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Hostile Attribution Bias in Children and Adolescents

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Abstract

Hostile Attribution Biases in Children and Adolescents

by

Kim M. Freeman

Childhood aggression affects a significant number of children and represents the majority of referrals to child clinical services (Ford, Hamilton, Meltzer, & Goodman, 2007). There are substantial costs for the child, their family and society more generally if aggressive behaviour remains untreated (Shivram et al., 2009). Social-cognitive models of aggression have provided the theoretical framework for much of the research into childhood aggression over the past twenty years and formed the focus of clinical interventions (Crick & Dodge, 1994). A key finding from this research is that aggressive children have a tendency to attribute hostility to the intentions of others in ambiguous situations (Orobio de Castro, Veerman, Koops, Bosch and Monshouwer, 2002). The aim of literature review is to explore the factors that lead to the development of this bias. Limitations to extant literature and suggestions for future research are discussed.

Although evidence from a number of studies demonstrates the effects of socialisation or peer contagion on children's aggressive and anti-social behaviour (Prinstein & Dodge, 2008; Thornberry & Krohn, 1997), currently no studies have examined peer contagion effects on hostile attribution bias. The empirical paper describes a study investigating whether hostile attribution biases are contagious amongst adolescents in a community sample of boys and girls. Using a computerised 'Chat-room' experimental paradigm, contagion effects were demonstrated across two conditions (hostile and benign) with those exposed to hostile group norms showing greater contagion effects. Four possible moderators on the effects of peer contagion were explored; gender, dispositional levels of aggression, social anxiety and friendship style. The role of peers in the socialisation of hostile intent attribution styles and implications for preventative interventions are discussed.

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Literature Review Paper

Hostile Attribution Biases:

An exploration of their origins in childhood

Clinical Psychology Review was used as a guide in determining the preparation of this paper. See Appendix 1 for notes to contributors.

Abstract

Childhood aggression affects a significant number of children and represents the majority of referrals to child clinical services (Ford, Hamilton, Meltzer, & Goodman, 2007). Aggression is highly stable over time and is associated with concurrent and future psychosocial adjustment difficulties (Crick, 1996; Dodge et al., 2003; Moffitt, Caspi, Rutter & Silva, 2001). The costs of untreated disruptive behaviour disorders are high, for the child, the family, as well as society more generally (Shivram et al., 2009). Social-cognitive models of aggression have provided a theoretical framework for much of the research into childhood aggression over the past twenty years and formed the focus of clinical interventions (Crick & Dodge, 1994). A key finding from this research is that aggressive children have a tendency to attribute hostility to the intentions of others in ambiguous situations. The aim of this paper is to review the literature that explores the factors that may lead to the development of this bias; thus, the paper discusses the role of parental physical maltreatment, parental attribution styles, and peer rejection. The review goes on to consider research that has demonstrated peer contagion effects for aggression (Cohen & Prinstein, 2006) and depressogenic attribution styles (Hogue & Steinberg, 1995; Rosenblatt & Greenberg, 1988; 1991; Stevens & Prinstein, 2005). The aim is to consider evidence to support the proposal that peer socialisation effects may influence the development of a hostile attribution bias in children and adolescents. Limitations to extant literature and suggestions for future research are highlighted.

Introduction

Research over the past thirty years has highlighted an association between childhood aggression with concurrent and future social adjustment difficulties including, peer rejection (Crick, 1996; Dodge et al., 2003) social-cognitive bias (Crick & Dodge, 1994) and deficits in social skills (Crick, Casas, & Mosher, 1997; Goldstein & Tisak, 2004; Werner & Crick, 2004). Furthermore, numerous studies have identified an association between childhood aggression and future delinquency related to criminal activity (Farrington & Welsh, 2007), substance misuse (Boles & Miotto, 2003) and permanent school exclusion (Hodgeson & Webb, 2005). Mental health problems in aggressive children are common and referral rates to Child and Adolescent Mental Health Services (CAMHS) are high (Ford, Hamilton, Meltzer, & Goodman, 2007). Aggression is not in and of itself a mental disorder, or an expression of individual psychopathology; and in some contexts and environments, aggressive behaviour is adaptive (Connor, 2002). However, maladaptive aggressive behaviours form a central component of Conduct Disorder (CD), Oppositional Defiant Disorder (ODD) (*Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (*DSM-IV-TR*; 2000) and anti-social behaviours more generally. Considerable economic costs are associated with childhood aggression, with an estimated ten-fold increase in the cost to social work, education, the criminal justice system, and to a lesser extent, health services, when compared to typically developing children (Scott, Knapp, Henderson, & McCann, 2001; Shivram et al., 2009). Cost estimates must also take into consideration the significant impact and potential long-term outcomes for children who are aggressive, their families, as well as society more generally (Scott et al., 2001).

In order to intervene effectively with aggressive children and adolescents, clinical psychologists must have robust models on which to base effective, empirically based protocols for treatment. A detailed understanding of the mechanisms thought to underlie the development of maladaptive behaviour also allows clinicians to identify potential risk factors, as well as those that protect against maladjustment. Social information-processing (SIP) theories have proved successful in providing a clear framework on which to base empirical investigations and effective interventions (Crick & Dodge, 1994; Huesmann, 1988). Empirical investigations have identified the tendency of aggressive children to routinely make attributions of hostile intent in ambiguous situations (Orobio de Castro, Veerman, Koops, Bosch and Monshouwer, 2002); and the term "hostile attribution bias" (Nasby, Hayden & DePaulo, 1980, p.460) is used to describe this tendency. With respect to associated interventions, the underlying premise is that to alter aggressive behaviour, the clinician intervenes to promote adaptive SIP patterns (Dodge, 2006).

More recently, research efforts have been directed towards investigating the aetiology of systematic disturbances in the processing of social information (e.g. Dodge, 2006; Halligan, Cooper, Healy & Murray, 2007; MacBrayer, Milich & Hundley, 2003; Nelson, Mitchell & Yang, 2008). Understanding how children develop and maintain such patterns will permit novel methods for effective intervention and prevention. The goal of this paper is to review the literature that has explored the factors that lead to the development of hostile attribution biases in children and adolescents. It defines aggression and discusses prevalence rates and the stability of maladaptive aggression over time. It outlines the Crick and Dodge, (1994) model and reviews the existing empirical evidence from longitudinal and intervention research that supports the contention that hostile attribution bias predicts

growth in aggressive behaviour. It goes on to consider research that has demonstrated peer contagion effects for aggression (Cohen & Prinstein, 2006) and depressogenic attribution styles (Hogue & Steinberg, 1995; Rosenblatt & Greenberg, 1988; 1991; Stevens & Prinstein, 2005). The aim is to explore evidence to support the proposal that peer socialisation effects may influence the development of a hostile attribution bias in children and adolescents. Future studies that could refine our knowledge in this area are proposed.

Definition of Aggression

Aggressive behaviours have two distinctive defining features: the behaviour is intended to harm or injure another individual, and the target perceives harm as a consequence of the aggressor's act (Connor, 2002; Marcus, 2007). The motivation for aggression can be categorised as either reactive (in response to frustration in goal-directed behaviour) or pro-active (to obtain a self-serving goal) (Dodge & Coie, 1987). Typologies of aggression distinguish between the acts of aggression which may be relational (Crick et al., 1997); intentional behaviours designed to manipulate and damage peer relationships (e.g., malicious gossiping, ignoring children, excluding children from the peer group) or overt; openly confrontational acts of verbal or physical aggression (Connor, 2002). While overt forms of aggression are found to decrease with age (Zimmer-Gembeck, Geiger, & Crick, 2005), relational aggression increases through childhood in both genders (e.g., Crick et al., 1997; Crick & Grotpeter, 1995); although is most common in interactions between females (Crick & Grotpeter, 1995; French, Jansen & Pidada, 2002; Murray-Close, Ostrov & Crick, 2007). Studies have shown that, as with overt forms of aggression, relational aggression can be reliably detected as early as preschool (Werner & Crick, 2004; Ostrov & Keating, 2004) and is often associated with significant social-psychological

adjustment problems in children (e.g., Prinstein, Boergers & Vernberg, 2001). For girls, this form of aggression may act as a precursor to physical aggression (Odgers & Moretti, 2002).

Aggression in childhood and adolescence

As no explicit specifications of aggression are made in the *DSM-IV-TR* (2000), prevalence figures of CD are used to give an approximation of the incidence of maladaptive aggression in the community (Connor, 2002). Several studies have shown an association between aggression and the development of CD (Coie & Dodge, 1998) and seven of the fifteen behaviours in the *DSM-IV-TR* criteria for CD involve direct aggression toward others.

A survey of the mental health of children within Great Britain (n= 10,496), reported that prevalence rates of CD in 2004 were around 7% in boys and 3% in girls aged between 5 and 10 years (Green, McGinnity, Meltzer, Ford & Goodman, 2005). In adolescence (11 – 16 years), these proportions increase respectively to 8% and 5% (Green et al., 2005). Symptoms are generally similar in boys and girls, although boys are reported as having more overtly aggressive behaviour and more persistent symptoms (Meltzer, Gatward, Goodman & Ford, 2003). CD is the most common psychiatric disorder in children with, the highest numbers of referrals to CAMHS (Ford et al. 2007). Research has shown that prognosis is poor, particularly in relation to those children with early-onset problems (Kratzer & Hodgins, 1997; Moffitt, Caspi, Rutter & Silva, 2001) and whose aggressive behaviours remain relatively stable across time.

The stability of aggression was highlighted in prospective longitudinal research in males. The Cambridge Study in delinquent development surveyed 400

London males from aged 8 to 48 years (Farrington, 1994). This study found that boys, rated by teachers as highly aggressive at age twelve, were more likely to engage in violence at age 18. In the follow-up study at aged 32, self-reports of violence against a spouse or female companion were frequent and those men who were fathers, were likely to have highly aggressive children (i.e., intergenerational continuity). These findings are highly concordant with those obtained in comparable research in other countries (e.g. Cairns & Cairns, 1994; Huesmann, Eron, Leftkowitz & Walder, 1984; Schaffer, Petras, Ialongo, Poduska & Kellam, 2003) and results obtained in British cross-sectional designs (Farrington & Welsh, 2007).

The stability of aggression in females is less well established and current knowledge is based on the broad outcome measures of anti-social behaviour* (Odgers & Moretti, 2002). In the Dunedin cohort, a longitudinal study which systematically analysed the anti-social behaviour of both males and females across the first twenty years of life, found anti-social behaviour to be predictable across time, in both genders. Relative to their same sex peers, boys and girls were equally likely to retain their standing in the distribution of anti-social behaviour (Moffitt et al., 2001). However, comparisons of life-course-persistent forms of anti-social behaviour showed very large differences between boys and girls, with prevalence rates ten times higher in boys (Moffitt et al., 2001). Adolescence–limited forms of anti-social behaviour show less disparity between gender, with boys showing only marginally greater rates compared to girls (approximate ratios are 1.5:1, boys to girls) (Moffitt et al., 2001; Fergusson, Horwood, & Nagin, 2000). Conduct problems

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*Anti-social behaviour is defined as "any aggressive, intimidating or destructive activity that damages or destroys another person's quality of life." Home Office (2009).

peak in mid-adolescence in both genders (Storvoll & Wichstrom, 2003). It is proposed that fewer females have the risk factors (i.e., difficult temperament, hyperactivity, peer rejection; Moffitt et al., 2001) for life-course-persistent development of anti-social behaviour (Moffitt, 2003). However, in adolescence-limited anti-social behaviour, individual stability of involvement is similar for girls and boys (Moffitt et al., 2001). For girls, the critical period for development of anti-social behaviour appears linked to the onset of puberty and deviant peer group affiliation; membership of a delinquent peer group (Caspi & Moffitt, 1991), and/or romantic relationships with delinquent males (Moffitt, et al. 2001). Adolescent-onset aggression was once considered less concerning that early-onset aggression. However, research shows that girls who develop anti-social aggressive behaviours in adolescence are at risk for adult mental health problems (e.g., anxiety, depression, suicidal ideation, suicide attempts, substance misuse) and poor social adjustment (Odgers & Moretti, 2002).

The research on the stability of aggression over time suggests that early recognition is clinically important if interventions are to be successful, particularly in males. By late childhood or early adolescence, aggressive behaviours have become a relatively fixed pattern, that persists throughout the lifespan (Loeber et al., 2005). Family interventions which target specific parenting skills to focus on building social competence and resilience represent the most widely researched and effective way of preventing or reducing aggressive behaviour problems in young children (Conduct Problems Prevention Research Group (CPPRG), 1992; Dodge & Pettit, 2003; for a recent review see Hutchings & Lane, 2005). More recently, new evidence has emerged which suggest substantial benefits of parent and family focused interventions for youth with severe conduct problems (e.g., Forgatch, Bullock, &

Patterson, 2004; Dishion, & Kavanaugh, 2002). Even so, these interventions are costly and show only modest success (Dodge, 2006).

Cognitive Models of Aggression

Dodge's (1986) Social Information Processing (SIP) theory (reformulated by Crick and Dodge in 1994) has been the most influential cognitive model of aggression and has provided the theoretical framework for much of the research in this field over the past twenty five years. The theory describes a set of cognitive-emotional mechanisms that serve to understand links between risk factors and the subsequent development of aggression.

The model proposes that children come to a social situation with a set of biologically limited capabilities (e.g., maturation, temperament, attention, persistence; Pakaslahti, 2000) and a database of memories of experience, thought to evolve from prior social experiences with family and peers. Schemas, scripts, core beliefs, or patterns of thinking, are said to develop and serve as cognitive heuristics that help the child to organise and translate social information in an efficient and meaningful way. According to the theory, the way that the child interprets a particular event influences how they will respond to that situation. A series of sequential steps are proposed in the generation of a child's behavioural response, which include; (1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarifying or selecting a goal, (4) accessing or constructing responses, (5) deciding on a response, and (6) enacting behaviours.

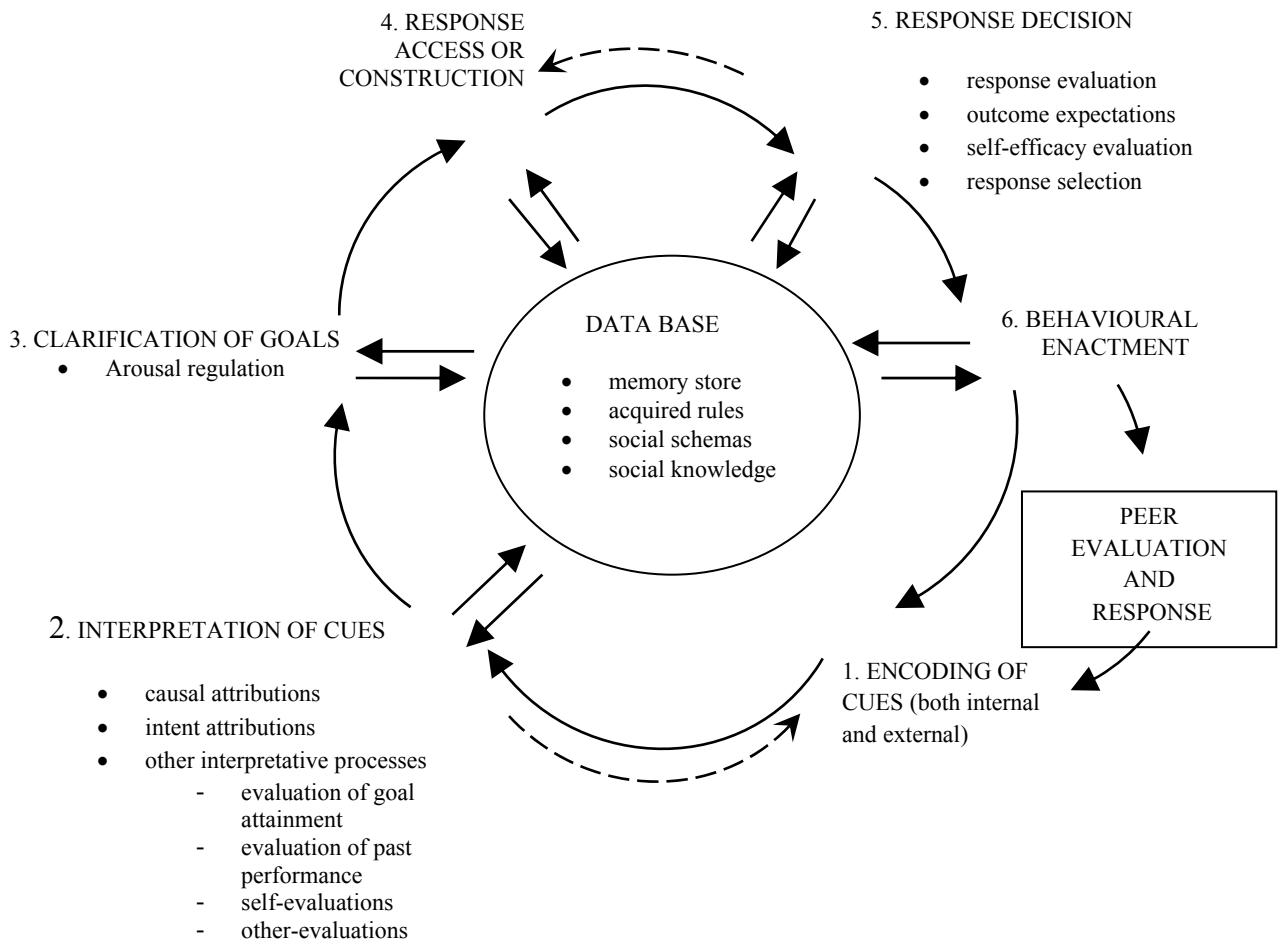

Figure 1. Crick and Dodge's social information processing model of children's social adjustment. (From Crick & Dodge, 1994, p. 74).

