative level of alpha ($p < .01$) was used. Effects significant at $p < .05$ were interpreted as marginal.

Simple Correlations

Simple correlations between SIP variables and reactive and proactive aggression are reported in Table 4. As can be seen for positive vignettes positive intent was significantly positively correlated with aggression while positive outcome attribution was negatively correlated with aggression. In negative vignettes, negative intent was positively related to aggression and outcome attribution negatively related to aggression. The generation of neutral responses was positively related to aggression. Overall, the detection of positive cues, neutral cues, and generation of positive responses, was negatively related to aggression. The magnitudes of significant correlations ranged between medium ($r = -.20$) to large ($r = .52$) (Hemphill, 2003).

Table 4
Correlations between social information processing variables and reactive and proactive aggression

		Positive Vignettes		Negative Vignettes		Ambiguous Vignettes		Ambiguous-Positive Vignettes		Ambiguous-Negative Vignettes	
Aggression Type		R	P	R	P	R	P	R	P	R	P
Cues Encoded	Pos	-.13	-.10	-.29*	-.33*	.05	-.03	-.07	-.02	.00	-.03
	Neg	--	--	.03	-.02	.02	.03	-.08	-.13	-.10	-.07
	Neu	-.20 ⁺	-.14	-.11	-.09	-.26 ⁺	-.18	-.27*	-.23 ⁺	-.23 ⁺	-.21 ⁺
Intent Attribution	Pos	.51*	.44*	.04	-.02	.08	.04	.31*	.23 ⁺	.12	.04
	Neg	.10	.04	.59*	.51*	.12	.05	.01	.06	-.12	.02
	Neu	.17	.11	.18	.15	.11	-.01	.07	.05	.13	-.01
Outcome Attribution	Pos	-.52*	-.43*	--	--	-.01	-.03	-.20 ⁺	-.17	--	--
	Neg	.09	.16	-.51*	-.43*	-.05	.09	-.29*	-.24 ⁺	.05	-.00
	Neu	--	--	-.16	-.08	-.06	-.12	--	--	-.15	-.09
Response Generation	Pos	-.20 ⁺	-.15	-.31*	-.19	-.26*	-.18	-.20 ⁺	-.06	-.26*	-.12
	Neg	.03	.12	.18	.16	.14	.02	.03	-.05	-.05	.02
	Neu	.40*	.27*	.25 ⁺	.10	.52*	.42*	.28*	.13	.39*	.32*

Note. Aggression Type ("R" denotes Reactive aggression and "P" denotes Proactive aggression). Pos – Positive, Neg – Negative, Neu – Neutral, * = $p < .01$, ⁺ = $p < .05$

Regression Analysis

A series of linear regressions were computed to investigate the association between children's ability to detect social cues, attribute intent, make outcome judgements, and generate responses, and their reactive and proactive aggressive behaviour. Counts of positive, negative, and neutral SIP variables were entered simultaneously on the first step of the analysis to investigate their combined association with reactive or proactive aggression. Significant overall analyses were further examined by inspection of regression coefficients. Findings are presented in Tables 5 and 6 and significant results are described in the following text.

Table 5: Summary of Linear Regression Analyses Predicting Reactive Aggression

<i>Predictor</i>	<i>Positive</i>		<i>Negative</i>		<i>Ambiguous</i>		<i>Ambiguous-Pos</i>		<i>Ambiguous-Neg</i>	
	B	SEB	B	SEB	B	SEB	B	SEB	B	SEB
Cue										
Positive	.01	.09	-.53*	.21	.14	.09	.18	.18	.34	.27
Negative	--	--	.08	.07	.02	.17	.06	.14	-.00	.06
Neutral	-.12	.10	.09	.17	-.18	.07	-.21	.08	-.22	.10
Equation										
F-value	1.42		2.63 ⁺		2.53		2.30		.08	
Rsquare	.04		.11		.11		.10		.08	
Intent										
Positive	.48*	.10	.63	.53	.14	.15	.31	.12	.20	.25
Negative	.39	.38	.49*	.09	.17	.15	.10	.17	-.06	.11
Neutral	.55	.49	.76	.92	.49	.51	.43	1.08	.17	.22
Equation										
F-value	8.75*		12.23*		.87		2.51		.74	
Rsquare	.29		.36		.04		.11		.03	
Outcome										
Positive	-.43*	.09	--	--	-.03	.17	-.16	.10	--	--
Negative	-.24	.51	-.44*	.09	-.07	.15	-.99*	.42	.04	.11
Neutral	--	--	-1.01 ⁺	.48	-.22	.42	--	--	-1.38	1.11
Equation										
F-value	12.00*		14.55*		.16		4.34 ⁺		.85	
Rsquare	.27		.31		.01		.12		.03	
Response										
Positive	-.07 ⁺	.04	-.07 ⁺	.03	-.05	.04	-.07	.04	-.05	.03
Negative	.00	.24	.07	.06	.15	.13	.00	.21	.01	.11
Neutral	1.05*	.28	.57	.30	.85*	.19	.58 ⁺	.26	.44*	.15
Equation										
F-value	5.67*		3.93*		9.36*		2.69 ⁺		4.77*	
Rsquare	.21		.16		.31		.11		.18	

Note: * denotes $p < .01$, + denotes $p < .05$

Table 6: Summary of Linear Regression Analyses Predicting Proactive Aggression

<i>Predictor</i>	<i>Positive</i>		<i>Negative</i>		<i>Ambiguous</i>		<i>Ambiguous-Pos</i>		<i>Ambiguous-Neg</i>	
	B	SEB	B	SEB	B	SEB	B	SEB	B	SEB
<i>Cue</i>										
Positive	-.01	.07	-.50*	.16	.03	.07	.23	.14	.18	.22
Negative	—	—	.04	.06	.06	.14	-.06	.11	.01	.05
Neutral	-.06	.08	.15	.13	-.09	.05	-.14	.07	-.15	.08
<i>Equation</i>										
F-value	.69		3.41 ⁺		.89		2.08		1.23	
Rsquare	.02		.14		.04		.09		.05	
<i>Intent</i>										
Positive	.32*	.08	.22	.46	.05	.12	.19	.10	.07	.20
Negative	.14	.32	.34*	.07	.06	.12	.12	.13	.02	.09
Neutral	.27	.42	.43	.78	-.02	.42	.28	.88	-.01	.18
<i>Equation</i>										
F-value	5.29*		7.65*		.10		1.52		.05	
Rsquare	.20		.26		.01		.07		.00	
<i>Outcome</i>										
Positive	-.27*	.08	—	—	-.02	.13	-.11	.08	—	—
Negative	.17	.43	-.29*	.07	.08	.12	-.67 ⁺	.34	-.00	.08
Neutral	—	—	-.49	.41	-.34	.33	—	—	-.63	.89
<i>Equation</i>										
F-value	7.30*		8.34*		.51		2.98 ⁺		.25	
Rsquare	.18		.20		.02		.08		.01	
<i>Response</i>										
Positive	-.03	.03	-.03	.03	-.03	.03	-.02	.04	-.01	.03
Negative	.17	.20	.06	.05	.01	.11	-.08	.18	.06	.09
Neutral	.57 ⁺	.24	.16	.26	.56*	.16	.22	.21	.32 ⁺	.12
<i>Equation</i>										
F-value	2.56		1.29		4.79*		.49		2.63 ⁺	
Rsquare	.11		.06		.18		.02		.11	

Note: * denotes $p < .01$, + denotes $p < .05$

Reactive Aggression

Positive vignettes. As shown in Table 5, intent attributions, outcome attributions, and responses generated in positive vignettes, significantly predicted reactive aggression. Examination of significant regression coefficients for intent attributions indicated that positive intent was positively associated with reactive aggression. Thus, the attribution of positive intent to a peer in a hypothetical positive situation was uniquely related to higher levels of reactive aggression.

For outcome attributions examination of significant regression coefficients showed that positive outcome attribution was negatively associated with reactive aggression. Thus, a focus on the positive outcome of a hypothetical positive situation was uniquely related to lower levels of reactive aggression.

Examination of regression coefficients for responses generated demonstrated that neutral responses were significantly positively associated with reactive aggression, and positive responses were marginally negatively associated with reactive aggression. Thus generation of neutral responses in hypothetical positive situations was uniquely associated with higher levels of reactive aggression, and positive responses uniquely associated with lower levels of aggression.

Negative vignettes. As shown in Table 5, cues detected, intent attributions, outcome attributions, and responses generated each significantly predicted reactive aggression (although this association was marginal for cues detected). Examination of significant regression coefficients indicated that positive cue detection was negatively associated with reactive aggression. Thus, the detection of positive cues in negative situations was associated with lower levels of reactive aggression.

For intent attribution, negative attribution was positively associated with reactive aggression. Thus, attribution of negative intent was uniquely associated with higher levels of reactive aggression. However, for outcome attribution, negative attribution was negatively associated with reactive aggression. Thus, evaluating a negative situation based on the negative information contained within the outcome was uniquely associated with less reactive aggression. Similarly, positive responses generated were marginally negatively associated with reactive aggression. Thus, the generation of positive responses to hypothetical negative situations was uniquely related to lower levels of reactive aggression.

Ambiguous vignettes. As shown in Table 5, responses generated in ambiguous vignettes significantly predicted reactive aggression. Inspection of significant regression coefficients showed that neutral responses generated was positively associated with reactive aggression. Thus, generation of neutral responses in unclear situations was uniquely associated with higher levels of reactive aggression.

Ambiguous-Positive vignettes. As shown in Table 5, outcome attributions and responses generated in ambiguous-positive vignettes significantly, and marginally, respectively, predicted reactive aggression. Inspection of significant regression coefficients for outcome attribution showed that negative outcome attribution was marginally negatively associated with reactive aggression. Thus a focus on negative outcome information was uniquely associated with less reactive aggression. However, similar to ambiguous vignettes, neutral responses generated were positively, albeit marginally, associated with reactive aggression.

Ambiguous-Negative vignettes. As shown in Table 5, responses generated in ambiguous-negative situations significantly predicted reactive aggression. Inspection of significant coefficients showed that neutral response generation was positively associated with reactive aggression. Thus, similar to other situations with ambiguous information, generation of neutral responses in unclear situations with a negative outcome was uniquely associated with higher levels of reactive aggression.

Proactive Aggression

Positive vignettes. As shown in Table 6, intent attributions and outcome attributions for positive vignettes significantly predicted proactive aggression. Inspection of significant regression coefficients showed that positive intent attributions were positively associated with proactive aggression. Thus, the inference of positive intent in hypothetical positive situations was uniquely related to greater degrees of proactive aggression. However, positive outcome attributions were negatively associated with proactive aggression. Thus, the tendency to base judgments on positive outcome information in hypothetical positive situations was uniquely related to less proactive aggression.

Negative vignettes. As shown in Table 6, cues detected, intent attributions, and outcome attributions for negative vignettes significantly predicted proactive aggression (although marginally for cues detected). Inspection of significant regression coefficients showed that positive cues detected was negatively associated with proactive aggression. Thus, detecting positive information in negative situations was uniquely related to lower levels of proactive aggression. However, negative intent was positively associated with proactive aggression. Thus, the inference of negative intent in hypothetical negative

situations was uniquely related to greater degrees of proactive aggression. Negative outcome attribution was negatively associated with proactive aggression. Thus, the tendency to base judgments on negative outcome information in hypothetical negative situations was uniquely related to lower levels of proactive aggression.

Ambiguous vignettes. As shown in Table 6, response generation in ambiguous vignettes significantly predicted proactive aggression. Inspection of significant regression coefficients showed that neutral response generation was positively associated with proactive aggression. Thus, the tendency to generate neutral responses in hypothetical ambiguous situations was uniquely related to higher levels of proactive aggression.

Ambiguous-positive vignettes. As shown in Table 6, outcome attributions for ambiguous-positive vignettes marginally significantly predicted proactive aggression. Inspection of significant regression coefficients showed that negative outcome attribution was negatively associated with proactive aggression. Thus, the tendency to base judgments on negative outcome information was uniquely related to lower levels of proactive aggression.

Discussion

The purpose of this study was to investigate the relationship between SIP, aggressive behaviour and ADHD. A number of hypotheses were made. First, it was hypothesised that children with ADHD-aggression and ADHD-only would differ from controls, with the ADHD-aggression group showing the largest differences. Hence, children with ADHD would demonstrate SIP deficits and children with ADHD and aggression would be the most impaired. Second, deficient SIP abilities were

hypothesised to predict elevated levels of reactive and proactive aggression. More specifically, deficits in cue encoding, intent attribution and outcome attribution were hypothesised to predict elevated reactive aggression and deficits in response generation elevated proactive aggression. Two sets of analyses were undertaken to evaluate these hypotheses. First, differences in cue detection, intent attribution, outcome attribution, and response generation were compared between children with ADHD-only, ADHD-aggression and control children. Second, SIP abilities were used to predict reactive and proactive aggressive behaviour. As discussed next, results showed mixed support for the hypotheses.

Step 1: Cue Detection

Positive and negative cues detected in social vignettes were compared between groups of children and were used to predict reactive and proactive aggression. Results suggest two general patterns. First, the control group detected more positive and negative cues in positive and negative situations. Second, detection of positive or neutral cues in situations containing positive, negative, or ambiguous information was related to lower levels of reactive and proactive aggression.

Results of this study are consistent with numerous other studies demonstrating cue detection deficits in children with ADHD and children with aggressive behaviour (Dodge et al., 1984; Dodge & Newman, 1981; Matthys et al., 1999; Milich & Dodge, 1984). However, a primary finding in the present study was that regardless of social vignette, or valence of social information (i.e., positive, negative, neutral), control children detected more cues than children with ADHD. These results parallel other studies showing that children with ADHD, and those with aggression, detect fewer cues

of any valence compared to control children (Matthys, Cuperus et. al., 1999; Dodge & Newman, 1989). This finding is important given that cue detection is the first step of the information processing cycle that provides information processed in all later steps, including information stored in the SIP database. Detecting fewer cues results in less available social information and likely also dysfunctional behaviour (i.e., behaviour that is not based on the facts or information available in the social situation). Control children have more positive and negative information available in their processing mechanisms to make accurate behavioural decisions, whereas this essential information is not available in the processing mechanisms of children with ADHD. Inattention might result in missing important social cues, regardless of serial position in a situation. For example the children with ADHD in the present study might have missed positive, negative, and neutral social cues at the start, middle and end of the social situation. Missing cues possibly resulted in more reliance on past stored social knowledge that has been associated with aggressive behaviour in past research. In contrast, children without ADHD (controls) might have effectively detected important social cues and used these to generate situationally appropriate decisions regardless of their serial position, as others have suggested (Milich & Dodge, 1984). For example, detecting fewer positive cues results in less positive information available to be processed, less stored positive cognitive social scripts, and less positive behavioural responding (Dodge, Pettit, Bates & Valente, 1995). Therefore, a deficit in cue detection is logically related to deficits at all subsequent stages of information processing.

Additionally, in support of the hypotheses, detection of positive social information was related to lower levels of reactive and proactive aggression. That is,

children that had a more pronounced ability to detect positive information were also rated as the least aggressive. These results show that positive processing (or lack thereof) is related to aggressive behaviour.

Step 2: Interpretation of Social information through Intent Attributions and Outcome Attributions

Intent Attribution

Intent attributions for positive and negative social information were compared between groups of children and were used to predict reactive and proactive aggression. Results follow three consistent themes. First, children with ADHD (i.e., ADHD-only and ADHD-aggression) demonstrated an attribution style such that they focussed on the intention of the peer in vignettes to a greater extent than the control group. Second, intent attribution in situations containing positive social information (i.e., positive and ambiguous-positive situations) was similar for both ADHD groups. Children in both ADHD groups attributed greater positive intent in positive and ambiguous-positive situations compared to the control group (i.e., regardless of ambiguity of situation). Third, in situations containing positive information (positive and ambiguous-positive situations) or clearly negative information, attribution of intent was related to elevated aggressive behaviour.

Results support a growing body of research describing social cognitive biases in aggressive and disruptive children (Dodge et al., 1986; Milich & Dodge, 1984). In the present study, children with ADHD demonstrated an information processing style that emphasised the judgement of peer intent when analysing social situations. Children with ADHD were more likely to infer intent even when the intent of the peer in the situation

was ambiguous. This attribution bias is consistent with other research examining social cognition of children with ADHD in a number of ways. First, children with ADHD in the present study attributed more positive intent to peers in positive and ambiguous-positive situations. Much previous research has described an illusory processing bias of children with ADHD. In academic and peer based interactions children with ADHD inaccurately judge their actions as more positive and overestimate their abilities relative to same age peers without ADHD (Hoza et al., 2004; Owens & Hoza, 2003). Although the positive illusory bias is typically directed towards the child's own abilities, the present study suggests that their tendency to over-emphasize positive information is a more general phenomenon (i.e., perception of positive intent directed toward them could have esteem protective effects similar to that of the previously described illusory bias).

Additionally, children with ADHD attributing more positive intent to peers in positive situations compared to control children may partly explain two previous research findings. First, past research has demonstrated that children with ADHD routinely interact with peers that tease and manipulate them (Hinshaw et al., 1997; Hodgins et al., 2000; Landau et al., 1998). A positive intent bias may contribute to maintenance of this behaviour because children with ADHD may believe that their peer has their best interest at heart and therefore may not view the peers' teasing and manipulation as negative. Second, past research has demonstrated that children with ADHD jump into activities at inopportune moments (Milich & Landau, 1982; Mrug, Hoza, & Gerdes, 2001). Positive intent biases may contribute to the child with ADHD assuming that others want them involved, when the reality of the social situation may be different.

The present study also showed that reactive and proactive aggressive children focussed on peer intent in negative situations. Research has described that children with aggressive behaviour not only misinterpret intent but also the degree of aggressive behaviour in a social situation (Dodge & Feldman, 1990; Hubbard et al., 2001). For example, when involved in an aggressive interaction, children with aggressive tendencies are more likely to underestimate their own level of aggression than are other children. These results and those of the present study suggest that aggressive children misjudge their level of aggression possibly because they over-attribute hostile intention to their peers' actions thereby justifying aggressive behaviour. Aggressive children may be more used to hostile provocation situations and as such may overestimate the negative intent of peers.

