**SOCIAL ANXIETY AND EMPATHY**


by


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**Abstract**

Individuals with high levels of social anxiety often have difficulty developing and maintaining interpersonal relationships (Alden & Taylor, 2004). Researchers have uncovered many of the negative cognitive and behavioural processes that mediate the relationship between social anxiety and relationship difficulties (e.g., Baker & Edelmann, 2002; Stopa & Clark, 1993) however, relatively little research has investigated the relationship between social anxiety and the basic social and emotional processes that facilitate *positive* relational functioning (Lochner et al., 2003; Schneier et al., 1994). One such factor is the ability to *empathize* with the emotional and cognitive experience of others. The link between social anxiety and empathy has not been examined. In this study, 121 undergraduate participants observed videos of individuals discussing high school events in which they were either socially included or excluded. Participants rated the positive and negative emotions the target individuals were feeling while discussing the events. The absolute discrepancy between participants' and targets' emotion ratings was used as a measure of empathic accuracy. This study produced preliminary evidence that socially anxious individuals demonstrate greater accuracy at empathizing with others' negative affect. This finding however, appears to be specific to negative social experiences such as exclusion, and only occurs when the viewer themselves is experiencing a degree of social pain or social scrutiny. There was also partial evidence that socially anxious individuals perceive more negative affect in comparison to how others' rate themselves. This result was only found in participants in the social threat experimental condition, suggesting that negative cognitive biases may be activated when socially anxious individuals feel anxious and/or socially scrutinized. These results provide continuing support for research on empathy gaps for social pain.

**Preface**

This thesis is based on research conducted in UBC's Interpersonal lab by Dr. L. Alden and Karen Auyeung. In collaboration with Dr. Alden, I developed the design and methodology for the study. I was responsible for coordinating and conducting the testing of participants and I wrote the manuscript in its entirety.

The research design received ethics approval from the UBC Behavioural Research Ethics Board ID# H11-02526.

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## Introduction

Individuals with high levels of social anxiety often have difficulty developing and maintaining interpersonal relationships (Alden & Taylor, 2004; Caspi, Elder, & Bem, 1988; Wittchen & Beloch, 1996). Researchers have devoted considerable effort to investigating the negative cognitive and behavioural processes that mediate the relationship between social anxiety and relationship difficulties (Baker & Edelmann, 2002; Beidel, Turner, & Dancu, 1985; Bögels, Rijsemus, & de Jong, 2002; Stopa & Clark, 1993); however, relatively little research has investigated the relationship between social anxiety and the basic social and emotional processes that facilitate *positive* relational functioning (Lochner et al., 2003; Schneier et al., 1994). One such factor is the ability to empathize with others' feelings.

*Empathy* can be broadly defined as the capacity to recognize the emotional and cognitive experience of others with corresponding emotional changes in oneself (Davis, 1994). Empathy is fundamentally involved in promoting positive social interactions and healthy social and emotional functioning (Eisenberg, 2000; M. L. Hoffman, 1977). Therefore, deficiencies in the capacity for empathy would be expected to impede adaptive interpersonal functioning and relationship development.  This study examines the relationship between empathy and social anxiety, paying particular attention to whether social anxiety helps or hinders accurate empathy for others' positive and negative social feelings.

## Social Anxiety

Social anxiety commonly affects the interpersonal, occupational, educational, and every day aspects of individuals' lives. Researchers agree that social anxiety falls along a continuum of severity, ranging from the mild situational anxiety that virtually everyone experiences to Social Anxiety Disorder (SAD), a persistent clinical condition in which social anxiety produces

significant impairment and distress (American Psychiatric Association, 1994; Widiger, 2001).

Chronically socially anxious individuals are characterized by a persistent fear of embarrassment

and rejection in social situations (APA, 1994). In these situations, the person fears that they

might be negatively evaluated and/or that they might embarrass or humiliate themselves in front

of others.  Participants from community and university samples routinely report experiencing

symptoms of social anxiety (Burke & Stephens, 1999; Purdon, Antony, Monteiro, & Swinson,

2001), although these levels are usually sub-clinical. Interestingly, individuals with significant

but sub-clinical levels of social anxiety closely resemble individuals who met criteria for a

diagnosis of SAD and are often used to examine processes believed to contribute to severe social

anxiety (Davidson, Hughes, George, & Blazer, 1994; Essau, Conradt, & Petermann, 1999; Fehm,

Beesdo, Jacobi, & Fiedler, 2008; Morris, Stewart, Theakston, & Mellings, 2004; Wittchen, Stein,

& Kessler, 1999). Indeed, research with nonclinical samples has yielded important theoretical

and empirical advancements in our understanding of social anxiety, particularly the interpersonal

patterns that characterize socially anxious individuals (Baumeister & Leary, 1995; Creed &

Funder, 1998; Leary & Kowalski, 1995; Schlenker & Leary, 1982). The current study follows

this tradition and examines social anxiety as an individual difference in a university student

population.

      **Cognitive processes in social anxiety.** Contemporary theories of SAD underscore the

role of negative cognitive processes in the onset and maintenance of social anxiety (Clark &

Wells, 1995; Rapee & Heimberg, 1997). Existing research focuses on the role of cognitive biases

in social predictions, attention, and judgment. Cognitive researchers indicate that socially

anxious individuals tend to make overly-negative predictions about the outcomes of social events

(Foa, Franklin, Perry, & Herbert, 1996), which is hypothesized to result in anticipatory anxiety

prior to social events and selective attention to threat-related cues during social events (Clark & Wells, 1995; Rapee & Heimberg, 1997). Studies demonstrate that socially anxious individuals selectively attend to anxiety-related physical sensations, small behavioural missteps, and negative social cues (Gilboa-Schechtman, Presburger, Marom, & Hermesh, 2005; Hope, Heimberg, & Klein, 1990; Mellings & Alden, 2000; Veljaca & Rapee, 1998; see also review by Bögels & Mansell, 2004). This negative self-focus depletes the individuals' self-regulatory resources and actually results in a paradoxical increase in anxiety (Muraven & Baumeister, 2000; Vohs, Baumeister, & Ciarocco, 2005). In addition, attentional biases can lead individuals to miss relevant information in the environment. For example, undergraduates with non-clinical levels of social anxiety recall less detailed information and make more errors in recall about previous interactions than do their non-anxious peers (Hope et al., 1990).These individuals are so tuned into their internal processes that they fail to attend to cues in their surrounding environment, such as information about their interaction partners' appearance and the content of the conversation. This is particularly important in the maintenance of social anxiety as this would mean these individuals are missing both negative cues, which could help them to adjust their behaviour, and positive cues that might help to disprove some of their negative internal biases.

Selective processing of threat-related cues is hypothesized to increase the salience of this information and negatively bias the individual's judgments about social events (Clark & Wells, 1995). For example, in interpersonal interactions, socially anxious individuals interpret ambiguous stimuli (e.g., facial expressions) in a negative fashion and mildly negative social events as catastrophic (Beck, Emery, & Greenberg, 1985; Clark & Beck, 1988; Hirsch & Clark, 2004). After social events have passed, these individuals also overestimate how anxious they appear to others as well as how negatively others responded to them (Alden & Wallace, 1995;

Rapee & Lim, 1992; Stopa & Clark, 1993; Taylor & Alden, 2005). Such biases also influence conceptualizations of past events, such that socially anxious individuals are more likely to recall memories related to social threats (Wenzel, Jackson, & Holt, 2002). To summarize, according to cognitive researchers, biases in social predictions, attention, and judgments lead to a negative cycle that maintains fear and avoidance of social situations (Clark & Wells, 1995; S. G. Hoffman, 2007; Rapee & Heimberg, 1997; Taylor & Alden, 2010).

  **Social anxiety and interpersonal behaviours.** Socially anxious individuals have difficulty developing and maintaining interpersonal relationships (Alden & Taylor, 2004; Caspi et al., 1988; Wittchen & Beloch, 1996). Research indicates that these individuals elicit negative reactions from others. For example, compared to non-anxious individuals, socially anxious individuals are viewed as less sympathetic and less easy to talk to by their friends and families (Jones & Carpenter, 1986). Similarly, in studies where socially anxious individuals interact with other participants, they are rated as less likeable and less comfortable to be around (Meleshko & Alden, 1993); less warm, and interested (Alden & Wallace, 1995); less friendly, assertive, and relaxed (Jones & Russell, 1982; Pilkonis, 1977), and moodier and more sensitive to demands (Creed & Funder, 1998) than non-anxious participants. As a result of these negative impressions, others are less likely to want to engage in ongoing interactions (Meleshko & Alden, 1993; Voncken, Alden, Bögels, & Roelofs, 2008). Similarly, socially anxious individuals report spending less time feeling happy and relaxed, and that they experience fewer positive social interactions (Alden & Wallace, 1995; Kashdan, 2007).

  Cognitive and interpersonal theorists propose that socially anxious individuals engage in behaviours that lead others to back away (Alden & Taylor, 2004). The dysfunctional behavioural performances of socially anxious individuals are variously viewed as arising from social skill

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deficiencies or from reliance on safety behaviours. Behavioural researchers suggest that socially anxious individuals have poor *social skills* and that these skills deficits are an important contributor to social rejection in both clinical (Baker & Edelmann, 2002; Stopa & Clark, 1993) and non clinical-samples (e.g., Beidel et al., 1985; Bögels et al., 2002). Evidence for such deficits is more likely to emerge on global than on molar measures of performance (e.g., Beidel et al., 1985). Research finds that following rejection, individuals with higher levels of social anxiety not only display poor verbal and non-verbal behaviours such as poorer eye contact and vocal quality, but they also respond to interaction partners with fewer prosocial behaviours (Mallot, Maner, DeWall, & Schmidt, 2009).