These steps are conceptualised as discrete processes through which individuals' progress; however, the model is cyclical in structure, with multiple feedback loops (see Figure 1). The framework assumes that the processing of a particular stimulus is sequential and individuals are engaged in multiple SIP activities simultaneously. In other words, as new cues are encoded, earlier cues are interpreted and acted upon. Crick and Dodge (1994) suggest that this conceptualisation best captures the complexities inherent in most social situations. The model also makes clear the bi-directional interplay between the existing database of experiences and online-processing (see Gifford-Smith & Rabiner, 2004 for review).

Sophisticated statistics and analytical techniques have allowed a number of studies to demonstrate that the conceptualisation of a database, or latent mental structure, together with six discrete SIP steps, best fit the data, rather than models of a single underlying construct, or models that propose fewer SIP steps (e.g., Dodge, Laird, Lochman, Zelli, & Conduct Problems Prevention Research Group (CPPRG), 2002). Research has shown the effect of pre-existing experiences or belief structures on social adjustment can be mediated by biased processing (Zelli, Dodge, Lochman, Laird, & CPPRG, 1999). For example, Zelli et al. (1999), used the latent mental structure of retaliatory aggression beliefs, to determine the effects of three information steps (i.e. hostile attribution bias, response access and response evaluation) on aggressive behaviour. They found that 50% of the association between aggressive beliefs and behaviour was accounted for by deviant SIP. Moreover, this mediation model provided a significantly better fit for the data than a direct effects model. The results of this study provide support for the validity of distinguishing between latent knowledge and processing operations as two mechanisms regulating aggression. This research also supports the validity of a mediation model in which social knowledge effects operate through proximal on-line processing mechanisms.

Hostile Attribution Bias and Aggressive Behaviour

Over 100 studies have shown that individual differences in aggressive behaviour occur as a function of errors in the encoding and interpretation of social cues. Specifically, aggressive children are more likely to attribute hostile intent to others in ambiguous provocation situations (compared with non-aggressive children), and they are more likely to respond with excessive and inappropriate aggression (verbal or physical) (see Orobio de Castro et al., 2002 for meta-analysis). In order to

make an attribution of hostile intent the perceiver's view must be that the protagonist was motivated by hostility and any hurt caused was intentional (Crick & Dodge, 1994).

Typically, interpretation biases are assessed by asking children to imagine themselves in a hypothetical, scenario depicting ambiguous provocation situations. One or more scenarios are presented through varying modalities (including filmed or enacted sequences, verbal descriptions, picture sequences, and written text). The hypothetical situations are intended to be relevant to real-life situations (with consideration give to the age group) and typically include overt and relational provocation (Orobio de Castro et al., 2002). For example, "Pretend that you are walking to the dinner table at lunch time. You are carrying your lunch and talking to a friend when suddenly another child bumps into you. You fall over and your lunch goes all over the floor. The other children in the room start laughing" (Halligan et al., 2007). Children are asked to consider the protagonist's intention in the situation depicted (Why do you think the [protagonist] acted in this way?), either by making a forced choice on multiple ratings, or by providing open-ended responses.

Measures of aggressive behaviour used in the extant research have been diverse and have included indices based on self, parent (Weiss, Dodge, Bates & Pettit, 1992) and peer reports (Crick, Grotpeter & Bigbee, 2002) as well as direct observations (Dodge & Coie, 1987), psychiatric reports (Milich & Dodge, 1984) and criminal records (Dodge, Price, Bachorowski, & Newman, 1990).

Early research found that aggressive boys who held a hostile attribution bias tended to rely on pre-existing beliefs to derive their interpretation of a social provocation, rather than utilising cues from the situation. For example, one study (Milich & Dodge, 1984) showed that when aggressive children were asked to

describe the intention of a nominated aggressive peer, after listening to a story in which four possible outcomes were possible, they used fewer social cues prior to making a attributional decision than typically developing children, believing the protagonists intention was hostile regardless of the stories outcome. This lack of attention to cues means that aggressive children rely on a smaller pool of information than is available to their peers. Equally, the database of the aggressive child is not updated with information that is contrary to their hypothesis of hostile intentions of others. Moreover, further research has found that aggressive boys are more likely to recall hostile information from vignettes, even if it had not been present in the story (Dodge & Frame, 1982), and they are less likely to successfully recall positive information presented in scenarios, when compared to typically developing children (Dodge & Tomlin, 1987). This set of results indicates that attributional biases, guided by a schema, prompt the child to focus on specific cues, while ignoring others. This style of thinking is proposed to promote a narrowed interpretation where the child perceives harm where none exists, leading to inappropriate responses of aggression. Dodge (2003) suggested that this style of thinking can become habitual and develop into personality-like traits.

Gender

Much of the early research into SIP processes and aggression focused on overt forms of aggression, not typically displayed by girls (Crick et al., 2002). Therefore, relatively little was known about the utility of the SIP model for understanding female aggression. Indeed, Orobio de Castro et al., (2002) commented in his meta-analysis of forty-one studies, (including 6,017 participants and both clinical and community samples), on the relative absence of female studies.

However, over the last decade, research into the nature of SIP biases in girls has gained momentum.

In large community samples of children, girls are shown to have fewer SIP problems (e.g., response decision biases, hostile attributional biases, cue-utilization deficiencies) than boys (Fraser et al. 2005; Lansford et al., 2006). However, where SIP deficits exist, girls are at equal risk of aggressive behaviour (Dodge et al. 2003; Zelli et al. 1999). Crick et al. (2002) also demonstrated that the processing patterns of aggressive children are directly related to the type of aggressive behaviour displayed, with overtly aggressive children exhibiting hostile attribution biases for overt provocation situations and relationally aggressive children exhibiting hostile attribution biases for relational provocation situations (Crick et al. 2002). These finding highlight the necessity for detailed experimental design, which considers the role of context in eliciting SIP patterns, associated with aggression. In order to tap into the SIP patterns of both girls and boys, scenarios should include both overt and relational provocation scenarios. The omission of relational scenarios in early research may explain the lack of support for the SIP model in girls (Crick et al. 2002).

Other studies have not supported the relevance of SIP for understanding relational aggression. Crain, Finch and Foster (2005), for example, studied girls aged nine to eleven years and found no concurrent relationship between relational aggression and hostile attribution biases and aggressive solutions. Similarly, in a longitudinal study of adolescent girls, with and without Attention Deficit Hyperactivity Disorder (ADHD), no association was found between hostile attribution bias and aggression either at baseline or at follow-up (Mikami, Lee, Hinshaw & Mullin, 2008).

The inconsistent findings across theses studies may be an artefact of the differences in approach. First, hypothetical scenarios have differed amongst studies, for example, Crain et al. (2005) used only one of the relational provocation scenarios from the Crick et al. (2002) study. Therefore, it is possible that some scenarios are more provocative than others and lead to greater hostile responding. Furthermore, different response formats have been employed; from forced-choice formats (mean or not mean) (Crick et al., 2002), to rating scales (Crain et al. 2005) and open-ended responses (MacBrayer et al., 2003).

Further explanations for the disparity in findings may be attributed to difficulties in assessment of SIP biases linked to relational provocations (Mikami et al, 2008). In a typical experimental paradigm, children are invited to give their interpretation of a protagonist's intention in a hypothetical vignette (Crick & Grotpeter, 1995). However, unlike overt aggression, relational aggression entails secretive, covert, subtle actions that the child may feel they need not disclose (Mikami, et al. 2008). Processes of metacognition ("I hold a negative belief about my peer but I should not report it") may also prevent the child from reporting negative attitudes toward others (Mikami et al. 2008). This is particularly true of adolescents who, like adults, learn to rationalise and neutralise their reported beliefs in order to promote social desirability (van de Mortel, 2008).

Further empirical investigations are required to evaluate the possible moderating effects of gender on SIP patterns and aggressive behaviour. Future research may also benefit from incorporating anonymity for the participant into the experimental design in order to promote the disclosure of the use secretive relationally aggressive tactics.

Evidence that Hostile Attribution Biases are a cause of Aggressive Behaviour

Whilst successive studies have shown associations between aggression and representations of others as hostile, the direction of effect is ambiguous. It is possible that processing patterns cause aggression. However, it is also possible that aggressive behaviour leads to a bias in attribution styles; and indeed the two hypotheses may not be mutually exclusive (Dodge, 2003). It is plausible that children who are aggressive, particularly to peers, become embroiled in unhelpful cycles whereby their aggressive behaviour leads to negative evaluations by others and aggressive retaliation. Thus, the child's database is updated with maladaptive interactions, which serve to heighten hypervigilance to hostile cues and hostile attribution biases; factors that are posited to be antecedents for aggressive behaviour (Crick & Dodge, 1994). One way of understanding the direction of effect is to examine patterns over time to look for causal relationships through longitudinal studies, as well as clinical interventions that target SIP in aggressive children.

Weiss et al. (1992), for example, used a longitudinal study design to assess 585 boys and girls, over a three year period. They found that measures of selective attention to relevant cues, hostile attribution biases, response generation, and response evaluation at time one, predicted growth in aggressive behaviour, as measured by teacher, parent and peer report, at time two. Further follow-up assessments of these children at ages 9 to 10 years (Dodge, Pettit, Bates, & Valente, 1995) and 15 to 16 years (Dodge, Crozier & Lansford, 2001) found that this effect continued to hold true. Further longitudinal studies have shown similar results (Burks, Laird, Dodge, Pettit, & Bates, 1999; Egan, Monson & Perry, 1998; Lansford, et al., 2006).

However, whilst these longitudinal studies have shown SIP patterns are predictive of future levels of aggression, it is also true that they account for only a modest portion of the variance. This suggests that other influences are associated with the development and stability of aggressive behaviour in children and adolescents (e.g. individual, familial and environmental factors). Furthermore, despite attempts to control for prior measures of aggression or other correlated factors, it is not possible to rule out the possibility that an unmeasured third variable (e.g. neural responding, biological emotion regulation) can account for all effects.

Another way of testing the theory that social-information processes play a causal role in the activation of aggressive behaviour is to implement treatment programs designed to change children's patterns of SIP (specifically hostile attribution biases) with the aim of reducing aggressive behaviour. Hudley and Graham (1993) used an experimental design to evaluate their 'BrainPower' intervention. One hundred and eight African-American boys aged between 8 and 11 years, comprising 72 aggressive (as rated by both teachers and peers) and 36 non-aggressive boys, were selected and randomly assigned to one of three groups; 'BrainPower' group, 'Academic Enrichment' group and a 'Control' group (where no special attention was given). The 'BrainPower' group was designed to change children's patterns of SIP in order to reduce aggressive responding with peers. The group based intervention consists of twelve, one hourly sessions, delivered by trained therapists twice weekly. Its aim was to promote an understanding that an attribution of accidental causes should be the preferred first option in the absence of clear evidence to the contrary. Non-aggressive children formed part of the intervention programme in order to provide alternative views to hypothetical situations. The 'Academic Enrichment' group received the same intensity of input however, the

children were taught critical thinking skills, primarily through science and social studies activities.

Pre- and post-comparisons showed that aggressive children in the 'BrainPower' program made fewer hostile attributions in ambiguous social scenarios on completion of the program. Indeed, their rating levels were comparable to that of non-aggressive boys. In comparison, aggressive boys in the 'Academic Enrichment' and 'Control' groups showed no decrease in hostile attribution bias and 12% of the children in these groups showed an increase in negative ratings. Teachers, blind to the intervention groups, rated the children's behaviour pre- and post-intervention. Only the 'BrainPower' group showed significant improvements in behaviour, compared to pre-intervention ratings. No detrimental effects were found on the non-aggressive children who took part in the intervention. The authors concluded that the 'BrainPower' intervention not only reduced attribution bias, but it also served to counteract a normative developmental increase in bias and aggressive behaviour amongst aggressive children, over a six week period.

However, using the same study design, with follow-ups one year later (Hudley et al., 1998), the 'BrainPower' group effects had diminished and teacher ratings of aggressive students as a group remained higher than those assigned to non-aggressive children. Comparisons of individual children's pre- and post-hostile attribution scores looked more promising in that a number of children had maintained improvements (Hudley, 2008). This finding suggests that interventions that do not address the wider environment in which children live (families, communities, peer groups, schools) may be of limited value, since improvements in SIP and aggressive behaviour are only sustained over a short period of time. Nevertheless, this well controlled study provides evidence to suggest SIP patterns are

associated with aggressive behaviour, and can be effectively targeted in an attempt to reduce aggression in middle childhood.

The Family and Schools Together (FAST) Track Program (CPPRG, 1999) is an example of a prevention intervention which does incorporate the family and wider community for children at risk of conduct problems. FAST is a comprehensive, multimodal, long-term, community-based, treatment program designed to target the specific processes implicated in the development of CD. It includes children's processing of social cues. Cognitive-behavioural skills training is used to target anger coping strategies, interpersonal problem-solving skills, and friendship skills, through didactic instruction and positive social experience. Participants for the intervention are recruited when the children enter school at age five. Outcome evaluations are promising, as children randomly assigned to this intervention showed lower levels of aggressive behaviour. Furthermore, structural equation modelling analyses have demonstrated that changes in children's attributions of hostile intent explain changes in behavioural outcomes (CPPRG, 2002). More recent outcome data have continued to support the Fast Track prevention program, with a twelve-year follow-up showing reduced use of general health and outpatient mental health services in adolescence (Jones, et al. 2010).

Although not conclusive, the evidence from longitudinal and intervention research suggests that hostile attribution bias precedes aggressive behaviour problems and that changing or preventing these biases results in behaviour improvements (CPPRG, 1992; Dodge, 2003). Over the last decade, research has begun to examine the factors that lead to the development of a bias towards attribution of hostile intent. Understanding the aetiology of this processing style will allow researchers and clinicians to intervene at a level that prevents deviant social

processing patterns developing in the first place, thus promoting the reduction of aggression in children.

Aetiology of Hostile Attribution Bias

Parental factors

Physical Maltreatment

The experience of physical maltreatment in early life has been found to be a major predictor of serious conduct problems in adolescence (Dodge, 2003; Finzi, Ram, Har-Even, Shnit & Weizman, 2001). It is suggested that maltreatment alters the way in which children process social information. Internal representations are proposed to become maladaptive; 'others' are viewed as hostile, unpredictable and threatening and children hold a poor self-concept, particularly in relation to their own comparison with others (Keil & Price, 2009). Consequently, the child's response in social interaction becomes maladaptive (Dodge, Bates, & Pettit, 1990; Weiss et al., 1992; Price & Glad, 2003). Therefore, biases in attribution style are viewed as mediators between the effects of early experience, and the development of aggressive behaviour (Dodge, 2003).

In support of this proposal, a number of studies have found that physically maltreated children are less attentive to social cues and show increased hostile attribution bias toward unfamiliar peers (Dodge et al., 1990; Weiss et al., 1992). In addition, they are less adept at providing solutions to interpersonal problems and show an increased tendency to generate aggressive responses (Dodge et al., 1990). Indeed, Weiss et al., (1992) showed the more severe the physical discipline the greater the impact on SIP steps. This result held when controlling for potential confounding influences of socio-economic status, child temperament and marital

violence (Weiss et al., 1992). Further studies have shown that the frequency, as opposed to intensity, of physical abuse is significantly related to maltreated boys' hostile attribution bias (Price & Glad, 2003). In addition, maltreated boys' hostile attributions of their mothers have been found to mediate associations between physical abuse and attributions of hostility to unfamiliar peers (Price & Glad, 2003).

The above observations are consistent with attachment theory, which argues that the social representations that children form through their interactions with their mothers (or caregivers) create the prototype for later relationships (Bowlby, 1980). However, while such an attributional style may be adaptive in the home setting for some children, it is likely that the general tendency to perceive others as hostile undermines their attempts at relationship formation and maintenance outside the home (Price & Glad, 2003).

Recently, investigations have been undertaken into how different types of maltreatment (neglect only, neglect plus physical maltreatment) impact on processing styles within specific social situations (Keil & Price, 2009). This research suggests that the attribution and evaluation steps of social information-processing may be especially sensitive to social context, whereas the encoding, problem solving, and enactment steps show relatively little variance across social domains. Specifically, physically maltreated children showed greater hostile processing styles and aggressive responding in peer-provocation situations than peer-group-entry scenarios, compared to neglected only children (Keil & Price, 2009). In contrast, peer-group-entry scenarios generated greater hostile processing and aggressive responding in neglected only children. These findings suggest that distinct processing profiles develop as a function of the type of maltreatment the child receives. Interventions to modify SIP patterns would benefit from considering the nature of

social situations likely to elicit hostile intent attributions as patterns may vary depending upon the context (Keil & Price, 2009).

Collectively, the research suggests that the experiences of maltreatment are related to SIP deficits, particularly hostile attribution bias. However, with the exception of Weiss et al.'s (1992) research, a major limitation of these studies is that maladaptive children are identified by social service agencies. Therefore, it is not clear that SIP patterns and high levels of aggressive behaviour reported in these children are directly due to the child's maltreatment or a consequence of being "in the system" and labelled "abused" (Dodge, 2003). Furthermore, children identified by social services as maltreated are typically exposed to more chronic or severe forms of abuse and they are often removed from their homes, sometimes on more than one occasion (Richardson & Lelliott, 2003). Out-of-home placements vary dramatically, from placements with an estranged biological parent to living in a group home. This variation makes compatibility with non-maltreated comparison groups who live with their own families problematic (Dodge, 2003).

Further research has used prospective longitudinal research designs to overcome this limitation. The Child Development Project (CDP), for example, identified children who experienced physical maltreatment by their parents, who were not registered as "at-risk" by social services (Lansford, et al., 2002). The authors found that those adolescents who were physically maltreated showed poor school attendance, higher levels of aggression, anxiety and depression, increased dissociative symptoms, post-traumatic stress disorder symptoms, social problems, cognitive deficits, and social withdrawal. The findings held after controlling for other risk factors associated with maltreatment, including poverty, single-parent status and family stressors. Exploring the SIP patterns in these children across time it was

established that early physical maltreatment was predictive of later hypervigilance to social cues, hostile attribution biases, aggressive response generation, and positive evaluations of the outcomes of aggressive behaviour (Dodge et al., 2001). A more recent study, examined antecedents and developmental outcomes associated with trajectories of mild and harsh parental physical discipline with the same sample. It found that children whose parents continued to use high levels of physical discipline in the early years showed the highest level of anti-social behaviour in adolescence (Lansford, et al., 2009).