Third, a bias towards misattribution of hostility in peers' intentions has been demonstrated in numerous studies. In situations with ambiguous intent and clearly negative outcomes children with aggressive behaviour misattribute hostility that in turn contributes to hostile responding. The present study provides additional evidence of this type of bias in attributing peer intention. However, the present study suggests this bias may extend beyond ambiguous situations with negative outcomes to positive, ambiguous, and negative social situations. For example, regardless of information content or clarity of situation, children with ADHD (with and without aggression) focussed on the intention of the peer in the situation more so than controls. This suggests that biased SIP (i.e., a focus on an implied mental process) is related to dysfunctional social behaviour, regardless of type of situation. Children with ADHD appear to not be focussing on the objective, observable, situational facts, but on their opinion of what is taking place in the

situation. Given that children with ADHD are deficient in the amount of social information they have available in their processing mechanisms (i.e., not detecting as many relevant information cues), it seems likely that relying on intent attribution based on incomplete information will lead to dysfunctional behaviour.

It is possible that deficient attention might mediate or moderate the relationship between social cognition and dysfunctional behaviour. For example as mentioned above, inattention may contribute to biased cue detection, biased interpretation, and multiple failed social interactions. However, because the present study did not investigate causal links, or moderation effects, it is equally likely that attribution biases are compounding attention deficits. These are areas in need of further investigation.

Previous research has provided some support for processing biases favouring intent attribution over realistic situation appraisal in aggressive children (Dodge & Tomlin, 1987). Dodge and Tomlin compared the use of situational cues to the use of prior knowledge, termed “self-schema” in making decisions in social situations. Aggressive children relied more on previous knowledge than on available social information when making decisions. Dodge and Tomlin speculated that this reliance on stored social knowledge is another aspect, apart from hostile attribution, that contributes to social difficulties and aggressive behaviour.

Finally, results showed that a focus on peer intent was positively related to a behavioural style that utilized aggression. Intent attribution in positive, negative, and ambiguous-positive situations, were associated with elevated reactive and proactive aggressive behaviour. This result is consistent with previous research showing that judgments based on assumptions as to the motivating factors contributing to other's

behaviours are related to incompetent social behaviour. For example, much research has described that presumed hostile intent is associated with reactive aggressive behaviour (Dodge, 1980; Dodge et al., 1986). However, in the present study intent attribution was related to both reactive and proactive aggression. The association between intent attribution and proactive aggression may be present here for a number of reasons. First, SIP performance of all children was used to predict proactive aggression scores. Therefore children with low and high levels of proactive aggression characteristics were included rather than children in previous research that typically showed markedly elevated reactive and proactive aggression. A continuum of both subtypes of aggression may more accurately represent children in general. Second, consistent with previous research reactive and proactive aggression were highly correlated (i.e., $r^2 = .80$). This is an important consideration because it suggests that reactive and proactive aggression are driven, or exacerbated by, similar underlying processes (i.e., SIP deficits). Therefore the relationship of intent attribution to both subtypes of aggression, as found in the present study, may be expected.

Contrary to hypothesis, results from this study showed that the ADHD-aggression group was not more impaired than the ADHD-only group. The ADHD-aggression group did not demonstrate more intent attribution biases or deficits compared to the ADHD-only group. This finding argues that ADHD and aggression are primary factors that contribute to dysfunctional SIP. Results of the study support the hypotheses that SIP abilities, specifically intent attributions, of children with ADHD are biased compared with typically developing children. As such, inclusion of ADHD as a factor in future

theoretical formulations, investigations and interventions that rely on SIP appear warranted.

Outcome Attribution

Outcome attributions for positive and negative social information were compared between groups of children and were used to predict reactive and proactive aggression. Results followed three consistent themes. First, control group children focussed more on situational outcome compared to children with ADHD (i.e., both ADHD-only and ADHD-aggressive). Second, in positive situations control group children focussed on positive outcome and in negative situations control group children focussed on negative outcome. Third, processing of outcome information was associated with lower levels of reactive and proactive aggression.

Results from the present study differ from some previous research. Specifically, Dodge and Tomlin (1987) showed that aggressive children were more likely to utilize outcome cues when formulating a judgement about a peer's intention. Social cues, termed "distracter cues" that were either hostile or benign, when placed at the end of a social situation were related to judgement errors from aggressive children. The present study showed that typically developing children (i.e., non-aggressive children without ADHD) were more likely to use situational cues and outcome information when making judgements, regardless of placement in vignette, or valence of information. This difference may have occurred partly because Dodge and Tomlin (1987) did not clearly differentiate between intention and outcome in social situations. Even though aggressive children utilized social cues from the end of vignettes to make decisions, they might also be relying on a great deal of implied intent information (that may be present at the

beginning or end of the vignette). The present study separated intent and outcome and therefore may have more effectively pieced apart this information.

The present study also found that in positive situations (i.e., positive and ambiguous-positive vignettes) children in the control group were more likely to focus on positive outcomes. Similarly, in negative situations (negative and ambiguous-negative vignettes) children in the control group focussed on negative outcome. Since each of these vignettes had a salient and carefully defined positive or negative outcome, this finding supports the assertion that control group children are utilizing available salient social information when making judgements. In other words, control group children, who were assessed to have typically developing attention skills, were able to capitalize on the clarity of outcome information and used it to formulate judgements. In contrast, children with ADHD were less likely to utilize this social information when interpreting the situations. Thus, in this study it is believed that an outcome focus is associated with efficient processing of available social information.

Step 4: Generation of Responses

Positive, negative and neutral responses generated were compared between groups of children and were used to predict reactive and proactive aggression. Three themes emerged from these data. First, control children generated more positive responses in positive and negative situations. Second, children with ADHD (both ADHD-only and ADHD-aggression) generated more neutral responses in ambiguous, positive and negative situations. Third, neutral response generation was related to elevated levels of reactive and proactive aggression, and positive response generation associated with lower levels of reactive aggression.

The generation of a greater amount of adaptive social responses by control group children compared to children with ADHD parallels findings from the available research literature (Bierman & Welsh, 2000; Dodge, 1980; Dodge & Newman, 1981; Dodge et al., 1986; Rubin & Krasnor, 1983). For example, Matthys and colleagues showed that hyperactive children generated the fewest positive responses and most negative responses in ambiguous provocation situations. Typically developing children generated and demonstrated a wider repertoire of positive responses to social situations compared to children with ADHD. Positive response generation and response enactment contributed to adaptive social relationships and friendships. Children with ADHD had a smaller repertoire of positive responses. Researchers have speculated that lack of positive responses are a product of lack of exposure to appropriate social situations or practice with enacting positive social behaviours (Coie et al., 1990; Crick, 1996; Wentzel & McNamara, 1999). Children with ADHD may be inattentive to social opportunities, miss important social information and fail to develop a repertoire of positive actions. As such, children with ADHD may experience less positive friendship opportunities and may be exposed to greater amounts of negative and deviant peer relationships.

Some research has shown that aggressive children and children with ADHD generate fewer total strategies in social situations compared to typically developing children (Matthys et al., 1999; Mayeux & Cillessen, 2003; Milich & Dodge, 1984; Rabiner et al., 1990). Although these include all valences of responses, this deficit in total strategy generation may in part be due to a decrement in positive responses. For example, Rabiner and colleagues showed that aggressive boys produced fewer and more deviant responses to provocation compared to control children.

A second finding of the present study is that children with ADHD produced more neutral responses than control group children. Neutral responses were classified as “inactive” or benign responses. For example, “I would think about it” or “I would play with a toy” were responses that were not action oriented and were not directed at a social object. As such, neutral responses generated were characterised as those that lacked in social knowledge or potentially in social skill. However, response generation is a cognitive ability and different than behavioural enactment which includes social skills. Positive and negative responses, although very different, were each action oriented and were directed towards a social object. Results from this study support previous research demonstrating that children with aggressive behaviour lack specific social knowledge or the ability to access this knowledge in a specified social context.

Consistent with the present study some research has shown that aggressive children demonstrate the least socially competent behaviour and access the most help seeking behaviour in response to provocation situations (Mize & Cox, 2001; Rabiner et al., 1990). Although these findings are not identical to that of the current study, taken together, results demonstrate that children with aggressive behaviour generate the least effective social strategies, have the fewest active social skills, and may rely on others to solve social problems (i.e., appeal to authority).

Finally, results of the present study show that neutral response generation was predictive of proactive and reactive aggression. Individuals with the most neutral responses also demonstrated elevated levels of reactive and proactive aggression. These results argue that the generation of inactive and socially unassertive responses is associated with more dysfunctional behaviour. Intuitively this makes sense. For example

a child on the playground that is faced with a complex social situation for which they are unable to generate a response (i.e., because it is not in their repertoire) may be more likely to either be dominated or victimised in that situation (possibly resulting in a retaliatory response) or devise other aggressive and extreme strategies to assert themselves.

Although similar, the relationship between SIP and aggressive behaviour differed somewhat from that of previous research. Response generation deficits in the current study were predictive of reactive and proactive aggression. Previous research has demonstrated links between response generation and mainly proactive aggression. The novel finding in this study may in part be due to the diagnostic inclusion of children with ADHD, or the moderate correlation between reactive and proactive aggression. Dysfunctional behaviour may be more pervasive in children with ADHD and therefore SIP deficits may be related to multiple subtypes of aggression. However this possibility is in need of further investigation.

Study 2 - Summary

The present study demonstrated a number of interesting findings. First, as expected, differences in SIP abilities between control children and children with ADHD emerged in all analysis. For example, control children tended to detect more positive cues, attribute less negative and positive intent, focus more on situational outcome, and generate more positive responses compared to either ADHD group. Second, differences between the ADHD-only and ADHD-aggression groups were mixed, suggesting similarity in information processing in some areas and differences in others. For example, the ADHD-only group, and not the ADHD-aggression group, attributed more

negative intent in ambiguous situations compared to the control group. However, both ADHD groups were similar in their attribution of negative intent in negative situations. It may be that the combination of ADHD and aggression impacts specific steps in the SIP cycle to a greater extent than other steps (e.g., intent attribution more than response generation). Similarly, ADHD and aggression may differentially impact SIP depending on the type of social situation (i.e., context dependent effects). Third, children with ADHD generated more neutral (i.e., socially ineffective) responses compared to control children. Fourth, a focus on the intention of peers in the vignette, rather than outcome, was associated with both reactive and proactive aggression. Conversely, an outcome focus was associated with less aggression. Finally, generation of neutral responses was associated with greater aggression, whereas positive response generation was associated with less aggression. Each of these findings has important theoretical and applied implications. These will be expanded upon in the general discussion following study three.

CHAPTER 4

STUDY 3:

ASSOCIATIONS BETWEEN SOCIAL INFORMATION PROCESSING, AGGRESSIVE, AND PROSOCIAL BEHAVIOUR

Introduction

Research that has described the cognitive mechanisms that contribute to aggressive behaviour has also made a number of other important contributions to the field of child psychology. First, by highlighting the cognitive structures that contribute to aggressive behaviour researchers have also further accentuated the impact of mental processes on observed behaviour (Dodge et al., 1986; Dodge & Price, 1994; Dodge & Tomlin, 1987; Huesmann, 1998). It appears likely, and has been described in some research, that cognitive structures may contribute to other forms of social behaviour (Dodge, 1993).

Second, the vast amount of research has encouraged the development of a number of social cognitive models that organise the available information and further guide research (Crick & Dodge, 1994; Rubin & Krasnor, 1986). Although research has primarily used these models to investigate information processing and aggression relationships, the models describe general processing abilities and as such can be utilised with other forms of information processing and behaviour connections.

Third, because social cognitive research has typically been theory driven, the results from much of the research has been used to guide clinical interventions to help prevent and remediate behavioural disturbances (McFadyen-Ketchum & Dodge, 1998; Mrug et al., 2001; Pelham et al., 1998; Pfiffner et al., 2000).

Although the bulk of research has been informative, the majority of studies have cited small to modest information processing and behaviour connections (Dodge & Price, 1994; Price & Dodge, 1989). Potential reasons for these effects may include: (1) The majority of studies have investigated aspects of information processing separately (Crick, 1996; Crick & Dodge, 1994; Dodge & Pettit, 2003). For example, children's ability to detect social information may be moderately related to social behaviour in one study while interpretation of social behaviour may be moderately related to social behaviour in another. Because recent information processing models have cited the interrelationship between processing steps, considering aspects of processing in isolation may have limited the explanatory power of overall findings (Crick & Dodge, 1994); (2) Much of the existing research has focused on biases in information processing that occur from the over-detection or misattribution of information with a negative social valence. For example, researchers have described that aggressive children are hyper-focussed on negative social cues (Dodge & Newman, 1981; Gouze, 1987; Schippell et al., 2003) and misperceive others intentions as negative in ambiguous social situations (Dodge, 1980; Dodge et al., 1984; Dodge et al., 1986). However social situations are comprised of both negative and positive social information. Just as negative biases in information processing contribute to hostile behaviour, positive information processing may contribute to prosocial behaviour (Nelson & Crick, 1999). In addition, and possibly more relevant to aggressive children, positive information processing deficits may further exacerbate behavioural dysfunction such that children with negative and positive information processing biases may be the most socially impaired group of children (Day et al., 1991; Volling et al., 1993).

The presence of unique positive information processing deficits in aggressive children appears likely for a number of reasons. First, children with aggressive behaviours typically have social learning histories that include harsh and authoritarian parenting (Snyder & Patterson, 1995) and peer and family directed aggression (Schwartz et al., 1998; Schwartz et al., 2000). The exposure to hostility may provide a model for hostility such that aggressive children may develop SIP structures consistent with the use of aggressive strategies and have a well-developed repertoire of aggressive cognitions and behaviours (Dodge, 1991; Snyder & Patterson, 1995). However, being exposed to large amounts of negative social information may limit the potential exposure to positive social information and hence, development of positive information processing abilities. Research has described that parents of children with disruptive behaviours engage in less positive and more negative social interaction with their children (Johnston & Mash, 2001). Lack of exposure to positive social information might limit the development of the cognitive mechanisms to process prosocial information and limit prosocial behavioural skills.

Second, aggressive and disruptive children are rejected more often and more quickly by their peers compared to typical children (Coie et al., 1991; Milich & Landau, 1984; Ollendick, Weist, Borden, & Greene, 1992; Pelham & Bender, 1982). Research investigating the peer relationships of aggressive children has consistently shown that aggressive behaviour, especially retaliatory behaviour, is related to peer rejection, less positive social interaction, and more negative social interaction (Coie & Dodge, 1988; Dodge et al., 2003; Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997; Guevremont & Dumas, 1994). Children with aggressive hostile behaviour are likely

exposed to more frequent disruptive interactions and as such not exposed to many prosocial interactions. Because children likely learn and refine appropriate social behaviour through social interaction, lack of exposure to adaptive social situations likely limits children's exposure and practice with social skills, and hence knowledge of appropriate social behaviours.

Third, aggressive children may have positive information processing deficits because researchers have shown that children anticipate aggressive behaviour from children that are labelled aggressive (Dodge & Frame, 1982). Children observing video taped scenarios of unknown peers in social situations were more likely to misattribute negative intentions to an actor if they were labelled aggressive as compared to not being labelled. Even though the actor's behaviour did not change, the expectation of aggression contributed to a perception of aggression. Given that aggressive children demonstrate more aggressive behaviour the expectation likely contributes to a self-fulfilling prophecy for both the aggressive and non-aggressive child where expectation leads to negative behaviour (and hence, diminished positive interactions).

Finally, children with aggressive behaviour that demonstrate some adaptive behaviour appear less socially impaired than children without much prosocial behaviour (Coie et al., 1990; Criss et al., 2002; Mayeux & Cillessen, 2003; Parkhurst & Asher, 1992; Rodkin et al., 2000). Prosocial behaviour, and possibly prosocial information processing, may be protective for children. Reactive negative social behaviour contributes to elevated behavioural disturbances beyond that accounted for by rejected status alone (Dodge et al., 2003). In contrast assertive behaviour, when demonstrated in a behavioural repertoire that includes aggressive and disruptive behaviour, is associated

with less peer rejection, less unhappiness, and less loneliness (Day et al., 1991; Volling et al., 1993). Additionally, children that demonstrate adaptive social behaviours without aggression appear to be the best adjusted socially and behaviourally (Dodge & Price, 1994; Mayeux & Cillessen, 2003; Mize & Cox, 2001).

Similarly, research by Crick (1996) showed that prosocial behaviour uniquely contributed to the adjustment of aggressive children beyond that accounted for by antisocial behaviour. Using a longitudinal design, Crick (1996) showed that 9 – 12 year old children that demonstrated prosocial behaviour, in addition to antisocial behaviour, were more accepted by their peers at the end of the school year compared to aggressive children without prosocial behaviour. Lacking prosocial behaviours at the start of the school year predicted peer rejection at the end of the school year. This study further highlighted the distinction between prosocial behaviour and antisocial behaviour and their unique contribution to behavioural adjustment. Given these distinctions it appears likely that this behavioural differentiation may also be reflected in the cognitive correlates of these behaviours. For example, the degree of positive and negative information processed by groups of children might mirror their degree of prosocial and antisocial behaviour. As such, the relationship between positive information processing and prosocial behaviour would parallel the relationship between negative information processing and antisocial behaviour.

Some research has related specific aspects of information processing with prosocial behaviour. Nelson and Crick (1999) assessed cue interpretation, goal clarification, and the response decision processes of a large community sample of young adolescents. Using a hypothetical situation questionnaire, the investigators compared the

responses of prosocial adolescents to adolescents with neither prosocial nor antisocial attribution bias (i.e., average children). Prosocial adolescents generally perceived benign intent for provocation situations, were less distressed by provocation, and were more likely to use a prosocial strategy to solve provocation situations. Compared to average adolescents, prosocial adolescents were more positive and less reactive in provocation situations, likely contributing to their prosocial behaviour. The presence of both positive and negative social processing biases highlights the potential distinct mental representation of positive and negative behaviour and the possible unique contribution of processing differences to overt behaviour. Understanding negative information processing provides understanding of half of the relevant social information but misses the other half.