Cognitive writers have a somewhat different conceptualization of social anxiety-related behaviours, which they view as *safety behaviours*. Whereas skill deficits imply behavioural deficiencies, cognitive writers believe these actions are *strategically* adopted in an attempt to prevent feared outcomes and to allow individuals to stay in anxiety-provoking situations while maintaining a sense of safety. Socially anxious individuals use a larger number of safety behaviours more often and in a greater number of situations than individuals with low levels of social anxiety (McManus, Sacadura, & Clark, 2008). Because safety behaviours are under strategic control, cognitive writers view socially anxious individuals as having greater behavioral control. Consistent with that reasoning, research indicates that even individuals with clinical SAD are able to identify and reduce their habitual safety behaviours with resulting improvements in attention and judgmental biases (Kim, 2005; McManus et al., 2008; Taylor & Alden, 2010, 2011; Wells et al., 1995). Moreover, safety behaviour use is shown to produce corresponding changes in others' reactions to anxious individuals. For example, (McManus et al., 2008) found that the conversation partners of socially anxious people found the interaction to be less

enjoyable, their partner less likeable, and believed their partner performed more poorly when the participants were using self-focused attention and safety behaviours than when they were not. Similarly, (Taylor & Alden, 2011) found that others were more willing to engage in subsequent interactions with individuals with SAD when they eliminated their safety behaviours.

To date, the literature on social anxiety presents a strong connection between social anxiety and negative interpersonal behaviours. Less is known, however, about positive behaviours and interpersonal processes. In particular, the research literature is shifting towards enhancing resiliency and preventing problems before they arise by better understanding positive social and emotional functioning (Greenberg et al., 2003). An important step in advancing this research is to understand the mechanisms through which positive social behaviours operate. One of the constructs that has emerged as a fundamental component in promoting positive and constructive social functioning is empathy (Bohart & Greenberg, 1997; Rogers, 1975).

**Empathy**

Empathy is the capacity to recognize and feel the experiences, emotions, and perspectives of others, resulting in changes in our own thoughts and feelings (Davis, 1994).  As a broader construct, empathy is thought to be fundamentally linked to and instrumental in the formation of basic social and emotional functioning and psychological well-being. The operational definition of empathy varies across the literature, but most researchers agree that it includes the complex interaction of a cognitive-related component, which incorporates the ability to understand others' perspectives, and an automatic affective response that mirrors the emotion state of target (Davis, 1983; Preston & de Waal, 2002).

Research suggests that the development of empathy begins with basic emotion contagion such that young children react to other children's displayed emotion with the exact same

response or with a response that they themselves would find comforting (Eisenberg & Fabes, 1998). As children's cognitions develop, they become more aware of others' mind states and are better able to recognize others' experiences and perspectives as different from their own. Children as young as two years of age begin to display empathy for other children's feelings even when the feeling states are different from their own (M. L. Hoffman, 1982). Around four years of age, children's perspective taking and theory of mind abilities are typically developed (M. L. Hoffman, 2000) and relatively stable (Koestner, Franz, & Weinberger, 1990). Empathic ability at age five has been found to predict adult levels of empathy (M. L. Hoffman, 2000), although it is likely that this ability increases across early childhood and elementary school (Eisenberg & Fabes, 1998).

Empathy is seen as a vital element in fostering social competence, positive interpersonal relationships, and personal growth (Eisenberg, 1998). Individuals who experience greater empathy tend to show a greater concern for the welfare of others and are more likely to display helping behaviours towards others (Batson, 1991, 1998; Dovidio, Allen, & Schroeder, 1990; Eisenberg et al., 2002; Oswald, 1996). Individuals with greater empathy have been found to experience greater intimacy with other individuals (Long, Angera, Carter, Nakamoto, & Kalso, 1999) and greater life satisfaction (Grühn, Rebucal, Diehl, Lumley, & Labouvie-Vief, 2008). Similarly, greater empathy is also associated with the experience of fewer negative outcomes. Individuals who experience greater empathy tend to experience reduced depressive symptoms (Grühn et al., 2008), show less aggressive behaviours, and have fewer discordant relationships (Batanova & Loukas, 2011; Loudin, Loukas, & Robinson, 2003). Researchers suggest that if individuals are better able to take others' perspectives, they are more likely to understand how others might feel as a result of their own actions, and thus may be less likely to engage in

aggressive behaviours (Carlo, Raffaelli, Laible, & Meyer, 1999; Kaukiainen et al., 1999). Similarly, they are more likely to make accurate attributions about others' intentions and behaviours, which might help these individuals to avoid conflicts due to misunderstandings.

A related but conceptually distinct construct is *empathic accuracy* – the ability to *accurately* perceive and infer the content of others' thoughts and feelings (Ickes, Stinson, Bissonnette, & Garcia, 1990). Research in this area stems from the Rogerian view that successful therapeutic relationships involve the therapist being sensitive to and able to *accurately* understand the patients' needs and emotions (Bohart, Elliot, Greenberg, & Watson, 2002; Rogers, 1975). At a basic interpersonal level, empathic accuracy is seen as being a vital part of effective communication (e.g., Honeycutt, Knapp, & Powers, 1983). It is suggested that those who are proficient at noticing cues to others' internal states can avoid or minimize conflict with others as well as align their ideas and action plans with them (Simpson, Ickes, & Oriña, 2001). Research finds that high empathic accuracy is associated with positive interpersonal outcomes in adults (Bissonnette, Rusbult, & Kilpatrick, 1997; Ickes & Simpson, 2004; see Simpson et al., 2001) and adolescents (Eisenberg, Fabes, Guthrie, & Reiser, 2000; Gleason, Jensen-Campbell, & Ickes, 2009).

Empathic accuracy can be broken down into several components, however *content* and *valence accuracy* are most commonly examined in interpersonal contexts (Ickes, 2001; Ickes et al., 1990). Content accuracy is seen as the degree to which an individual can accurately infer the specific content of another individuals' thoughts and feelings, whereas valence accuracy refers to the ability to accurately make inferences about the emotional direction (i.e., positive, negative) of another individuals' thoughts and feelings. Previous studies have focused on assessing content accuracy using a technique developed by Ickes and colleagues (1990), where participants write

down the specific thoughts they believe the individual was experiencing. In these studies, valence accuracy is normally assessed with a single rating of affective tone (positive, neutral, or negative). This study will explore a new method of assessing the valence of empathic accuracy that uses specific emotion words for positive and negative affect to obtain a more nuanced understanding of how we understand others' emotional experience.

**Pain and Empathy**

There are numerous studies on the experience of empathy for those in physical pain. In general, people tend to exhibit a *cold-to-hot empathy gap* such that individuals in a "cold" state (i.e., not in pain, hungry, sexually aroused, etc.) underestimate the influence that a "hot" state will have on their behaviour (Loewenstein, 1996). Findings on empathy for physical pain indicate that doctors underestimate the pain associated with physical procedures experienced by patients (Hodgkins, Albert, & Daltroy, 1985; Kappesser, Williams, & Prkachin, 2006; Marquie et al., 2003) and that patients underestimate the severity of pain associated with upcoming procedures (Christensen-Szalanski, 1984; Nordgren, van der Pligt, & van Harreveld, 2006; Read & Loewenstein, 1999). Important for the current work are studies indicating that participants more accurately judge another's pain when they themselves are experiencing pain than when they are not (Nordgren, MacDonald, & Banas, 2011; Read & Loewenstein, 1999).

Researchers are now beginning to investigate the overlap between physical and what has been dubbed as "social pain." Social pain most often refers to the emotional experience associated with negative social events such as being ignored, ostracized, or bullied. Individuals usually report that such experiences (collectively referred to as social rejection) are highly aversive and painful (Baumeister & Tice, 1990; Baumeister, Twenge, & Nuss, 2002; Gardner, Gabriel, & Diekman, 2000; Leary, Tambor, Terdal, & Downs, 1995). At the basic verbal level,

people frequently use terms that imply physical pain following painful social experiences such as "heartache" or feeling "hurt" (Leary & Springer, 2001). Moreover, the pain experienced from social rejection shares neurological and psychological correlates with physical pain (Eisenberger & Lieberman, 2004; MacDonald & Leary, 2005; Panksepp, 1998). Functional MRI studies have revealed that social pain correlates with activation of the dorsal anterior cingulate cortex (ACC) (Bush, Luu, & Posner, 2000; Eisenberger & Lieberman, 2004; Kimbrell et al., 1999) and right ventral prefrontal cortex (Eisenberger, Gable, & Lieberman, 2007; Eisenberger, Lieberman, & Williams, 2003; Eisenberger, Way, Taylor, & Welch, 2007), brain areas shown to respond to the affective experience of physical pain. The right prefrontal cortex is also been linked to the regulation of distress and negative affect associated with physical pain (Hariri, Bookheimer, & Mazziotta, 2000; Petrovic, Kalso, Petersson, & Ingvar, 2002). Similarly, recalling experiences of social loss results in a decrease in the level of endogenous opioids, which are known to help reduce physical pain (Zubieta et al., 2003).

Taken together, if physical and social pain share some of the same mechanisms, then the processes associated with physical pain, such as the hot-to-cold empathy gap, might also apply to experiences of social pain. Consistent with this proposition, Nordgren, MacDonald, and Banas, (2011) found that participants who were actively experiencing social pain (i.e., via social exclusion) rated socially distressing events to be more painful compared to participants who were not. They also found that teachers who recently experienced social pain had heightened estimates of the social pain experienced by students, which in turn led to recommendations for more comprehensive treatment for the victims and greater punishment for bullies. Thus, it might be necessary for individuals to be actively experiencing social pain in order to fully appreciate (i.e., empathize with) the severity of social pain experienced by others.

There are still many uncertainties as to whether social pain functions like physical pain (MacDonald & Jensen-Campbell, 2010). Logically, given that social exclusion appears to threaten the fundamental need to belong, it would make sense that the negative experience of social pain would motivate individuals to try and reconnect. However, there is little evidence for this reconnection hypothesis (Gruter & Masters, 1986; Williams, Cheung, & Choi, 2000). Instead, recently rejected individuals appear to engage in negative behaviours that would seem to hamper any form of reconnection to the social group. For example, recently rejected individuals demonstrate increases in antisocial behaviours such as aggression, even towards a neutral party (Twenge, Baumeister, Tice, & Stucke, 2001), and decreased prosocial behaviours (Twenge, Ciarocco, Baumeister, DeWall, & Bartels, 2007). Rejection can also cause individuals to be less sensitive or "numb" to physical and emotional pain, thereby leading them to demonstrate less empathy for others' negative experiences (DeWall & Baumeister, 2006; Eisenberger & Lieberman, 2004). Similarly, studies find that social exclusion impairs certain self-regulation processes, leading to impulsive eating of cookies, reduced persistence on difficult tasks, impaired achievement on attention tasks (Baumeister, DeWall, Ciarocco, & Twenge, 2005), and decreased consumption of healthy but unpleasant drinks (Oaten, Williams, Jones, & Andrew, 2008). Self-regulation is linked to interpersonal behaviours, such that individuals with lower levels of self-regulation tend to have difficulty responding appropriately in certain social situations (Eisenberg & Fabes, 1998). Individuals who are unable to properly self-regulate can be overwhelmed by their emotions and/or distress, leading them to have difficulty appropriately empathizing with others' experiences.