The evidence suggests that early physical maltreatment by adults leads to the development of biased SIP patterns. Indeed, even harsh, punitive discipline (e.g., removal of toys, smacking), that does not reach the level of physical maltreatment, is found to predict increased levels of aggression in adolescence (Knutson, DeGarmo & Reid, 2004). This suggests that the child's internal working model of conflict and dominance, leads them to misinterpret the intentions of others, heightens their vigilance against aggression, and leads them to respond aggressively (Dodge et al., 2001). As others' react to their aggression negatively, this confirms their model of a hostile world. However, not all aggressive children who display a hostile attribution bias are physically maltreated as young children; this has lead researchers to ask what alternative mechanisms could promote deviant SIP styles.

Parental attribution styles

Empirical studies have tested the hypothesis that parental attributions may shape the development of equivalent social processing styles in their children (Dix & Lochman, 1990; Bickett, Milich and Brown, 1996). As described in social learning theories, children observe and model parental social responding (Bandura, Ross & Ross, 1961; Constanzo & Dix, 1983), which parents then reinforce or reward

(Bickett et al., 1996), thus creating a transmission effect of biased SIP styles. Equally, it is feasible that parents who hold a hostile attribution bias come to expect their relationship with their child to be difficult, and so respond with harsh parenting practices (Nix et al., 1999). A maladaptive cycle ensues whereby mothers' interpret and respond to their child's behaviour negatively, thus increasing the likelihood of an child's externalising behaviour, which then supports mother's initial hypothesis. In this way, mother's hostile attribution bias becomes a self-fulfilling prophecy (Nix et al. 1999).

Dix and Lochman (1990) tested the contention that hostile biases are present in mothers of aggressive boys by comparing their judgements of videotapes of children misbehaving with those of mothers of nonaggressive boys. It was found that mothers of aggressive boys made more negative attributions and reported stronger negative affect than comparison mothers. Mothers of aggressive children were also more likely to state that the child's actions were deliberate and reflected the child's negative personality type. Further research explored the possibility of transmission of attribution bias between mothers and their sons more directly, by comparing the interpretations of hypothetical situations of both mother and sons (Bickett et al., 1996). Mothers of aggressive boys were compared to mothers of nonaggressive boys. The mothers were asked to interpret hypothetical situations that involved themselves interacting with their own child, with a partner, and with an adult peer, as well as hypothetical situations involving their child in interaction with a classmate and with a teacher. The results highlighted that, across situations, mothers of aggressive boys were more likely to infer hostility than controls. The aggressive boys also showed the expected hostile attribution bias. However, no direct correlations were found between mothers' and sons' attributions. This result suggests that while similarities

exist between mothers' and their sons' atrributional styles, direct transmission effects are not supported.

The inability to find an association between mothers' and sons' attributions could, in part, be explained by limitations in research design. In particular, findings derived from social learning theory (Bandura et al., 1961) indicate that children imitate same-sex models more readily than opposite-sex models, but only mother-son dyads have typically been studied. In addition, studies have generally failed to include measures of processing relevant to relational aggression, meaning that female biased processing may not be adequately measured (MacBrayer et al., 2003). To explore the link between parental and child hostile attribution bias MacBrayer et al., (2003) examined mother-daughter and mother-son pairs (aged 8 – 12 years) using hypothetical scenarios that included both overt and relational provocation situations. A mixed gender sample of children diagnosed with externalising problems (ADHD, ODD, Bipolar), and their mothers, were recruited through child mental health services and compared to non-aggressive children and their mothers. As previous research indicated (see Orobio de Castro et al. 2002 for review), the aggressive children were found to make significantly more hostile attributions than comparison children. Mothers of aggressive children also made more hostile attributions than mothers of non-aggressive children, across interpersonal contexts. This finding suggest that mothers of aggressive children have biased attributions styles that generalise to a number of social contexts and are not specific to their antagonistic relationship with their own child. No correlations were found between mothers and sons attributions to provocation situations; however, attributions for mothers and their daughters were significantly correlated. These results provide some support for

an intergenerational transmission of attribution bias from mothers to daughters, which fit the social learning theory model of modelling along same gender lines.

However, this study may be confounded by the use of children from a clinical setting. It is important to consider the impact of child behaviour on mothers of children who display externalising behaviours of the severity that warrant diagnosis. Continued negative feedback from others about their child's behaviour may promote a generalised hostile attribution bias. Prospective studies that follow individuals into parenthood would allow a more detailed exploration of how attribution styles might change as a function of having an aggressive child.

More recently, research has been extended to include mothers and fathers of children from community samples (Halligan et al., 2007; Nelson et al., 2008). In an examination of young children (aged 5 to 7 years), Halligan et al. (2007) showed that child aggression was positively associated with the child's tendency to attribute hostility in the intentions of others and to generate aggressive solutions. Parents of this sample also showed high hostile attribution bias in ambiguous imaginary scenarios and specifically in situations involving their children. Further, regression analyses indicated that parental attributions made to the child, were best accounted for by measures of pre-existing parental bias, rather than the child's problematic behaviours. However, no direct associations were found between parental and child attributions of hostile intent.

In a study of slightly older children (aged 8 to 9 years), examination of transmission effects of intent attributions between parents and their children showed mothers', but not fathers', social cognition was associated with children's attributions of intent, but not with their children's behaviour. However, fathers' intent attributions were associated with children's use of relational aggression

(Nelson et al. 2008). Findings from this research suggest that parental attribution styles impact on their children. However, it would appear that mothers and fathers contribute to their child's intent attributions and aggressive behaviour in unique ways. This research suggests that children learn their mother's attribution style. Perhaps through didactic instruction and modelling of interpretation processes, children are taught benign attributions and come to learn that some provocations are *not* hostile. This idea fits with ethological concepts which suggest that aggression and its cognitive correlates are universal to all species and therefore must be unlearned or controlled through development (Dodge, 2006). The finding that fathers influence their children's relational aggression, (which is more instrumental in nature and therefore more likely to be learned), indicates that they demonstrate more relationally aggressive tactics more frequently than mothers (Nelson et al., 2008).

In sum, transmission of attribution styles from parents to children is not yet fully understood, particularly the mechanism within which it takes place. Some of the literature reviewed here supports a social learning model, whereby children learn to attribute the intentions of others through observations of their parents (MacBrayer et al., 2003; Nelson, et al., 2008), however, these findings have not been replicated in all studies (Bickett et al 1996; Halligan, et al., 2007). Further research is required to delineate the nature of the relationship between parental and child attribution styles. Nonetheless, it seems reasonable to assume that parents can influence their children's intent attributions and aggressive behaviour and therefore intervention programs, which include opportunities for parents to learn how to promote children's adaptive attributions of intent would be beneficial.

Peer factors

While families are seen to be primarily responsible for socialising children (Bronfenbrenner, 1979), extant research suggests that peers also play an important role in the development of aggressive behaviour and the associated social-cognitive correlates (see Coie & Dodge, 1998, for a review, Dodge et al , 2003). Two possible pathways are proposed; peer rejection and anti-social peer involvement.

Peer Rejection

Research has found that the experience of early peer rejection predicts later growth in aggressive behaviour, even after controlling for the effects of earlier aggressiveness, (Dodge et al. 2003; Coie, Lochman, Terry, & Hyman, 1992; CPPRG, 2004). Two theories are posited for the enduring adverse effects of peer rejection.

First, all humans are proposed to be innately motivated to form long-term, positive and significant interpersonal relationships. This need for union is met through frequent, warm interactions in a reciprocated relationship in which there is emotional concern for each other (Baumeister & Leary, 1995). When this need for union is not met, the child experiences a negative affect (loneliness, jealousy, low-self esteem, anger) or emotional-dysregulation, which may dispose him or her to become defensive, hypervigilant to hostile cues and attribute hostile intent in others (Coie, 2004). It is argued that over time, this attribution style generalises to all social interactions and promotes an escalating cycle of aggression, rejection and retaliation (Coie, 2004). Dodge et al. (2003) suggested that this hostile environment, within which the child must interact, would represent a chronically stressful experience, much like the loss of a parent.

A second theory proposed is that a rejected child has fewer opportunities for social growth and development of social-cognitive skills (Kupersmidt, Coie, & Dodge, 1990). Peer acceptance serves as a protective factor for aggression. Extensive research suggests that skills of cooperation, empathy, perspective taking, intention-cue detection, social problem solving, and response evaluation, develop through interactions with an accepting peer group (Coie, 2004). Those children, who receive positive social feedback from their peers, are found to learn to develop emotion-regulation skills and adaptive interpersonal behaviours, thus attenuating or arresting the trajectories towards maladaptive behaviour (Coie & Dodge, 1998). Further research has shown that support from an accepting peer group facilitates the management of distress and regulation of negative affect (Bierman, 2004; Coie, 1990).

Dodge and colleagues (Dodge et al., 2003) investigated the role of social information processing as a mediator of the link between peer rejection and aggression. Using the Social Development Project, which followed 259 boys and girls across six time periods from age 6 to 12 years, it was shown that children who were socially rejected by their peers in kindergarten had concurrent teacher reported aggression scores three times higher than those of non-rejected children. Moreover, those children who were rejected over more than one school year, showed an accumulative effect; they received aggression scores almost four times higher than children who had never been rejected. Furthermore, measures of peer rejection in Year 1 (5- to 6-year olds) significantly correlated with three SIP steps; encoding, attributions and response evaluation, measured at Year 4 (8-9 year olds). Analysis showed that peer rejection predicted growth in biased SIP patterns from kindergarten to Year 4. Teacher reports of aggression in Year 5 also correlated with Year 4 SIP

patterns, even after controlling for early teacher-rated aggression. Using a mediation model the authors identified that 39% of the total effect of early peer rejection on later aggressive behaviour was accounted for by the development of biased SIP patterns. Using a larger sample (585 children) from the Child Development Project these findings were replicated, although to a lesser degree (16% the rejection effect explained) (Dodge, et al., 2003).

The authors concluded that biased SIP patterns grow out of the experience of social rejection by peers, and partially mediate the effects of peer rejection and aggressive behaviour. What remains unclear is whether rejected children fail to learn social-information skills that serve to protect against later maladaptive behaviour, or whether social rejection by peers acts as a social stressor that increases hostile attribution bias and the tendency to react aggressively. Either way, children's status within the peer group promotes the development of hostile attribution bias and aggressive behaviour. Therefore, developing interventions to support children by improving social skills to promote acceptance by their peer group are warranted. However, SIP patterns explain only a modest portion of the variance in the aggression/rejection association, future research that improves on the conceptualisation and measurement of biased SIP patterns may help to account for a greater portion of the variance or allow researchers to identify further relevant factors (Dodge, et al. 2003).

Anti-social peer involvement.

Studies of peer influence have long established that there is a strong association between children and adolescent's attitudes and behaviour and the attitudes and behaviours of their peers (Prinstein & Dodge, 2008; Thornberry &

Krohn, 1997). Two prominent explanations are posited to explain these findings: selection and socialisation effects.

Selection effects

Selection effects (Kandal, 1978) refer to the tendency of children and adolescents to choose to affiliate with peers who exhibit similar attitudes or behaviours as their own. It assumes that individuals with similar attitudes and behaviours are attracted to each other (Hartup, 1996). This similarity allows peers to establish a common purpose and shared experience to create and maintain their friendship (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988). Aggressive children are not different from non-aggressive children in this respect. For example, research into aggressive children's socialisation shows that children like, and are liked, by others with similar levels of aggression (Nangle, Erdley, & Gold, 1996), even as early as preschool (Snyder, Horsch & Childs, 1997) and they are likely to share pre-existing levels of aggression even before a friendship is formed (Poulin & Boivin, 2000). Furthermore, aggressive children show considerable overlap in normative beliefs about aggression (Huesmann & Guerra, 1997). The propensity for an aggressive child to seek out equally aggressive peers for social interaction is likely exacerbated by the fact that socially appropriate peers may reject the aggressive child (Coie, 2004).

Overall, research findings suggest that despite being less popular with the wider peer group, aggressive children (like non-aggressive children) can create and maintain relationships that are meaningful and reciprocal (Cairns, et al., 1988) and that by early adolescence, deviant peer networks are well established (Dishion, Andrews & Crosby, 1995). Conversely, with age, both physically and relationally aggressive adolescents show an increase in perceived popularity and higher social

prominence within the community (Cillessen & Mayeux, 2004; Vitaro, Brendgen & Wanner, 2005).

Socialisation effects

An alternative explanation for peer influence on the development of aggressive behaviour and the associated social-cognitive correlates is socialisation. That is, children are considered to become more similar to their friends over time, as the result of the influence operating within their friendship groups (Dishion et al., 1995). This effect is of particular importance during adolescence, when there is a strong desire to be similar to one's peers (Pakaslahti, 2000).

Several studies have shown that association with deviant peers amplifies or exacerbates aggressive children's pre-existing levels of aggression (Werner & Crick, 2004); a form of iatrogenic effect recently termed 'peer contagion' (Dishion & Dodge, 2005, p. 395). For example, Laird and colleagues explored the pathways to externalising behaviours and found that affiliation with anti-social peers maintains early-onset maladaptive behaviour, and promotes the development of late-onset aggression and delinquent behaviour (Laird, Jordan, Dodge, Pettit & Bates, 2001; see also Werner & Crick, 2004). Moreover, a further study to test the generalisability of these findings demonstrated that deviant peer affiliation was a risk factor for girls as well as boys, and African American and European American children alike (Laird, Pettit, Dodge & Bates, 2005). These findings are not restricted to children who only display overt aggression: cross-sectional and longitudinal research has demonstrated that relationally aggressive children are more likely to have maladaptive peer relations (Crick, Casas & Ku, 1999; Werner & Crick, 2004).

This research helps to clarify the effects of peer relationships and the development of aggression in adolescents in both girls and boys. This understanding is important if intervention programmes are to be developed that aim to reduce aggression in children. The mechanisms associated with early-onset aggressive behaviour, such as family processes, are likely to be different from those involved in late-onset aggression, for which anti-social peer affiliation is a significant risk factor (Patterson & Yoerger, 2002; Moffit, 1993). Interventions designed to target these independent but related effects are likely to be most beneficial.

Currently, there are no investigations into peer contagion effects of social-cognitive patterns between aggressive children and their peers. However, research into the extrinsic and intrinsic mechanisms for contagion effects on aggression, and the moderators and mediators of these effects, may provide direction for future research into peer contagion of SIP styles.

Mechanisms of contagion effects

It is assumed that peers exert their influence through modelling processes, behaviour reinforcement, active coercion, or by providing opportunities to engage in delinquent behaviour (Dishion, Patterson & Griesler, 1994; Dishion et al., 1995). Research has begun to identify and describe the processes by which peer influence might occur during the course of interactions between delinquent children and adolescents. Dishion, Spracklen, Andrews and Patterson (1996), for example, demonstrated the effect of peer reinforcement (through positive affective responses) on deviant conversation. Controls were found to react more positively to discussions of socially appropriate behaviour, whereas delinquent male adolescents were shown to display positive affect (laughter) in dyadic discussions of anti-social behaviour. Moreover, the relative rate at which deviant peers reinforced each other was directly

related to the rate and duration of these deviant conversations. Deviant male dyads were shown to engage in up to four times the amount of rule-breaking talk than controls. Follow-up analysis over two years revealed that the mean duration of "deviant talk", combined with observer ratings of endorsement of substance use and anti-social behaviour and time spent with the adolescent's friend, predicted increases in self-reported delinquent behaviour, even after controlling for prior levels of delinquency. A follow-up study, to explore the 'attractiveness' of "deviant talk" (as measured by the peer's proclivity to return to deviant topics as their interactions unfolded) was conducted. Results indicated that the length of time spent discussing deviant topics was predictive of objective measures of future serious anti-social behaviour (school expulsion and drug abuse), even after controlling for prior anti-social behaviour, family coercion and deviant peer associations (Granic & Dishion, 2003).

This body of research suggests that one important extrinsic mechanism in the development of serious anti-social behaviour is the process by which adolescents reinforce and become increasingly engaged in "deviant talk". This form of delinquency training is also implicated in aggression toward female partners among boys and young men (Capaldi, Dishion, Stoolmiller, & Yoerger, 2001) and serious adolescent violence (Dishion, Eddy, Haas, & Spracklen, 1997). Furthermore, the predictive validity of longer "deviant talk" bouts has been established in females. Average duration of talk bouts at ages 16 and 17 years were predictive of anti-social behaviour, drug use and having more sexual partners at age 18 to 19 years, after controlling for the stability of aggression, in both males and females (Piehler & Dishion, 2007; Dishion, Piehler, & Myers, 2008).

Mediators and moderators of contagion effects.

Further research has explored factors that may mediate or moderate the effects of peer contagion on adolescents and children. For example, Adams, Bukowski and Bagwell's (2005) longitudinal study of a community sample of children in early adolescence, compared levels of aggression and friendship type over a six month period. The child's level of aggression, nominated best friend's level of aggression, and friendship style (reciprocated / unreciprocated) were measured at time one and compared to time two. Analyses showed that changes in the child's level of aggression were greatest in those children who were in unreciprocated friendships with an aggressive child. This finding supports socialisation effects and suggests that children in unreciprocated friendships are more motivated than children who are in reciprocated friendships to take on the characteristics of their desired friend, and thus more susceptible to contagion effects. The authors explained these findings as a condition of disequilibrium; an internal state associated with the perception of current functioning as discrepant from a desired state; in this case friendlessness to one of friendship.