Mayeux and Cillessen (2003) showed that prosocial response generation (i.e., from Crick and Dodge's [1994] information processing model) was related to prosocial behaviour in kindergarten students. Boys classified by their peers as accepted were more likely to provide a prosocial solution to a social problem than boys with lower peer status. Prosocial information processing contributed to prosocial behaviour and likely to peer acceptance (Mayeux & Cillessen, 2003). Although these findings are consistent with those demonstrating that information processing mechanisms impact social behaviour, this and other studies were conducted with a typically developing group of children and as such the relationship between aggression, prosocial information processing, and prosocial behaviour was not clarified.

Study Overview

Given the potential link between social cognitive mechanisms and prosocial behaviour, a more thorough investigation of the impact of social information processing on prosocial behaviour seems warranted. The present investigation was designed with two purposes. First, differences in specific aspects of social behaviour were compared in children with and without aggression and disruptive behaviour disturbances. This investigation was done to highlight whether group differences in prosocial behaviour were present and if so, provide some categorization of differences. Second, specific aspects of social information processing were used to predict adult and peer preferred social behaviour. This investigation was done to highlight specific information processing deficits that might contribute to specific prosocial behavioural deficits.

Two sets of hypotheses were made. First, it was hypothesised that children with ADHD and aggression would have the lowest prosocial behaviour scores followed by the group with ADHD-only, with control children having the highest scores. Thus, children with ADHD and aggression would experience the most social, school, and family difficulties and have the most socially incompetent behaviour. Second, it was hypothesised that accurate processing of positive and negative social information in positive, negative and ambiguous situations would be related to greater degrees of adult and peer preferred social behaviour. Thus, children that process social information most accurately, regardless of clarity of social situation (i.e., ambiguous or clear), were expected to demonstrate the most competent behaviours towards adults and peers.

Methods

See general methods section for study 2.

Results

Analysis

Two sets of analyses were completed to investigate the relationship between SIP, prosocial behaviour, and disruptive behaviour. The first set of analyses examined whether general categories of prosocial behaviour differed as a function of children's level of disruptive and aggressive behaviour. This analysis was necessary to determine whether group differences in prosocial behaviour existed, in order to further investigate the contribution of SIP variables to specific subtypes of prosocial behaviour. The second set of analyses examined whether unique aspects of SIP (i.e., aspects of prosocial behaviour that are hypothesised to be deficient in children with disruptive behaviour) predicted specific subtypes of prosocial behaviour. This second analysis parallels that previously done relating SIP variables to specific subtypes of aggression.

Group differences in prosocial behaviour

A series of one-way ANOVAs was computed comparing groups on each type of prosocial behaviour. Group (ADHD-only, ADHD-aggression, control) was the independent variable and type of prosocial behaviour (adult preferred social behaviour, peer preferred social behaviour, school adjustment behaviour, total social competence from the Walker-McConnell) were the dependent variables. These analyses investigated differences in specific forms of prosocial behaviour between aggressive and non-aggressive children with and without ADHD. Main effects were followed up by Tukey's Honestly Significant Difference (Tukey's HSD) post hoc tests.

Significant main effects of Group were found for adult preferred social behaviour $F(2, 67) = 22.9, p < .01$, peer preferred social behaviour $F(2, 67) = 11.4, p < .01$, school

adjustment behaviour $F(2, 67) = 17.1, p < .01$, and total social competence $F(2, 67) = 22.1, p < .01$.

Tukey HSD Post Hoc tests and analysis of means (see Table 7) showed that the following: (1) ADHD-only and ADHD-aggression groups had significantly lower scores on all forms of prosocial behaviour and significantly lower total social competence scores compared to the control group, (2) Although not significant, the ADHD-aggression group had a lower peer preferred social behaviour score compared to the ADHD-only group. Therefore, children with ADHD-only and ADHD-aggression demonstrated less prosocial behaviour in all domains of social functioning compared to typically developing children and the ADHD-aggression group was the most impaired.

Table 7

Tukey HSD Post Hoc Analysis of Mean Differences in Prosocial Behaviour Between Groups of Children with and without ADHD and Aggression

	ADHD-aggressive		ADHD-only		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Adult preferred social behaviour	49.5 ^a	10.3	53.4 ^a	10.4	66.6 ^b	7.9
Peer preferred social behaviour	61.2 ^a	9.8	62.8 ^a	10.1	72.7 ^b	8.3
School adjustment behaviour	32.9 ^a	7.0	32.2 ^a	4.9	41.5 ^b	6.5
Total social competence	143.6 ^a	23.2	148.4 ^a	21.0	180.8 ^b	20.7

Note. Means within the same row that do not share a superscript differ ($p < .01$).

Prosocial behaviour scores on the Walker-McConnell Scale of Social Competence and School Adjustment (Walker & McConnell, 1995)

Social Information Processing Predicting Specific Subtypes of Social Behaviour

The second series of analyses investigated the association between SIP and specific forms of prosocial behaviour. Two types of analyses were used as recommended by Tabachnick and Fidell (2001). First, simple correlations were calculated to investigate the relationship between SIP variables and adult and peer preferred social behaviour, independent of other variables. Second, a series of linear regressions were used to investigate the unique contribution of SIP variables to adult and peer preferred social behaviour. Positive, negative, and neutral intent attributions, outcome attributions, responses generated, and cues detected, were used to predict adult and peer preferred social behaviour. Vignette type was held constant in each of these analyses to determine if information processing differentially predicted prosocial behaviour as a function of situation type. Because of multiple calculations, significance levels were set conservatively (i.e., $p < .01$). Effects significant at $p < .05$ were interpreted as marginal.

Simple Correlations

Simple correlations between SIP variables and adult and peer preferred social behaviour are reported in Table 8. As can be seen, SIP variables, and particularly positive responses generated, were related to both adult and peer preferred social behaviour. The overall magnitudes of correlations ranged between medium ($r = -.20$) and large ($r = -.41$) (Hemphill, 2003).

Table 8

Correlations between Social Information Processing Variables and Adult and Peer

Preferred Prosocial Behaviour in Vignettes

		Positive vignettes		Negative vignettes		Ambiguous vignettes		Ambiguous-pos		Ambiguous-neg	
Prosocial											
behaviour		Adult	Peer	Adult	Peer	Adult	Peer	Adult	Peer	Adult	Peer
Cues encoded	Positive	.17	.02	.37*	.17	-.07	-.15	.12	.03	.14	.11
	Negative	—	—	.09	.03	.10	-.06	.21 ⁺	.09	.09	.04
	Neutral	.29*	.12	.10	-.01	.27*	.16	.34*	.19	.29*	.13
Intent attribution	Positive	-.24*	-.23 ⁺	-.19	-.26*	.05	.06	-.03	-.02	-.02	.07
	Negative	-.14	-.18	-.37*	-.35*	-.11	-.20 ⁺	-.14	-.22 ⁺	.13	-.02
	Neutral	-.02	.01	.15	.13	-.04	-.03	-.07	-.09	.03	.10
Outcome attribution	Positive	.37*	.26*	—	—	.09	.07	.18	.13	—	—
	Negative	-.03	-.04	.36*	.33*	.01	.01	.18	.18	-.06	-.04
	Neutral	—	—	.09	.09	.03	.04	—	—	.23 ⁺	.19
Response generation	Positive	.24 ⁺	.18	.41*	.26*	.36*	.28*	.29*	.20 ⁺	.28*	.15
	Negative	-.06	-.07	-.29*	-.09	-.21 ⁺	-.18	-.01	.01	-.11	-.04
	Neutral	-.18	-.20 ⁺	-.15	-.15	-.30*	-.22 ⁺	-.13	-.24 ⁺	-.12	-.11

Note. ⁺ indicates ($p < .01$), * indicates ($p < .05$)

Regression Analysis

A series of linear regressions were computed to investigate the association between cues detected, intent attributions, outcome attributions, and responses generated by children with adult and peer preferred prosocial behaviour. Counts of positive, negative and neutral SIP variables were entered together on the first step of the analysis to investigate their combined association with each subtype of prosocial behaviour. Significant overall analyses were further examined by inspection of regression coefficients as presented in Table 9 and 10 and described in the following text.

Adult Preferred Social Behaviour

Positive vignettes. As shown in Table 9, outcome attributions for positive vignettes significantly predicted adult preferred social behaviour. Inspection of significant regression coefficients showed that positive outcome attribution was positively related to adult preferred social behaviour. Thus positive outcome judgments in hypothetical positive situations were uniquely related to a greater degree of adult preferred social behaviour.

Negative vignettes. As shown in Table 9, cues detected, intent attributions, outcome attributions, and responses generated from negative vignettes significantly predicted adult preferred social behaviour. Inspection of significant regression coefficients showed that positive cue detection was positively associated with adult preferred social behaviour. Thus, the detection of positive information in hypothetical negative situations was uniquely related to a greater degree of adult (teacher and parent combined) preferred social behaviour.

Negative intent attribution was negatively associated with adult preferred social behaviour (see Table 9). A marginally significant negative association was found between positive intent attribution and positive association between neutral intent attribution. Thus the inference of negative and positive intent in hypothetical negative situations was uniquely associated with less adult preferred social behaviour, and the inference of neutral intent was uniquely associated with more adult preferred social behaviour. However, outcome attribution was positively associated with adult preferred social behaviour (see Table 9). Thus negative outcome judgments in hypothetical negative social situations were uniquely related to greater degrees of adult preferred social behaviour.

Responses generated from negative vignettes also significantly predicted adult preferred social behaviour (see Table 9). Inspection of significant regression coefficients showed positive responses generated were positively related to adult preferred social behaviour. Negative responses generated were marginally negatively associated with adult preferred social behaviour. Thus the generation of positive responses in hypothetical negative situations were uniquely related to greater degrees of adult preferred social behaviour. The generation of negative responses tended to be uniquely related to less adult preferred social behaviour.

Ambiguous vignettes. As shown in Table 9, cues detected and responses generated from ambiguous vignettes marginally significantly predicted adult preferred social behaviour. Inspection of significant regression coefficients showed that positive cue detection was marginally negatively associated with adult preferred social behaviour. Neutral cue detection was positively associated with adult preferred social behaviour.

Thus the detection of positive information in hypothetical ambiguous situations was uniquely related to lower levels of adult preferred social behaviour. The detection of neutral cues was associated with a greater degree of adult preferred social behaviour.

However, positive response generation was positively associated with adult reported social behaviour (see Table 9). Neutral responses generated were marginally negatively associated with adult preferred social behaviour. Thus the generation of positive responses in ambiguous situations was uniquely related to a greater degree of adult preferred social behaviour. The generation of neutral responses tended to be related to less adult preferred social behaviour.

Ambiguous-positive vignettes. As shown in Table 9, cues detected from ambiguous-positive vignettes marginally significantly predicted adult preferred social behaviour. Inspection of significant regression coefficients showed that the detection of neutral cues was positively associated with adult preferred social behaviour.

Table 9: Summary of Linear Regression Analyses Predicting Adult Preferred Social Behaviour

<i>Predictor</i>	<i>Positive</i>		<i>Negative</i>		<i>Ambiguous</i>		<i>Ambiguous-Pos</i>		<i>Ambiguous-Neg</i>	
	B	SEB	B	SEB	B	SEB	B	SEB	B	SEB
<i>Cue</i>										
Positive	-.22	.98	7.31*	2.19	-2.01 ⁺	.94	-2.40	1.91	-.46	2.92
Negative			-.09	.74	1.92	1.87	.88	1.47	-.37	.67
Neutral	2.00	1.04	-2.43	1.82	2.06*	.70	2.35*	.90	2.47	1.12
<i>Equation</i>										
F-value	2.90		4.02*		3.41 ⁺		3.34 ⁺		2.09	
Rsquare	.08		.15		.13		.13		.09	
<i>Intent</i>										
Positive	-2.57	1.23	-14.02 ⁺	6.40	.29	1.69	-.45	1.33	-.08	2.79
Negative	-6.11	4.75	-4.05*	1.03	-1.32	1.67	-2.23	1.88	1.30	1.15
Neutral	.982	6.14	21.47 ⁺	10.99	-1.34	5.72	-7.77	12.32	1.37	2.43
<i>Equation</i>										
F-value	1.90		6.70*		.28		.58		.45	
Rsquare	.08		.23		.01		.02		.02	
<i>Outcome</i>										
Positive	3.44*	1.06	—	—	1.36	1.81	1.61	1.12		
Negative	3.83	6.05	3.35*	1.03	.31	1.61	6.77	4.73	-.56	1.13
Neutral	—	—	6.86	5.85	1.21	4.63	—	—	22.47	11.96
<i>Equation</i>										
F-value	5.29*		5.56*		.20		2.19		1.89	
Rsquare	.14		.14		.01		.06		.05	
<i>Response</i>										
Positive	.84	.41	1.01*	.32	1.16*	.43	1.16	.48	.77	.35
Negative	-.26	2.76	-1.28 ⁺	.65	-2.69	1.52	.23	2.35	-1.35	1.29
Neutral	-5.40	3.31	-2.84	3.18	-4.30 ⁺	2.20	-2.82	2.82	-1.01	1.70
<i>Equation</i>										
F-value	2.28		6.11*		5.94*		2.36		2.27	
Rsquare	.09		.22		.21		.10		.09	

Note: *denotes $p < .01$. +denotes $p < .05$

Peer Preferred Social Behaviour

Negative vignettes. As shown in Table 10, intent attributions and outcome attributions for negative vignettes significantly predicted peer preferred social behaviour. Inspection of significant regression coefficients showed that negative and positive intent attribution was negatively associated with peer preferred social behaviour. Thus the inference of negative or positive intent in hypothetical negative situations was uniquely related to lower levels of prosocial behaviour. However, negative outcome attributions were positively associated with peer preferred social behaviour (see Table 10). Thus negative outcome judgments in hypothetical negative situations were uniquely associated with greater degrees of peer preferred social behaviour.

Ambiguous vignettes. As shown in Table 10, responses generated from ambiguous vignettes marginally significantly predicted peer preferred social behaviour. Inspection of significant regression coefficients showed that positive response generation was marginally positively related to peer preferred social behaviour. Thus generation of positive responses in ambiguous social situations was uniquely associated with a greater degree of peer preferred social behaviour.

Table 10: Summary of Linear Regression Analyses Predicting Peer Preferred Social Behaviour

<i>Predictor</i>	<i>Positive</i>		<i>Negative</i>		<i>Ambiguous</i>		<i>Ambiguous-Pos</i>		<i>Ambiguous-Neg</i>	
	B	SEB	B	SEB	B	SEB	B	SEB	B	SEB
<i>Cue</i>										
Positive	-.64	.89	3.78	2.04	-1.66	.85	-1.78	1.76	.95	2.67
Negative			-.04	.69	-.26	1.69	.30	1.36	-.17	.61
Neutral	1.12	.95	-2.00	1.70	1.38	.64	1.39	.83	.77	1.02
<i>Equation</i>										
F-value	.70		1.16		2.07		1.15		.44	
Rsquare	.02		.05		.09		.05		.02	
<i>Intent</i>										
Positive	-2.18	1.08	-16.10*	5.55	.24	1.46	-.42	1.15	1.2	2.4
Negative	-6.97	4.15	-3.48*	.89	-2.27	1.45	-3.14	1.63	.17	1.0
Neutral	2.34	5.37	17.53	9.53	-.42	4.96	-9.05	10.64	1.6	2.1
<i>Equation</i>										
F-value	2.17		7.52*		.92		1.41		.31	
Rsquare	.09		.26		.04		.06		.01	
<i>Outcome</i>										
Positive	2.12	.97	—	—	.98	1.59	.93	1.00	—	—
Negative	1.32	5.54	2.71*	.92	.31	1.42	6.00	4.20	-.28	1.00
Neutral	—	—	5.95	5.21	1.59	4.07	—	—	16.69	10.62
<i>Equation</i>										
F-value	2.45		4.66*		1.59		1.55		1.27	
Rsquare	.07		.12		1.42		.04		.03	
<i>Response</i>										
Positive	.54	.36	.59	.31	.80 ⁺	.40	.68	.42	.33	.32
Negative	-.79	2.45	-.20	.62	-2.06	1.41	.61	2.08	-.57	1.17
Neutral	-5.18	2.94	-3.07	3.04	-2.70	2.04	-4.74	2.49	-1.02	1.55
<i>Equation</i>										
F-value	1.82		1.92		3.25 ⁺		2.18		.67	
Rsquare	.07		.08		.13		.09		.03	

Note: *denotes $p < .01$, +denotes $p < .05$

Discussion

The purpose of this study was twofold. First, prosocial behaviour was compared between groups of children with ADHD-only, ADHD with aggression, and control. Second, SIP abilities were related to specific subtypes of prosocial behaviour, namely adult and peer preferred social behaviour. Three hypotheses were made. First, it was hypothesised that groups of children would differ on all forms of prosocial behaviour with the ADHD-aggressive group showing the lowest scores (i.e., most impaired), followed by the ADHD-only group, and the control group respectively. Second, it was hypothesised the efficient SIP would predict prosocial behaviour. More precisely, the ability to accurately process positive and negative social information would be positively related to adult and peer preferred prosocial behaviour. Third, biased SIP, specifically negative intent attribution biases, would be negatively related to prosocial behaviour. As described next, the results of the study generally supported these hypotheses.

Group Differences in Prosocial Behaviour

As hypothesised, groups differed on all subtypes of prosocial behaviour. Two notable findings emerged: First, as expected the ADHD-only and ADHD-aggressive groups demonstrated lower scores on peer preferred social behaviour and adult preferred social behaviour compared to the control group. Second, as expected the ADHD-aggressive group had lower peer preferred social behaviour scores compared to the ADHD-only group (although this finding was a non-significant trend). Taken together, children with ADHD demonstrated the most impoverished prosocial functioning with the combination of ADHD and aggression the most impairing.