In addition to uncertainty about how social pain affects empathic processes in social situations, research has yet to examine how chronic rejection might affect individuals' empathic

abilities. The literature on empathy gaps would suggest that individuals may need to be *actively* experiencing pain in order to heighten their understanding of others' negative social experiences (Nordgren et al., 2011). Some researchers suggest that the negative effects of social rejection might be more persistent in certain individuals such that the experience of being excluded continues to influence their cognitions, emotions, and behaviours, long after most individuals have recovered (Zadro, Boland, & Richardson, 2006). In one study, all participants rated their interaction partners less positively and were more likely to interpret ambiguous situations as hostile directly after being socially excluded. After 45 minutes, these negative effects completely dissipated in participants with low levels of fear of negative evaluation, but persisted for participants with high levels of fear. This research suggests that the aforementioned effects of social pain may be found in certain individuals, such as those who are chronically rejected and/or are highly socially anxious, despite not actively or recently experiencing social rejection.

It is also unclear how chronically rejected individuals might empathize with the positive experiences of others. In line with research on the hot-to-cold empathy gap, it is possible that individuals might underestimate positive outcomes, such as seeking connection with others, if they are not actively experiencing inclusion and/or positive social experiences, leading them to be *less* able to empathize with positive social experiences. Previous research on *affective forecasting,* defined as predicting one's own future feelings (Wilson & Gilbert, 2003), has shown that people generally overestimate their own future happiness (Wilson, Wheatley, Kurtz, Dunn, & Gilbert, 2004). In spite of this, one study found that recently rejected individuals predicted *less* happiness when forecasting their emotional reaction to positive events (DeWall & Baumeister, 2006), suggesting that rejection or the lack of current positive events might change the way we process our own and possibly others' emotional reactions to positive events.

A new literature has emerged investigating how trait empathy might influence the interpretation of others' pain experiences. Generally, it has been found that individuals who have higher levels of empathic concern perceive *more* pain than those without (Green, Tripp, Sullivan, & Davidson, 2009). It should be noted that while individuals with elevated of empathy perceived more pain, they were not necessarily more accurate. The authors suggest that individuals with higher levels of empathy engage in more social monitoring and thus would be more likely and/or more able to attend to facial and behavioural cues of pain (Goubert et al., 2005). Similarly elevated levels of social monitoring are also found in individuals who report being lonely (Gardner et al., 2000). The experience and/or perception of chronic rejection in lonely individuals may lead them to attempt to acquire social information in order to facilitate reconciliation and inclusion with others. The elevated social monitoring found in lonely individuals might also result in an overestimation of others' experiences of pain. Research finds that lonely individuals also tend to be socially anxious (Inderbitzen-Pisaruk, Clark, & Solano, 1992; Jones, Rose, & Russell, 1990; Solano & Koester, 1989), suggesting that we might find also similar results in individuals who are highly socially anxious.

Given the incomplete and inconsistent nature of the literature, more research is required to explore basic social and emotional processes involved when individuals respond to the social pain of others. In particular, it would be of interest to see how individuals who more frequently experience social rejection respond to the positive and negative social feelings experienced by others.

**Social Anxiety and Empathy**

The link between social anxiety and empathy has not been examined. As a result, it is unclear whether empathic functioning in individuals with social anxiety differs from that of

others and if so, how this difference might contribute to their difficulties with interpersonal interactions. Only two studies have examined topics related to social anxiety and neither measured social anxiety per se. The first study found that general anxiety was negatively correlated with empathy (Deardorff, Kendall, Finch, & Sitarz, 1977). The second study examined the contributions of fear of negative evaluation and empathy to the presentation of relational aggression, defined as manipulating and damaging interpersonal relationships in order to harm others (Crick, 1996; Crick & Grotpeter, 1995). Findings revealed that fear of negative evaluation and empathic concern were unique predictors of relational aggression; individuals who reported greater fear of negative evaluation and individuals who reported lower empathic concern were more relationally aggressive (Loudin et al., 2003). The authors speculated that in those who feared negative evaluation, these aggressive behaviours might be a strategy to deflect criticism by focusing on the weakness of others (Watson & Friend, 1969), however they did not investigate participants' levels of empathy or social anxiety per se. To summarize, the proposed research will address a gap in the research literature and stands to make a novel contribution to our understanding of both social anxiety and empathy.

**Current Study**

The current study was designed to investigate the influence of social anxiety and social pain on empathic accuracy for positive and negative social experiences. Participants observed videos of individuals discussing high school events in which they were socially included or excluded and elicited positive and negative feelings, respectively. Both the videotaped targets and participants rated the emotions the target individuals were feeling when discussing the event. (Note: not at the time of the event but when talking about it.) The discrepancy between participants' and targets' emotion ratings was used as the measure of empathic accuracy.

Participants were randomly assigned to either a control or experimental condition. The experimental condition was designed to increase self-consciousness and social anxiety in the participants while they completed the task to investigate whether the active experience of social pain differentially affects participants' empathic accuracy. The research described in the above introduction suggests three possibilities as to how social anxiety might influence empathic processing.

**Social pain hypothesis.** The literature on the hot-to-cold empathy gap suggests that individuals who are experiencing social pain would be more accurate at empathizing with the social pain and negative emotions of others. As individuals with social anxiety tend to be more sensitive to negative social cues, it is hypothesized that these participants in the experimental condition would perceive a social threat. This perception might be expected to increase the level of social pain they experience, thus allowing them to more accurately empathize with the negative emotions of others. This "enhanced" level of empathy would be particularly relevant for videos where the target is experiencing social pain (i.e., exclusion). Therefore, we would expect a three-way interaction between social anxiety, condition, and video type in predicting accuracy for negative affect, such that socially anxious individuals in the experimental condition would show greater accuracy (i.e., smaller absolute discrepancies between their ratings of target's emotions and those of target individuals) for negative affect when rating the exclusion videos.

It is also possible that trait social anxiety might produce enhanced levels of empathy for social pain regardless of the experimental condition manipulation. This secondary hypothesis suggests that socially anxious individuals tend to experience and/or perceive more social rejection such that they might experience chronic levels of social pain. The effects of chronic rejection might "correct" the hot-to-cold empathy bias, leading these individuals to generally

empathize more accurately with the negative emotions of others. This finding would be reflected in a two-way interaction between social anxiety and video type.

It is not clear whether this effect would extend to ratings of positive affect and/or experiences (i.e., social inclusion). Overall, the social pain hypothesis suggests that individuals with higher levels of social anxiety may demonstrate higher levels of empathic accuracy, particularly or only when making judgments for negative social experiences.

**Cognitive interference hypothesis.** The cognitive literature on social anxiety suggests that attentional and judgmental biases may impair how accurately socially anxious individuals are able to process others' emotions. While these individuals might display average levels of trait empathy, their selective focus on self-related threat cues may result in fewer resources available to process the external information needed to accurately judge others' emotions. Consequently, participants in the experimental condition may display less accuracy, i.e., display greater absolute discrepancies between their ratings of the target's emotions and those of target individuals. This finding is expected to hold regardless of the stimuli content (i.e., exclusion versus inclusion). Therefore, we would expect a two-way interaction between social anxiety and condition in predicting less accuracy for positive and negative affect.

**Negative bias hypothesis.** Socially anxious individuals tend to experience more negative emotions, particularly those associated with social experiences. It is possible that these experiences might result in these individuals being "dulled" or less sensitive to both the positive and negative experiences of others. In this case, socially anxious individuals might judge negative experiences as producing greater negative emotions than those reported by targets, and positive experiences as producing less positive emotions than those reported by targets. Certain cognitive biases are only found when the individuals are feeling socially anxious (e.g., Voncken,

Bögels, & Peeters, 2007), thus it is possible that only participants in the experimental condition demonstrate the negative bias. Alternatively, it is possible that this negative bias is associated with social anxiety regardless of their current emotional state. In this case, we would expect a main effect of social anxiety, regardless of condition or video type.

In addition to the primary empathy judgment task, we assessed participants' trait level of empathy to investigate i) how socially anxious individuals' levels of empathy compare to individuals with lower levels of social anxiety and ii) whether trait empathy influences participants' ratings regardless of level of social anxiety.

**Method**

**Participants**

A total of 122 undergraduate participants completed the study (78.7% female; mean age = 20.14 years, SD = 2.34; mean years of university education = 2.18, SD = 1.26). Of these participants, 25 participants (20.5%) identified themselves as being of European Canadian descent, 52 (42.5%) as Asian Canadian, 10 (8.2%) as Indo-Canadian, three (2.5%) as French Canadian, two (1.6%) as First Nations Canadian, and 29 (23.8%) as "other" cultural descent. Additionally, 61 participants (50%) were born in Canada and 61 participants (50%) were born abroad, and 55 participants (45.1%) spoke English as a first language. One participant was missing data on the rating task and was removed from the analyses, resulting in a final total of 121 participants.

**Measures**

**Social anxiety.** The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item inventory that is commonly used to assess the affective and behavioural symptoms of social anxiety experienced while interacting with different kinds of companions. Items are rated on a five-point scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). The SIAS has high internal consistency with Cronbach's alphas ranging from .86 - .94, and high test-retest reliability over 4-12 weeks, with correlations ranging from $r$ = .86- .92, respectively. Previous correlational data provide support for the convergent and discriminant validity of the SIAS (e.g., Heimberg, Mueller, Holt, & Hope, 1992 as cited in Mattick & Clarke, 1998; Orsillo, 2001). In the current sample, Cronbach's α = .95

**Trait empathy.** Interpersonal Reactivity Index (IRI; Davis, 1983). The IRI is a 28-item self-report measure of trait empathy. Items are rated on a five-point scale ranging from 0 (*does*

*not describe me well*) to 4 (*describes me very well*). The IRI has four seven-item subscales that

tap cognitive and affective dimensions of empathy: perspective-taking (PT), fantasy (FA),

empathic concern (EC), and personal distress (PD). The empathic concern subscale assesses

affective responses such as the tendency to experience feelings or warmth and concern for others

(e.g., "I often have tender, concerned feelings for people less fortunate than me"), the personal

distress subscale assesses the affective responses (i.e., anxiety) that can emerge with empathic

responding (e.g., "I sometimes feel helpless when I am in the middle of a very emotional

situation". For the cognitive dimensions, the perspective taking subscale measures the tendency

to take another's point of view (e.g., "When I'm upset at someone, I usually try to 'put myself in

his shoes' for a while"), and the fantasy scale assessed the ability to imagine oneself or identify

with fictional characters (e.g., "I daydream and fantasize, with some regularity, about things that

might happen that might happen to me"). The IRI has demonstrated good reliability, with alphas

ranging from .71 to .77 and test-retest reliability alphas ranging from .62 to .71 (Davis, 1983). In

the current sample, Cronbach's $\alpha$ = .78.