Implications for interventions

It has been suggested that failure to structure group-based interventions such that they reduce opportunities for aggressive adolescents to converse, may exacerbate the problems they intend to treat by encouraging the formation of close friendships centred on anti-social and aggressive behaviour (Dishion, McCord, & Poulin, 1999; Dodge, Lansford & Dishion, 2006; Dodge & Sherrill, 2006). Research into the mechanisms of deviant peer influence would support this conjecture. Several studies

involving randomised selected prevention trials (see Gifford-Smith, Dodge, Dishion, & McCord, 2005 for review) have found possible peer contagion effects which serve to undermine or moderate reductions in aggressive behaviour (Boxer, Guerra, Huesman, & Morales, 2005; Mager, Milich, Harris, & Howard, 2005). Indeed, research with young children on The Fast Track intervention, which aims to prevent serious anti-social behaviour and related adolescent problems, found that, compared to pre-intervention measures, children showed increased levels of teacher-reported and peer-nominated aggression when a child's in-session disruptive behaviour was reinforced by his or her peer (Lavallee, Bierman, Nix, & The Conduct Problems Prevention Research Group, 2005).

Summary of Peer Influence

The search for mechanisms that account for peer influence in aggression is still in its infancy. Examples from both clinical and community populations indicate that aggressive children select friends who display similar attitudes and behaviour as their own and they can socialise peers into maladaptive conduct through behaviour reinforcement (e.g., Dishion et al., 1996). However, currently, there is no evidence to suggest that the intention to attribute hostility to others can develop through association with peers who hold a hostile attribution bias (Pakaslahti, 2000). It seems likely that, just as peers are able to influence children's and adolescents' levels of aggression, social-cognitive patterns may be susceptible to contagion effects. Evidence from studies on adolescent depressogenic attributional styles would lend credence to this hypothesis.

Research into the development of depressogenic attributional styles supports the contention that depressive cognitions are also transmitted within significant interpersonal relationships. Both processes of selection and socialisation appear to be

in play. For example, a number of adults studies have revealed that depressed individuals are particularly likely to select others as friends if they are also depressed (Rosenblatt & Greenberg, 1988; 1991). Similarly, in an adolescent sample, Hogue and Steinberg (1995) found that adolescents tended to choose friends with similar levels of internalised distress, and that distress levels became increasingly similar to that of peers over time; this effect was greater in males than in females. Likewise, Stevens and Prinstein (2005), used a prospective longitudinal design and demonstrated that a friend's severity of depression at time one was predictive of adolescents' own depressive symptoms and depressogenic cognitions at time two, even after controlling for adolescents' initial levels of attributional style and the effects of adolescents' own depressive symptoms. This relationship was greater in reciprocal friendships. While this study does not make claim that friend's depressogenic attribution style and depressive symptoms cause the onset of depression in their friends, the findings do suggest that a socialization effect between friends over time serves to maintain and exacerbate adolescents' tendencies towards depression.

Future research into the effects on hostile attributional style may reveal similar findings and could go some way to explain the maintenance and exacerbation of aggression in children and adolescents. This research would be an important addition to the understanding of the development of hostile attribution bias. If it were established that peers are able to influence each other's attribution style, social-cognitive intervention programmes could be designed to include opportunities for children to learn from non-aggressive peers who hold an alternative social-information style (Hudley, 2008). This approach is likely to be more effective than attempts to target adolescents' attitudes directly. Opportunities to interact with non-

aggressive peers are also beneficial. Non-aggressive children are able to reappraise their aggressive peers as they work towards changing their attitudes, beliefs and behaviours (Bierman, 2004). In this way, interventions work beyond the clinic room.

Methodological considerations

In the studies reviewed here, assessments of children's attribution style have most commonly used hypothetical situation interviews or questionnaires. Support for the ecological validity of this assessment method is found in Steinberg and Dodge's (1983) research. Young boys and girls were invited to work in same-sex pairs to construct a block tower, in order to win a prize. However, the children were intentionally distracted and when they returned to the towers they found them damaged. The children were asked individually to describe why they thought the damage had happened. Just as in hypothetical scenarios, those children rated as high aggressors by their teachers were more likely to attribute the event to the hostile behaviour of peers (compared to non-aggressive children) (Steinberg & Dodge, 1983).

However, the window on SIP deficits is the child's verbal response to hypothetical scenarios, which represents "the output of SIP rather than SIP action per se" (Dodge, 2003. p 270). As children reach adolescence, this output will always be susceptible to rationalisation and neutralisation effects that promote social desirability. Future experimental designs would benefit from employing methods in which the child can become anonymous, thus allowing more freedom to express their views, hostile or otherwise.

Similarly, although prior work has offered important evidence to suggest that peers and parents may be implicated in the development of children's hostile

attribution bias, much of this work is methodologically limited. Studies of both peer and parental influence rely on correlational analysis, and despite the increased analytical sophistication of these investigations (longitudinal studies and growth trajectories), it is not possible to draw causal conclusions. Experimental designs are required in order to assess the influence of peers and parents on children and adolescent's SIP styles.

Recently, Cohen and Prinstein (2006), used a novel experimental design, to investigate the causal models of peer contagion on aggression and health risk behaviour. Adolescent males with moderate sociometric peer status were invited to participate in a chat-room discussion with e-confederates whom the participants were led to believe were either high or low in peer status. In reality, the participants were viewing responses created by the experimenters to hypothetical scenarios. Baseline measures of previous engagement in aggression/risk behaviours were compared to those endorsed by the participants in the two conditions. Analysis revealed that adolescents displayed more public conformity, internalisation of aggressive/health risk attitudes, and a greater propensity to exclusionary behaviour when (ostensibly) in the company of high status peers. In addition, participants' level of social anxiety moderated contagion effects; non-socially anxious participants conformed only to high-status peers, whereas socially anxious participants conformed to low-status peers. This study was the first to demonstrate the causal role of peer status and provided data consistent with theories of socialisation effects. Moreover, social anxiety and sociometric status were identified as moderators on contagion effects. Similar designs may prove helpful in the study of contagion effects on hostile attribution bias.

Conclusions and Implications for Future Research

The Crick and Dodge (1994) SIP model has added much to the understanding of aggression in adolescents and children. Research has found a robust association between hostile attribution bias and aggression (Orobio de Castro et al., 2002). Moreover, the literature reviewed here largely supports the conjecture that both parents and peers contribute to the development of a hostile attribution bias in the social information-processing of aggressive children.

Parental physical maltreatment has been found to alter the way in which children process social information, such that internal representations become maladaptive and lead to aggressive responding in the child (e.g. Dodge et al., 1990; Weiss et al., 1992; Price & Glad, 2003). In this respect, biases in attribution style mediate the effects of early experience, and development of aggressive behaviour (Dodge, 2003). There is also evidence to suggest that parents may transmit their own SIP style to their children (MacBrayer et al., 2003; Nelson et al., 2008). Similarly, biased SIP patterns are associated with the experience of early social rejection by peers, which then partially mediate the effects of peer rejection on aggressive behaviour (Dodge, et al., 2003). Further evidence demonstrates that aggressive children can socialise their peers into externalising behaviour (Laird et al., 2001; 2005). What remains unclear is whether the intention to attribute hostility to others can develop through association with peers who hold a hostile attribution bias.

Despite the empirical evidence to support the finding that aggressive children and adolescents have maladaptive social information-processing patterns, statistically significant findings do not account for all the variance in aggressive behaviour or all

the effects of adverse life experiences; indeed, effect sizes remain relatively small (Dodge, 2003). This suggests that more comprehensive models of childhood aggression are warranted; these might include environmental and social factors such as public-labelling effects and increased segregation of aggressive children in educational settings. Furthermore, there is still much to learn about how parents and peers contribute to the development of hostile attribution bias.

Finally, research into hostile attribution bias and aggression has focused on risk and relatively little appears to be known about protective factors. Therefore, research to further our understanding of how protective factors moderate risk would be justified. This research agenda should include an examination of the effects of gender as it is important to learn whether protective factors are as equally influential for boys and girls. It seems likely that one positive relationship with a non-aggressive peer would help encourage pro-social behaviour and modulate hostile attribution bias (Dodge et al., 2003). Research that makes clear the mechanisms and processes by which this reduction in aggression and aggressive cognitive styles takes place will provide the information required to develop effective protocols for treatment and inform service provision. By attending to and studying both risk and protective factors we increase our understanding of the development of maladaptive social-cognition and aggression and establish effective prevention and intervention methods to deter it.

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Empirical Paper

Hostile Attribution Biases in Adolescence: Are they Contagious?

Developmental Psychology was used as a guide in determining the preparation of this paper. See Appendix 2 for notes to contributors.

Abstract

Aggressive behaviours in children and adolescents are associated with a bias towards attributing hostile intent to others (Crick& Dodge, 1994). The current study examined whether the tendency towards attributing hostile intent is contagious amongst adolescents in a community sample of boys and girls (13 – 14 years old), using a computerised 'Chat-room' experimental paradigm. Adolescents (N = 134) were randomly assigned to one of two experimentally manipulated conditions and were led to believe they were communicating with students from other schools (i.e., 'e-confederates') who endorsed either hostile (condition one) or benign intent (condition two) attributions. Four possible moderators of peer contagion were tested; gender, dispositional levels of social anxiety, baseline levels of aggression and friendship styles (reciprocated/unreciprocated). Contagion effects were demonstrated across conditions with adjustment in individual attribution scores occurring in response to both benign and hostile "peer group" conditions, although the latter appeared to be more potent. Furthermore, adolescent's dispositional levels of social anxiety moderated peer contagion; socially anxious adolescents showed fewer contagion effects, specifically in response to hostile peer attributions. The present study offers preliminary evidence for conditions that may moderate adolescents' susceptibility to peer contagion effects in the development of a hostile attribution bias.

Introduction

Extant research has demonstrated the utility of cognitive models in explaining the development and maintenance of aggressive behaviour problems in children and adolescents (e.g., Crick & Dodge, 1994; Huesmann, 1988). Social-Information Processing (SIP) theory (Crick & Dodge, 1994) is one of the most influential of these models. SIP theory, proposes that when faced with a social situation, children and adolescents engage in five mental stages that lead to the generation of a behavioural response: the encoding of external and internal cues, interpretation and mental representation of those cues, clarifying or selecting a goal, accessing or constructing responses, and deciding on a response (Crick & Dodge, 1994). Over 100 experimental studies have identified reliable correlations between deficiencies in the encoding and interpretation of cues and aggressive behaviour in children and adolescents (Dodge, 2006). Specifically, aggressive children show a bias towards attributing hostile intent to the actions of others, when faced with ambiguous provocation situations (see Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002 for meta-analysis).

In view of the robust relationship between a hostile attribution bias and aggression, the processes and cognitive mechanisms that underpin the development of a child's SIP style are of significant interest. The SIP model proposes that children come to new social situations with a set of biologically limited capabilities (e.g., maturation, temperament, attention, persistence; Pakaslahti, 2000) and a "database" of memories of experience on which to base their interpretations. The "database" is thought to evolve from prior social experiences with both family and peers and the related schemas that grow out of their experience (Crick & Dodge, 1994). While

families are seen to be primarily responsible for socialising young children (Bronfenbrenner, 1979), research suggests that peers may also play an increasingly important role in the emergence of aggressive behaviour and associated social-cognitive correlates as children go through development (see Coie & Dodge, 1997, for a review, Dodge et al , 2003).

Studies of peer influence have established that there is a strong association between children's attitudes and behaviour with those of their peers, particularly in adolescence (Prinstein & Dodge, 2008; Thornberry & Krohn, 1997). Two explanations are offered to account for this effect; selection and socialisation (Prinstein & Dodge, 2008). Children and adolescents are suggested to select friends who share similar attitudes and behaviours with their own (Kandal, 1978). Through socialisation, children are argued to become more similar to their friends over time, as the result of influences operating within friendship groups (Dishion, Andrews, & Crosby, 1995).

Several studies have shown that association with deviant peers amplifies aggressive children's pre-existing levels of aggression (Werner & Crick, 2004). Moreover, affiliation with anti-social peers is a significant risk factor for the development of late-onset aggression and delinquent behaviour (Laird, Jordan, Dodge, Pettit & Bates, 2001; Moffit, 1993; Werner & Crick, 2004), an effect has recently been termed 'peer contagion' (Cohen & Prinstein, 2006; Dishion & Dodge, 2005). Evidence suggests that peers exert their influence through modelling processes, behaviour reinforcement, active coercion and by providing opportunities to engage in delinquent behaviour (Dishion, Patterson & Griesler, 1994; Dishion et al., 1995).

While much of this research is limited by correlational design, one study has demonstrated the causal role of peer contagion on aggression and health risk behaviour in adolescent males, highlighting the processes that moderate socialisation effects. Cohen and Prinstein (2006) explored the role of peer influence on public conformity to aggressive/risk attitudes, private acceptance of aggressive/risk attitudes and actual aggressive behaviour. Here, they asked adolescents males with moderate sociometric peer status to take part in a 'Chat-room' discussion with e-confederates whom the participants believed were either high or low in peer status. In reality, the participants were viewing responses created by the experimenters to hypothetical scenarios. Baseline measures of previous engagement in aggression/risk behaviours were compared to similar behaviours endorsed by the participants in the two conditions.

The results showed that adolescents displayed more public conformity (i.e., changed their public response to a more aggressive/risky response in line with the group norm); greater internalisation of aggressive/health risk attitudes (i.e., continued to endorse aggressive/health risk behaviours in a private session post 'Chat-room' discussion); and a greater propensity to exclusionary behaviour (excluding e-confederates from 'Chat-room'), when in the company of high status peers. Furthermore, participant's levels of social anxiety were found to moderate contagion effects, where non-socially anxious participants conformed to high-status peers and socially anxious participants were influenced by low-status peers. The findings are consistent with socialisation effects and highlight one of the conditions in which conformity occurs, to promote status within the peer hierarchy. Such observations are consistent with social-psychological models of conformity which suggest that conformity comes from a desire to fit in with social norms and the

perceived social rewards that follow from emulating those attitudes and behaviours (Bandura, 1973; Fishbein & Azjen, 1975).

Further work has looked at the role of contagion on cognition. Evidence from studies on adolescent depressogenic attributional styles has found that depressive cognitions can be transmitted within adolescent close friendships (Hogue & Steinberg, 1995; Stevens & Prinstien, 2005). Using a prospective longitudinal design it was demonstrated that a friend's severity of depression at time one was predictive of an adolescents' own depressive symptoms and depressogenic cognitions at time two, even after controlling for their initial levels of attributional style and the effects of adolescents' own depressive symptoms.

Taken together, this literature suggests that peers are able to influence children and adolescents' behaviour and that attributional styles are also susceptible to peer contagion effects. However, the effects of peer contagion on the social-cognitive correlates of aggression have not been tested. The present study aims to investigate whether social information-processing styles, specifically hostile attribution biases, are contagious amongst adolescent peers using an experimental design to test causal relationships. In principle, hostile attribution biases may be acquired through peer modelling; either by direct expression of malign intent or by displaying behaviour consistent with hostile interpretations. Equally, children who share similar hostile intent attributions may serve to reinforce maladaptive social-information processing styles in one another (Halligan & Philips, in press).

The current investigation is guided by the theoretical assumption that peer contagion arises from adolescents' motivation to conform to the peer group by adopting or reinforcing group norms. Individual differences are likely to moderate

the effects of peer influence on social-cognitive patterns. Therefore, as a secondary objective, the present study examines four possible moderators of peer contagion effects; gender, dispositional levels of social anxiety, pre-existing levels of aggression and friendship styles.

Evidence suggests that gender may serve to moderate contagion effects. In a meta-analysis of Asch's line judgement task, a robust association was found between higher levels of conformity and female respondents (Bond & Smith, 1996). Consistent with these findings, a more recent study has shown that female attitudes show greater change following group discussions as compared to changes following didactic instruction. In contrast, male adolescents used informational rather than normative influence (Werner, Sansone & Brown, 2008). Moreover, research has found that females show greater conformity when their actions are observed by members of the group (Eagly, Wood & Fishbaugh, 1981). The tendency of females to be more influenced by others opinions, as compared to males, is thought to be related to an increased proclivity to pro-social behaviour in females (Eagly, 1987) and a desire to stay close to the group (Eckel & Grossman, 1998).

Research has also shown that social anxiety leads to greater contagion effects amongst adolescent males' in the context of sociometric status. Specifically, socially anxious adolescents publically conformed to the endorsement of aggressive and health-risk behaviours in a low-status peer condition (Cohen & Prinstein, 2006). Socially anxious individuals have a marked and persistent fear of social performance and are particularly fearful of negative evaluation by others (*DSM-IV-TR*; 2000); therefore public conformity is perhaps not surprising in the context of a chat-room forum where adolescents are exposed to the potential judgement of others. Typically,

individuals with social phobia believe that they will act in a way that will be embarrassing or humiliating which will lead to them become socially rejected (La Greca, 1999). Therefore, in public response situations it is expected that the socially anxious adolescent will be keen to conform to the group norm and will thus show greater contagion effects.

A third moderator on contagion effects considered here is pre-existing levels of aggression. Previous research has shown that individuals with low levels of aggression remain fairly stable across time and show little or no contagion of aggression, even where relationship type (un/reciprocated) and friend's level of aggression are considered (Adams, Bukowski & Bagwell, 2005). However, individuals with high levels of aggression show large variability depending on the types of relationship they have and their friend's level of aggression. Aggression is shown to thrive in certain contexts, where both the child and their friend are aggressive (Adams et al., 2005). Furthermore, group discussions with family members have been shown to enhance pre-existing social problem solving tendencies in both anxious and aggressive children; with anxious children showing an increase in avoidant solutions and oppositional children an increase in aggressive solutions (Barrett, Rapee, Dadds, & Ryan, 1996). These findings suggest that children are susceptible to contagion effects on information processing styles through the process of family discussions, with pre-existing biases being particularly enhanced.

The present study also explores the moderating effects of friendship styles on contagion of attribution styles. Relationship styles are likely to be an important factor in moderating the effects of peer influence on adolescents (Brown, Bakken, Ameringer & Mahon, 2008). Previous research has found that children in an

unreciprocated friendship with a desired aggressive peer show greater contagion effects as compared to children in reciprocated friendships (Adam, et al., 2005). Unreciprocated friendships encouraged children and adolescents to take on the attributes and behaviours of a peer with whom they would like to be a friend in order to facilitate the development of a friendship (Bukowski, Velasquez & Brendgen, 2008).