Results support much previous research that has demonstrated poor peer functioning and diminished social behavioural skills in children with ADHD (Bagwell, Molina, Pelham, & Hoza, 2001; Farmer Jr et al., 2002; Guevremont & Dumas, 1994; Milich & Landau, 1982; Pelham & Bender, 1982). However the present study further delineated the specific types of social behavioural deficits. Children with ADHD had deficits in prosocial behaviour in multiple domains that included adult, peer, and classroom directed behaviours. As such, the pervasive negative impact of ADHD was highlighted.

The pervasiveness of impairment in prosocial ability in children with ADHD is not surprising for a number of reasons. First, past research has shown that children with ADHD, especially those with comorbid conduct problems such as aggression, are exposed to a larger proportion of negative social interactions compared to peers with typical behaviour (Johnston & Mash, 2001; Landau et al., 1998; Whalen & Henker, 1999). As such, children with ADHD may not be exposed to as many positive peer interactions as other children and may not benefit from social learning of prosocial skills that may accompany these interactions. Second, children with ADHD may not value prosocial strategies to the same degree as peers with typical behaviour. Children with ADHD may not be aware of, or have experienced, the benefits that may result from prosocial behaviour. As such, a child with ADHD may be less likely to enact a prosocial strategy because they do not think it is beneficial. Third, children with ADHD may value aggressive strategies to a greater degree than non-aggressive strategies. Regardless of prosocial behaviour, children with ADHD may emphasise aggressive and inappropriate behaviour to achieve an end. Finally, friendships and positive peer relationships have

been reported in past research to be “protective” for children (Bagwell, Schmidt et al., 2001; Bukowski & Hoza, 1989; Criss et al., 2002). Children that have friends may be less likely to experience bullying and victimization on the playground, and friendships may buffer some of the negative impact of harsh home environments. Because children with ADHD (and conduct problems) may experience both negative home environments and negative school interactions, their social and behavioural deficits may be amplified.

Given the prosocial deficits found in the present study, it is not surprising that previous research has shown that children with ADHD are typically rejected or ignored by peers (Landau et al., 1998; Milich & Landau, , 1982; Milich et al., 1982). In addition to aggressive and socially incompetent behaviour, not enacting prosocial behaviour may be related to diminished peer relationships. Children with ADHD may be rejected not only because they *are* disruptive but also because they *are not* prosocial. For example, not kicking a child might be necessary but not sufficient for forming a friendship, whereas not kicking a child and acting in a pleasant manner towards them may be both necessary and sufficient. However, this assertion is in need of empirical evaluation.

In support of the hypotheses, children with ADHD and aggression showed the least prosocial behaviour (although this finding was not significant). This result suggests the possibility that the combination of ADHD and aggression may place children at additional risk for peer difficulties. Much previous research has documented the negative impact of aggression or the negative impact of ADHD (Bagwell, Molina et al., 2001; Coie & Dodge, 1998; Coie et al., 1991; Molina & Pelham, 2003; Pelham & Bender, 1982). Few studies have described the combined impact of ADHD and aggression on social behaviour, and especially lacking is information on prosocial behaviour. The

present study showed that children with ADHD and aggression are an exceptionally challenged group. These findings are consistent with other research showing differences in many areas of functioning of children with ADHD and aggression compared to children with ADHD-only (Waschbusch, 2002).

Social Information Processing and Prosocial Behaviour

Cue Detection. The ability to detect positive cues in situations that contained very little positive information (i.e., negative and ambiguous situations) was differentially associated with prosocial behaviour. Positive cue detection was positively related to adult preferred social behaviour in negative situations (see Table 9). This finding is interesting and not surprising given that cue detection is the first step of Crick and Dodge's (1994) SIP cycle. According to the model, children that are able to detect positive social cues will have a larger proportion of positive social information entering their processing system compared to children that do not. This, in turn, contributes to a larger repertoire of positive social knowledge, positive response generation, and ultimately positive behaviour.

However, positive cues detected in ambiguous situations were marginally associated with lower levels of adult preferred social behaviour (see Table 9). This finding is surprising and suggests that cue detection in situations with ambiguous intent and outcome is not as closely related to prosocial behaviour compared to cues detected in unambiguous social situations.

Intent attributions. Results consistently showed that intent attributions (both positive and negative) were associated with lower levels of prosocial behaviour (see

Tables 9 and 10). This finding argues that regardless of positive or negative attribution, the tendency to focus on the intention of peers is related to impoverished prosocial behavioural skills. This finding adds to existing knowledge in a number of ways. First, much research has described biased hostile information processing in aggressive children. Attribution errors that lead to misinterpretation of peers' intentions relate to reactive aggressive behaviour. The present results show that biased processing of peers' intentions is also associated with lower levels of prosocial behaviour. Therefore, children with attribution biases have elevated aggressive behaviour and decrements in prosocial behaviour. The combination of these deficits may be additive such that the presence of both may contribute to the most extreme social difficulties. However this final assertion is in need of further investigation. Second, some researchers have speculated that children with socially incompetent behaviour, and (presumably) associated SIP deficits, are not exposed to opportunities to learn appropriate social skills (Crick, 1996; Jenson et al., 2004). Results from the present study support this idea. Children with the most social behavioural deficits also had attribution deficits. These children may not be exposed to opportunities to develop appropriate understanding of peer intentions and the relationship between peer intention and social behaviour (both positive and negative). Third, attribution biases were associated with social behavioural deficits that impact interactions with children but also adults. Children that focused on intent experienced deficits that impacted adult and peer relationships. As such home, school, and leisure environments are likely affected.

Of particular importance is the finding that in ambiguous situations (i.e., ambiguous and ambiguous-positive), negative intent attribution was associated with

social behavioural deficits (see Tables 9 and 10). Dodge and colleagues have highlighted a broad spectrum of antisocial behaviour that is associated with hostile attribution in ambiguous situations (Dodge, 1980; Dodge et al., 1997; Lochman & Dodge, 1994). The present results argue that in addition to predicting aggressive behaviour, biased intent attribution in ambiguous situations is associated with impoverished prosocial behaviour. The same information processing cycle (see Figure 1) that results in biased hostile processing and contributes to aggressive behaviour may also limit prosocial information processing and adaptive behaviour. However, because this study was correlational, causal relationships between intent attribution and prosocial behaviour cannot be evaluated.

Outcome Attribution. Examination of children's attributions for outcomes showed that these were significantly related to adaptive social behaviour (see Tables 9 and 10). This finding adds to existing research in a number of ways. First, some previous research has related outcome focus to antisocial behaviour (Coie et al., 1991; Milich & Dodge, 1984). The present research considered numerous varied social situations and found that a focus on outcome, whether positive or negative, was associated with appropriate adult and peer directed behaviours. Second, the present study showed that using the facts of a situation (i.e., whether the situation contains negative or positive information) when making an outcome attribution was related to more prosocial behaviour (see Table 10). This finding supports the idea that children who are able to process relevant information from a social situation, and to filter out irrelevant information, will likely express the least negative and most positive behaviours. Additionally, social cognitive programs that focus on developing children's ability to

efficiently detect and interpret social information (McFadyen-Ketchum & Dodge, 1998) may help to develop prosocial skills and facilitate adaptive behaviour.

Response Generation. Responses generated were used to predict adult and peer preferred social behaviour. Three consistent themes emerged. First, positive response generation in most social situations was related to a greater amount of prosocial behaviour. Second, negative response generation was associated with lower levels of prosocial behaviour. Third, neutral response generation was associated with less adult preferred social behaviour.

These results (see Tables 9 and 10) suggest that children that are able to generate positive solutions to social situations are also those who enact prosocial behaviour. Thus, at least for prosocial behaviour, positive social knowledge is related to adaptive behaviour. Some research has described the relationship between response generation and social behaviour (Crick & Ladd, 1990; Mize & Cox, 2001; Rubin & Krasnor, 1983; Schwartz et al., 1998). Many of these studies have shown that an inability to generate appropriate social responses is related to dysfunctional and aggressive social behaviour. Apart from the present study, few studies have related response generation and prosocial behaviour (Mayeux & Cillessen, 2003). From an intervention perspective fostering development of children's adaptive social strategies may contribute to a larger repertoire of skills and more prosocial behaviour. However, the causal link between response generation and social behaviour was not investigated and as such this assertion is in need of further investigation.

Negative response generation in the present study was associated with lower levels of prosocial behaviour (see Tables 9 and 10), further linking SIP and behaviour.

One explanation for this finding may be that children that generated more negative responses may have social knowledge that was saturated with negative information and thus enacting prosocial behaviours was less likely. In addition, children that generated negative responses may value these forms of responses. Previous research has described that proactively aggressive children value aggressive responses for achieving social goals (Crick & Ladd, 1990).

Results also showed that response generation predicted both adult and peer preferred social behaviour. The tendency to generate positive responses or negative responses (because it is the last step in the SIP cycle) may be the most direct link between SIP and social behaviour. As such, positive response generation is likely closely linked to behaviour valued by adults and children. Of particular note is response generation in ambiguous situations. Positive response generation in ambiguous situations was positively related to both adult and peer preferred social behaviour. These findings are especially important because in ambiguous situations no clear response is warranted or expected. It is possible that the generation of positive responses in these situations underscored the children's previous social knowledge and as such more closely resembled their social experiences. For example, a child that had experienced more positive social encounters may have a wealth of prosocial knowledge that could be implemented in situations that lacked clear social information (i.e., ambiguous situations). However, the relationship between previous social knowledge and prosocial behaviour is in need of further investigation.

One interesting finding was that neutral response generation was negatively associated with adult preferred social behaviour. Neutral responses were those that were

“inactive” or did not utilize a specific social skill (e.g., staring, standing, doing something unrelated). Because adults may prefer behaviour that demonstrates social knowledge, the lack of implementation of a socially skilled behaviour may signify defiance or diminished ability. Similarly, adults may be very aware of inappropriate social responses, and may be quicker to react to these negative behaviours than peers (Jenson et al., 2004). However, both of these assertions are in need of further investigation.

Study 3 - Summary

The present study demonstrated a number of interesting findings. First, children with ADHD and aggression demonstrated the least well developed adult and peer preferred social behaviour, although children with ADHD-aggression were the most impaired. Second, positive cue detection and positive (or negative) outcome attribution was generally associated with prosocial behaviour; while intent attributions were associated with less prosocial behaviour. Finally, positive responses were significantly related to higher levels of prosocial behaviour; while negative or neutral responses were associated with lower levels of prosocial behaviour. Theoretical and practical implications of these findings are elaborated upon in the general discussion to follow.

CHAPTER 5

GENERAL DISCUSSION

This dissertation examined the relationship between SIP, aggressive behaviour, prosocial behaviour, and ADHD. The research compared the SIP abilities of groups of children with ADHD-only, ADHD with aggression (ADHD-aggression) and control children, and related these abilities to specific aggressive and prosocial behaviours. The results showed that general SIP abilities differed between the groups of children and were associated with both antisocial and prosocial behaviour.

Results of this series of studies support literature delineating the relationship between SIP mechanisms and social behaviour. However, these studies are unique in that prosocial and antisocial information processing were evaluated together to assess the role of both aspects of information processing on social behaviour. Additionally, examination of information processing in scenarios that systematically varied in intent and outcome, and the role of ADHD and aggression on information processing were considered.

Because this dissertation was designed to further investigate Crick and Dodge's (1994) SIP model and apply it to the processing of positive and negative social information results can be directly translated into the framework of SIP model. Figures 8 and 9 provide a summary of each step of the SIP cycle investigated for positive, negative and ambiguous social situations. As theorised by Crick and Dodge, each figure begins with a type of peer behaviour and ends in a social behaviour. Figures are broken down according to type of peer situation (i.e., positive, negative, and ambiguous). Each is described below.

Positive and Negative Social Situations

A consistent pattern of results emerged for SIP in situations where peer actions were either clearly positive or clearly negative. In these situations the ability to encode positive cues, focus on the outcome of the social situation, and generate positive responses, were each associated with decreased levels of reactive and proactive aggression and elevated levels of adult and peer preferred social behaviour (see Figure 8). Regardless of the social situation, children that abstracted this pattern of social information from a situation were less likely to be aggressive and more likely to be prosocial.

Dodge has described a cycle that begins with cue encoding and leads to reactive aggressive behaviour, peer rejection, peer hostility, and ultimately fulfilment of the distorted hostile belief (Dodge & Pettit, 2003). Results from the present set of studies suggest a similar cycle for positive social information. Children that encoded positive social information, focused on outcome of situations, and generated positive responses to positive and negative situations, were reported to act in a less aggressive and more prosocial manner (see Figure 8). Fewer aggressive behaviours and more prosocial behaviours may contribute to more positive peer interactions, more positive peer behaviours, and a positive relationship cycle. Much research has supported the positive benefits of appropriate friendships and the protective aspects of peer relationships (Hodges et al., 1999; Schwartz et al., 2000). Thus the findings contribute to a growing body of research emphasising the importance of positive social cognitive abilities and behaviour for appropriate social functioning (Bowers, Woods, Carlyon, & Friman, 2000;

Denham, 1986; Jenson et al., 2004). However, results from the present study were correlational and therefore causal links were not established. Future longitudinal research investigating these hypothesized causal links would be informative.

In contrast, children that detected fewer social cues, focused on the intention of peers, and generated less socially skilled responses, demonstrated elevated levels of reactive and proactive aggressive behaviour and less adult and peer preferred social behaviour (see Figure 9). As described above, this pattern of information processing is consistent with much previous research, but novel in that intention focus (i.e., either positive or negative) is associated with both aggressive behaviour and less prosocial behaviour.

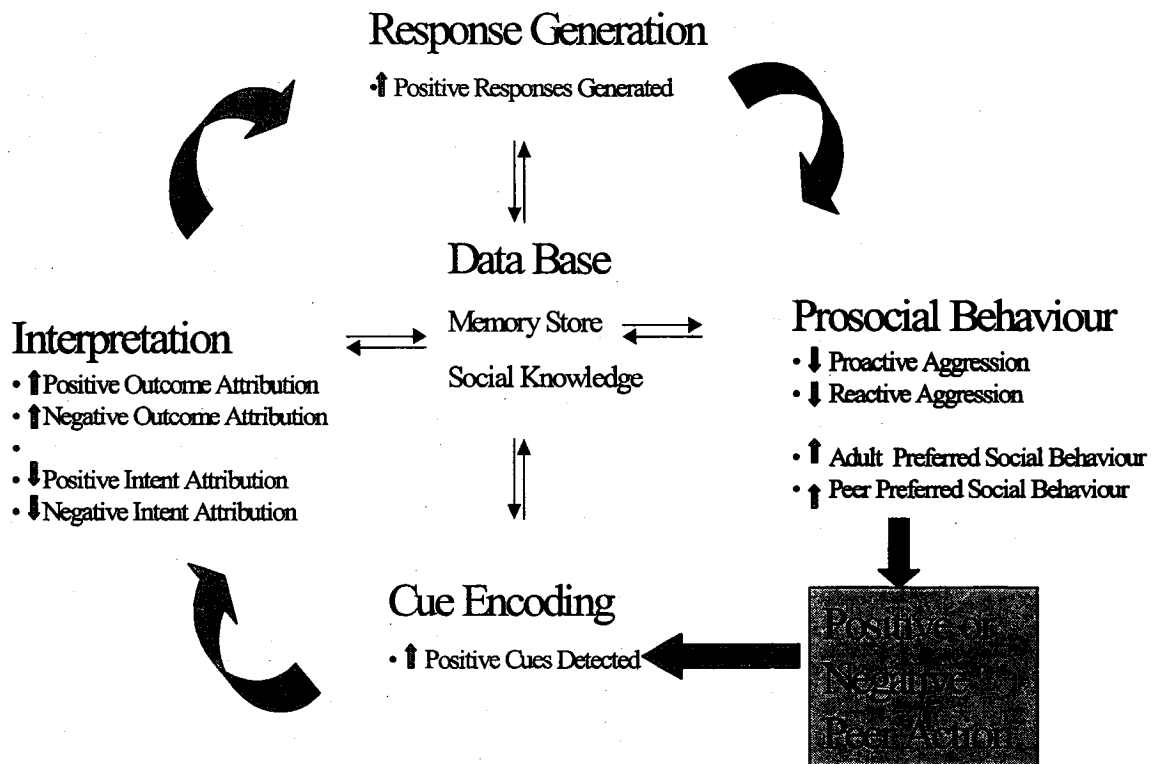


Figure 8. Social information processing cycle adapted from Crick and Dodge, 1994 with results of present investigation included.