   **Empathic accuracy and bias.** Positive and Negative Affect Schedule Short Form (I-

PANAS-SF; Thompson, 2007). The I-PANAS-SF is a 10-item measure comprised of two

independent five-item scales that measure positive (PA) and negative affect (NA), respectively.

Participants rate "to what extent they feel:" a negative or positive emotion on a five-point scale

ranging from 1 (*Never*) to 5 (*Always*). Higher scores indicate higher positive or negative affect.

The I-PANAS-SF was developed to address the ambiguity and redundancy of some of the

original items while retaining psychometric robustness. The original 20-item PANAS (Watson,

Clark, & Tellegen, 1988) was created using the positive and negative affect descriptor word

clusters described by (Zevon & Tellegen, 1982). The short form items for the positive emotion

domain are: active, alert, attentive, determined, and inspired; the items for the negative emotion domain are: afraid, ashamed, hostile, nervous, and upset. The PA and NA subscales have shown good internal reliability, with Cronbach's $\alpha = .78$ and $.76$, respectively, cross-sample and cross-cultural factorial invariance, temporal stability, and convergent and criterion-related validities.

The I-PANAS-SF is being used as a measure of *others'* emotions in the current study, which is different than its usual use as a self-report measure. After viewing each video, participants in the current study used the I-PANAS-F to make ratings of what emotions they perceived the individuals in the video were experiencing. The wording of the I-PANAS-SF questions was changed to "to what extent does the person in the video feel". Participant ratings of PA and NA were examined in three distinct ways: 1) Participants' PA and NA ratings were summed across the videos and used as absolute ratings of perceived *total NA and PA,* respectively, and used to validate the video stimuli. 2) The absolute discrepancy between ratings of NA and PA made by the target individuals and participants' ratings was used as a measure of empathic accuracy (i.e., *NA accuracy and PA accuracy*). 3) Directional discrepancy scores between the target individuals and participants were used to specifically examine the negative bias hypothesis. Specifically, *NA discrepancy* scores were calculated by subtracting target ratings from participant ratings and *PA discrepancy* scores were calculated by subtracting participant ratings from target ratings. Scores were calculated in this manner so that higher scores indicate a negative bias.

**Stimuli.** The stimuli for the current study consist of 8 videos of individuals recalling and describing experiences in high school. The videos consisted of four adults, two females and two males, recounting an experience in high school when they felt a) social included or b) socially excluded, corresponding to feelings of positive and negative emotions, respectively. The videos

were approximately 1 to 2.5 minutes in length. The individuals in the videos (targets) rated the

emotion they were experiencing while recalling these experiencing using the I-PANAS-SF.

**Experimental manipulation.** As a manipulation check, participants were asked to

evaluate their experience while rating the videos with three questions related to whether they felt

self-conscious and/or anxious about being observed, 1) "You feel self-conscious about someone

watching you while making ratings?", 2) "You thought you were doing something wrong on the

task", and 3) "You felt anxious while making ratings". Participants rated these questions on a

100-point scale ranging from 0 (*not at all*) to 100 (*extremely*). The methods for these questions

were adapted from previous studies (Nordgren et al., 2011; Woody & Rodriguez, 2000; Zou,

Hudson, & Rapee, 2007).

## Procedure

Participants were recruited from undergraduate psychology classes at a major Canadian

university and received partial course credit for their participation. Upon arriving to the

laboratory, participants were greeted by the experimenter, informed about the study procedures

(see Experimental condition), and provided written informed consent. The participants rated the

emotions they perceived the target individuals were feeling while discussing the event. After this

task participants completed a questionnaire battery.

**Experimental condition.** Participants were randomly assigned to one of two conditions –

social threat (ST) and no threat (C) conditions. The ST condition was designed to enhance social

anxiety and self-consciousness in participants to investigate whether active social anxiety

influences participants' empathy ratings. All participants were told that the study is investigating

the influence of microexpressions, small involuntary facial movements made when listening to

others speak, on how individuals interact and empathize with each other. In the ST condition,

research assistants informed participants that their microexpressions were being observed from behind a two-way mirror in the room. This statement was omitted from the instructions to the C participants.

**Descriptive Statistics**

The means and standard deviations for the sample's demographic measures and the primary descriptive measures are presented in Table 1. Independent t-tests were conducted to determine if there were significant differences between conditions on these measures. Age was significantly higher in the control group ($M = 20.73$, $SD = 2.68$) than the experimental group ($M = 19.63$, $SD = 1.88$), $t(119) = 2.64$, $p < .05$. Age was not expected to be related to the outcome variables. Age was centered around the mean and added to the analysis such that all possible interactions were computed between age and the primary variables. The addition of age did not significantly affect the results of the main analyses so it was not included in the results section (see Appendix A for results tables). There were no other significant differences between groups on measures of gender, place of birth, social anxiety, empathy, or depression. The bivariate correlations between the primary descriptive measures are presented in Table 2. Social anxiety was unexpectedly positively correlated with trait empathy. Closer examination of correlations between social anxiety and empathy subscales revealed that this correlation was largely driven by the PD subscale, which represents a tendency to experience distress and/or be overwhelmed by emotions, particularly in response to stressful situations and the distress of others (Davis, 1994). Thus, it is more the intensity of affective responding rather than empathic concern or perspective-taking that is positively correlated with social anxiety.

**Preliminary Analyses**

**Measure validation.** As the I-PANAS-SF is being used in a novel manner in the current study, it was important to confirm the two-factor structure of the measure. Factors were extracted using unweighted least squares with an oblimin rotation. The factor analyses supported the two-

factor structure across all eight videos however factor loadings for the item "Hostile" on the NA scale were notably low (below .4) across several of the videos ranging from .163 to .596 (See also Table 3). Similarly, descriptive statistics revealed that distribution of responses for the "Hostile" item were extremely positively skewed across several of the videos indicating that most participants did not endorse the target individuals as experiencing this emotion. As a result, the item was removed from the scale. The internal consistency for the PA and NA subscales in this sample were good, with Cronbach's $\alpha$ = .86 and .81, respectively.

**Stimuli validation.** Several analyses were conducted to investigate whether the four inclusion and four exclusion videos were perceived as significantly different types of videos and whether they can be respectively combined to form two video types (i.e., inclusion, exclusion) for the purposes of this study. Analyses were conducted separately for targets and participants.

*Targets.* Two paired-samples *t*-tests were conducted to evaluate whether the target individuals in the videos rated their own PA and NA significantly differently across the four inclusion and four exclusion videos. It was expected that participants would rate the exclusion videos as more negative and less positive, and vice versa for inclusion videos, so one-tailed t-tests were used to accommodate for these hypotheses and the small number of targets.

Target individuals rated the exclusion videos ($M$ = 13.00, $SD$ = 1.63) as being significantly higher in NA than the inclusion videos ($M$ = 6.75, $SD$ = 2.22), $t(3)$ = 8.33, $p$ = .002 (one-tailed), $d$ = 4.17. Target individuals rated the exclusion videos ($M$ = 11.75, $SD$ = 4.65) as being significantly lower in PA than the inclusion videos ($M$ = 16.00, $SD$ = 3.56), $t(3)$ = -2.66, $p$ = .04 (one-tailed), $d$ = 1.33.

*Participants.* Two paired-samples *t*-tests were conducted to evaluate whether the study's current participants rated positive and negative affect as significantly different across the

inclusion and exclusion videos. Participants rated the negative affect in the exclusion videos ($M$ = 47.10, $SD$ = 10.82) as being significantly higher than in the inclusion videos ($M$ = 25.51, $SD$ = 6.85), $t(114) = 21.84$, $p < .001$, $d$= 2.01. Participants also rated the positive affect in the exclusion videos ($M$ = 46.79, $SD$ 12.74) as being significantly lower than in the inclusion videos ($M$ = 62.66, $SD$ = 13.80), $t(100) = -15.86$, $p < .001$, $d = 1.50$.

Reliability analyses were conducted to ensure that when combined, the four respective inclusion and exclusion videos were internally consistent across ratings of PA and NA. For ratings of PA, the inclusion and exclusion videos had Cronbach's α = .83 and .91, respectively. For ratings of NA, the inclusion and exclusion videos had Cronbach's α = .62 and .83, respectively.

**Manipulation check.** A hierarchical regression analysis was conducted to investigate the effect of the social threat manipulation. The predictor variables (social anxiety, experimental condition, and the interaction term) were entered separately in three steps to allow us to examine whether adding predictors to the model significantly change the predictive contribution of the variables entered in the prior step. The dependent variable was the sum of the three manipulation questions assessing the degree to which participants felt self-conscious and anxious. The standardized regression coefficients for the analysis are presented in Table 3. Social anxiety accounted for a significant proportion of variance when entered alone in step I, $R^2 = .132$, $F(1, 98) = 14.91$, $p < .001$. Condition, when added in step II of the analysis, also accounted for a proportion of variance in cost scores, $R^2\varDelta = .035$, $F(1, 97) = 4.08$, p = .05, with both condition and social anxiety making significant and independent contributions to the prediction equation. The interaction between condition and social anxiety did not contribute significant variance, $R^2\varDelta = .001$, $F(1, 96) = .07$, $p = .79$.

Overall, these results suggest that in general, individuals with higher levels of SA report more self-consciousness and anxiety, regardless of experimental condition. Experimental condition on its own did not have an effect, however if you control for social anxiety, condition had a small effect such that individuals in the experimental condition endorse more self-consciousness and anxiety. The lack of significant interaction suggests that the effect of condition is not unique to socially anxious individuals. The lack of strong effect of condition is likely due to inadequate manipulation check questions. In general, only one of the three items, "You felt self-conscious while making ratings", drove this effect. Despite these findings, experimental manipulation is still included in the main analyses as it was anticipated that the manipulation would exert a specific effect on socially anxious individuals.