We developed an experimental paradigm based on a design used in prior research (Cohen & Prinstein, 2006) to examine socialisation of hostile attribution bias in a community sample of adolescent boys and girls. This age group was selected since evidence suggests that social cognition becomes more strongly connected with actual behaviour as children develop (Davis-Kean et al., 1997) and peer influence peaks in early- to mid-adolescence (Brown, et al., 2008). Adolescents responded to ambiguous vignettes both 'Alone' and in a computerised 'Chat-room'. The latter condition was experimentally manipulated so that other respondents in the 'Chat-room' modelled either benign or hostile problem solving to vignettes. Adolescent hostile attributions were coded, and the following hypotheses were examined.

1) A positive association will be found between hostile attribution bias and aggression in adolescents. Specifically, participants who score high on a measure of aggression will be more likely to attribute hostile intent to others in ambiguous provocation situations than participants who score low on a measure of aggression. 2) Transmission of social information processing styles will occur in adolescents during a 'Chat-room' discussion, with e-confederates with benign attribution styles serving to attenuate the hostile

attributions of participants; and e-confederates with hostile attribution style increasing the hostile responding of participants.

3) Gender will moderate effects, with girls showing greater contagion effects than boys.

4) Social anxiety will moderate contagion effects with higher levels of social anxiety being associated with greater contagion effects.

5) Aggression will moderate contagion effects with adolescents high in aggression showing greater contagion effects, specifically in the hostile condition.

6) Friendship style will moderate contagion effects with adolescents in unreciprocated friendships showing greater contagion effects than adolescents in reciprocated friendships.

Method

Overview of Design

Associations between hostile attribution bias and aggression were tested by comparing the attribution scores of adolescents when responding to ambiguous social vignettes privately ('Alone' condition) with two measures of aggression. A mixed experimental design was used to test causal models of peer contagion. Hostile attribution scores in the 'Alone' condition (time one) were compared to hostile attribution scores in the 'Chat-room' condition (time two) to test for contagion effects. Adolescents were randomly assigned to either hostile or benign 'Chat-room' groups. Four possible moderators of peer contagion were tested; gender,

dispositional levels of social anxiety, pre-existing levels of aggression and friendship styles (reciprocated/unreciprocated).

Participants

Participants were recruited from a local secondary school. One hundred and fifty six adolescents were invited to take part in the study, three declined, twelve were absent, and seven adolescents failed to complete the study, leaving a sample of 134 adolescents (Mean age = 13.78 years, range 13.27 to 14.27 years; 66 girls and 68 boys). Passive parental consent and student assent were obtained (see appendices 6 & 7). Those recruited were primarily white Caucasian, English-speaking children (93.3%; Black and Minority Ethnic 6.7%). According to government data (National Statistics Online, 2007) the sample was located in a middle-income socioeconomic status bracket (reported average annual incomes of £37,440). School records indicated that 4.5% of students were eligible for free school meals.

Measures

This study was conducted using on-line questionnaires which comprised of five main measures: friendship selection, attributional style, self-report aggression, self-report relational aggression, and social anxiety (see below). Demographic information (gender, age and ethnicity) was also gathered. The experimental paradigm was designed to simulate an Internet-like 'Chat-room' named 'Southampton University WebChat'.

Friendship Nomination Measure

A friendship nomination measure was used to assess adolescents' participation in friendships within their year group. Adolescents were asked to nominate three peers from the year list with whom they were close friends. Adolescents were considered to be involved in a reciprocated friendship if any of the peers they nominated as a close friend also nominated them (Ladd, Kochenderfer, & Coleman, 1997). The reliability and validity of this measure have been established in past research (Ladd, 2005).

Hostile Attributional Style

Adolescents were asked to respond to 30 hypothetical ambiguous scenarios by typing their views on a laptop computer. Half the vignettes were presented in the 'Alone' condition and half in the 'Chat-room' condition, counterbalanced across time and condition to prevent vignette effects across the sample. Vignettes derived from two sources. Twenty of the vignettes were employed in previous research, and found to be both ambiguous and reliable (Halligan & Philips, in press). Remaining vignettes were generated based on consultation with a small focus group of adolescents (N = 18), followed by pilot work with a second group of 20 adolescents to confirm that all vignettes were appropriate for the study age group and showed attribution scores consistent with ambiguity. Flesch-Kincaid reading level check showed that the vignettes were easily understandable by an average 11 year old student (Kincaid, Fishburne, Rogers & Chissom, 1975). A final pilot phase was conducted in order to establish reliability for the new vignettes, trial the 'Chat-room' software, and test the feasibility of the design. Thirty children (Mean age = 14.25 years), were recruited from a second school, not participating in the main study.

Parental consent and student assent was sought and the pilot sample followed the same procedure as set out in the main study. Analysis showed that hostile attribution scores derived from vignettes had acceptable internal consistency (Cronbach's alpha 0.73). The feasibility of the design was supported: adolescents successfully completed the assessment and did not see through the manipulation.

The final set of 30 vignettes use in the main study comprised a mixture of overt (n=15) and relational (n=15) provocation scenarios. The protagonists were described as either; a teacher (n=6), a parent (n=6), an adult stranger (n=5) or a peer (n=13) (see appendix 8). Participants viewed each of 30 scenarios on a computer screen in the form of a one sentence vignette, for example, "*Imagine your friend has invited some mates over to their house. Usually you're invited, but this week you weren't asked.*" The scenarios were presented in a random order and all references were made in non-gender specific language. Each vignette was followed by a question about the intention of the protagonist (*"Why do you think they were acting this way?"*). Open-ended responses to scenarios were typewritten by participants and gathered for subsequent coding.

Coding and Reliability

Participants' attributions for the protagonists actions were coded based on rules pre-specified in the literature (Crick & Dodge, 1996; MacBrayer, Milich & Hundley, 2003; Bickett, Milich, & Brown 1996; Halligan, Cooper, Healy & Murray, 2007). Criteria were as follows: hostile attributions were coded when the participant inferred that the peer performed the action to be mean or intentionally hurtful (scored 1); benign attributions were coded when the participant inferred that the peer's action was accidental, an attempt to be helpful, or was behaving with a neutral intention

(scored 0). Zero scores were also assigned when: participants provided more than one explanation for the protagonists' actions, indicating both hostile and benign interpretations; responses were negative but not hostile (e.g., the adolescent indicated that the protagonist is sad but not angry); or the adolescent provided irrelevant responses (jokes or unintelligible comments) or indicated that they didn't know what the intentions of the protagonist were (see appendix 9). Individual scores were calculated by counting the number of times a hostile interpretation was endorsed among the fifteen stories, within each condition ('Alone' versus 'Chat-room'). All responses were coded blind to group status. Thirty participant responses (20% of sample) were second coded to ensure interrater reliability. Intraclass correlations for absolute agreement were .98.

McDonald Relational Aggression (MRA)

Self-report measures of relational aggression were obtained using a subscale from a larger measure of aggression (McDonald, D'Amico, & O'Laughlin, 2000). Participants were asked to indicate how often in the last 6 months they engaged in a series of behaviours (e.g., *threatened to stop being someone's friend in order to hurt them or get what you wanted from them*) using a 5-point scale (1 = *never* to 5 = *5 or more times*). Previous research has found this subscale to be reliable and valid with this age group (Werner & Nixon, 2005). Internal consistency was supported in this sample (alpha = 0.71).

Buss-Perry Aggression Questionnaire (BPAQ)

The BPAQ (Buss & Perry, 1992) is an extensively used self-report questionnaire for assessing hostility and aggression and is suitable for persons aged

between 8 and 85 years old. This 29-item questionnaire contains brief statements (e.g., *Once in a while I can't control my urge to strike another person*) and participants are asked to indicate how the description best fits their view of themselves using a 5-point scale (1 = *Not like me at all* to 5 = *5 A lot like me*). This questionnaire yields a total score and four subscale scores: Physical Aggression, Verbal Aggression, Anger, and Hostility. Among adolescents, internal consistency coefficients of the BPAQ range from 0.72 to 0.85 Cronbach's alpha (Buss & Perry, 1992). Internal consistency for the total aggression score utilised in analyses in the present study was alpha = .90.

Social Anxiety Scale for Adolescents (Revised) (SASA-R)

The SASA-R (La Greca & Lopez, 1998) is a self-report measure designed to assess adolescents' levels of social anxiety. The measure has 22 items (including 4 filler items) which evaluate three aspects of social anxiety: Fear of Negative Evaluation from peers (FNE = 8 items; e.g., *"I worry what others might think of me"*), Social Avoidance and Distress around New Peers or in New Situations (SAD-New = 6 items; e.g., *" I get nervous when I talk to peers I don't know very well"*), and Generalized Social Avoidance and Distress (SAD-General = 4 items; *"I'm afraid to ask others to do thing with me because they might say no"*). Items are rated on a 5-point Likert scale and summed across relevant items to obtain scores for SAS total and each of the three subscales. Substantial data supports the reliability and validity of this instrument for both genders. In both adolescent community and clinical populations, researchers have replicated the three-factor structure of the SASA–R and reported good internal consistencies (ranging from .76 to .91; Ginsburg, La

Greca, & Silverman, 1997; La Greca & Lopez, 1998). Internal consistency for the total score used in the present study was alpha = .93.

Procedure

The adolescents were first informed that the study was an investigation of adolescent behaviour, their friendships, and how they think about and deal with different social situations. They were told that there were no right or wrong answers to the questions being asked of them and reassured that all information would remain confidential and anonymous, and only be used for research purposes. All data was encrypted to ensure confidentiality. It was explained that participants would have an opportunity to communicate electronically via the Internet 'Chat-room' with adolescents from schools within a neighbouring county. The researcher ostensibly placed a telephone call to other sites to ensure all parties were ready to take part in the forum.

The research was carried out in the library setting using laptop computer terminals and headphones under the supervision of the researcher. The study duration was less than one hour. The participants were tested as groups of fifty. Each participant was seated in front of a laptop computer. The participants were requested to remain silent and in order to minimize the opportunity for the children to communicate with each other, headphones were provided and easy-listening music played throughout the study. The 'Chat-room' condition (Hostile versus Benign) was randomly determined for each participant before the study commenced and a seating plan devised so that participants were positioned alternately between conditions. In this way, the adolescents were prevented from viewing the same e-

confederate responses on a neighbouring computer thus remaining naive to the manipulation.

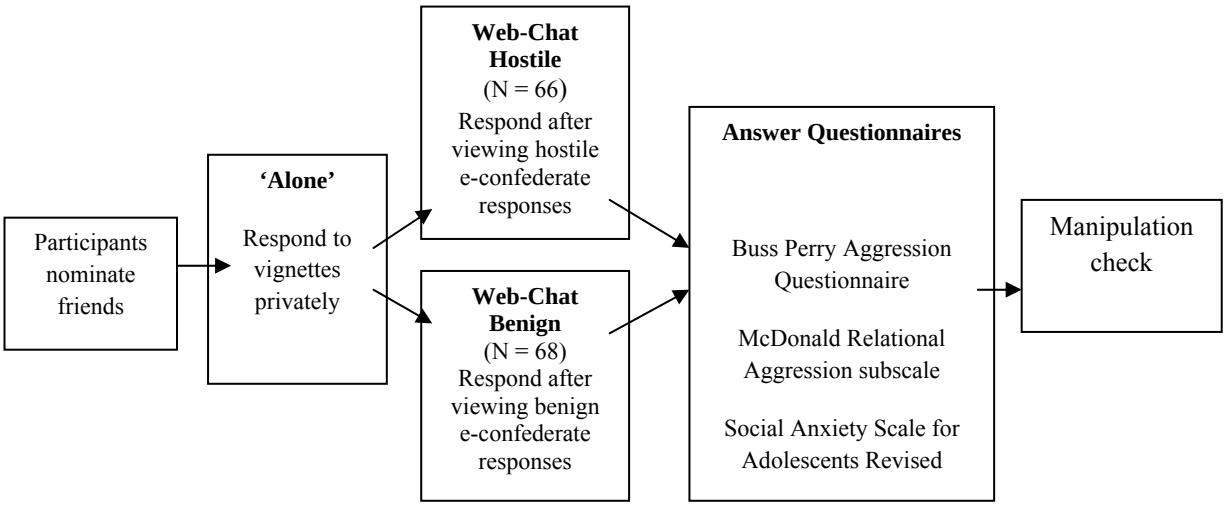

Figure 2: Diagrammatic illustration of participant procedure

The participants were first presented with a fabricated (i.e., computer generated) image of Southampton University WebChat. The participants were asked (via computer-generated instructions) to consent to the study and provide personal information before entering the website (name, gender and ethnic group). Next, the adolescents were required to drag and drop their three closest friends from a list of their year group into a rank ordered file.

Next, the participants were given computer-generated instructions, which read "*Now you will read a number of short stories. As you read each story imagine that it is about YOU. After reading the story, answer the question as quickly and honestly as you can according to how YOU would feel."* Fifteen ambiguous scenarios were presented individually in written form on screen, one sentence in length, followed by a question about the intention of the protagonist. To keep the

participants engaged with the programme sound effects (i.e., chime as vignette slid on to screen, zap sounds when asked to respond) were added like those typically associated with Internet chat-room sites. After the presentation of each vignette, adolescents were asked to describe the protagonist's intentions. Open-ended responses to scenarios were gathered and later coded.

The participant was next invited to participate with adolescents from other schools in an Internet-like 'Chat-room' (As noted, participants were interacting with computer-generated e-confederates). They were *advised "To protect your identity you will be seen only as "User". The specific order in which you respond has been randomly determined."* In reality, all participants were allocated "User 4" who was asked to respond last after viewing Users 1, 2 and 3 responses. The participants viewed genuine responses from adolescents written in the vernacular, however these responses were grouped together and pre-programmed to form the two conditions (see appendix 8 for e-confederate responses).

Participants then "logged on" to the 'Chat-room'. As they did so, a window opened on the computer screen, designed to amplify the verisimilitude of the 'Chat-room', which read "*WELCOME USER 4! - Now you will read short stories with other Users who are currently on line. As you read each story imagine that it is about you. After reading the story, answer the question as quickly and honestly as you can according to how YOU would feel. You are asked only to respond after Users 1, 2 and 3 have responded. Press the ENTER button below to enter Southampton University WebChat."* A graphic response window identified "Users currently logged on" (e.g. Users 1, 2, 3, and 4) and User name's flashed to indicate who was expected to respond. Pre-programmed responses for users 1-3 were

presented sequentially on screen. The timing of these responses reinforced the verisimilitude of the e-confederates since a pause before each e-confederate's response was programmed in so that it appeared they were deliberating each answer. Both the content and the timing of the e-confederates' responses remained constant within each experimental condition.

Once all 15 vignettes were completed, the participants were invited to "Log Off". The participants were able to see computer-generated notifications which read "User [2,3,1] has now logged off" for each of the three e-confederates. Next, computerised versions of the MRA (McDonald et al., 2000); BPAQ (Buss &Perry, 1992) and SASA-R (La Greca & Lopez, 1998) were completed on screen.

Finally, the participants were asked to answer three questions which read; a) *What age do you think the other 'Users' were?*, b) *Do you think the other 'Users' were from the same background as you – how can you tell on-line?*, and c) *how likely is it that you would be friends with the other 'Users' if they went to your school?* (scored on a 5 point Likert-scale from very unlikely to very likely). *Please briefly explain your answer* (see figure 2 for diagrammatic illustration of participant procedure). Responses served as a manipulation check of the verisimilitude of the study. It was assumed that if the adolescents had not believed that other 'Users' were indeed on line they would be unlikely to hold a view of them. A review of the responses suggested the participants had formed opinions of e-confederates (e.g. "they're the same as me, they made references to things I can relate to", " they talk in the same way as me and seem to have the same views"). Furthermore, many children were leaving messages for other Users in their responses (e.g. "lol User 1 I'm with you!"). Responses to questions between groups were equivalent.

Consistent with these responses, only 2/134 adolescents reported believing that responses in the 'Chat-room' were pre-programmed prior to debriefing.

After the study was complete, participants were immediately partially debriefed (see appendix 10), when all participants were run full debrief was given as one group (see appendices 11 & 12). The experimenter explained the rationale for the cover story and the necessity for the deceptive elements of the procedure. The adolescents were invited to raise any questions they had so that they might depart with a clear understanding of the topic under investigation.

RESULTS

Descriptive Statistics

Examination of histograms indicated that all continuous data were approximately normally distributed. Mean scores for all measures are reported in Table 1. As can be seen from the table, boys and girls showed similar means for 'Alone' attribution scores (t (132) =1.74, $p=.71$), MRA scores (t (132) = -.22, $p=.827$), and SASA-R total scores (t (132) = -1.76, $p=.08$). However, a significant difference was found on the BPAQ (t (132) = 2.88, $p<.01$), with boys scoring higher for aggression than girls. Gender effects are taken into account in further analyses.

Table 1

The mean number of hostile responses in 'Alone' condition from a possible score of 15 and questionnaire mean scores and standard deviations (SD) by gender.

	Male *(N = 68)*	Female *(N = 66)*	Total *(N = 134)*
Total 'Alone' Attribution	4.07 (*2.4*)	3.36 (*2.3*)	3.72 *(2.39)*
Total BPAQ	82.44 (*17.0*)	73.53 (*18.8*)	78.05 (18.38)
Total MRA	8.56 (*3.2*)	8.68 (*3.34*)	8.62 (3.25)
SASA-R Total	42.78 (*13.4*)	46.76 (*12.79*)	44.74 (13.19)

BPAQ = Buss Perry Aggression Questionnaire, MRA McDonald Relational Aggression subscale, SASA-R = Social Anxiety Scale for Adolescents (Revised)

Associations between hostile attribution bias and aggression

In order to test the first hypothesis of positive associations between 'Alone' hostile attribution scores and aggression, correlations between the 'Alone' attribution score, total BPAQ and total MRA were conducted. Statistics are reported in Table 2. Consistent with the first hypothesis, attribution scores correlated significantly and positively with aggression (as measured by the total BPAQ score). However, no relationship was found between relational aggression (measured on the MRA subscale) and hostile attribution scores. The BPAQ also showed significant positive associations with the MRA and SASA-R and the MRA correlated with the SASA-R (see Table 2). Given the lack of associations between MRA and attributions, further analyses focus on the BPAQ.