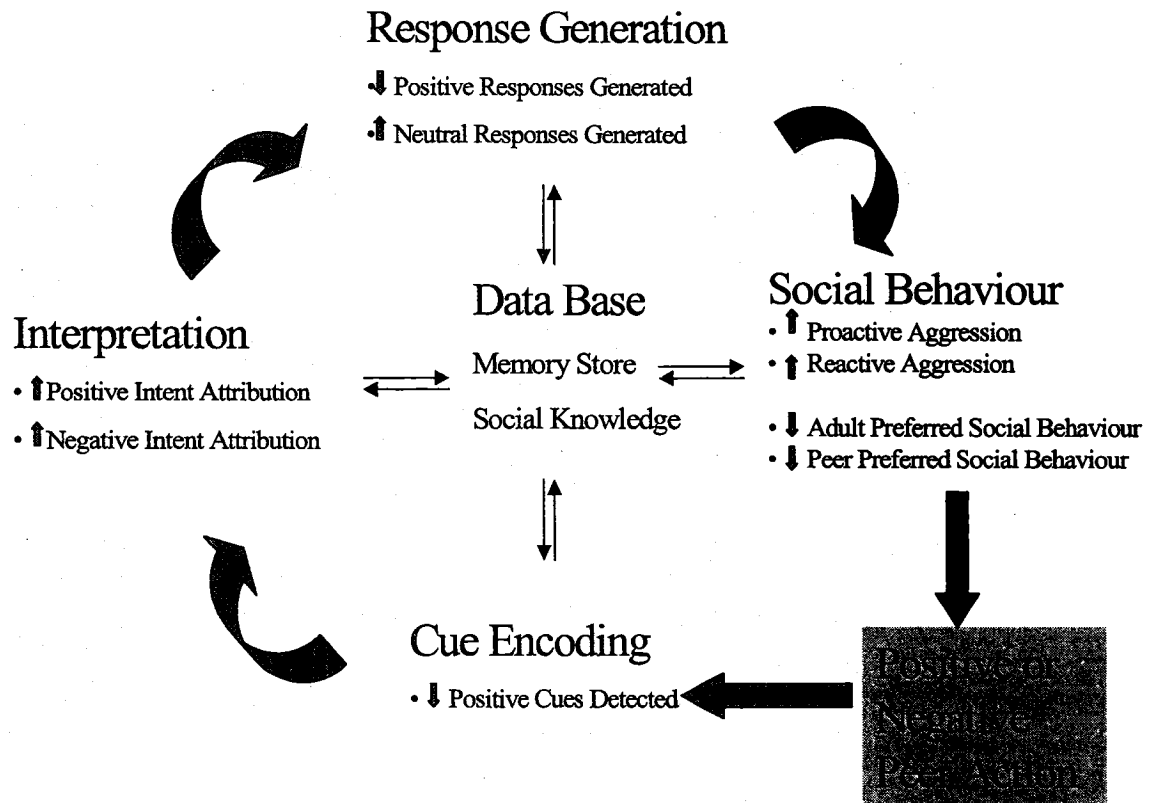


Figure 9. Social information processing cycle adapted from Crick and Dodge, 1994 with inclusion of results from the present study

Ambiguous Social Situations

Child behaviours resulting from situations that are ambiguous have received considerable attention (Dodge, 1980; Dodge & Frame, 1982; Dodge et al., 1986). Behavioural responses in these situations are considered especially important because it is believed that a clear response is not warranted and as such the child must utilize stored knowledge and cognitive processes to abstract information and react. The present series of studies investigated SIP in three types of situations with ambiguous peer intent: (1) Ambiguous situations with a clear positive outcome, (2) Ambiguous situations with a clear negative outcome, and (3) Ambiguous situations with an ambiguous outcome. Child responses to each of these situations had a similar pattern and as such were combined into an overall framework displayed in figures 10 and 11.

Children that detected a larger proportion of neutral and negative cues, focussed on outcome (and not intent) and generated a larger proportion of positive responses, demonstrated less reactive and proactive aggressive behaviour, and more adult and peer preferred prosocial behaviour (see Figure 10). Conversely children that detected fewer neutral cues, focussed on peer's intent, and generated fewer positive responses (and more neutral responses), demonstrated more proactive and reactive aggressive behaviour and less adult and peer preferred prosocial behaviour (see Figures 11).

Aspects of these patterns of information processing are similar to those found in some previous research. Specifically, the relationship between deficient cue encoding and elevated aggressive behaviour has been shown in previous research (Dodge, 1980; Dodge et al., 1984; Gouze, 1987; Matthys et al., 1999). The present results showed that specific biases in cue encoding are associated with specific behaviours. For example,

increased processing of neutral cues was significantly associated with decreased aggression and increased prosocial behaviour. In addition, processing of negative and not positive cues, in ambiguous situations, was associated with decreased aggressive behaviour. This finding is important because it differs from that predicted by the Crick and Dodge (1994) model that hypothesizes that increased processing of negative social information should contribute to negative social knowledge and elevated aggressive behaviour. It is possible that children in the present study that detected negative cues in ambiguous situations were also children who equally considered negative and positive information when making judgements. This balanced approach to information processing may have contributed to less aggressive behaviour; however this assertion is in need of further investigation.

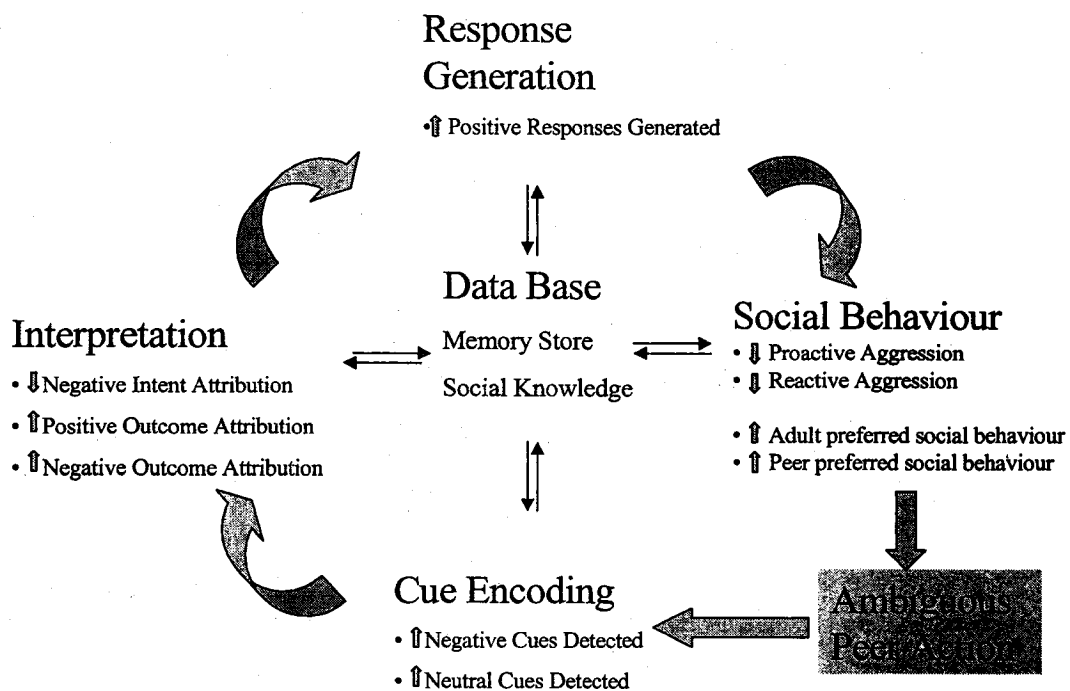


Figure 10. Social information processing cycle adapted from Crick and Dodge, 1994 with inclusion of results from the present investigation

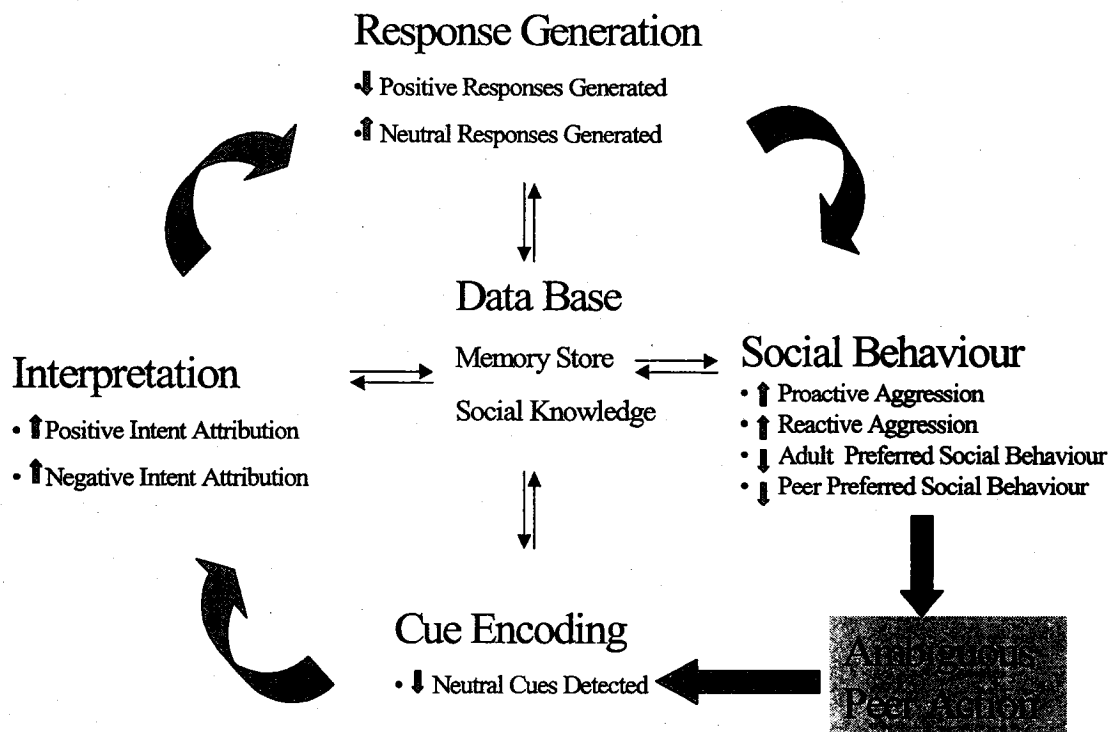


Figure 11. Social information processing cycle adapted from Crick and Dodge, 1994 with inclusion of results from the present investigation

General Summary and Implications

Ambiguous, Positive and Negative Social Situations

The present set of studies was designed to investigate SIP in multiple social situations and as such form a more thorough understanding of a diverse set of cognitive-behaviour relationships. Results from the present investigations showed that information processing deficits/biases were present in all types of social situations for children with ADHD and ADHD and aggression. Additionally, deficits/biases were related to aggressive and prosocial behaviour in situations that contained not only ambiguous peer actions but also clearly positive and clearly negative peer actions. However, some group differences in information processing were found in specific social situations. For example, children with ADHD-only, and *not* children with ADHD-aggression, attributed significantly more negative intent in ambiguous situations compared to the control group. However, in clearly negative situations, children with ADHD-only and children with ADHD-aggression made similar intent attributions. These findings are important given the prevailing focus in the SIP literature on ambiguous social situations. Children's social interactions are comprised of multiple types of social situations and as such each should be considered when evaluating the aspects of a child's information processing. Future studies would benefit from investigation of SIP in these varied social situations.

Intention and Outcome Differentiation

The present set of studies demonstrated that differences in attribution for intention and outcome exist between ADHD-only, ADHD-aggression, and control children, and that these differences are differentially related to subtypes of aggression and prosocial behaviour. These findings are extremely important both theoretically and practically.

Theoretically it is important to understand that social situations can be broken down into component parts, and that emphasis on processing of a specific part might influence behaviour differently. Practically, it is important for clinicians and educators to know that these differences in perception exist and that targeting these during intervention may be of benefit for disruptive children.

ADHD and Developmental Psychopathology

The present investigation showed the contribution of ADHD to a number of SIP deficits and negative social behaviours. Children with ADHD (with or without aggression) generally encoded less positive cues, made more negative intent attributions, focussed less on the outcome of situations, generated less positive and more neutral responses, and showed less prosocial behaviour compared to the control group. Given the prevalence of ADHD and its association with aggressive and antisocial behaviour, these results and those of other studies argue that ADHD should be considered in future SIP studies. Longitudinal studies that investigate SIP and prosocial behaviour in children with ADHD (with and without aggression) are lacking and necessary.

Prosocial vs. Aggressive Behaviour

An important aspect of the present series of studies was the investigation of the association between aspects of SIP and aggressive and prosocial behaviour. This connection has been shown here for aggressive children, and previously for depressed persons, and other mental health concerns. For example, children with ADHD and aggression demonstrated less prosocial behaviour than children with ADHD-only. This is important because aggression appears to add an additional social risk beyond that of ADHD alone. Additionally, specific SIP variables such as outcome attributions, and

positive response generation were closely related to higher levels of prosocial behaviour. Unfortunately, much previous research has neglected the association between SIP and prosocial behaviour. This neglect may in part be due to the salience of aggressive behaviour and its rational and theoretical connection with thought processes. For example, it makes sense that a child acting aggressively might be “thinking aggressive thoughts”. Additionally it makes sense that aggressive behaviour contributes to peer rejection and difficult social encounters (i.e., nobody likes someone that is beating them up). However, what is not as intuitive is the contribution of prosocial behaviour to social functioning and adaptive social encounters. For example, it may be clear to most people that acting aggressively leads almost directly to a hostile encounter, but it may be less clear as to the result of a prosocial action such as giving a complement. Negative behaviours are salient and positive may be less so. Given the finding from the present series of studies showing differences in prosocial behaviour between groups of children and the relationship between SIP abilities and prosocial behaviour, more thorough investigation seems warranted. Further, investigation of the direct impact of prosocial and antisocial behaviour on peer relationships (in the same study) with an emphasis on the specific forms of prosocial behaviour that contribute most to positive peer relationships would be informative.

Intervention Studies

A primary benefit of applying SIP theory to the study of social behaviour is the applicability of the models to interventions. Deficits at specific stages in the information processing cycle can be targeted by cognitive interventions. For example, deficits in the ability to detect information cues or generate appropriate responses have been targeted by

cognitive interventions. The present set of studies showed that children with ADHD (both with and without aggression) detect fewer positive cues, focus on the intention of peers, and generate fewer positive and more neutral responses to social problems. Additionally, each of these abilities (or deficits) is associated with more aggressive behaviour and less prosocial behaviour. Conversely, the ability to detect appropriate social cues, focus on realistic aspects of the social situations (e.g., outcome information), and generate adaptive responses are each related to less aggression and more adaptive social behaviours. Future longitudinal investigations and controlled studies investigating the precise SIP deficits that contribute to specific aggressive and prosocial behavioural deficits would greatly inform intervention. For example, specifically targeting development of an outcome focus (i.e., focus on the facts of the situation rather than peer intent) may provide a more concrete behavioural strategy for children with ADHD with or without aggression. Additionally, intervention studies also serve as a test of the causal role of SIP deficits in behavioural problems. Changes in SIP accompanied by changes in behaviour would clearly demonstrate SIP causality.

However, in order to implement effective interventions the following considerations are important. First, interventions should focus on limiting aggressive cognition and behaviour but also facilitation of adaptive cognition and behaviour. Decreasing aggressive behaviour may be a necessary but not sufficient aspect for peer acceptance. The combination of aggressive behaviour remediation and prosocial behaviour facilitation may be both necessary and sufficient. The most successful interventions appear to be those that target multiple domains of functioning including social behaviour, parent management and school consultation (Jenson et al., 2004; Mrug

et al., 2001). Remediation of social behavioural deficits requires understanding of peer status but especially, understanding of the deficits that contribute to peer rejection and/or neglect (i.e., prosocial and antisocial information processing and behavioural deficits). Research that delineates the specific prosocial behavioural deficits of children with ADHD with and without aggressive behaviour will contribute to more targeted programs to help mental health clinicians, parents, and schools deliver more effective interventions.

Second, interventions should consider differences between aggressive and socially incompetent children that may or may not have ADHD. Interventions for children with ADHD may need to focus on different aspects of information processing than intervention with children not challenged by ADHD.

Third, interventions should consider the actual behavioural deficits. For example targeting aggressive behaviour may not be specific enough. However, targeting specific subtypes of aggressive behaviour and tracking progress with each subtype would likely be more effective. In addition, targeting specific prosocial behaviour and developing aspects of prosocial behaviour that relate most closely to peer acceptance may be most beneficial for the child's social functioning.

Fourth, consideration of peer relationship factors that may be influencing deficient cognitions is important. For example, certain biased cognitions on the part of peers may contribute equally to negative social interactions. Finally, consideration of the social environment of children is important. Combining cognitive and behavioural interventions with environmental intervention to adjust the culture of families, schools and communities is likely critical. An important part of the SIP mechanism is its interface with real world functioning. Helping children, without adjusting prevailing

approaches to parenting, education practices, and other environmental variables, may be a futile endeavour.

Study Limitations

Although the present study demonstrated many interesting findings, some limitations should be considered. First, many of the analyses conducted were correlations and as such causal links could not be established. For example, even though a focus on outcome predicted higher levels of prosocial behaviour, it cannot be inferred that this relationship is unidirectional and as such the presence of prosocial behaviour may contribute to a focus on outcome.

Second, the present set of studies used data from 68 participants. A larger number of participants would have allowed for increased power to detect significant effects.

Third, a limited set of aggressive and prosocial behaviours were chosen for analysis. Additionally all behaviours were reported by parents and teachers. Investigation of a broader spectrum of social behaviours, with multiple data collection strategies (e.g., adult report, experimenter observation, sociometrics), and multiple measures, although beyond the scope of the present study, may provide additional information.

Fourth, a SIP questionnaire was developed and validated in the first study. Although differentiation of social situations that included positive and negative social information is important, these are hypothetical written vignettes. Development of videotaped vignettes and potentially conducting playgroups may supplement information obtained in the present study.

Finally, many of the children with aggressive behaviour, although demonstrating clear symptoms of aggression, tended not to be “extremely aggressive”. Additionally, the average child in the study had a lower middle class socioeconomic status. Although this is a representative sample of children in this small urban centre in Canada, it may not be representative of children in larger urban centres.

Final Comment

An old and familiar proverb states “do onto others as you would wish them do onto you”. Given this well-known belief it is easy for us to think that the actions of children that are aggressive are absolutely intentional and are “unchangeable” because their actions mirror their ‘attitude’ towards the world. However, research that examines the social cognitive abilities, social histories, social environments, mental health, and contributing factors to aggressive and disruptive behaviour may moderate this belief. Aggressive children may expect more negative and less prosocial behaviour directed towards them, and be less aware of positive social information. As a result aggressive children may act congruently with their impression of *their social world*. Research that equally focuses on positive and negative aspects of SIP and behaviour may elucidate alternate factors contributing to antisocial and prosocial behaviour. Investigation of factors such as inattention, impulsivity, impoverished social interactions, and other cognitive and social factors may help form a clearer conceptualisation of aggression and contribute to the development of strategies to reduce aggression and facilitate prosocial behaviour.

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Appendix A

Social Information Processing Vignettes

The following are vignettes of children in different social situations. After each vignette you will be asked to rate (1) the *intention* of the child committing an action and (2) the *outcome* of the situation from the perspective of the child receiving an action. Please use the following definitions as guidelines for making ratings.