**Main Analyses**

Four multiple regression analyses were conducted using hierarchical linear modeling (HLM) to investigate differences in participants' ratings of the target individuals' emotions. There were three independent predictors, condition (i.e., control, experimental), type of video (i.e., inclusion, exclusion), and trait social anxiety. The dependent variables for the analyses were the accuracy of participants' ratings of PA and NA, and the directional discrepancy ratings of PA and NA. These analyses were conducted to examine the three main hypotheses (i.e., cognitive interference, social pain, and negative bias).

The HLM approach was used to account for the possible shared variances amongst the independent variables and to ensure that standard errors were not underestimated given the inclusion of both between- and within-subjects variables. Estimation was performed using R's lme4 package (R Development Core Team, 2011; Bates, Maechler, & Bolker, 2011). In all initial analyses, social anxiety was centered around the mean to reduce the risk of

multicollinearity between the main effects and the interaction. Similarly, in all analyses condition and video type were dummy coded such that the experimental group (i.e., Experimental group = 0; Control group = 1) and exclusion videos (Exclusion = 0; Inclusion = 1) were the reference groups, respectively.

**Negative affect accuracy.** Results indicated that the three-way cross-level interaction (Condition X Video Type X Social Anxiety) was significant, $b = -.25$, $z = -2.35$, $p < .05$ (see also Table 4). The results of this interaction indicated that there was a significant two-way interaction between social anxiety and condition within the exclusion videos, $b = .26$, $z = 2.45$, $p < .05$. This interaction was not significant within the inclusion videos, $b = .009$, $z = .24$, $p > .05$. Within the exclusion videos, the relationship between social anxiety and NA accuracy was significant in the experimental group, $b = -.17$, $z = -2.32$, $p < .05$, indicating that individuals with greater levels of social anxiety who were in the experimental condition were significantly more accurate at rating negative affect while watching exclusion videos. The relationship between social anxiety and NA accuracy was not significant in the control group-rated exclusion videos, $b = .09$, $z = 1.19$, $p > .05$, or inclusion videos, $b = .03$, $z = 1.09$, $p > .05$, or the experimental group-rated inclusion videos, $b = .02$, $z = .83$, $p > .05$ (see Figure 1).

**Negative affect discrepancy.** There was no significant three-way interaction in the regression analyses of total NA however there was a significant two-way interaction. In order to effectively interpret these effects, the analyses were re-run using effects coding for video type (Exclusion = 1, Inclusion = -1) and condition (Control = 1, Experimental = -1). The two-way interaction between condition and social anxiety was significant within the exclusion videos, $b = -.09$, $z = .04$, $p < .05$ (see also Table 5), indicating that the relationship between social anxiety and NA differs by condition.

To interpret the two-way interaction, the analyses were rerun twice such that the experimental and control conditions were alternatively dummy coded as the reference group. With control group as the reference group, the relationship between social anxiety and NA is not significant, $b = -.02$, $z = -.41$, $p > .05$. With the experimental group as the reference group, social anxiety significantly predicts NA, $b = .15$, $z = 2.81$, $p < .05$, indicating that participants with higher levels of social anxiety rate NA significantly higher than participants with lower levels, in comparison to the targets (see Figure 2).

**Positive affect accuracy.** There were no significant three-way or two-way interactions in the regression analyses of PA accuracy, however there were significant main effects. In order to effectively interpret these main effects, the analyses were re-run using effects coding for video type (Exclusion = 1, Inclusion = -1) and condition (Control = 1, Experimental = -1). There was a significant main effect of video type, $b = -1,07$, $z = -3.62$, $p < .001$ (see also Table 6), indicating that participants rated PA in the exclusion videos significantly more accurately. There were no significant effects of condition or social anxiety for PA accuracy.

**Positive affect discrepancy.** There were no significant interactions in the regression analyses of the PA discrepancy ratings so the analyses were re-run using effects coding for video type (Exclusion = 1, Inclusion = -1) and condition (Control = 1, Experimental = -1). There were no interpretable effects for positive affect discrepancy (see also Table 7).

**Secondary Analyses**

Several analyses were conducted to investigate the influence of trait empathy as a possible confound. Four multiple regression analyses were conducted using HLM to investigate whether trait empathy influenced the results found in the main analyses in the prediction of the four main outcomes (i.e., NA and PA accuracy, NA and PA discrepancies). All analyses were

conducted as described in the main analyses, with the exception that the interaction term between trait empathy, condition, and video type was also entered into the equation. For both NA accuracy and discrepancy ratings, the addition of trait empathy did not significantly reduce the variance accounted for by the three- and two-way interactions, respectively, and did not account for a significant proportion of the variance. Similarly, the addition of empathy did not affect the results for PA discrepancy ratings. The addition of empathy did reduce the significance of the video type main effect for PA accuracy such that the effect was no longer significant, however empathy did not significantly account for any proportion of the variance in PA accuracy. These results indicate that the differences in trait empathy amongst participants do not better explain the relationship between social anxiety and empathic processes and thus empathy was not included in the main analyses. See Appendix A for results tables of the above analyses.

**Concluding Chapter**

The current study investigated three hypotheses about how empathy operates in individuals with elevated levels of social anxiety – the social pain, cognitive interference, and negative bias hypotheses. Previous research on socially anxious populations indicates that these individuals tend to demonstrate negative cognitive biases in attention, judgment, and predictions of self-related social information. Less is known about how these biases may extend to the perception of *other's* social experiences. This study provides emerging support for the social pain hypothesis.

Multilevel models were used to explore how social anxiety, experimental condition, and type of video affected the empathic processes of participants. More specifically, analyses investigated the accuracy of participants' ratings of targets' negative and positive affect, as well as the direction of these ratings in comparison to the targets' ratings. Overall, this study provides evidence that socially anxious individuals appear to be more accurate at judging the negative emotions of others when watching others recount experiences of social exclusion. Furthermore, these effects appear to only be present when the individual is in a state of heightened social anxiety (i.e., in the experimental condition). This is in line with the predictions of the social pain hypothesis, which proposes that when an individual is in a "hot" state, they may have an increased understanding of the experience of another individual also in the same "hot state" (Nordgren et al., 2011). Participants in the experimental condition were experiencing enhanced levels of self-consciousness and/or social anxiety which may have activated feelings of social pain. Consequently, these feelings of social pain may have allowed them to have a more accurate understanding of the severity if the target individuals' negative social experiences. Feelings of social pain may stem from the fact that socially anxious individuals tend to perceive greater

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levels of social rejection and experience more negative cognitions regarding their own social interactions (Bögels & Mansell, 2004; Foa et al., 1996; Mellings & Alden, 2000). Of particular note, the relationship between social anxiety and negative affect accuracy was not affected by the addition of trait empathy. This indicates that greater accuracy is not simply associated with being a more empathic individual.

At first, the finding that socially anxious individuals are *more* accurate at empathizing with others appears to conflict with the general understanding that socially anxious individuals tend to have difficulty with interpersonal interactions. Within the framework of empathy research, it makes intuitive sense that greater empathic accuracy would allow individuals to better navigate interpersonal interactions. Yet research examining empathic accuracy in close relationships has produced mixed findings as to whether better accuracy is positively or negatively correlated to relationship quality (see Simpson, Oriña, & Ickes, 2003). Within the context of romantic relationships, Ickes and Simpson (1997, 2001) suggest that the relationship between empathic accuracy and perceived relationship quality is moderated by the degree of threat perceived in the issue being discussed at hand. In this way, if the perceiver believes that negative or threatening consequences might emerge from their partner being more accurate, there is a generally negative effect on relationship quality. Of particular interest, it appears that partners who score highly on anxious and avoidant dimensions of personality measures are more accurate at inferring their partners' relationship-threatening thoughts (Simpson, Ickes, & Grich, 1999). This accuracy however, led the perceiver to become more distressed, jealous, and/or threatening, leading them to display negative behaviours that notified their partners of their negative feelings. It is less clear how these mechanisms might operate with non-intimate partner and/or with topics that are unrelated to the overall relationship between interaction partners. It is

possible that increased accuracy for negative social events may lead socially anxious individuals to display more outward signs of distress. Similarly, socially anxious might misattribute the negative affect experienced by others as being the result of their actions (i.e., they elicited the negative affect in others). More research is needed to explore empathic accuracy in non-intimate relationships as well as understanding how individuals are using this information.

There was some partial evidence for the negative bias hypothesis, which predicted that individuals with higher levels of social anxiety would rate all videos more negatively than the targets across both negative and positive affect (i.e., rate more NA and less PA). The main analyses suggested that individuals with higher levels of social anxiety rated negative affect higher than the targets did, however this was only found in the experimental condition. This suggests that this "negative bias" might have been elicited from the increased state of social anxiety or self-consciousness experienced in the experimental condition. Despite these findings, there was no evidence that individuals with higher levels of social anxiety rated videos *less* positively than other participants, as the hypothesis would suggest. This finding is somewhat surprising given the previous research on social anxiety and positive emotions. For example, research has documented the tendency of socially anxious individuals to experience diminished positive affect (Kashdan, 2007) and experiences (Alden & Wallace, 1995), particularly when feeling more socially anxious (Kashdan & Steger, 2006). Similarly, one study found that recently rejected individuals underestimated their own happiness when predicting their emotional reaction to positive events, as opposed to the usual trend of overestimation found in non-rejected participants (DeWall & Baumeister, 2006). It is possible that the influence of rejection may differentially affect how we process our own versus others' emotion experiences. Further limitations will be discussed below.

There was no evidence to support the cognitive interference hypothesis, which predicts that socially anxious individuals would demonstrate less accuracy for both positive and negative affect as compared to less anxious participants due to the diversion of their attentional resources to self-related threat cues. Contrary to the predictions of this hypothesis, socially anxious participants actually demonstrated *greater* accuracy for others' negative emotions, particularly when viewing others' experiences of exclusion. Despite finding no support for this hypothesis, it is unclear what role participants' self-focused attention played in affecting (or not affecting) empathic processes while rating videos.