Table 2

Intercorrelations among study variables

Construct	1	2	3	4
1'Alone' Hostile Attribution	-	.308**	-.040	.110
2 BPAQ		-	.211**	.225**
3 MRA			-	.313**
4 SASA-R Total				-

BPAQ = Buss Perry Aggression Questionnaire, MRA McDonald Relational Aggression subscale, SASA-R = Social Anxiety Scale for Adolescents Revised

Contagion Effects

To test the hypothesis that transmission of social information processing styles will occur in adolescents as a function of a 'Chat-room' discussion, with e-confederates with benign attribution styles serving to attenuate the hostile attribution of participants and e-confederates with hostile attribution style increasing the hostile responding of participants, a three-way repeated measures analysis of variance (ANOVA) was conducted. The first factor is a within-subject factor: time ('Alone' versus 'Chat-room'). The second and third factors are between-subject factors: condition (Hostile versus Benign) and gender (girls versus boys). The dependent variables were the scores of adolescent hostile attribution responses.

There was a significant main effect of time ('Alone' versus 'Chat-room', $F(1,130) = 35.17$, $p < 0.001$) with attribution scores being higher overall when participants responded in the 'Chat-room' ($M = 4.90$, $SE = 3.35$) versus 'Alone' ($M = 3.72$, $SE = 2.39$) condition. A significant interaction effect was found between time and condition, $F(1,130) = 120.64$, $p < 0.001$, as illustrated in Figure 3. While adolescents showed comparable levels of hostile attributions in the 'Alone'

condition, irrespective of the Hostile or Benign condition randomly assigned (Hostile, *M* = 3.59, *SE* = 2.37, Benign, *M* = 3.85, *SE* = 2.41; t (132) *p* = -0.634), adolescent responses showed marked differences in the 'Chat-room' context depending on which condition they were allocated. Relative to their 'Alone' scores, during the 'Chat-room' adolescents in the Hostile condition showed an increase in hostile responses (change score *M* = 3.53, *SE* = 2.55), and adolescents in the Benign condition showed a decrease in hostile responses (change score *M* = -1.10, *SE* = 2.25), as illustrated in Figure 3. Independent samples t-test with absolute change scores, revealed that the hostile 'Chat-room' group was significantly more potent than the benign 'Chat-room' group (t (132) = 5.28, SD = .34, $p < 0.001$). One sampled t-test using a test value of zero found that the 'Chat-room' had a significant effect in the Hostile and Benign conditions (Hostile, t (65) = 11.22, $p<0.001$; Benign, t (67) = -4.05, $p < 0.001$), suggesting peer influence can have both a significant positive and negative effect.

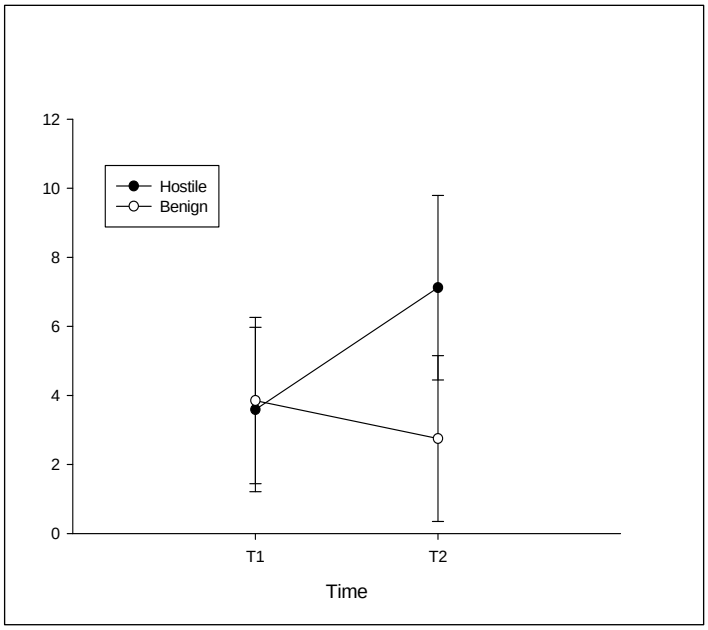

Figure 3. Mean hostile attribution scores and Standard Error by time ('Alone' and 'Chat-room') and condition.

There was a significant main effect of gender (F (1,130) = 5.60, *p* = .02) with males showing greater hostile responding than females overall, as shown in Table 3. However, no interaction was found between time and gender (F (1,130) = 0.305, p = .58) and therefore our hypothesis that gender would moderate the effects of contagion was not supported. That is, girls were no more likely than boys to adopt the attitudes of their 'peers' in the 'Chat-room' conditions.

Table 3

Mean hostile responses and standard deviations (SD) by condition and gender.

		Male (N = 68)	Female (N = 66)
'Alone'	Hostile	3.84 (*2.39*)	3.25 (*2.35*)
	Benign	4.37 (*2.47*)	3.45 (*2.31*)
'Chat-room'	Hostile	7.26 (*2.57*)	6.93 (*2.84*)
	Benign	3.67 (*2.26*)	2.03 (*2.27*)

Examination of Moderators

Linear regression analyses were conducted to examine the potential moderation of contagion effects by: a) adolescents' level of social anxiety; and b) their pre-existing levels of aggression. Two interaction terms were computed using centred variables (i.e., social anxiety symptoms (SASA-R total score) x condition; aggression score (BPAQ total score) x condition.

In order to test for potential moderation by social anxiety, we examined the prediction of participants' attributional change score (i.e., from 'Alone' to 'Chat-

room) by dispositional levels of social anxiety and condition (Hostile versus Benign), and the interaction between these two. Standardised SASA-R total scores and condition were entered into the model as a first step which was significant (see Table 4). The addition of the SASA-R x condition interaction term in a second step significantly improved model fit, and the interaction term itself was significant in the final model (Table 4). Further analysis revealed a significant negative association between change scores and dispositional levels of social anxiety in the Hostile condition only (r = -.321, p < 0.01; Benign condition, r = -.039, *ns*). Thus, counter to predictions, socially anxious adolescents appeared to be relatively resistant to contagion effects in the hostile condition.

Table 4

Examination of Social Anxiety as a moderator of adolescent peer contagion in regression analyses

	B	SE B	β
Step 1	**R^2 = .49, F = 64.84, df = 2,131, p<0.001**		
Condition (Hostile/Benign)	-4.65	0.41	-.69**
SASA-R total score	-.37	0.21	-.11†
Step 2	**Change R^2 = .02, F = 4.70, df = 1, 130, p<0.05**		
Condition (Hostile/Benign)	-4.65	0.41	-.70**
SASA-R total score	-0.80	0.28	-.24**
SASA-R x condition	0.89	0.41	.18*
Final Model	**R^2 = .51, df = 3,130, F = 46.02 , p< 0.001**		

† p = 0.07; * p<0.05; ** p<0.001

To explore whether pre-existing levels of aggression influence peer contagion, we conducted a second linear regression analysis examining the prediction of attribution change scores by aggression scores, condition (Benign versus Hostile) and their interaction. Standardised BPAQ scores and condition were entered into the model as the first step, which was highly significant (see Table 5). The addition of the interaction term as a second step did not significantly improve the fit of the model and the interaction term itself was not significant (see Table 5). Therefore, counter to predictions, participant's pre-existing level of aggression did not influence the extent to which they adopted peer attitudes in either the Benign or Hostile experimental condition.

Table 5

Examination of Aggression as a moderator of adolescent peer contagion in linear regression analyses.

	B	SE B	β
Step 1	**R^2 = .49, F = 64.33, df = 2, 131, p<0.001**		
Condition (Hostile/Benign)	-4.58	0.41	-.69**
BPAQ total score	-.34	0.21	-.10
Step 2	**Change R^2 = .01, F = 2.17, df = 1, 130, p=0.143**		
Condition (Hostile/Benign)	-4.57	0.41	-.69**
BPAQ total score	-0.69	0.32	-.21*
BPAQ x condition	0.62	0.41	.14
Final Model	**R^2 = .50, df = 3, 130, F = 43.99 , p< 0.001**		

*p<0.05; **p<0.001

To examine our final hypothesis, that friendship style would moderate contagion effects such that participants who did not have reciprocal friendships would be particularly vulnerable to peer influences, a repeated measures analysis (ANOVA) of variance was conducted. Two groups were formed for friendship style; unreciprocated friendships (N=22), who did not receive any reciprocal nominations versus reciprocated friendships (N=112), which included all adolescents who had been nominated by at least one friend. The first factor was a within-subject factor: time ('Alone' vs 'Chat-room'). The second and third factors are between-subject factors: condition (Benign versus Hostile) and friendship style (reciprocated versus unreciprocated). The dependent variables were the scores of adolescent's hostile attribution responses. As already reported, there were significant effects of time ('Alone' versus 'Chat-room', $F(1,130) = 28.42$, $p < 0.001$) on hostile attribution scores, as well as a time by condition interaction ($F(1,130) = 67.31$, $p < 0.001$). There was also a main effect of friendship style ($F(1,130) = 4.94$, $p < 0.05$) with adolescents in non-reciprocated friendships reporting less hostility than adolescents in reciprocal friendships (non-reciprocated; 'Alone', $M = 2.45$, $SE = 1.68$, 'Chat-room', $M = 4.36$, $SE = 3.35$; reciprocated; 'Alone', $M = 3.97$, $SE = 2.42$, 'Chat-room' $M = 5.01$, $SE = 3.34$). However, there was no interaction effect between time x friendship style ($F(1,130) = 2.21$, $p = 0.140$) or time x friendship style x condition ($F(1,130) = 0.01$, $p = 0.929$). Thus, counter to predictions we found no evidence to suggest that adolescents who did not have reciprocal friendships were more susceptible to contagion effects. However, given the very small numbers of adolescents within the unreciprocated group in the two conditions (N= 11 in each case), it is possible that our sample size was not sufficient to find significant effects.

Discussion

Using a community sample of adolescent girls and boys, the present study showed positive associations between hostile attribution bias and aggression. This finding is in line with the theoretical SIP model and the wealth of existing evidence linking aggression with SIP deficits (e.g. Crick & Dodge, 1994; Dodge, 2006, Orobio de Castro et al., 2002). Furthermore, while extensive research has suggested that adolescents' attitudes and behaviours are socialised by their peers (Laird et al., 2001; Moffit, 1993; Werner & Crick, 2004) few studies have examined this experimentally (Cohen & Prinstein, 2006) and no research to our knowledge has explored the effects of peer contagion on SIP patterns. Results from the current study suggest that peers are potentially potent socialisation agents in relation to SIP; we demonstrated that adolescents conformed to group norms while participating in a chat-room forum. In addition, the present study offers preliminary evidence for conditions that may moderate adolescents' susceptibility to peer contagion effects and therefore extends current knowledge of peer influence on the development of a hostile attribution bias in adolescents. These findings offer implications for preventative intervention.

Our hypothesis that transmission of SIP styles will occur in adolescents during a chat-room discussion was supported; e-confederates with benign attribution styles served to attenuate the hostile attribution of participants and e-confederates with hostile attribution style increased the hostile responding of participants. However, participants did not conform equally to all peers: those exposed to hostile group norms showed greater contagion effects than those exposed to benign group norms, which suggest that hostile environments are particularly potent for adolescents.

The current results support the proposal that interacting with a group may increase hostile attribution bias (Meier, Hinsz & Heimerdinger, 2007) and the finding that information processing by groups tends to accentuate beliefs that are prevalent among individuals (Hinsz, Tindale, & Nagao, 2008). The anonymity of the 'Chat-room' environment may have also lead to adolescents becoming less inhibited in their expression of hostile attributions since a group context is proposed to cause 'deindividuation' and release individual's social constraints against aggression (Postmes & Spears, 1998). Nevertheless, when conversing with a benign group, adolescents showed a significant reduction in hostile responding compared to their 'Alone' scores. This provides evidence that peer influence processes may be positive (Allen & Antonishak, 2008) and act to socialise peers into adaptive processing styles.

A further contribution of this study involves a preliminary examination of factors that may moderate peer contagion among adolescents. First, contrary to previous research (Bond & Smith, 1996; Eagly, 1987; Eagly et al., 1981; Eckel & Grossman, 1998; Werner et al., 2008) and our expectations, gender did not influence the extent to which individuals adopted peer attitudes, and thus no support was found for our prediction that adolescent girls would show greater peer contagion effects than their male counterparts. One explanation could be that in the context of a chat-room, the environment is relatively absent of the factors that lead to greater conformity in girls, such as direct personal observation by others (Eagly et al., 1981), a warm relationship to the majority (Eagly, 1987), and a desire to stay close to the group (Eckel & Grossman, 1998). On the other hand, males are found to resist group influence when others in the group observe their opinions (Eagly et al., 1981). The relative anonymity of the current context may have made male conformity more

likely. In sum, the use of the chat-room limited contextual factors which might have otherwise served to activate gender differences in contagion effects.

Second, social anxiety was shown to be a significant moderator of peer contagion, but effects were counter to predictions. Specifically, the results indicated that adolescents high in social anxiety were relatively resilient to peer contagion effects, when the peer views expressed were hostile. This finding is surprising in the light of previous research with male adolescents, which observed that social anxiety increases susceptibility to antisocial peer influences (Cohen & Prinstein, 2006), albeit only when peers were presented as being of low status. One interpretation of the current findings is that adolescents high in social anxiety feel particularly insecure in expressing hostile interpretations of a protagonist's intentions, perhaps because of fear of reprisal. Equally, the hostile group environment may feel particularly threatening to socially anxious individuals, resulting in reduced drive to adopt group attitudes. Finally, theoretical models of social phobia (e.g., Clark & Wells, 1995) suggest that individuals high in social anxiety will pay reduced attention to external social cues in conditions of social threat, and focus more on themselves and their own cognitive processes. In principle, this could contribute to reduced homophily in the hostile condition.

Third, in respect of friendship status, we found that adolescents in unreciprocated friendships had a stronger tendency to perceive benign intent in response to relational and overt provocation compared to adolescents in reciprocated friendships, findings more in line with studies of pro-social adolescents (Nelson & Crick, 1999). This was surprising and counter to our expectations given that previous research has demonstrated that peer-rejection is predictive of SIP deficits and aggressive behaviour (Dodge et al., 2003). However, it cannot be assumed that

adolescents in unreciprocated friendships were rejected by their peers, rather they may be low-accepted adolescents (young people with few friends). Research has demonstrated that friends of low-accepted children are likely to be younger and from outside of school (George & Hartmann, 1996) therefore our design may have precluded low-accepted participants from making friend nominations.

Greater contagion effects have also been demonstrated in children with unreciprocated friendships (Adam et al. 2005) however, no moderator effects were found in the present study. This could be explained by the absence of the possibility of kindling a real friendship. No face-to-face contact took place and peers were presented as being from another school and therefore unlikely to become friends. In addition, the small sample of adolescents with unreciprocated friendships, within each condition, may have prevented the detection of moderator effects.

Finally, participants' levels of aggression did not moderate the effect of peer contagion, which is counter to our hypothesis and previous research (Adams et al., 2005). However, in a similar study design pre-existing levels of aggression were not found to moderate peer contagion effects (Cohen & Prinstein, 2006). The effects of the experimental manipulation appeared to be consistent across adolescents with high and low aggression scores. Therefore, rather than the group enhancing pre-existing social problem solving tendencies as found in previous research (Barrett et al., 1996) the participants conformed to the attribution styles of their peers. It would appear that the goal of social cohesion prevails over individual differences in levels of aggression in this context. At the same time, comparisons of our sample to standardised means on BPAQ sub-scales and total scale (Fischer & Corcoran, 2007) showed participants were within the average range and variance along this measure.

Perhaps more extreme groups in terms of levels of aggressive behaviour are required to demonstrate differential responding to peer influence.

This present study has offered an initial examination of the role of peers in the socialisation of hostile attribution bias. Future research should address the limitations of this study. The participants were drawn from a school within a middle-class White area, the large majority of which were in reciprocated friendships. Indeed, even those children in unreciprocated friendships did not hold attribution styles consistent with peer-rejected adolescents. Research has established that well-socialised peers are amongst the most likely to be influenced by their peers precisely because they are well socialised (Allen & Antonishak, 2008). Future research would benefit by examining peer contagion effects on hostile attribution bias in adolescents from different socio-economic backgrounds in order to determine whether peer socialisation effects hold. Longitudinal research might address whether children and adolescents internalise the social information-processing styles of a peer group norm over time, by examining the attribution styles of aggressive children and adolescents after inclusion in benign group-talk.

This experimental investigation, into peer contagion of SIP styles, is consistent with theoretical accounts of socialisation effects and may go some way in identifying one of the mechanisms that drive the increase in aggression among groups; the contagion of the social-cognitive correlates of aggressive behaviour. It is notable that peer contagion effects have been demonstrated despite a lack of face-to-face interaction; peers were presented as being from another school and therefore unknown to the participant, meaning there was no particular incentive for the individual to try to obtain peer group approval. It seems likely then that even stronger contagion effects would be demonstrated in actual peer group interactions,

particularly where high status/desirable peers are involved (Cohen & Prinstein, 2006). Overall, the findings support the contention that an effective route to improving aggressive and antisocial behaviour in adolescents includes changing adolescents' perceptions of the attitudes of their peers (Prinstein & Wang, 2005).