Possible valence of intention and outcome:

Positive – Intention and/or outcome that is good or generally perceived as prosocial.

Negative – Intention and/or outcome that is not good or generally perceived as harmful.

Ambiguous – Intention and/or outcome that is unclear, lacks information for which a positive or negative valence is not clear.

Mixed – Intention and/or outcome that has aspects of both positive and negative

Please note that situations can be rated as having different intentions and outcomes (e.g., a situation with an ambiguous intent may have a positive outcome). Therefore please consider the intention and outcome as separate entities and try to not let your perspective of intention influence your perspective of outcome

Try to answer the following questions when making your decisions about intention and outcome:

Ask yourself

- 1) Without considering outcome at all what would the valence of the intention be?)**
- 2) Without considering intention at all what would the valence of the outcome be?)**

Please also provide any comments with regards to wording of questions, difficulties etc. in the comment section at the end of each question. However, when answering intent and outcome of scenerios please do not spend much time or "over think" this process.

Scenerios have been randomly ordered (please ignore numbering)

Story #1

What would be the one present you want if your birthday was coming up? Pretend that your birthday is coming up and you have been asking your friend Wayne/Wendy for (Insert present name) for the past two months. Your birthday finally arrives and you get your present and open it. The present is not the one you wanted. Can you pretend that?

Please rate the Wayne/Wendy's *intention*:

- 1) Positive
- 2) Negative
- 3) Ambiguous
- 4) Mixed

Please rate the *outcome* of the situation from the child receiving the present's perspective:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #21

Pretend that you lost your favorite pencil. Later that day you see your classmate John/Fran holding the pencil in their hand. Can you pretend that?

Please rate the *intention* of the child holding the pencil:

- 5) Positive
- 6) Negative
- 7) Ambiguous
- 8) Mixed

Please rate the *outcome* of the situation from the child who lost their pencils perspective:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #11

Pretend that you are walking to school and you're wearing brand new sneakers. You really like your new sneakers and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named John/Lisa. You stumble into a mud puddle and your new sneakers get muddy. Can you pretend that?

Please rate the *intention* of John/Lisa:

- 9) Positive
- 10) Negative
- 11) Ambiguous
- 12) Mixed

Please rate the *outcome* of the situation from "the child being bumped" perspective:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #3

Pretend that you are doing an art project with a friend and you're about half way through. You see another boy/girl in your class named John/Sara giggling with their friend. John/Sara then comes over to the table you are working at and asks to join. Can you pretend that?

Please rate John's/Sara's *intention*:

- 13) Positive
- 14) Negative
- 15) Ambiguous
- 16) Mixed

Please rate the *outcome* of the situation from the perspective of "the child doing the art":

- Positive
- Negative
- Ambiguous
- Mixed

Comment**Story #4**

Pretend that you want to join two of your classmates who already have been working on an art project for 10 minutes. You take a box of crayons with you and ask to join. The boys/girls whisper to each other, giggle and one of the boys/girls, Sam/Cindy says "yes in 5 minutes". Can you pretend that?

Please rate Sam/Cindy's *intention*:

- 17) Positive
- 18) Negative
- 19) Ambiguous
- 20) Mixed

Please rate the *outcome* of the situation from the perspective of the child asking to join:

- Positive
- Negative
- Ambiguous
- Mixed

Comment**Story #5**

Pretend that you want to go sit with two boys/girls and share your recess snack with them. You ask the boys/girls to sit with them and share snacks with them. One of the boys, Jeremy/Wendy says that you can't share snacks with them but you can sit with them. Can you pretend that?

Please rate the Jeremy/Wendy's *intention*:

- 21) Positive
- 22) Negative
- 23) Ambiguous
- 24) Mixed

Please rate the *outcome* of the situation from the perspective of the child wanting to sit and share snacks:

Positive
Negative
Ambiguous
Mixed

Comment

Story #7

Pretend that you have just finished a really long race. It was really difficult to finish but you did it and now feel really tired. You see your friend Jimmy/Jane at the finish line. Jimmy/Jane says to you "good effort!" Can you pretend that?

Please rate Jimmy/Jane's *intention*:

- 25) Positive
- 26) Negative
- 27) Ambiguous
- 28) Mixed

Please rate the *outcome* of the situation from the perspective of the child completing the race:

Positive
Negative
Ambiguous
Mixed

Comment

Story #8

Pretend that you are standing on the playground. You see two children from your class, John and Joey/ Jane and Jackie standing a little ways from you. John and Joey/ Jane and Jackie are giggling and looking around. A little while later John/Jane comes over and asks you to play with him/her. Can you pretend that?

Please rate the John/Jane's *intention*:

- 29) Positive
- 30) Negative
- 31) Ambiguous
- 32) Mixed

Please rate the *outcome* of the situation from the perspective of the child being asked to play:

Positive
Negative
Ambiguous
Mixed

Comment

Story #9

Pretend that you are standing on the playground playing catch with a kid named Todd/Jessica. You throw the ball to Todd/Jessica and he/she catches it. You turn around, and the next thing you realize is that Todd/Jessica has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot. Can you pretend that?

Please rate Todd/Jessica's *intention*:

- 33) Positive
- 34) Negative
- 35) Ambiguous
- 36) Mixed

Please rate the *outcome* of the situation from the perspective of the child hit by the ball:

- Positive
- Negative
- Ambiguous
- Mixed

Comment**Story #10**

Pretend that you see some kids playing on the playground. You would really like to play with them, so you go over and ask one of them, a kid named Alan/Leah, if you can play. Alan/Leah says no. Can you pretend that?

Please rate Allan/Leah's *intention*:

- 37) Positive
- 38) Negative
- 39) Ambiguous
- 40) Mixed

Please rate the *outcome* of the situation from the perspective of the child asking to play:

- Positive
- Negative
- Ambiguous
- Mixed

Comment**Story #2**

Pretend that you are playing hockey with a bunch of other kids. The kids on the team tell you that they want you on for the last shift. The game is coming to an end and you are waiting for the teammate Jimmy/Jackie playing your position to get off so you can go on. When the Jimmy/Jackie finally comes off there is only 30 seconds left in the game. Can you pretend that?

Please rate Jimmy/Jackie's *intention*:

- 41) Positive
- 42) Negative

- 43) Ambiguous
- 44) Mixed

Please rate the *outcome* of the situation from perspective of the child waiting for the shift:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #12

Pretend that you are a new kid in school and you would really like to make friends. At lunch time you see some kids you would like to sit with and you go over to their table. You ask if you can sit with them and a kid named Carl/Carolyn says no. Can you pretend that?

Please rate Carl/Carolyn's *intention*:

- 45) Positive
- 46) Negative
- 47) Ambiguous
- 48) Mixed

Please rate the *outcome* of the situation from the perspective of the child asking to sit:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #13

Pretend that you go to the first meeting of a club you want to join. You would like to make friends with the other kids in the club. You walk up to one of the other kids named Joey/Jessica and say "Hi!" Joey/Jessica doesn't say anything back. Can you pretend that?

Please rate Joey/Jessica's *intention*:

- 49) Positive
- 50) Negative
- 51) Ambiguous
- 52) Mixed

Please rate the *outcome* of the situation from the perspective of the child saying "Hi!":

- Positive
- Negative
- Ambiguous

Mixed

Comment

Story #6

Pretend that you are playing soccer. You are calling for the ball because you think you have a good chance to score. Your teammate James/Jessica passes you the ball and you receive it. The ball was passed really hard and it hurts your foot. Can you pretend that?

Please rate James/Jessica's *intention*:

- 53) Positive
- 54) Negative
- 55) Ambiguous
- 56) Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving the ball:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #15

Pretend that you and your class went on a field trip to the zoo. You stop to buy a coke. Suddenly, a kid named David/Allison bumps your arm and spills your coke all over your shirt. The coke is cold, and your shirt is all wet. Can you pretend that?

Please rate David/Allison's *intention*:

- 57) Positive
- 58) Negative
- 59) Ambiguous
- 60) Mixed

Please rate the *outcome* of the situation from the perspective of child who had coke spilled on them:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #32

Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize that you left your book bag outside. Just then you turn around and a boy/girl in your class named Jimmy/Susie hands you the bag. Can you pretend that?

Please rate Jimmy/Susie's *intention*:

- 61) Positive
- 62) Negative
- 63) Ambiguous
- 64) Mixed

Please rate the *outcome* of the situation from the perspective of the child who left their bag outside:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #26

Pretend that you are on the playground after school. A kid in your class Brian/Sandy is **passing out** invitations to their birthday party. They have given out invitations to most of the kids in your class but you haven't gotten one yet. The next day when you arrive at school Brian/Sandy calls you over and gives you an invitation. Can you pretend that?

Please rate Brian/Sandy's *intention*:

- 65) Positive
- 66) Negative
- 67) Ambiguous
- 68) Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving the invitation:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #16

Pretend that you are watching TV with a friend of yours named Mark/Tina. After about **10 minutes**, Mark/Tina changes the channel without asking you. The channel they change it too is showing a TV program you like. Can you pretend that?

Please rate Mark/Tina's *intention*:

- 69) Positive
- 70) Negative
- 71) Ambiguous
- 72) Mixed

Please rate the *outcome* of the situation from the perspective of the child who didn't change the channel:

Positive
 Negative
 Ambiguous
 Mixed

Comment

Story #17

Pretend that you are playing soccer. You see two of your teammates John and Tim/Louise and Tina giggling and looking around at other players just as the game is starting. After a few minutes you are all alone and calling for the ball. Tim/Tina is still giggling and passes you the ball. Can you pretend that?

Please rate Tim/Tina's *intention*:

73) Positive
 74) Negative
 75) Ambiguous
 76) Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving the pass:

Positive
 Negative
 Ambiguous
 Mixed

Comment

Story #18

Pretend that you are on the playground during recess. You see Jimmy/Kristy walking towards you. Also pretend that Jimmy/Kristy has been teasing you for the past 2 days. Jimmy/Kristy walks up to you and asks you to play. Can you pretend that?

Please rate Jimmy/Kristy's *intention*:

77) Positive
 78) Negative
 79) Ambiguous
 80) Mixed

Please rate the *outcome* of the situation from the perspective of the child being asked to play:

Positive
 Negative
 Ambiguous
 Mixed

Comment

Story #19

Pretend that you and your classmates are about to play a game of baseball. Jimmy and Steve/Susie and Pam are chosen as team captains. Pretend also that every time Jimmy/Pam has been captain he/she has always chosen you around last and you wonder if Jimmy/Pam likes you. Today Jimmy/Pam chose you close to first. Can you pretend that?

Please rate Jimmy/Pam's *intention*:

- 81) Positive
- 82) Negative
- 83) Ambiguous
- 84) Mixed

Please rate the *outcome* of the situation from the perspective of the child being chosen:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #20

Pretend that you are sitting at a table for lunch. You have your back turned to the path where people are walking and there are many people walking in all directions behind you. Suddenly you feel wet on your back and realize that Joey/Cindy has spilled his/her milk all over your back. Can you pretend that?

Please rate Joey/Cindy's *intention*:

- 85) Positive
- 86) Negative
- 87) Ambiguous
- 88) Mixed

Please rate the *outcome* of the situation from the perspective of the child having milk spilled on them:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #22

Pretend that you can't find your favorite pencil but you are sure that you brought it to school with you. Later that day you see one of the kids in your class John/Cindy putting the pencil on your desk. Can you pretend that?

Please rate John/Cindy's *intention*:

- 89) Positive
- 90) Negative
- 91) Ambiguous
- 92) Mixed

Please rate the *outcome* of the situation from the perspective of the child seeing the pencil being put on their desk:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #14

Pretend that you are walking down the hallway in school. You're carrying your books in your arm and talking to a friend. Suddenly, a kid named Brett/Wendy bumps you from behind. You **stumble and fall** and your books go flying across the floor. The other kids in the hall start laughing. Can you pretend that?

Please rate Brett/Wendy's *intention*:

- 93) Positive
- 94) Negative
- 95) Ambiguous
- 96) Mixed

Please rate the *outcome* of the situation from the perspective of the child who was bumped:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #23

Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize that you left your book bag outside. When you run to get it you see a kid in your class Frank/Susie holding it and walking toward the school entrance. Can you pretend that?

Please rate Frank/Susie's *intention*:

- 97) Positive
- 98) Negative
- 99) Ambiguous
- 100) Mixed

Please rate the *outcome* of the situation from the perspective of the child who left their bag outside:

- Positive
- Negative
- Ambiguous
- Mixed

Comment

Story #25

Pretend that you are new in a school. You see a child in your class named John/Lisa smile at you then whisper something to the child sitting next to them. Can you pretend that?

Please rate John/Lisa's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the new child:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #27

Pretend that Joey/Jenny is a kid in your class and it's his/her birthday. His/Her mother has baked cookies for everyone in the class because of Joey's/Jenny's birthday. Joey/Jenny is passing out the cookies. When he gets to your desk you notice that he/she puts the cookie down really hard on your desk. The cookie doesn't break. Can you pretend that?

Please rate Joey/Jenny's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving the cookie:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #28

Pretend that a kid in your class named Joey/Jenny is passing out cookies to the entire class. When Joey/Jenny gets to your desk they give you the cookie but you notice that Joey/Jenny is **smirking** (he has a strange smile on his face). Can you pretend that?

Please rate Joey/Jenny's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving the cookie:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #32

Pretend that you have left your school bag on the playground. You go to get it and see a kid in your class named Jimmy/Susie holding it. Can you pretend that?

Please rate Jimmy/Susie's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child who left their bag on the playground:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #29

Pretend that there is a new kid in your class named Steven/Sara. You have heard from other people that Steven/Sara did not get along well with people from their old school. On the first day that Steven/Sara is in your class he/she comes over and asks you to play. Can you pretend that?

Please rate Steven/Sara's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child being asked to play:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #30

Pretend that you are just about to go out for recess. You have made a plan with a kid in your class named Steven/Sara to play (or hang around) with them during recess. When recess begins you go up to Steven/Sara and they say that they want to play with you but later on. Can you pretend that?

Please rate Steven/Sara's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child asking to play:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment:

Story #24

Pretend that it is lunch time and you are sitting with a group of kids in your class at a table. You leave the room to go to the washroom. When you get back to the lunch table you see one of the kids from the table, Frank/Susie holding your lunch. Can you pretend that?

Please rate Frank/Susie's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child who left the room:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment:

Story #31

Pretend that you have had an argument with one of the kids in your class named Jerry/Joan. Jerry/Joan became really angry and called you a bad name. Your teacher heard and called Jerry/Joan over to speak to them. Right after Jerry/Joan speaks to the teacher he/she comes over to you and says sorry. Can you pretend that?

Please rate Jerry/Joan's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child who was apologized to:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #33

Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize that you left your book bag outside. As you are walking to look for your bag you see a kid in your class named Jimmy/Susie holding your bag and walking into the Principal's office. Can you pretend that?

Please rate John/Lisa's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the new child:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Story #34

Pretend that you lost your favorite pencil. Later that day you see your classmate John/Fran comes over to your desk and gives you the pencil. Can you pretend that?

Please rate John/Fran's *intention*:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Please rate the *outcome* of the situation from the perspective of the child receiving their pencil:

- 100)Positive
- 101)Negative
- 102)Ambiguous
- 103)Mixed

Comment

Appendix B

Student Questionnaire

The following are descriptions of parts of social situations involving children. Pretend that you are in the situation and rate the descriptions according to 1) The intent of the child undertaking an action and 2) The outcome to you. Please use the following scales and criteria:

For intention ratings please use the following scale:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative
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Description of ratings:

- A) **Very Much Positive:** Description of a child's intention that would be generally perceived by most people in society to be something they would want to happen to them
- B) **Somewhat Positive:** Description of a good intention. Description of intention is prosocial but less so than A (i.e., very much positive)
- C) **Ambiguous/Unclear:** Intention of the child in the vignette is unclear, lacks information or has both positive and negative aspects (i.e., you are unsure whether the child's intention fits into either positive or negative categories because of clarity or containing both positive and negative components)
- D) **Somewhat Negative:** Intention that would not be judged as good for most people but less bad than E (i.e., very much negative)
- E) **Very Much Negative:** Intention that is not good or would be generally perceived by most people in society to be bad

For outcome ratings please use the following scale and criteria:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative
-------------------------------	------------------------------	-----------------------------	------------------------------	-------------------------------

- A) **Very Much Positive:** Description of a good occurrence or would be generally perceived by most people in society to be something they would want to happen
- B) **Somewhat Positive:** Description of a good occurrence. Description is prosocial but less so than A (i.e., very much positive)
- C) **Ambiguous/Mixed:** Description is unclear, lacks information or has both positive and negative aspects (mixed) (i.e., you are unsure whether description fits into either positive or negative categories because of clarity or containing both positive and negative components)
- D) **Somewhat Negative:** Description would not be judged as good for most people but less bad than E (i.e., very much negative)
- E) **Very Much Negative:** Description of an occurrence that is not good or would be generally perceived by most people in society to be a bad thing to occur

Please provide two ratings for each question (i.e., intent and outcome) by placing an "x" in the appropriate box. Refer back to descriptions of ratings as necessary. Outcome and intention ratings can be different. Please rate each separately (i.e., without considering outcome rate intention). There are 38 questions

1) Pretend that you are walking to school and you're wearing brand new sneakers. You really like your new sneakers and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named John.

Please rate the intention of the child that bumped you:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

You stumble into a mud puddle and your new sneakers get muddy.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

2) Pretend that a kid in your class named Jeremy told you he was going to bring in a new game boy game to play with you. You see Jeremy walking towards you holding the new game and smiling.

Please rate Jeremy's intention:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Jeremy walks up to you and lets you play his new game

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

3) Pretend that you are standing on the playground playing catch with a kid named Todd. You throw the ball to Todd and he catches it. You turn around, and the next thing you realize is that Todd has thrown the ball and hit you in the middle of your back.

Please rate the intention of the child that threw the ball:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

The ball hits you hard and it hurts a lot.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

4) Pretend that you and your class went on a field trip to the zoo. You stop to buy a coke. Suddenly, a kid named David bumps your arm and spills your coke all over your shirt.