Overall, there were no significant interactions between participants' ratings of positive affect and social anxiety or experimental condition, although one significant main effect emerged. Participants rated positive affect more accurately for the exclusion videos. Overall, both participants and targets rated low levels of positive affect for the exclusion videos. Thus, it is likely that this finding of accuracy is the result of a floor effect (i.e., both targets rated positive affect similarly low).

**Limitations and Future Directions**

The results from the current study are interesting and reveal important information regarding the influence of social pain on social interactions, however there are some limitations. These results were obtained using an undergraduate university sample and thus we cannot generalize these findings to the broader population or to clinical samples of socially anxious individuals. Participants made ratings of others' emotions using prerecorded videos in a structured laboratory task, so we cannot know whether the relationship between social anxiety and empathy interacts similarly in real interpersonal interactions. For example, the "enhancement" of empathic accuracy stemming from shared social pain may only operate when

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the individual is feeling a specific level of social anxiety such that too little or too much anxiety may differentially affect how they empathize with others.  Possible follow-up studies could manipulate social anxiety in within interpersonal dyads using similar ratings of positive and negative affect to determine if the social pain effects persist in real interactions.

This study was also somewhat limited by the experimental design and corresponding data analyses. Given the variety of dependent variables and moderators, some of the effects may have been lost due to small group size and lack of power. Future studies may focus on testing one hypothesis or looking at only PA or NA. In spite of this research design, we were still able to detect several findings.  Similarly, the inclusion of all the variables provides the added benefit of being able to directly compare differences between participants' ratings for both exclusion and inclusion-type social situations.

The current study had limited findings related to positive affect. One possible explanation is that the I-PANAS-SF is not an appropriate measure for assessing others' emotional experiences. The scale was originally designed to be used as a self-report measure and was alternatively being used as a measure of *others´* emotions in the current study. Alternatively, it is possible that the items that make up the PA scale (i.e., Alert, Inspired, Determined, Attentive, Active) do not adequately capture the positive affect displayed by the target individuals in the stimuli videos. In addition, the scale reflects only *activated* PA and therefore fails to assess the full range of PA. Future studies might draw other emotion words from the PANAS (Watson et al., 1988) or pilot new positive emotion words for use in future empathic accuracy studies.

Despite the lack of findings using the PA scale, the I-PANAS-SF still effectively captured differences in participants' perceptions of NA and their empathic accuracy, indicating that there is potential for the scale to be used in this manner. Previous studies of social and

physical pain often use the Faces Pain Scale – Revised (Bieri, Reeve, Champion, Addicoat, & Ziegler, 1990) or a pain thermometer rating scale to evaluate how participants empathize with others. This study did not take a measure of pain and thus we cannot accurately infer a direct connection between "social pain" and the empathy effect. The use of the I-PANAS-SF however, allows for a more detailed understanding of participants' empathy for others' emotions rather than just an estimation of pain severity. Future studies would benefit from using a combination of pain severity and emotion ratings more broadly understand the relationship between social pain, affect, and empathic accuracy.

Despite these limitations, this study is an important first step in understanding the role that social pain might play in influencing empathic processes. This study adds to previous literature investigating the role of empathy gaps for physical (Loewenstein, 1996) and social pain (Eisenberger & Lieberman, 2004; MacDonald & Leary, 2005; Nordgren et al., 2011). Nordgren and colleagues (2011) found that the active experience of social pain leads individuals to appraise others' pain as being more severe. This study extends beyond previous research by investigating not only whether individuals over- or underestimate total affect, but also whether these perceptions are accurate. This work also provides important information about the empathic processes in individuals with elevated social anxiety. It suggests that socially anxious individuals are more accurate at perceiving others' negative affect in relation to experiences of social exclusion. In light of the interpersonal difficulties that socially anxious individuals often experience, it will be valuable to further understand the mechanisms of empathic accuracy within socially anxious individuals and how this accuracy might serve to ameliorate or detract from interpersonal interactions. Treatment formulations might benefit from considering the role that

social pain and the interpretation of others' negative affect may play in the etiology and maintenance of social anxiety and relational outcomes.

Future work will investigate the mechanisms that influence the social pain hypothesis and lead to increased empathic accuracy for negative social interactions. It is possible that this effect is not unique to social anxiety and rather might be shared with other conditions or disorders that lead the individual to experience elevated negative affect, anxiety, and/or focus on negative social information. For example, future studies could include measures of depression, somatoform disorder, and other anxiety disorders, as well as obtaining detailed information about the experience of participants while watching videos and making ratings.

**Tables and Figures**

Table 1

*Means and Standard Deviations for Demographic and Primary Descriptive Measures*

| Measure | Total sample | Control Group | Experimental Group |
|---|---|---|---|
| Age | 20.14 (*2.34*) | 20.73 (*2.68*) | 19.63 (*1.88*) |
| Gender (% female) | 78.5% | 76.8% | 80.0% |
| North American born (%) | 54.5% | 53.6% | 55.4% |
| Social Anxiety (SIAS) | 29.20 (*16.30*) | 29.84 (*16.29*) | 28.65 (*16.40*) |
| Empathy (IRI) | 70.05 (*11.09*) | 69.16 (*11.71*) | 70.81 (*10.58*) |
| Depression (BDI-II) | 12.14 (*8.66*) | 13.39 (*9.02*) | 11.00 (*8.23*) |

Table 2

*Intercorrelations Between Primary Descriptive Measures*

| Variable | 1. | 2. | 3. | 4. | 5. | 6. |
|---|---|---|---|---|---|---|
| 1. SIAS | 1.00 | .19* | .03 | -.07 | -.10 | .66** |
| 2. IRI – Total | | 1.00 | .68** | .72** | .51** | .41** |
| 3. IRI - FS | | | 1.00 | .36** | .18* | .02 |
| 4. IRI – EC | | | | 1.00 | .35** | .06 |
| 5. IRI – PT | | | | | 1.00 | -.23* |
| 6. IRI – PD | | | | | | 1.00 |

*Note*: SIAS: Social Interaction Anxiety Scale; IRI: Interpersonal Reactivity Scale; FA: Fantasy Scale; EC: Empathic Concern;

PT: Perspective Taking; PD: Personal Distress

* $p < .05$, ** $p < .01$.

Table 3

*Oblimin-Rotated Component Loadings for I-PANAS-SF Items across Video Stimuli*

| Component | Upset | Hostile | Alert | Ashamed | Inspired | Nervous | Determined | Attentive | Afraid | Active |
|---|---|---|---|---|---|---|---|---|---|---|
| Video 1 | | | | | | | | | | |
| Positive Affect | -.07 | .08 | .54* | .21 | .35 | -.11 | .51* | .84* | -.05 | .78* |
| Negative Affect | .67* | .47* | .06 | .62* | .03 | .49* | .12 | -.14 | .78* | -.16 |
| Video 2 | | | | | | | | | | |
| Positive Affect | -.09 | -.01 | .50* | -.00 | .46* | .00 | .52* | .87* | .08 | .62* |
| Negative Affect | .67* | .60* | .04 | .84* | -.04 | .63* | .15 | -.07 | .65* | -.14 |
| Video 3 | | | | | | | | | | |
| Positive Affect | -.06 | .00 | .63* | -.02 | .44* | .06 | .47* | .72* | -.04 | .70* |
| Negative Affect | .69* | .24 | .34 | .63* | -.09 | .61* | -.22 | .20 | .81* | -.09 |
| Video 4 | | | | | | | | | | |
| Positive Affect | -.08 | .02 | .44* | -.13 | .51* | .06 | .69* | .69* | .03 | .59* |
| Negative Affect | -.62* | -.46* | -.13 | -.73* | .16 | -.41* | -.04 | -.04 | -.65* | .13 |

*\* Loadings > .40*

| Component | Upset | Hostile | Alert | Ashamed | Inspired | Nervous | Determined | Attentive | Afraid | Active |
|---|---|---|---|---|---|---|---|---|---|---|
| Video 5 | | | | | | | | | | |
| Positive Affect | -.13 | -.05 | .59* | -.03 | .42* | .08 | .55* | .77* | .10 | .75* |
| Negative Affect | .49* | .53* | .17 | .74* | -.06 | .27 | -.07 | .15 | .56* | -.08 |
| Video 6 | | | | | | | | | | |
| Positive Affect | -.01 | -.01 | .43* | -.14 | .46* | -.03 | .64* | .75* | .20 | .74* |
| Negative Affect | .74* | .33 | -.02 | .48* | .10 | .51* | -.02 | -.10 | .68* | -.05 |
| Video 7 | | | | | | | | | | |
| Positive Affect | -.10 | .16 | .60* | -.07 | .39 | -.04 | .64* | .70* | .07 | .82* |
| Negative Affect | .69* | .32 | .24 | .69* | -.12 | .54* | -.02 | .08 | .69* | -.04 |
| Video 8 | | | | | | | | | | |
| Positive Affect | -.06 | -.08 | .70* | .07 | .59* | -.02 | .82* | .77* | .07 | .77* |
| Negative Affect | .69* | .16 | .14 | .88* | -.22 | .54* | .03 | -.06 | .72* | -.09 |

*Loadings > .40*

Table 4

*Hierarchical Multiple Regression: Self-Consciousness Manipulation Check onto Social Anxiety and Experimental Condition*

|  | B | SE | t | P |
|---|---|---|---|---|
| **Step 1** |  |  |  |  |
| (Constant) | 37.07 | 12.74 | 2.91 | .004 |
| Social Anxiety | 1.45 | .38 | 3.86 | < .001 |
| **Step 2** |  |  |  |  |
| (Constant) | 18.32 | 15.60 | 1.18 | .24 |
| Social Anxiety | 1.54 | .37 | 4.13 | < .001 |
| Condition | 25.26 | 12.51 | 2.02 | .05 |
| **Step 3** |  |  |  |  |
| (Constant) | 22.78 | 23.10 | .99 | .33 |
| Social Anxiety | 1.40 | .65 | 2.17 | .03 |
| Condition | 18.83 | 27.57 | .68 | .50 |
| Interaction | .21 | .79 | .26 | .79 |

Table 5

*Hierarchical Linear Modeling (HLM) Regression Analyses: Fixed Effect Estimates for Negative*

*Affect Accuracy Ratings*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 21.63 | 1.16 | 18.612 |
| Condition | .42 | 1.71 | .25 |
| Video Type | -10.85 | 1.70 | -9.28** |
| Social Anxiety (SA) | -.17 | .07 | -2.32* |
| Condition X Video | .36 | 1.72 | .21 |
| Condition X SA | .26 | .11 | 2.45* |
| Video X SA | .19 | .07 | 2.60* |
| Condition X Video X SA | -.25 | .11 | -2.35* |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

\* $p < .05$, \*\* $p < .001$

Table 6

*HLM Regression Analyses: Fixed Effect Estimates for Negative Affect Discrepancy Ratings*

| *Fixed Effect* | *Coefficient* | *Standard Error (SE)* | *Z-value* |
|---|---|---|---|
| Intercept | -3.21 | .65 | -4.92 |
| Condition | -.27 | .65 | -.42 |
| Video Type | -1.84 | .48 | -3.82** |
| Social Anxiety (SA) | .06 | .04 | 1.60 |
| Condition X Video | -.30 | .48 | -.62 |
| Condition X SA | -.09 | .04 | -2.20* |
| Video X SA | -.01 | .03 | -.47 |
| Condition X Video X SA | -.05 | .03 | -1.82 |

*Note*: Condition and Video are effects coded such that experimental condition and inclusion videos are coded as -1.