These findings have significant implications for interventions with aggressive children and adolescents. As well as directly targeting cognitive information-processing styles of children and adolescents with aggressive behaviour, an effective intervention may be to involve making available the SIP styles of non-aggressive peers (Hudley, 2008). Peers may act to model appropriate responding to ambiguous provocation situations and positively reinforce adaptive social information-processing styles. In this way, clinicians can maximize the likelihood that cognitive restructuring with the child will be reinforced and maintained within the child's social environment. What seems clear is failure to structure group-based interventions, to reduce opportunities for aggressive adolescents to share SIP patterns, may have an iatrogenic effect and exacerbate the very problems they intend to treat (Dishion, McCord, & Poulin, 1999; Dodge, Dishion & Lansford, 2006).

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A concise and factual abstract is required (not exceeding 200 words). This should be typed on a separate page following the title page. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separate from the article, so it must be able to stand alone. References should therefore be avoided, but if essential, they must be cited in full, without reference to the reference list.

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Immediately after the abstract, provide a maximum of 6 keywords, using American spelling and avoiding general and plural terms and multiple concepts (avoid, for example, "and", "of"). Be sparing with abbreviations: only abbreviations firmly established in the field may be eligible. These keywords will be used for indexing purposes.

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Acknowledgements

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

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• All tables (including title, description, footnotes)

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• References are in the correct format for this journal

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The following instructions pertain to all journals published by APA and the Educational Publishing Foundation (EPF).

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Numbers following entries refer to relevant section numbers in the *Publication Manual*.

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- Have you checked the journal's website for instructions to authors regarding specific formatting requirements for submission (8.03)?
- Is the entire manuscript—including quotations, references, author note, content footnotes, and figure captions—double-spaced (8.03)? Is the manuscript neatly prepared (8.03)?
- Are the margins at least 1 in. (2.54 cm; 8.03)?
- Are the title page, abstract, references, appendices, content footnotes, tables, and figures on separate pages (with only one table or figure per page)? Are the figure captions on the same page as the figures? Are manuscript elements ordered in sequence, with the text pages between the abstract and the references (8.03)?
- Are all pages numbered in sequence, starting with the title page (8.03)?

Title Page and Abstract

- Is the title no more than 12 words (2.01)?
- Does the byline reflect the institution or institutions where the work was conducted (2.02)?
- Does the title page include the running head, article title, byline, date, and author note (8.03)? (Note, however, that some publishers prefer that you include author identification information only in the cover letter. Check with your publisher and follow the recommended format.)
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- Do the levels of headings accurately reflect the organization of the paper (3.02–3.03)?
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- Are unnecessary abbreviations eliminated and necessary ones explained (4.22–4.23)?
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- Are Greek letters and all but the most common mathematical symbols identified on the manuscript (4.45, 4.49)?
- Are all non-Greek letters that are used as statistical symbols for algebraic variables in italics (4.45)?

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- Are metric equivalents for all nonmetric units provided (except measurements of time, which have no metric equivalents; see 4.39)?
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- Are references cited both in text and in the reference list (6.11–6.21)?
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- Are journal titles in the reference list spelled out fully (6.29)?
- Are the references (both in the parenthetical text citations and in the reference list) ordered alphabetically by the authors' surnames (6.16, 6.25)?
- Are inclusive page numbers for all articles or chapters in books provided in the reference list (7.01, 7.02)?
- Are references to studies included in your meta-analysis preceded by an asterisk (6.26)?

Notes and Footnotes

- Is the departmental affiliation given for each author in the author note (2.03)?
- Does the author note include both the author's current affiliation if it is different from the byline affiliation and a current address for correspondence (2.03)?
- Does the author note disclose special circumstances about the article (portions presented at a meeting, student paper as basis for the article, report of a longitudinal study, relationship that may be perceived as a conflict of interest; 2.03)?
- In the text, are all footnotes indicated, and are footnote numbers correctly located (2.12)?

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- Does every table column, including the stub column, have a heading (5.13, 5.19)?
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Appendix 3. LREC Approval Letter

Appendix 4. Letter to Head Teacher

[ON UNIVERSITY OF SOUTHAMPTON HEADED PAPER]

Head Teacher

[*Date*]

Dear [*Head Teacher*],

Thank you for agreeing to participate in our study examining adolescent behaviour, their friendships and how they think about, and deal with, different social situations and whether this is related to the beliefs and attitudes of their friends. As agreed I will carry out the research on [*the date*].

The study will involve the completion of on-line questionnaires and participation in a short "chat-room" forum around adolescent beliefs and attitudes in different social situations. It will be explained to the child clearly that if at anytime they wish to stop participating in the research they can do so without a need for explanation. The study will take a maximum of one hour and will be carried out during a [*lesson*].

The participants' responses will be recorded and analysed in order to ascertain whether their belief style can be influenced by the beliefs of others when communicating in a "chat-room". We are also interested in whether adolescent friendship groups hold similar beliefs and attitudes to social situations.

Individual results will remain confidential to the experimenter and data will be stored and disseminated anonymously once friendship groups have been identified.

We have enclosed copies of the Parental Consent forms and Information Sheets for distribution. In addition, our Ethics committee require an assurance that you are happy to proceed using parental opt out and to accept responsibility for any parental objections that may arise.

I have been through the formal Disclosure procedure and have been approved by the School to work with children. In addition, this project has been reviewed, according to procedures specified by the University of Southampton Ethics and Research Committee.

Should you wish to discuss the study further please do not hesitate to contact me at kmf1v07@soton.ac.uk or alternatively the study supervisors, supervisor Dr Julie Hadwin on telephone number (023) 8059 2590 or email J.A. Hadwin@soton.ac.uk

Yours sincerely,

Kim Freeman
Trainee Clinical Psychologist

Enclosures: Parental Passive Consent Forms
Information Sheets for participants

Appendix 5. Head Teachers Consent to use parental passive consent

[ON SCHOOL HEADED PAPER]

To the Chair of the University of Southampton School of Psychology Ethics Committee

I am happy to agree to using parental opt out for research study on xxx and to accept responsibility for any parental objections that may arise.

Yours faithfully

(Headteacher)

Appendix 6. Participant Information Sheet

[ON UNIVERSITY OF SOUTHAMPTON HEADED PAPER]

Participant Information Sheet

Study Title: **Hostile Attribution Style among Adolescents: Are they Contagious?**

Researcher: Kim Freeman

Ethics number: 783

Please read this information carefully before deciding to take part in this research. If you are happy to participate you will be asked to give your consent.

What is the research about?

I am Kim Freeman a Trainee Clinical Psychologist at the University of Southampton. I am requesting your participation in a study examining adolescent behaviour, friendships and how you think about, and deal with, different social situations and whether this is related to the beliefs and attitudes of your friends.

Why have I been chosen?

We are particularly interested in adolescents aged between 13 and 14 years and your Head Teacher has given permission for this study to take place in your school.

What will happen to me if I take part?

The study will involve completing questionnaires on the computer, whilst wearing headphones, and engaging in a short chat-room discussion. The study will take approximately one hour during your [*lesson*], and you will not be asked to do anything further.

Are there any benefits in my taking part?

Students typically find our studies interesting and those who take part will be entered into a prize draw for an iPod Shuffle.

Are there any risks involved?

We do not anticipate any risks involved in taking part in this study.

Will my participation be confidential?

Personal information will not be released to, or viewed by, anyone other than researchers involved in this project. **Your responses will not be seen by anyone at your school.** Results of this study will not include your name or any other identifying characteristics. All information will be stored in an anonymous format, on a password protected computer, accessible only to the researchers. The data will only be used for the purposes of this study. On completion all records will be confidentially destroyed.

What happens if I change my mind?

Your participation is voluntary and you may withdraw your participation at any time.

What happens if something goes wrong?

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578.

Where can I get more information?

If you have any questions you can email me at kmf1v07@soton.ac.uk or contact my supervisor Dr Julie Hadwin on telephone number (023) 8059 2590 or email her at J.A.Hadwin@soton.ac.uk

Appendix 7. Parental Consent

[ON UNIVERSITY OF SOUTHAMPTON HEADED PAPER]

Parental Consent

Dear Parent/Guardian:

Research Study into adolescent attitudes within friendship groups

I am Kim Freeman a student at the University of Southampton and am currently completing a Doctoral Programme in Clinical Psychology. For my research project I am conducting a study examining adolescents' behaviour, their friendships and how they think about, and deal with, different social situations and whether this is related to the beliefs and attitudes of their friends. I am seeking your permission for your child to be included in my research.

The study will require your son or daughter to complete a few computerised questionnaires and have a short "chat-room" discussion with other adolescents. The study will be completed within one hour during [*lesson*] with no effect to the rest of the school day. The results will remain confidential to the experimenters. Students typically find our studies interesting and those who take part will be entered into a prize draw for iPod Shuffle. I hope that the data I collect will tell us more about whether adolescents are influenced by the beliefs and attitudes of their friends.

Your child's personal information will not be released to or viewed by anyone other than researchers involved in this project. Their responses will not be seen by anyone at school. Results of this study will not include your child's name or any other identifying characteristics.

It will be explained to your child clearly that if at any time they wish to stop participating in the study they can do so without a need for explanation. Permission has been given by the Head Teacher for this study to take place on [*the date*]. **If you are happy for your Son/Daughter to take part in the study you do not need to do anything**; they will of course be free to decide for themselves whether or not they wish to join in. If however, **you do not wish your child to participate in this research please fill in the slip below and return it to the school office.**

I have been through the formal Disclosure procedure and have been approved by the School to work with children. In addition, this project has been reviewed, according to procedures specified by the University of Southampton Ethics and Research Committee.
Should you have any queries regarding this study or would like to request a copy of our findings once completed please do not hesitate to contact us.

Supervisor: Dr Julie Hadwin
Email: J.A. Hadwin@soton.ac.uk
Phone: (023) 8059 2590

Researcher: Kim Freeman
Email: kmf1v07@soton.ac.uk

Dear Head Teacher

I **do not** wish my child to participate in the study into adolescent attitudes within friendship groups explained above.

CHILDS NAME ---------- FORM ----------

Signed ----------

SET A VIGNETTES

Alone

1. Imagine that during a lesson you and a few of your friends are told off, but after class the teacher only asks you to stay behind.

Why do you think they are acting in this way? **R**

2. Imagine that you're in a busy corridor at break. The people next to you are laughing and talking. One of them brushes against you then bumps into you again, making you spill your drink. You look over and they are laughing.

Why do you think they are acting in this way? **O**

3. Imagine that you mention to your parent that your birthday is coming up and they quickly change the subject.

Why do you think they are acting in this way? **R**

4. Imagine that you arrange to meet a friend on the weekend. You go, but they don't show up. On Monday you find out that they went out with some of your other friends and didn't invite you.

Why do you think they are acting in this way? **O**

5. Imagine that your parent promises to take you shopping for new trainers, but on the weekend says you all have to go visit a relative.

Why do you think they are acting in this way? **R**

6. Imagine that as you're walking down the street you see a group of kids you don't know sitting on a wall. As you get closer, they all look over at you and stand up.

Why do you think they are acting in this way? **O**

7. Imagine that you put your hand up in class several times, but the teacher doesn't call on you.

Why do you think they are acting in this way? **R**

8. Imagine that you are walking down a street and you notice a stranger walking towards you. As they approach, you see that they are smiling.

Why do you think they are acting in this way? **O**

9. Imagine that you ask your parent to lend you some money. They say no but won't tell you why.

Why do you think they are acting in this way? **R**

10. Imagine you are in the dining hall eating lunch and you notice someone at the next table glancing over at you and whispering. Shortly afterwards, the people on that table start laughing loudly.

Why do you think they are acting in this way? **O**

11. Imagine your friend has invited some mates over to their house, usually you're invited, but this week you weren't asked.

Why do you think they are acting in this way? **O**

12. Imagine you comment someone on a social network site (e.g. Facebook or Bebo) you receive no reply but they appear to have replied to others.

Why do you think they are acting in this way? **R**

13. Imagine you are sitting waiting for the bus/train listening to your personal music player. A lady waiting with you asks you to turn your music off.

Why do you think they are acting in this way? **O**

14. Imagine you receive a text from a friend which reads What time's the party start? you are not aware of a party and so reply, What Party? Your friend responds Sorry, wrong person .

Why do you think they are acting in this way? **R**

15. Imagine that you receive your school report. You are really pleased with the grades and eager to show your parents how well you have done. As soon as you get home you ask your parents to read the report, they read it but don't say anything.

Why do you think they are acting in this way? **R**

Set A Web-Chat Vignettes

Hostile Condition Responses/*Non-Hostile Condition Responses*

1. Imagine that you really need to talk to your parent about something important, but they're watching T.V. and tell you to wait.

Why do you think they are acting in this way? **R**

User 1: They actually find the programme more interesting than my petty life problems.
User 2: They don't think what I have to say is important
User 3: They don't really care about my problems and me.

User 1: good tv programme
User 2: Football/jamie oliver is on
User 3: Because they are very interested in the television programme and know they have more time to devote their attention to you afterwards

2. Imagine you and some friends are making plans for the school holidays. You make a few suggestions. But next time you talk, one of your friends slags off your ideas.

Why do you think they are acting in this way? **O**

User 1: They wanted me to look bad/feel upset, rejected.
User 2: They probably have a problem with me
User 3: JEALOUS MATE!

User 1: They are going off the idea
User 2: Maybe it is not your friend being nasty. Maybe they are just really terrible ideas!
User 3: because they don't like the idea

3. Imagine that in class your teacher is letting one table at a time go to lunch and picks your table to go last.

Why do you think they are acting in this way? **R**

User 1: Because they think i haven't done it before so I deserve it
User 2: The teacher doesn't like me!
User 3: Any excuse to make my life a misery

User 1: random selection, wouldn't think anything of it
User 2: To stop a riot when people leave! It's about order and discipline, it's just bad luck that my tables picked last!
User 3: Because my table was very loud or caused the most disturbance during the lesson?

4. Imagine that you are queuing for tickets at the cinema. Someone comes over and starts talking to the person in front of you.

Why do you think they are acting in this way? **O**

User 1: trying to push in the queue
User 2: Because they know the person in front and they want to push in to get tickets before me.
User 3: They have no respect !

User 1: they're with them and had just gone to the toilet
User 2: Knew the person in front of me, wanted to chat to them.
User 3: To find out what film they are going to see

5. Imagine that after a PE lesson the teacher asks you to stay behind and put the sports equipment away.

Why do you think they are acting in this way? **R**

User 1: I misbehaved in the lesson and they want to punish me
User 2: Because it needs to get done and they can't be bothered - PE teachers are getting lazier!
User 3: Cos I hate PE so the teacher has it in for me.

User 1: I was probably first person they saw
User 2: Cos I'm fit and strong
User 3: Because I'm helpful

6. Imagine that you're hanging around with a group of friends. One of your friends is telling a story about you, which is funny but paints you in a bad light.

Why do you think they are acting in this way? **O**

User 1: Envy that you did the funny thing and wants to be the one to tell the funny story but doesn't want you to get the credit
User 2: Because they can't humour people with jokes, so they put other people down by making others laugh at them
User 3: To make them look better, embarrass me and have a laugh.

User 1: It may be an attempt to try and tell you to stop acting like a fool
User 2: Because I've probably done it to them before
User 3: Because the story is genuinely funny and they don't mean for you to be painted in a bad light

7. Imagine that when you get home from school you say 'hello' to your parent but they don't respond like they normally would.

Why do you think they are acting in this way? **R**

User 1: I'm in trouble!
User 2: My brothers probably grassed me up for something.
User 3: They aren't in a good mood and taking it out on me

User 1: Probably didn't hear me
User 2: They had a bad day
User 3: because they're distracted

8. Imagine that you're waiting in a shop to pay. You're next in line, but the person behind the counter serves someone else.

Why do you think they are acting in this way? **R**

User 1: Didn't like the look of me probably
User 2: Because they're older and think they're more valid
User 3: They're trying to p* me off**

User 1: Maybe they didn't see me
User 2: They didn't realise I was next in line
User 3: Because they assume im standing with an adult

9. Imagine that you try hard in class and finish all your work, but at the end of the class your teacher tells you off for talking.

Why do you think they are acting in this way? **R**

User 1: They are looking for something to blame me with
User 2: Because they can and they just love the power
User 3: Some teachers have a problem with me no matter what I do!

User 1: They are disappointed that I was distracted towards the end, as I have worked hard all lesson - its more noticeable when you eventually talk
User 2: Because I was talking…....??
User 3: they didn't realise I'd finished all my work

10. Imagine that on your way home you see a group of kids from your school. As you pass them, someone flicks a cigarette butt and it lands next to you.

Why do you think they are acting in this way? **O**

User 1: To try and scare me
User 2: OMG CAUSE THEY IS A PIKEY ENIT! Again it's this whole argument about self confidence and low self esteem. Sad really
User 3: Cos they're stupid idiots

User 1: to look cool and show they smoke
User 2: They probably didn't mean it to land near you, if they did they wanted you to notice them smoking.
User 3: Because smoking is cool, and flicking fags makes you look twice as cool. Safe and ting

11. Imagine that you are taking the bus/train home. The bus/train is really busy but you see an empty seat and make your way over to it. As you go to sit down the person sitting in the next seat shouts Don't sit there!

Why do you think they are acting in this way? **O**

User 1: Cos they're ignorant and don't know how to speak to people
User 2: Cos they don't like to the look of me and want someone else to sit next to them
User 3: How rude are they ..... peasant!

User 1: They just saw a kid wee on the seat!
User 2: Becuase theres an old person without a seat right trying to sit there too
User 3: Maybe there trying to get off the bus/train

12. Imagine that you are walking down a street and you notice a stranger walking towards you. As they approach, you see that they are frowning.

Why do you think they are acting in this way? **R**

User 1: maybe their trying to make me feel uncomfortable
User 2: the sun might be in their eyes or they're trying to look tough and scare me
User 3: Probably jealous of my outfit so trying to make out its rubbish

User 1: maybe there lost
User 2: could have just had a row with their boss
User 3: probably listening to someone on the phone through their ear piece and cant ear what they're saying properly

13**.** Imagine that your teacher is giving back homework to the class. She tells everyone that they have not done very well in this homework, but reads your homework out loud as an example of how badly the class did.