Please rate the intention of the child that bumped your arm:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

The coke is cold, and your shirt is all wet.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

5) Pretend that you really want to play soccer at recess. When recess begins a kid in your class named Steven is holding a soccer ball, smiling and calling you over.

Please rate Steven's intention:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Steven then walks up to you and asks you to play soccer with him.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

6) Pretend that you are sitting at a table for lunch. You have your back turned to the path where people are walking and there are many people walking in all directions behind you. Suddenly you feel wet on your back

Please rate the intention of the child that caused the wet on your back:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Joey has spilled his milk all over your back.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

7) Pretend that you are walking down the hallway in school. You're carrying your books in your arm and talking to a friend. Suddenly, a kid named Brett bumps you from behind.

Please rate the intention of the child that bumped you from behind:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

You stumble and fall and your books go flying across the floor. The other kids in the hall start laughing.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

8) Pretend that you go to the first meeting of a club you want to join. You would like to make friends with the other kids in the club. You walk up to one of the other kids named Joey and say "Hi!" Joey looks at you for a few seconds.

Please rate the Joey's intention:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Joey then turns his back on you and starts talking to another kid

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

9) Pretend that you see some kids playing on the playground. You would really like to play with them, so you go over and ask one of them, a kid named Alan, if you can play. Alan turns and faces you.

Please rate Alan's intention:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Alan says no

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

10) Pretend that you are watching TV with a friend of yours named Tyler. Tyler asks you what show you want to watch and then changes the channel.

Please rate Tyler's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

The channel Tyler changes it to is showing the TV show you wanted to watch.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

11) Pretend that you are a new kid in school and you would really like to make friends. At lunchtime you see some kids you would like to sit with and you go over to their table. You ask them if you can sit with them. A kid named Carl turns and looks at you.

Please rate Carl's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Carl says no

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

12) Pretend that you are doing an art project with a bunch of other kids. You are almost out of blue paint. Suddenly a friend of yours named Jeremy looks at you and starts walking towards you holding blue paint.

Please rate Jeremy's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Jeremy smiles at you and hands you the paint.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

13) Pretend that you are standing on the playground. You see two children from your class, John and Joey standing a little ways from you. John and Joey are giggling.

Please rate John and Joey's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

John then comes over and asks you to play with him.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

14) Pretend that you are playing soccer. You see two of your teammates John and Tim giggling and pointing at other players just as the game is starting. After a few minutes Tim has the ball and you are calling for him to pass it to you.

Please rate John and Tim's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Tim is giggling and passes you the soccer ball.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

15) Pretend that you and your classmates are about to play a game of baseball. Jimmy and Steve are chosen as team captains. Pretend that every time Jimmy has been captain he has always chosen you around last. You see Jimmy looking at you before he begins to choose kids.

Please rate Jimmy's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Jimmy chooses you close to first.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

16) Pretend that a kid in your class named Joey has been picking on you for the past week. Today you see Joey walking up to you with an angry look on his face.

Please rate Joey's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Joey walks up to you and shoves you.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

17) Pretend that you are watching TV with a friend of yours named Mark. Mark changes the channel without asking you.

Please rate the intent of the child who changed the channel:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

The channel Mark changes it to is showing your favorite TV show.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

18) Pretend that you come in a little early from recess and see a kid in your class named Sam looking through your desk.

Please rate Sam's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

After a few seconds you see Sam walking away with your favourite marker.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

19) Pretend that a kid in your class named Jimmy hasn't talked to you for the past three days. Today you see Jimmy walking towards you.

Please rate Jimmy's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Jimmy walks up to you and asks you to play.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

20) Pretend that you and your classmates are about to go on a class trip. Your teacher tells the class to pair up in groups of two. You see a kid in your class named Daniel asking other kids to be his partner. Two minutes later you see Daniel walking towards you.

Please rate Daniel's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Daniel asks to be your partner.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

21) Pretend that you have just finished an art project and you are really happy with it. Suddenly you see a kid named Andrew reaching for your project with an angry look on his face.

Please rate Andrew's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Andrew tears your project into many pieces.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

22) Pretend that you can't find your favorite pencil but you are sure that you brought it to school with you. Later that day you see one of the kids in your class named John walking towards your desk with the pencil.

Please rate John's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

John puts your favorite pencil on your desk.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

23) Pretend that you can't find your favorite box of crayons. The last time you remember seeing it was when you were working with a group of other kids on a project. Later that day you see John holding your crayons and looking around.

Please rate John's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

John sees you and hands you your crayons.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

24) Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize you left your book bag in the hallway. You go into the hallway to get it and see a kid named Frank holding your book bag.

Please rate Frank's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Frank sees you and hands you your book bag.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

25) Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize you left one of your books in the hallway. You go into the hallway to get it and see a kid named Joe looking through your book.

Please rate Joe's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Joe sees you and hands you your book.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

26) Pretend that you are new in a school. You see a kid in your new class named John giggle and whisper something to the child sitting next to them.

Please rate John's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

John then comes over to you and says hi.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

27) Pretend that a kid in your class named Joey is passing out cookies to the entire class. Joey gets to your desk last and has a strange smile on his face.

Please rate Joey's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Joey gives you a cookie.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

28) Pretend that a kid in your class named Jimmy told you during recess that he was going to cut in line ahead of you. You are standing in line after recess and you see Jimmy walking towards you with a mean look on his face.

Please rate Jimmy's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Jimmy cuts in front of you.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

29) Pretend that you are playing hockey with a bunch of other kids. The kids on the team tell you that they want you to go when a kid on your team named Matthew gets off. The game is coming to an end and Matthew hasn't come off yet.

Please rate Matthew's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

After a little while Matthew comes off and you go on. There is only 30 seconds left in the game.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

30) Pretend that you are playing soccer. One of the kids on your team named James has the ball. You are calling for the ball because you think you have a good chance to score. James looks in your direction.

Please rate James' intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

James passes you the ball and you receive it. The ball hurts your foot.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

31) Pretend that you are just about to go out for recess. You have made a plan with a kid in your class named Steven to play with him during recess. When recess begins you ask Steven to play. He looks at you for a few seconds.

Please rate Steven's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Steven tells you that he wants to play with you but later on.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

32) Pretend that your birthday is coming up and you have been asking your friend Wayne for your favourite present for the past two months but you're not sure if Wayne has been listening to you.

Please rate Wayne's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Your birthday finally arrives and you get your present and open it. The present is not the one you wanted.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

33) Pretend that you are playing soccer. You look over at a kid on your team named James and call for the ball. James has a funny look on his face.

Please rate James' intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

James passes you the ball and you receive it. The ball hurts your foot.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

34) Pretend that you are on the playground after school. A kid in your class named Brian is passing out invitations to his birthday party. He has given out invitations to most of the kids in your class but you haven't gotten one.

Please rate Brian's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Brian finally gives you the last invitation.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

35) Pretend that a kid in your class named Joey is passing out cookies to the entire class. Joey has a weird smile on his face when he gets to your desk.

Please rate Joey's intent:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

Joey gives you a cookie but you don't like the kind he gives you.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

36) Pretend that you want to join two of your classmates who already have been working on an art project for 10 minutes. You take a box of crayons with you and ask to join. The two kids look at each other and whisper something to each other.

Please rate the intent of the two classmates you want to join:

Very Much Positive	Somewhat Positive	Ambiguous/Unclear	Somewhat Negative	Very Much Negative

One of the boys named Sam says "yes you can join us but in 5 minutes"

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/Mixed	Somewhat Negative	Very Much Negative

37) Pretend that you are watching TV with a friend of yours named Joey. Suddenly Joey changes the channel.

Please rate the intent of the child who changed the channel:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

The channel Joey changes it to is showing a TV show you like.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

38) Pretend that you are standing on the playground. You see two children from your class, Steven and Geoff standing a little ways from you. Steven and Geoff are giggling and looking around the playground.

Please rate Steven and Geoff's intent:

Very Much Positive	Somewhat Positive	Ambiguous/ Unclear	Somewhat Negative	Very Much Negative

Steven then comes over and smiles at you.

Please rate the outcome to you:

Very Much Positive	Somewhat Positive	Ambiguous/ Mixed	Somewhat Negative	Very Much Negative

Appendix C

Child Questionnaire (MALE)

Demonstration question:

A) Pretend that you really like candy and your best friend Sam gives you a whole bag of candy.

i) **What happened in the story?** (Prompt the participant to remember to tell me everything from beginning to end.)

ii) **How mean do you think Sam was in the story?**

Not mean	A little mean	Pretty mean	Very mean
1	2	3	4

(Orient the participant to the likert ratings by saying: since you like candy in the story then you should say that your friend is not mean because he's doing a nice thing for you. If he was doing a mean thing you could say that he was a little mean, pretty mean or very mean)

iii) **How nice do you think Sam was in the story?**

Not nice	A little nice	Pretty nice	Very nice
1	2	3	4

(Orient the participant to the likert ratings by saying: since you like candy in the story then you should say that your friend is being nice by giving you candy)

iv) **How could you tell whether this was a nice way to act or a mean way to act?**

(Prompt the participant to tell you all the things in the story that happened or that Sam did that told the participant that this was a nice thing to do or a mean thing. Prompt for multiple responses)

v) **How would you feel if Sam did this to you?**

(Prompt the participant to tell you a feeling they would have if Sam gave them candy. You can tell them that some kids could be happy, sad, upset, mad, frustrated or other feelings)

vi) **How happy would you feel about Sam doing this?**

Not happy	A little happy	Pretty happy	Very happy
1	2	3	4

(Orient the participant to the likert rating by saying: Since you like candy in the story you would be happy that Sam gave you candy so you would say a little happy, pretty happy or very happy. A little happy means a small amount of happiness, "pretty happy" is more happy than "a little happy" and "very happy" is the most happy)

vii) **How mad would you feel about Sam doing this?**

Not mad	A little mad	Pretty mad	Very mad
1	2	3	4

(Orient the participant to the likert rating by saying: Since you like candy in the story you would not be mad if Sam gave you candy. In a different story if you didn't like candy you could say you were mad)

viii) **How much would you care if Sam did this to you?**

Don't care	Care	Care	Care
at all	a little	pretty much	very much
1	2	3	4

(Orient the participant to the likert scale by saying: If you don't care about the candy you would say "don't care" but if you care about getting it you could say you cared "a little bit", "pretty much" or "very much". Caring pretty much is more than caring a little but less than caring very much.)

- ix) **What could you say or do if this happened to you?**
 (Prompt the participant by saying: In the story Sam gave you candy so you could say something to Sam, do something to Sam or say or do something with someone else. You can say all the different ways)

Repeat above steps with question "B" if child requires additional practice

- B) Pretend that you don't like eating Broccoli and your friend Pat gives you Broccoli to eat instead of giving you candy.

Begin the questionnaire by saying "Now I'm going to read some other stories to you followed by the same type of questions. Let me know what your answers are and I will be writing them down on these pages. Let's begin"

- 1) Pretend that a kid in your class named Joey has been picking on you for the past week. Today you see Joey walking up to you with an angry look on his face. Joey walks up to you and shoves you.

- a) **What happened in the story?**

Negative

Neutral

Positive

- b) **How mean do you think Joey was in this story?**

Not mean	A little mean	Pretty mean	Very mean
1	2	3	4

- c) **How nice do you think Joey was in this story?**

Not nice	A little nice	Pretty nice	Very nice
1	2	3	4

- d) **How could you tell whether this was a nice way to act or a mean way to act?**

- e) **How would you feel if Joey did this to you?**

- f) **How happy would you feel about Joey doing this to you?**

Not happy	A little happy	Pretty happy	Very happy
1	2	3	4

- g) **How mad/upset would you feel about Joey doing this to you?**

Not mad/upset	A little mad/upset	Pretty mad/upset	Very mad/upset
1	2	3	4

h) How much would you care if Joey did this?

Don't care at all	Care a little	Care pretty much	Care very much
1	2	3	4

i) What could you say or do if this happened to you? Tell me as many ways as you can.

- 2) Pretend that you want to join two of your classmates who already have been working on an art project for 10 minutes. You take a box of crayons with you and ask to join. The two kids look at each other and whisper something to each other. One of the boys named Sam says "yes you can join us but in 5 minutes".
- 3) Pretend that you can't find your favorite pack of markers. The last time you remember seeing it was when you were working with a group of other kids on a project. Later that day you see John holding your markers and looking around. John sees you and hands you your markers.
- 4) Pretend that a kid in your class named Jeremy told you he was going to bring in a new game boy game to play with you. You see Jeremy walking towards you holding the new game and smiling. Jeremy walks up to you and lets you play his new game.
- 5) Pretend that you have just finished an art project and you are really happy with it. Suddenly you see a kid named Andrew reaching for your project with an angry look on his face. Andrew tears your project into many pieces.
- 6) Pretend that you are standing on the playground playing catch with a kid named Todd. You throw the ball to Todd and he catches it. You turn around, and the next thing you realize is that Todd has thrown the ball and hit you in the middle of your back. The ball hits you hard and it hurts a lot.
- 7) Pretend that you have just arrived at school and you were really in a rush. When you get to the classroom you realize you left one of your books in the hallway. You go into the hallway to get it and see a kid named Brandon looking through your book. Brandon sees you and hands you your book.
- 8) Pretend that you come in a little early from recess and see a kid in your class named Ryan looking through your desk. After a few seconds you see Ryan walking away with your favourite marker.
- 9) Pretend that a kid in your class named Mathew told you during recess that he was going to cut in line ahead of you. You are standing in line after recess and you see Matthew walking towards you with a mean look on his face. Matthew cuts in front of you.
- 10) Pretend that you are walking down the hallway in school. You're carrying your books in your arm and talking to a friend. Suddeniy, a kid named Brett bumps you from behind. You stumble and fall and your books go flying across the floor. The other kids in the hall start laughing.
- 11) Pretend that you are walking to school and you're wearing brand new sneakers. You really like your new sneakers and this is the first day you have worn them. Suddenly, you are bumped from behind by a kid named Alex. You stumble into a mud puddle and your new sneakers get muddy.
- 12) Pretend that you are just about to go out for recess. You have made a plan with a kid in your class named Steven to play with him during recess. When recess begins you ask Steven to play. He looks at you for a few seconds. Steven tells you that he wants to play with you but later on.

- 13) Pretend that you are doing an art project with a bunch of other kids. You are almost out of blue paint. Suddenly a friend of yours named Nicholas looks at you and starts walking towards you holding blue paint. Nicholas smiles at you and hands you the paint.
- 14) Pretend that you and your classmates are about to play a game of baseball. Patrick and Steve are chosen as team captains. Pretend that every time Patrick has been captain he has always chosen you last. You see Patrick looking at you before he begins to choose kids. Patrick chooses you close to first.
- 15) Pretend that you and your class went on a field trip to the zoo. You stop to buy a coke. Suddenly, a kid named David bumps your arm and spills your coke all over your shirt. The coke is cold, and your shirt is all wet.
- 16) Pretend that you are playing soccer. You look over at a kid on your team named James and call for the ball. James has a weird look on his face. James passes you the ball and you receive it. The ball hurts your foot.
- 17) Pretend that you really want to play soccer at recess. When recess begins a kid in your class named Luke is holding a soccer ball, smiling and calling you over. Luke then walks up to you and asks you to play soccer with him.
- 18) Pretend that you can't find your favorite pencil but you are sure that you brought it to school with you. Later that day you see one of the kids in your class named Jesse walking towards your desk with the pencil. Jesse puts your favorite pencil on your desk.
- 19) Pretend that a kid in your class named Ben is passing out cookies to the entire class. Ben has a weird smile on his face when he gets to your desk. Ben gives you a cookie but you don't like the kind he gives you.
- 20) Pretend that you are watching TV with a friend of yours named Tyler. Tyler asks you what show you want to watch and then changes the channel. The channel Tyler changes it to is showing the TV show you wanted to watch.

Appendix D

Friendship Study for Kids

We are looking for children between the ages of 6 and 12 and their parents to participate in a research study at Dalhousie University.

Children will play a computer game and answer questions about social situations. Parents will be asked to complete three brief questionnaires about their child's behaviour and friendships.

Families will be paid \$15 for their participation.

If you are interested, please contact the Child Behaviour Lab at Dalhousie University at 494-2956 or email bestproj@dal.ca.