* $p < .05$, ** $p < .001$

Table 7

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Accuracy Ratings*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 16.59 | .43 | 38.68 |
| Condition | -.17 | .43 | -.39 |
| Video Type | 1.07 | .30 | -3.62** |
| Social Anxiety (SA) | -.02 | .03 | -.67 |
| Condition X Video | .35 | .30 | 1.19 |
| Condition X SA | -.01 | .03 | -.52 |
| Video X SA | -.01 | .02 | -.29 |
| Condition X Video X SA | -.03 | .02 | -1.66 |

*Note*: Condition and Video are effects coded such that experimental condition and inclusion videos are coded as -1.

** *p* < .001

Table 8

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Discrepancy Ratings*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | .54 | 1.04 | .52 |
| Condition | -1.60 | 1.04 | -1.53 |
| Video Type | -.77 | .47 | -1.64 |
| Social Anxiety (SA) | .08 | .06 | 1.31 |
| Condition X Video | -.16 | .47 | -.33 |
| Condition X SA | .12 | .06 | 1.84 |
| Video X SA | -.05 | .03 | -1.75 |
| Condition X Video X SA | -.01 | .03 | -.33 |

*Note*: Condition and Video are effects coded such that experimental condition and inclusion videos are coded as -1.
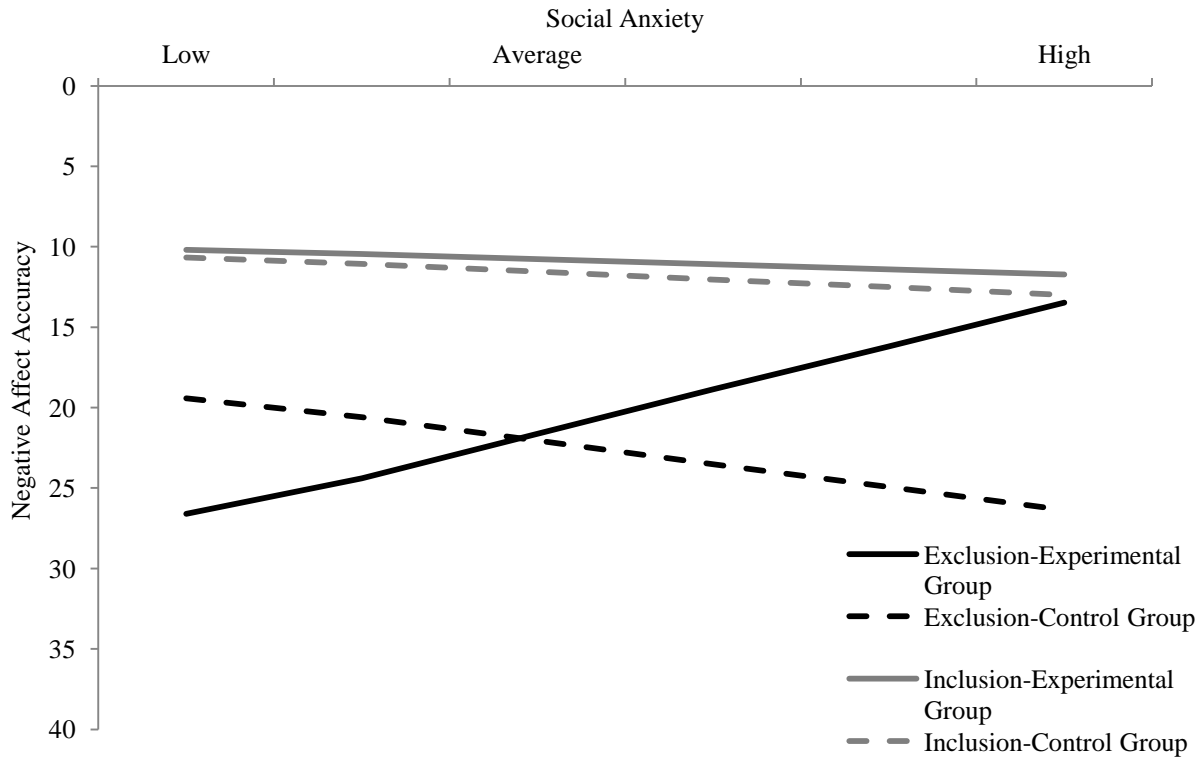
*Note:* Lower accuracy score indicates greater accuracy

*Figure 1*. Negative affect accuracy: Slopes of participants' ratings across inclusion and exclusion videos for both experimental and control groups.
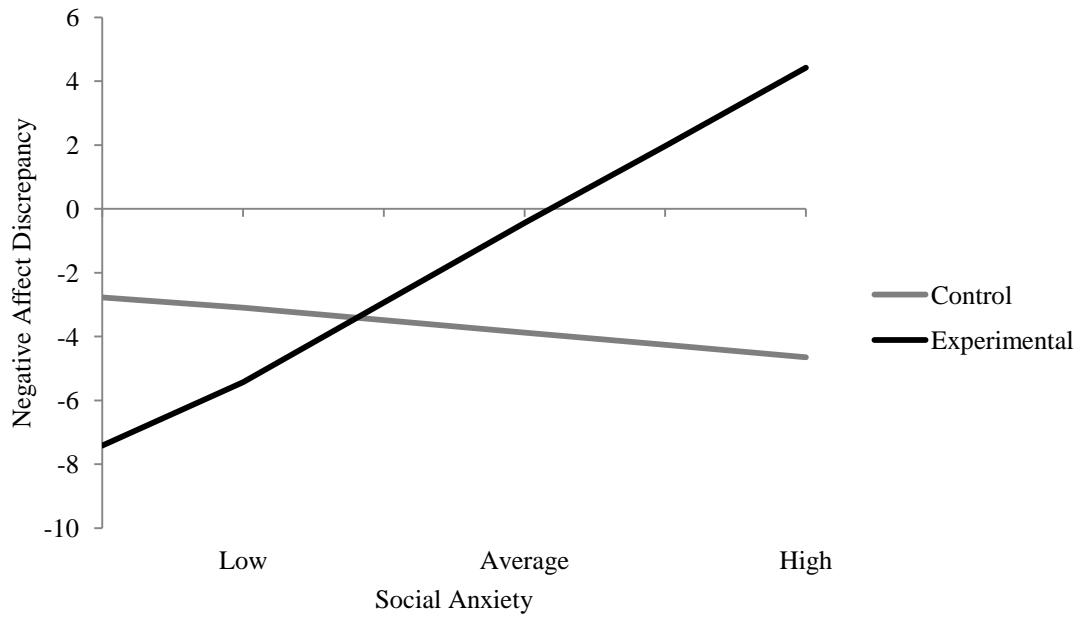
*Note:* Higher discrepancy scores indicate a greater negative bias

*Figure 2*. Negative affect discrepancy: Slopes of participants' ratings for participants in experimental and control groups.

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# Appendices

## Appendix A: Secondary Analyses

Table 9

*HLM Regression Analyses: Fixed Effect Estimates for Negative Affect Accuracy Ratings*

*Including Age*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 22.10 | 1.27 | 17.46 |
| Condition | .13 | 1.81 | .07 |
| Video Type | -11.38 | 1.26 | -9.01** |
| Social Anxiety (SA) | -.15 | .07 | -2.06* |
| Age | .39 | .72 | .54 |
| Condition X Video | .67 | 1.81 | .37 |
| Condition X SA | .24 | .11 | 2.24* |
| Video X SA | .17 | .07 | 2.30* |
| Condition X Age | -.79 | .86 | -.91 |
| Video X Age | -.40 | .72 | -.56 |
| SA X Age | -.03 | .03 | -1.33 |
| Condition X Video X SA | -.23 | .11 | -2.11* |
| Condition X Video X Age | .91 | .86 | 1.05 |
| Condition X SA X Age | .00 | .05 | .03 |
| Video X SA X Age | .04 | .03 | 1.55 |
| Condition X Video X SA X Age | .01 | .05 | .23 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

* $p < .05$, ** $p < .001$

Table 10

*HLM Regression Analyses: Fixed Effect Estimates for Negative Affect Discrepancy Ratings Including Age*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | -5.15 | 1.41 | -3.64 |
| Condition | -.64 | 2.02 | -.32 |
| Video Type | 3.61 | 1.40 | 2.58* |
| Social Anxiety (SA) | .16 | .08 | 1.94* |
| Age | -.33 | .81 | -.41 |
| Condition X Video | .15 | 2.00 | .07 |
| Condition X SA | -.25 | .12 | -2.06* |
| Video X SA | -.05 | .08 | -.56 |
| Condition X Age | .70 | .96 | .73 |
| Video X Age | .15 | .80 | .19 |
| SA X Age | .06 | .03 | 2.14* |
| Condition X Video X SA | .18 | .12 | 1.55 |
| Condition X Video X Age | .57 | .95 | .59 |
| Condition X SA X Age | -.03 | .05 | -.48 |
| Video X SA X Age | -.06 | .03 | -1.98* |
| Condition X Video X SA X Age | .01 | .06 | .12 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