Why do you think they are acting in this way? **O**

User 1: Any excuse to make me look a prat
User 2: because they hate me
User 3: mine was the worst and the teacher wants me to look as bad as possible

User 1: Mine just happens to be on the top of the pile
User 2: because i usually do things quite well so it shows a big difference
User 3: they just chose a random one out the pile

14. Imagine that you ask your best friend to sit next to you on the coach on the way to a school trip. You get on the coach, only to find your friend is sitting next to someone else.

Why do you think they are acting in this way? **R**

User 1: someone else asked them so they dumped me
User 2: Some so called friends don't care they say one thing and do another
User 3: To hurt my feelings and make me upset

User 1: maybe the teacher told them to sit there
User 2: They forgot they said they would sit with me
User 3: Someone else just sat down next to them

15. Imagine that you are having trouble with a subject at school. You hear there is a new 'Help Club' being offered at lunchtime and decide to go along. You ask your friend to go with you but they laugh and say No way

Why do you think they are acting in this way? **O**

User 1: To make me feel like an idiot
User 2: to show off that they don't need help and I do so I feel small
User 3: to make fun of me

User 1: Because they don't think the club is their sort of thing
User 2: They always see their other friends at lunch time and wont want to miss out by going to a Help Club
User 3: Because the teacher will probably not let them in because they have a bad reputation

SET B VIGNETTES

Alone

1. Imagine that you really need to talk to your parent about something important, but they're watching T.V. and tell you to wait.

Why do you think they are acting in this way? R

2. Imagine you and some friends are making plans for the school holidays. You make a few suggestions. But next time you talk, one of your friends slags off your ideas.

Why do you think they are acting in this way? O

3. Imagine that in class your teacher is letting one table at a time go to lunch and picks your table to go last.

Why do you think they are acting in this way? R

4. Imagine that you are queuing for tickets at the cinema. Someone comes over and starts talking to the person in front of you.

Why do you think they are acting in this way? O

5. Imagine that after a PE lesson the teacher asks you to stay behind and put the sports equipment away.

Why do you think they are acting in this way? R

6. Imagine that you're hanging around with a group of friends. One of your friends is telling a story about you, which is funny but paints you in a bad light.

Why do you think they are acting in this way? O

7. Imagine that when you get home from school you say 'hello' to your parent but they don't respond like they normally would.

Why do you think they are acting in this way? R

8. Imagine that you're waiting in a shop to pay. You're next in line, but the person behind the counter serves someone else.

Why do you think they are acting in this way? **R**

9. Imagine that you try hard in class and finish all your work, but at the end of the class your teacher tells you off for talking.

Why do you think they are acting in this way? **R**

10. Imagine that on your way home you see a group of kids from your school. As you pass them, someone flicks a cigarette butt and it lands next to you.

Why do you think they are acting in this way? **O**

11. Imagine that you are taking the bus/train home. The bus/train is really busy but you see an empty seat and make your way over to it. As you go to sit down the person sitting in the next seat shouts "Don't sit there!"

Why do you think they are acting in this way? **O**

12. Imagine that you are walking down a street and you notice a stranger walking towards you. As they approach, you see that they are frowning.

Why do you think they are acting in this way? **R**

13**.** Imagine that your teacher is giving back homework to the class. She tells everyone that they have not done very well in this homework, but reads your homework out loud as an example of how badly the class did.

Why do you think they are acting in this way? **O**

14. Imagine that you ask your best friend to sit next to you on the coach on the way to a school trip. You get on the coach, only to find your friend is sitting next to someone else.

Why do you think they are acting in this way? **R**

15. Imagine that you are having trouble with a subject at school. You hear there is a new 'Help Club' being offered at lunchtime and decide to go along. You ask your friend to go with you but they laugh and say "No way!"

Why do you think they are acting in this way? **O**

Set B Web-Chat Vignettes

Hostile Condition Responses/*Non-Hostile Condition Responses*

1. Imagine that during a lesson you and a few of your friends are told off, but after class the teacher only asks you to stay behind.

Why do you think they are acting in this way? **R**

User 1: 2 punish ME for wat we ALL were doin !!
User 2: the teacher dusnt like me
User 3: make an exmple of me an make my mates feel guilty

User 1: they prob only noticed me
User 2: because i was jokin around and not finkin it could get others in troble
User 3: maybe i was the ring leader - leadin my friends astray (lol)

2. Imagine that you're in a busy corridor at break. The people next to you are laughing and talking. One of them brushes against you then bumps into you again, making you spill your drink. You look over and they are laughing.

Why do you think they are acting in this way? **O**

User 1: they wnt 2 make me feel like a trget an make me feel vunerable
User 2: there talkin about me nd wnt to make it obvius so i feel bad
User 3: they hav insecuritys, nd think that makin fun of others will make there lives better – theyre prob jealous of me – hell yes!!

User 1: probably to bsuy thinkin about there conversation and not concentratin on who is around them
User 2: myb laughing cos theyr embrassed they made u spill ur drink
User 3: not 2 b mean, but sumtimes otha ppls bad luck is really funny lol!

3. Imagine that you mention to your parent that your birthday is coming up and they quickly change the subject.

Why do you think they are acting in this way? **R**

User 1: they probs forgot i'm the last thing of there mind
User 2: there terrified u mite ask them to spend some money on u lol- for like a prty - 2 much trouble in their busyyy lives!!
User 3: lol wldn't be suprised my rents dnt realy like me, lol

User 1: surprise party!!
User 2: their organising something for me and dnt want 2 slip up by accidently mentionin it!!
User 3: cos they have no money and dont want to let u down

4. Imagine that you arrange to meet a friend on the weekend. You go, but they don't show up. On Monday you find out that they went out with some of your other friends and didn't invite you.

Why do you think they are acting in this way? **O**

User 1: maybe there not cool when they hang out with me so they ditched me for cooler ppl
User 2: cos there selfish and didnt think about my feelings before changing their palns
User 3: there not really friends are they – they prob think dumping someone is funny and think tellin others theyve dumped u will boost their street cred - childish if u ask me!!

User 1: mayb they forgot u had made plans
User 2: maybe they wnted to spend time wiv other people an meant to call to reschedule, bit rude though
User 3: they were flatterd to be aksed out by anotha person!!

5. Imagine that your parent promises to take you shopping for new trainers, but on the weekend says you all have to go visit a relative.

Why do you think they are acting in this way? **R**

User 1: its probs an xcuse cos they alwys find a reason for me not 2 get things – harsh ppl lol
User 2: they want me 2 look like a loser with my scabby trainers lol
User 3: their priorites are diffferent to mine and im never a priority

User 1: well its likey they didnt hav a choice and neway it trainers .... its not like ur life depends on it! just go another day
User 2: cause they think familys more imprtant than some trainers
User 3: cos there putting family stuff first an the trainers will still b there on mmonday

6. . Imagine that as you're walking down the street you see a group of kids you don't know sitting on a wall. As you get closer, they all look over at you and stand up.

Why do you think they are acting in this way? **O**

User 1: 2 try and be intimidatin
User 2: to show dat its there teritory an seem more dominatin an make me feel small
User 3: cause theres a group of them they feel lke they hav the power to intimidate me an feel the need to mke a bit of drama in theer borin lives sitting on a wall!!! lol

User 1: mayb they think they kno me!
User 2: cos they feel threatened and so r being defensive lol
User 3: there leaving?

7. . Imagine that you put your hand up in class several times, but the teacher doesn't call on you.

Why do you think they are acting in this way? **R**

User 1: cos they think i'm an idiot and wldnt kno the answer
User 2: most teachers hate me lol
User 3: they cant xactly say shut up your irritating lol so ignorin u is there way of protestin lol

User 1: she prob knows i know the answer an wants 2 ask the people who dont usualy put their hands up, or just coincidence?
User 2: to giv others a chance to answer
User 3: wouldnt think nothin of it there r 30 people in the class they cant ask u everytime

8. Imagine that you are walking down a street and you notice a stranger walking towards you. As they approach, you see that they are smiling.

Why do you think they are acting in this way? **O**

User 1: probably a paedo, aggghah!
User 2: they might be acktin nice so they can try and take u or they mght just be friendly
User 3: weirdo! ii dont know them and wat they could do but im finkin its not nice

User 1: they think know me cos i probably look like someone they know
User 2: just being frendly
User 3: thyeve remembered somethin funny or couldve read a txt or thinkingabout something tht made them smile lol

9. Imagine that you ask your parent to lend you some money. They say no but won't tell you why.

Why do you think they are acting in this way? **R**

User 1: they r bein annoyin
User 2: cos they dont trust me an dont think i deserve an answer
User 3: cos they dont think they have to give me a reason it all about the POWER they hav over u

User 1: cos ive had enough money this month and need to learn how to use money better

User 2: they cld have a surpise for you soo they dont want to spend anymmnore money on u until you get what they have for you
User 3: they might of had some money troubles and dont want you to kno about it

10. Imagine you are in the dining hall eating lunch and you notice someone at the next table glancing over at you and whispering. Shortly afterwards, the people on that table start laughing loudly.

Why do you think they are acting in this way? **O**

User 1: cos they r bein harsh
User 2: they are probbly mockin the way i dress or the way ilook or somethin about me
User 3: cos theyve picked up on somethin about u and have shared it with the rest of there table and they make themslves superier to u and make u feel like an idiot – i know these people!!!!!!!!!!

User 1: cos I spilt something down my shirt prbably?
User 2: they could like u and their mates mayb laughin at them cos their trying 2 point u out without gettin your attention!! lol
User 3: they may wnt to appear like they are havign a great time to make themselves more popular so ppl want
to be in theri crew

11. Imagine your friend has invited some mates over to their house, usually you're invited, but this week you weren't asked.

Why do you think they are acting in this way? **O**

User 1: 2 let you kno they fell out with u – makin it obvious!
User 2: they wnt me to leave their group and tryin to let me know
User 3: so they can make me jealous on monday sayin they had a great time without me – lah lah lah

User 1: mayb my freind wants to spend time with other friends and didnt invite me because they saw me last week!
User 2: maybe they kno i dont like some1 they invited so it would be awkwrd
User 3: mayb they not aloud any more people and i have been alot recently – their loss

12. Imagine you comment someone on a social network site (e.g. Facebook or Bebo) you receive no reply but they appear to have replied to others.

Why do you think they are acting in this way? **R**

User 1: they dont want to make time for me more intrested in theer cool mates
User 2: tryin 2 upset me make me feel like their not interested
User 3: a bit stuck up and selfish cos theyre replyin to others

User 1: didnt think it needed a reply?
User 2: mayb they didnt have time to reply to urs or they forgot
User 3: might not have missed my message its easily done when u are a social network demon (lol)!!

13. Imagine you are sitting waiting for the bus/train listening to your personal music player. A lady waiting with you asks you to turn your music off.

Why do you think they are acting in this way? **O**

User 1: theri harsh and tryin to b difficult some old people h8 teenagers

User 2: its loud an bad an they dnt like they look of me so think theycan disrespect me -
User 3: she is 1 selfish, misrable old lady who wnts to spoil my enjoyment! down with the old folk lol

User 1: probbly wants to ask you somthin like wot times the train coming
User 2: she might not want to hear the tisk tisk noise tht earphones make when they r in your ear it is quite annoyin lol
User 3: the lady cld have a headache an JUST WANTS SOME PEACE IN HER LIFE!! lol

14. Imagine you receive a text from a friend which reads What time's the party start? you are not aware of a party and so reply, What Party? Your friend responds Sorry, wrong person .

Why do you think they are acting in this way? **R**

User 1: tryin to show you they r going to a party and youre not invited so you feel bad
User 2: tryin 2 make me jealus
User 3: they were tryin to hide a party from me cos they dont want me to come

User 1: they thght they were textin the party host
User 2: mayb they thought i was invited and felt embarased when i didnt know about it
User 3: they mite have actully text the wrong person or it cld be a surprise party for ME!!!

15. Imagine that you receive your school report. You are really pleased with the grades and eager to show your parents how well you have done. As soon as you get home you ask your parents to read the report, they read it but don't say anything.

Why do you think they are acting in this way? **R**

User 1: they think i cld do better – theyre neva happy
User 2: they might not be impresed by it - no change there lol
User 3: THEY DONT CARE!!!!

User 1: they are speechless with joy! lol
User 2: prob dont get the grade system so dont realise how great ive done
User 3: cos they mite wnat to sit down wit u later when they got a bit more time to take it in or thinkin up a great reward for you.... lol!!

R = Relational Vignettes

Coding Criteria

1. Criteria for benign attributions included the following:

(a) The negative event was described as being because of an accident,

misunderstanding, or temporary state or circumstance; (e.g. “they’re feeling grumpy”; “they are in a mood”, “they forgot to meet me”, “weren’t looking where they were going”)

(b) the negative event was attributed to some state or characteristic of the respondent (e.g., “I don’t pay enough attention to that person”; “I was talking in class”, or “I submitted the poorest piece of work”)

(c) the negative event was attributed to something about the other person, but the other person was seen as having acted in a benign or even helpful way (e.g., “She is trying to help me fit in”; “ they didn’t want me to feel left out”).

(d) the negative event was attributed to the content rather than the person per se and the respondent clearly appears to have not taken offence (e.g., “So they hate the idea, no big deal”, “they probably just dislike the music”)

2. Criteria for hostile attributions includes the following:

(a) The negative event was attributed to something about the other person; (e.g. “they are jealous of you”)

(b) the person was described as having acted intentionally, to achieve some effect (e.g. “He is trying to make a fool of me”; “he is trying to look hard”; “they are trying to push in the queue”)

(c) a personality trait or disposition was described that suggested that the person acted with hostility, indifference, or significant lack of concern (e.g., “She’s a snob”; “they’re gay”; “she’s a bitch”).

3. Criteria for Mixed/Ambiguous

(a) The participant gives both a hostile and benign response as per above criteria (e.g.it could be [Hostile response] OR it could be [Benign Response]).

4. Negative Non-Hostile Response

(a) The participants response recognises a negative feeling (sadness or disappointment) towards them, or to something they have done, but there is no sense of the protagonist behaving with hostility e.g. “they think I could do better” [the school report] or “they didn’t like the comment I left”

5. Irrelevant

(a) The participant’s response is ambiguous or incomplete; or is a response with no expression of how they perceive the protagonist (e.g. “lol”, “That wouldn’t happen”, “I don’t go on social networking sites”); or the response is a joke (“Michael Jackson has morphed into my Mum”)

6. Don’t Know

The participant indicates that they do not know what the protagonist’s intention might be, e.g. “Don’t Know” , “dunno”, “????”

Hostile Attribution Style among Adolescents: Are they Contagious?

Immediate Debriefing Statement

Thank you for volunteering to participate in our study today, your participation is really appreciated.

By carrying out this research it is hoped we may develop a better understanding of how peers might be an important influence on how people behave in day to day life.

If you felt that some of the questionnaire items related to issues that are a particular problem for you (e.g., problems with worry or your personal relationships), or feel that you have been affected by the nature of the study, you might like to talk about this with someone. You can speak to <SCHOOL'S COUNSELLING DETAILS>. In addition, national organisations that can help you are listed below.

Childline Call 0800 1111 or see www.childline.org.uk for more details.

If you have any further questions please contact me, at kmf1v07@soton.ac.uk or my supervisor Dr Julie Hadwin on telephone number (023) 8059 2590 or email J.A. Hadwin@soton.ac.uk

Signature _____ Date _____

Kim Freeman

Thank you.

Hostile Attribution Style among Adolescents: Are they Contagious?

Debriefing Statement

Thank you for volunteering to participate in our study today, your participation is really appreciated.

The primary aim of our investigation was to examine how adolescents think about other people's intentions in different social situations. We are also interested in whether one person's belief style can influence the beliefs of others when communicating in a "chat-room". Today you were asked to give your views of a character's intentions, first on your own and later as a member of a "chat-room", and to complete questionnaires to indicate the kinds of behaviour you have engaged in over the last 6 months. The responses you viewed from other "Users" were collected from adolescents at schools within the UK. Your responses were recorded and will be analysed in order to identify any changes between those you gave when responding alone, and your responses after viewing the hostile or neutral responses of others. The data will also be analysed to identify whether you hold similar views to your friends.

All the data collected will be extremely useful. By carrying out this research it is hoped we may develop a better understanding of how peers might be an important influence on how people behave in day-to-day life. Once again, results of this study will not include your name or any other identifying characteristics. The research did use deception in order to determine whether your attitudes changed to social scenarios when you *believed* you were taking part in a "chat-room" forum.

If you have any worries or concerns about the study please do speak to your Tutor.

If you have any further questions please contact me, at kmf1v07@soton.ac.uk or my supervisor Julie Hadwin on telephone number (023) 8059 2590 or email J.A. Hadwin@soton.ac.uk

Signature _____ Date _____

Kim Freeman

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ.Phone: (023) 8059 5578.

Thank you.

Script for Debrief

Thank pupils for participating in the study, hand out debriefing statement and give the following explanation.

- The study used an element of deception in that whilst the responses you viewed were **genuine responses** from other young people, they were not on-line at the same time.

- Responses were collected from other "Users" then grouped together to form two types of chat-room;

Hostile "User" Group - When these "Users" were asked to describe why someone is acting in a certain way they explain the actions of others as deliberately unkind or hurtful.
For example, to the vignette,

"*Imagine that you are walking down a street and you notice a stranger walking towards you. As they approach, you see that they are frowning – Why do you think they are acting in this way"*

they might reply, "*They are trying to look tough and scare me*" or "*they think I'm weird*".

Benign "User" Group – These "Users" explain the intentions of others quite differently. They are likely to say people behave in certain ways because of the environment, or something happening in their own lives **NOT** because they are wishing harm on others. So, to the same scenario they might reply,

"*He might be lost*" or "*probably had a row with his boss*"

- Your responses will help us to understand how your views may change from those you hold when you explain the actions of others on your own, and those you express when in a hostile or benign chat-room. We will let you know how the study turned out.

- The winner of the Ipod Shuffle was .....