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Appendix E

Social Information Processing – CodingQuestion 1:**What happened in the story?**

- Code what happened in the story according to the research participant (i.e., code according to what peers in the story are *doing to* the participant) according to the following:
- Scored:0 – **neutral**

- If the child describes the story but does not describe or infer any positive or negative behaviours, emotions or characteristics to the child in the story

- e.g., “Joey walked up to me and shoved me”
 - because this is a *literal description* of what occurred in the story *without inference of meanness, purposeful action or negativity* this statement is neutral

e.g., “Joey spilled the milk on my back”

- because this is a *literal description* of what occurred in the story *without the inclusion of additional information* this statement is neutral

1 – negative

- If the child suggests in any way that the other person did what he/she did *in order to be mean* or that the other person did the *mean action on purpose* (includes words that exaggerate emotions)
- e.g., “Joey walked up to me and pushed me really hard”
 - because the child added “really hard” indicates that the child who pushed them might have done it on purpose

e.g., “Joey spilled the milk all over my back”

- because the child added “all over” indicates that the other child may have done it on purpose

e.g., “Joey was mean and spilled the milk on my back”

- because the child interpreted Joey’s intention as mean beyond the information presented in the story

2 – positive

- If the child suggests in any way that the other person did what he/she *did in order to be good (or nice)* or the other person *did the nice action on purpose* (includes words that exaggerate emotions)
- e.g., “Jeremy walked up to me and gave me a big smile and let me play with his gameboy”
 - because the child added “big” indicates the child who gave the gameboy might have done it on purpose

e.g., “Jeremy came over right away and let me play”

- because the child added “came over right away” indicates the other child may have been positive in their intention to ask to play.

e.g., “Jeremy walked up to me and smiled and was nice to let me play with him”

- because the child interpreted Jeremy’s intention as nice beyond the information presented in the story

3- mixed (has both positive and negative components)

- If the child suggests in any way *both negative and positive* actions (i.e., somewhere in the child's interpretation is indicated a negative action or purpose *and* a positive action or purpose)

- e.g., "Brandon was being mean by looking at my book but he gave it back to me"
 - because the child interpreted Brandon's actions as being mean and resulting in a good outcome (i.e., giving the book back)

e.g., "Brandon was trying to find out whose book it was but he threw it at me instead"

- because the child interpreted Brandon's actions as being thoughtful (i.e., finding out who's book it was) and negative (i.e., threw the book)

b) Code the number of positive, negative and neutral cues described by the child **that are in the story** according to the following (see attached list of story cues). These include any cues that resemble or approach the intended meaning of the stated cues (i.e., same words or paraphrase)

- i) Positive – a positive statement or piece of information recalled by the child (i.e., a positive piece of information from the story)
 - e.g., "Jeremy let me play his new game", "Jeremy gave me a box of markers"
- ii) Negative – a negative statement or piece of information recalled by the child (i.e., a negative piece of information from the story)
 - e.g., "Brandon shoved me", "Brandon had an angry look on his face"
- iii) Neutral – a benign (not positive or negative) piece of information recalled by the child (i.e., piece of information from the story that is neither positive or negative)
 - e.g., "the other children are working on a project", "Jeremy was holding my markers and looking around"

c) Code the number of positive, negative, and neutral pieces of information recalled by the child **that is not in the story** (called "intrusions") according to the following:

- iv) Positive – a positive statement or piece of information recalled by the child that was not in the original story and not on the provided list of cues
 - e.g., "Jeremy was a really nice guy", "Jeremy is always nice to me"
- v) Negative – a negative statement or piece of information recalled by the child that was not in the original story
 - e.g., "Brandon doesn't like me", "Brandon always looks mean"
- vi) Neutral – a benign (not positive or negative) piece of information recalled by the child (i.e., piece of information from the story that is neither positive or negative)
 - e.g., "Joey has a lot of games", "Joey has dark hair"

Question 2:

How mean do you think.....was in the story?

- Likert rating ranging from 1(not mean) to 4(very mean)

Question 3:**How nice do you think.....was in the story?**

- Likert rating ranging from 1(not nice) to 4(very nice)

Question 4:**How could you tell whether this was a nice way to act or a mean way to act?**

- Record number of pieces of information (i.e., cues) from the story the child detected, separately for positive, negative, and neutral cues as described below
 - NOTE: Information can only be recorded as a cue if it was part of the story (i.e., contained within the story). The information does not have to be verbatim but must have occurred in the story. Irrelevant or extraneous information not contained in the story can not be counted as a cue
 - Total number of :
 - **Positive cues**
 - pieces of information in the story and reported by the child that are positive or represent something that would be generally interpreted by most people as nice. These can be actions that are even slightly or somewhat positive.
 - e.g., Brandon brought my book to me, Brandon smiled, Brandon handed me my book, Brandon handed me my book gently

NOTE: if descriptor word (e.g., gently, nicely etc) is part of the phrase, as above, then code as one cue. If part of two phrases (i.e., Brandon handed me the book and he did it gently) then code as two cues

- **Negative cues**
 - pieces of information in the story and reported by the child that are negative or represent something that would be generally interpreted by most people as not nice. These can be actions that are even slightly or somewhat negative.
 - e.g., Brandon had a mean look on his face, Brandon threw the book at me, Brandon didn't want to give the book back to me, Brandon gave me the book meanly
- NOTE: if descriptor word (e.g., meanly, angrily etc) is part of the phrase, as above, then code as one cue. If part of two phrases (i.e., Brandon handed me the book and he did it meanly) then code as two cues
- **Neutral cues**
 - pieces of information in the story and reported by the child that are neither positive nor negative but simply descriptive
 - e.g., Brandon had my book, I saw Brandon, I arrived at school late

- For each cue, score the relevance in terms of the story outcome, as follows:

- **0 – no**

- Cue that is contained within the story but not directly relevant to the story outcome. Cue that mostly has no relevance to the story outcome but still may make sense in the story context.
 - e.g., "because my books are always in the hallway"
"because I like my books and I want to get them back" (when outcome was someone taking your books)

- the child is reporting information from the story that is not directly important for the outcome or does not directly relate to the overall flow of the story

1 – yes

- Cue is contained within the story and relates directly to outcome and is necessary to interpret the story. Cue that is mostly not relevant to the story outcome and makes sense in the story context.
 - e.g., “because Brandon was trying to find out whose book it is and that’s a nice thing”
(when outcome is found Brandon looking through your book)
“because he had a mean look on his face and that’s not nice”
(when outcome is boy shoving you)
- b) Code whether the child makes reference to the **intention** of the child in the story when evaluating whether the child in the story was nice or mean. The intention is an inference made by the child as to the reason or purpose for the child (in the story) actions. This assumption of intent does not occur in the story but is implied by the participant as likely to be the thought process of the child in the story. Includes added words that imply *additional meaning, mental processes, morality etc.* Code each intent as positive, negative or neutral using the following criteria:
- Positive – an intention that would be generally considered by most people as positive. Code intentions as positive even if they are just somewhat positive
 - e.g., “Joey must like me”, “Joey is friendly”
 - Negative – an intention that would be generally considered by most people as negative. Code intentions as negative even if they are just somewhat negative
 - e.g., “Brandon purposely bumped me”, “Brandon threw it hard to hit me”
 - Neutral – an intention that is neither positive or negative
- c) Code whether the child makes reference to the **outcome** of the story when evaluating whether the child in the story was nice or mean. The outcome is what happened at the end of the vignette (i.e., directly from the last statement in the vignette or a close version of the statement). Code each outcome assertion using the following:
- Positive -- an outcome judgment that would be generally considered as positive or something good. Code outcome as positive even if they are just somewhat positive
 - e.g., “Jacob gave me a present”, “Simon played with me later”
 - Negative -- an outcome judgment that would be generally considered as negative or something bad. Code outcome as negative even if just somewhat negative
 - e.g., “Billy was mean because he shoved me”, “Billy was mean because he made me wait”

Note: Code either intent or outcome, not both.

Question 5:

How would you feel if....did this to you?

- Code how the child reports feeling in the situation as follows:
- 0 – neutral (e.g., ok, all right etc.)
- 1 – negative feeling (e.g., sad, upset, angry etc.)
- 2 – positive feeling (e.g., happy, glad, excited)
- 3- mixed (child reports both positive feelings and negative feelings)
 - e.g., “I feel happy that Brandon gave me my book but I am mad that he was looking threw it”

Question 6:

How happy would you feel about....doing this?

- Likert rating ranging from 1(not happy) to 4(very happy)

Question 7:

How mad would you feel about....doing this?

- Likert rating ranging from 1 (not mad) to 4 (very mad)

Question 8:

How much would you care if.....did this to you?

- Likert rating ranging from 1 (don't care at all) to 4 (care very much)

Question 9:

What could you say or do if this happened to you?

- Code the response generated by the child using the following:
 - 2 - Positive responses
 - Responses to the vignette that would be generally perceived by most people to be good or something that they would want to happen. Includes responses that are somewhat positive (assertive responses).
 - e.g., “I would smile back at him” “I would say thank-you”
 - 1 - Negative responses
 - Responses to the vignette that would be generally perceived by most people to be “not good” or something that they would not want to happen. Includes responses that are somewhat negative.
 - e.g., “I would throw the ball back at him” “I would call him stupid”
 - 0 - Neutral responses
 - Responses that neither display positive actions or negative actions.
 - e.g., “I would tie my shoe” “I would eat my lunch” “I wouldn't do anything”
- Code the valence of the first response according to the following:
 - 0 - Neutral
 - 1 - Negative

2 - Positive

- Person who response is directed towards (Code each response):
 - 1** – peer in vignette
 - 2** - adult
 - 3** – other (e.g., peer not in vignette, object, animal etc.)
 - 4** - none (e.g., I would walk away)
- For each response generated characterize the response according to how it relates to the outcome according to the following:
 - **1** – Relevant
e.g., “I would throw the ball back at him” “I would smile at him”
 - **0** - Irrelevant
e.g., “I would tie my shoe” “I would eat my lunch”

Appendix F



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Information and Consent Form

Study Title: Finding the positive in a hostile world: A comparison of social information processing mechanisms in children with different levels of aggressive behaviour

Study 1: Identification of adult's views of positive and negative situations

Investigators: Brendan Andrade, M.Sc
 (Ph.D. student – Clinical Psychology)
 Department of Psychology
 Dalhousie University
 Halifax, Nova Scotia B3H 4J1
 Tel: (902) 494 – 2956
 Fax: (902) 494 - 6585
bandrade@dal.ca

Dan Waschbusch, Ph.D.
 (Department of Psychology Dalhousie University)
dan.waschbusch@dal.ca

Please do not hesitate to contact investigators if any questions or difficulties should arise.

Introduction

You are being invited to take part in the research study named above. It is important that you understand the purpose of the study, how it may affect you, the risks and benefits of taking part in the research and what you will be asked to do, before you decide if you want to take part. This information and consent form is to help you decide if it is in your best interest to take part in this study. You do not have to take part in the study and you may withdraw at any time. Taking part is entirely voluntary (your choice). The quality of your education will not be affected by whether or not you participate. Participating in the study might not benefit you directly, but we might learn things that will benefit others. If you have any questions that this form does not answer, the study investigators will be happy to give you further information.

Purpose of Study

This study is designed as a preliminary study to investigate people's perception of differences in social situations. This information will be used in a subsequent study to investigate children's perceptions of social situations.

Study Design

The responses provided by will be compared to responses of all other participants in order to assess similarities of beliefs about each social situation. All participants will be given the same vignettes and questions.

Who can participate in the Study

Any individual above the age of 17 can participate in the study.

Who will be conducting the Research

Mr. Brendan Andrade will be responsible for the collection of responses and questionnaires from participants. Dr. Dan Waschbusch (Psychologist) will supervise the project.

What you will be asked to do

Participants will be asked to read a number of scenarios describing children doing positive, negative and unclear actions. An example of a typical negative action is the following: a child walks into a room and knocks down another child's blocks. Participants will then be asked a number of questions about the situation, the persons actions etc. This task will take approximately 30 minutes to complete.

Potential Risks and Discomforts

Participation in this study will not in any way affect your education. One risk from this study is that you may grow fatigued when completing the task. To reduce this possibility, you will be given the opportunity to take a short break partway through the task. There may also be risks that we are unaware of at this time.

Potential Benefits

Being exposed to questions about feelings, behaviours and beliefs may potentially generate positive coping thoughts that may not have been aware of prior to questioning. The results of this investigation will also be used to design a study investigating social knowledge in children.

Confidentiality

All assessments and information gathering will take place in Dr. Dan Waschbusch's laboratory at Dalhousie University. Assessments will take place in closed rooms to protect confidentiality of information. After you complete the study, your name will be removed from all of the files and replaced with numbers so that no one will be able to identify who gave us the information. Participants will not be identified by name in any publications, reports or presentations. Information will be presented in group form. All data maintained on computer files will only be identified by participant number. All data will be stored in Dr. Dan Waschbusch's laboratory in locked cabinets for 5 years. Only staff directly involved in the research and relevant members of the Research Ethics Board at Dalhousie University will have access to the data.

Questions

You have the right to ask questions about this study by contacting Mr. Brendan Andrade at the mailing address, phone number, fax, or email address listed above.

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Human Research Ethics Integrity Coordinator at Dalhousie University's Office of Human Research Ethics and Integrity for assistance: (902) 494 – 1462.

Study Title: Finding the positive in a hostile world: A comparison of social information processing mechanisms in children with different levels of aggressive behaviour

Study 1: Identification of adult's views of positive and negative situations

Participant ID: _____

Participant Initials: _____

Participant Authorization

I have read or had read to me this information and consent form and have had the chance to ask questions which have been answered to my satisfaction before I am signing my name. I understand the nature of the study. I understand that I have the right to withdraw from the study at any time without affecting my education in any way. I have received a copy of the Information and Consent Form for future reference. I freely agree to participate in this research study.

Name of Participant: _____

Signature: _____

Date: _____ Time: _____

STATEMENT BY PERSON PROVIDING INFORMATION AND OBTAINING CONSENT ON STUDY

I have explained the nature and demands of the research study and judge that the Participant named above understands the nature and demands of the study. I have explained the nature of the consent process to the person and judge that they understand that participation is voluntary and that they may withdraw at any time from participating.

Name (Print): _____ Position: _____

Signature: _____ Date: _____ Time: _____

Appendix G



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Information and Consent Form

Study Title: Finding the positive in a hostile world: A comparison of social information processing mechanisms in children with different levels of aggressive behaviour

Investigators: Brendan Andrade, M.Sc
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bandrade@dal.ca

Dan Waschbusch, Ph.D.
 (Department of Psychology Dalhousie University)
dan.waschbusch@dal.ca

Please do not hesitate to contact investigators if any questions or difficulties should arise.

Introduction

You and your child are being invited to take part in the research study named above. It is important that you understand the purpose of the study, how it may affect you and your child, the risks and benefits of taking part in the research and what you and your child will be asked to do, before you decide if you want to take part. This information and consent form is to help you decide if it is in your best interest to take part in this study. You do not have to take part in the study and you and your child may withdraw at any time. Taking part is entirely voluntary (your choice). The quality of your health care will not be affected by whether or not you participate. Participating in the study might not benefit you, but we might learn things that will benefit others. If you have any questions that this form does not answer, the study investigators will be happy to give you further information.

Purpose of Study

This study is designed to more fully understand the way children think about social situations. Children with different levels of social skills and positive behaviour will be interviewed to determine their view of positive and negative situations in order to help determine components to include in future interventions to build positive social behaviours in children. We are seeking to answer two questions. First, do children with different levels of behaviour difficulties think about positive and negative situations differently? Second, do the way children think about social situations effect their peer relationships?

Study Design

The responses provided by children will be related to parents and teachers responses of the child's social and behavioural skills. All children will be given the same vignettes. All parents and teachers will be given the same questionnaires.

Who can Participate in the Study

You can participate in this study if you are a parent with a child between the ages of 6 and 12 (inclusive).

Who will be conducting the Research

Mr. Brendan Andrade will be responsible for the collection of responses and questionnaires from children, parents and teachers. Dr. Dan Waschbusch (Psychologist) will supervise the project. Trained research assistants will read vignettes to children and record responses.

What you will be asked to do

Children participating in the study will be read sixteen scenarios describing other children doing positive, negative and unclear actions. Each scenario takes approximately 30 seconds to read. An example of a typical negative action is the following: a child walks into a room and knocks down another child's blocks. Children will then be asked a number of questions about the situation, the persons actions etc. For example each child will be asked what happened in the story, whether this was a good way for the person to act, their feelings about the persons actions and what they would do in the situation. This portion of the project will take approximately 45 minutes to complete.

A brief questionnaire that takes approximately 10 – 15 minutes to complete will be given to you. You will also be asked to give a form to your child's teacher to complete. Teachers will be given the option to complete the form or return the form not completed. The parent and teacher questionnaire contains questions about your child's relationships, behaviours and social skills. Each question assesses general areas of functioning and is answered by circling the appropriate number on a scale.

Potential Risks and Discomforts

Participation in this study will not in any way affect your child's health care in any way. One risk from this study is that children may grow fatigued when completing the task. To reduce this possibility, children will be given the opportunity to take a short break partway through the task. There may also be risks that we are unaware of at this time.

Potential Benefits

There are no direct benefits to either you or your child for participation in this research. However, because results will eventually be presented and published, parents and other interested people will have the opportunity to become more aware of the social difficulties children experience and gain knowledge of methods to alleviate these difficulties.

Compensation

There will be no monetary compensation for this project, but travel and parking expenses for the office visits will be reimbursed.

Confidentiality

All assessments and information gathering will take place in Dr. Dan Waschbusch's laboratory at Dalhousie University. Assessments will take place in closed rooms to protect confidentiality of information. After you and your child complete the study, both of your names will be removed from all of the files and replaced with numbers so that no one will be able to identify who gave us the information. Participants will not be identified by name in any publications, reports or presentations. Information will be presented in group form. All data maintained on computer files will only be identified by participant number. All data will be stored in Dr. Dan Waschbusch's laboratory in locked cabinets for 5 years. Only the primary investigators and lab research assistants directly involved in the research and relevant members of the Research Ethics Board at Dalhousie University will have access to the data.

Questions

You and your child have the right to ask questions about this study by contacting Mr. Brendan Andrade at the mailing address, phone number, fax, or email address listed above.

Problems or Concerns

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Human Research Ethics Integrity Coordinator at Dalhousie University's Office of Human Research Ethics and Integrity for assistance: (902) 494 – 1462.

Study Title: Finding the positive in a hostile world: A comparison of social information processing mechanisms in children with different levels of aggressive behaviour

Participant ID: _____ Participant Initials: _____

Parental or Guardian Authorization

I have read or had read to me this information and consent form and have had the chance to ask questions which have been answered to my satisfaction before I am signing my name. I understand the nature of the study. I understand that I have the right to withdraw myself and/or my child from the study at any time without affecting my child's health care in any way. I have received a copy of the Information and Consent Form for future reference. I freely agree to participate in this research study.

Name of Participant (Child): _____

Child Signature (if applicable): _____

Name of Participant (Parent): _____

Parent Signature: _____

Date: _____ Time: _____

I give permission for my child to be videotaped while completing research measures. I am aware that these tapes are confidential and will only be used for research purposes.

Name of Parent: _____

Signature: _____

Date: _____ Time: _____

STATEMENT BY PERSON PROVIDING INFORMATION AND OBTAINING CONSENT ON STUDY

I have explained the nature and demands of the research study and judge that the Parent/Guardian/Participant named above understands the nature and demands of the study. I have explained the nature of the consent process to the person and judge that they understand that participation is voluntary and that they/their child may withdraw at any time from participating.

Name (Print): _____ Position: _____

Signature: _____ Date: _____ Time: _____