* $p < .05$, ** $p < .001$

Table 11

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Accuracy Ratings*

*Including Age*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
| --- | --- | --- | --- |
| Intercept | 14.80 | .68 | 21.62 |
| Condition | .56 | .98 | .58 |
| Video Type | 2.84 | .85 | 3.24* |
| Social Anxiety (SA) | -.01 | .04 | -.15 |
| Age | -.23 | .39 | -.59 |
| Condition X Video | -.98 | 1.22 | -.81 |
| Condition X SA | -.06 | .06 | -1.00 |
| Video X SA | -.02 | .05 | -.49 |
| Condition X Age | .73 | .47 | 1.56 |
| Video X Age | -.39 | .49 | -.79 |
| SA X Age | .05 | .01 | 3.61* |
| Condition X Video X SA | .09 | .07 | 1.22 |
| Condition X Video X Age | -.37 | .58 | -.64 |
| Condition X SA X Age | -.07 | .03 | -2.60* |
| Video X SA X Age | -.02 | .02 | -1.22 |
| Condition X Video X SA X Age | -.00 | .03 | -.04 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

* $p < .05$

Table 12

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Discrepancy Ratings*

*Including Age*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | .57 | 1.50 | .38 |
| Condition | -1.68 | 2.14 | -.78 |
| Video Type | 1.26 | 1.38 | .91 |
| Social Anxiety (SA) | .01 | .09 | .15 |
| Age | -2.40 | .86 | -2.81* |
| Condition X Video | -.05 | 1.97 | -.03 |
| Condition X SA | .13 | .13 | 1.02 |
| Video X SA | .06 | .08 | .79 |
| Condition X Age | 2.42 | 1.02 | 1.38 |
| Video X Age | .31 | .79 | .39 |
| SA X Age | -.03 | .03 | -.89 |
| Condition X Video X SA | .06 | .12 | .53 |
| Condition X Video X Age | .66 | .94 | .71 |
| Condition X SA X Age | .18 | .06 | 3.08* |
| Video X SA X Age | .01 | .03 | .50 |
| Condition X Video X SA X Age | -.05 | .05 | -.86 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

* $p < .05$

Table 13

*HLM Regression Analyses: Fixed Effect Estimates for Negative Affect Accuracy Ratings*

*Including Empathy*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 24.84 | 8.13 | 3.06 |
| Condition | 11.43 | 11.19 | 1.02 |
| Video Type | -15.79 | 8.12 | -1.94* |
| Social Anxiety (SA) | -.15 | .07 | -2.10* |
| Empathy | -.05 | .11 | -.41 |
| Condition X Video | -6.75 | 11.19 | -.60 |
| Condition X SA | .27 | .11 | 2.50* |
| Video X SA | .17 | .07 | -2.29* |
| Condition X Empathy | -.15 | .16 | -.96 |
| Video X Empathy | .07 | .11 | .06 |
| Condition X Video X SA | -.25 | .11 | -2.30* |
| Condition X Video X Empathy | .09 | .16 | .69 |

*Note*: Condition and Video are dummy coded such that  experimental condition and exclusion videos are the reference categories (i.e., coded 0).

$* p < .05$

Table 14

*HLM Regression Analyses: Fixed Effect Estimates for Negative Affect Discrepancy Ratings*

*Including Empathy*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | -11.25 | 9.28 | -1.21 |
| Condition | -8.90 | 12.77 | -.70 |
| Video Type | 10.50 | 9.38 | 1.12 |
| Social Anxiety (SA) | .17 | .08 | 2.07* |
| Empathy | .10 | .13 | .75 |
| Condition X Video | 5.56 | 12.92 | .43 |
| Condition X SA | -.28 | .12 | -2.33* |
| Video X SA | -.06 | .08 | -.71 |
| Condition X Empathy | .11 | .18 | .59 |
| Video X Empathy | -.11 | .13 | -.81 |
| Condition X Video X SA | .21 | .12 | 1.74 |
| Condition X Video X Empathy | -.06 | .18 | -.32 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

* $p < .05$

Table 15

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Accuracy Ratings*

*Including Empathy*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 15.87 | 4.90 | 3.24 |
| Condition | -2.21 | 6.75 | -.33 |
| Video Type | 3.13 | 5.85 | .54 |
| Social Anxiety (SA) | .02 | .04 | .44 |
| Empathy | -.01 | .07 | -.10 |
| Condition X Video | -4.44 | 8.06 | -.55 |
| Condition X SA | -.09 | .06 | -1.43 |
| Video X SA | -.04 | .05 | -.80 |
| Condition X Empathy | .04 | .10 | .39 |
| Video X Empathy | -.01 | .08 | -.07 |
| Condition X Video X SA | .11 | .08 | 1.48 |
| Condition X Video X Empathy | .05 | .11 | .39 |

*Note*: Condition and Video are dummy coded such that experimental condition and exclusion videos are the reference categories (i.e., coded 0).

Table 16

*HLM Regression Analyses: Fixed Effect Estimates for Positive Affect Discrepancy Ratings*

*Including Empathy*

| Fixed Effect | Coefficient | Standard Error (SE) | Z-value |
|---|---|---|---|
| Intercept | 10.46 | 10.90 | .96 |
| Condition | -4.35 | 15.01 | -.29 |
| Video Type | 9.95 | 9.14 | 1.09 |
| Social Anxiety (SA) | -.07 | .10 | -.67 |
| Empathy | -.12 | .15 | -.81 |
| Condition X Video | -4.59 | 12.59 | -.37 |
| Condition X SA | .22 | .14 | 1.53 |
| Video X SA | .08 | .08 | .96 |
| Condition X Empathy | .00 | .21 | .01 |
| Video X Empathy | -.12 | .13 | -.92 |
| Condition X Video X SA | .05 | .12 | .42 |
| Condition X Video X Empathy | .07 | .18 | .38 |

*Note*: Condition and Video are dummy coded such that  experimental condition and exclusion videos are the reference categories (i.e., coded 0).

**Appendix B: Questionnaires**

## Social Anxiety and Peer Relationships

Thank you for agreeing to participate in our research project. We would like to ask you to complete the following questionnaire. Please read the instructions for each section carefully and answer the questions accordingly. Remember, your answers will be kept entirely confidential. There are no right or wrong answers on any of our questionnaires.

Please fill in the appropriate information about yourself.

## Background

**Your age:** _____

**Your gender:** Male ___ Female ___

**Your marital status:**

___ Single

___ Cohabitating

___ Married

___ Separated

___ Divorced

___ Other (please specify) _____

**Your cultural background:**

___ European Canadian

___ French Canadian

___ Asian Canadian

___ Indo-Canadian

___ First Nations Canadian

___ Other (please specify) _____

**Your place of birth:** _____

If you were not born in Canada, how many years have you been in Canada? _____ years

**Your parents' place(s) of birth:** _____

**Your first language:** _____

If English is <u>not</u> your first language, how long have you spoken English? _____ years

**How many years of university have you completed?** (please round to the nearest half year you've completed) _____ years

**Social Anxiety and Peer Relationships**

---

Please report to what extent you feel the following statements describe your experience

participating in this study, on a scale from 0 (*not at all*) to 100 (*extremely*). Write the number

that best describes your feelings in the box next to each statement.

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**To what extent did…**                                      **0** (*not at all*)

                                                             to **100** (*extremely*)

1.  You feel self-conscious about someone watching you while making ratings?

2.  You think you were doing something wrong on the task?

3.  You feel anxious while making ratings?

## SIAS

Please indicate the degree to which you feel the statement is characteristic or true of you.

|  | Extremely | Not at all | Slightly | Moderately | Very |
|---|---|---|---|---|---|
| 1. I get nervous if I have to speak with someone in authority (teacher/ boss, etc). | 0 | 1 | 2 | 3 | 4 |
| 2. I have difficulty making eye-contact with others. | 0 | 1 | 2 | 3 | 4 |
| 3. I become tense if I have to talk about myself or my feelings. | 0 | 1 | 2 | 3 | 4 |
| 4. I have difficulty mixing comfortably with the people I work with. | 0 | 1 | 2 | 3 | 4 |
| 5. I find it easy to make friends my own age. | 0 | 1 | 2 | 3 | 4 |
| 6. I tense up if I meet an acquaintance in the street. | 0 | 1 | 2 | 3 | 4 |
| 7. When mixing socially, I am uncomfortable. | 0 | 1 | 2 | 3 | 4 |
| 8. I feel tense if I am alone with just one person. | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| 9. I am at ease meeting people at parties, etc. | 0 | 1 | 2 | 3 | 4 |
| 10. I have difficulty talking with other people. | 0 | 1 | 2 | 3 | 4 |
| 11. I find it easy to think of things to talk about. | 0 | 1 | 2 | 3 | 4 |
| 12. I worry about expressing myself in case I appear awkward. | 0 | 1 | 2 | 3 | 4 |
| 13. I find it difficult to disagree with another's point of view. | 0 | 1 | 2 | 3 | 4 |
| 14. I have difficulty talking to an attractive person of the opposite sex. | 0 | 1 | 2 | 3 | 4 |
| 15. I find myself worrying that I won't know what to say in social situations. | 0 | 1 | 2 | 3 | 4 |
| 16. I am nervous mixing with people I don't know well. | 0 | 1 | 2 | 3 | 4 |
| 17. I feel I'll say something embarrassing when talking. | 0 | 1 | 2 | 3 | 4 |
| 18. When mixing in a group, I find myself worrying I will be ignored. | 0 | 1 | 2 | 3 | 4 |
| 19. I am tense mixing in a group. | 0 | 1 | 2 | 3 | 4 |
| 20. I am unsure whether to greet someone I know only slightly. | 0 | 1 | 2 | 3 | 4 |

# IRI

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate number on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

|  | **Does not describe me well** |  |  |  | **Describes me very well** |
|---|---|---|---|---|---|
| 1. I daydream and fantasize, with some regularity, about things that might happen to me. | 0 | 1 | 2 | 3 | 4 |
| 2. I often have tender, concerned feelings for people less fortunate than me. | 0 | 1 | 2 | 3 | 4 |
| 3. I sometimes find it difficult to see things from the "other guy's" point of view. | 0 | 1 | 2 | 3 | 4 |
| 4. Sometimes I don't feel very sorry for other people when they are having problems. | 0 | 1 | 2 | 3 | 4 |

| | | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 5. | I really get involved with the feelings of the characters in a novel. | 0 | 1 | 2 | 3 | 4 |
| 6. | In emergency situations, I feel apprehensive and ill-at-ease. | 0 | 1 | 2 | 3 | 4 |
| 7. | I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. | 0 | 1 | 2 | 3 | 4 |
| 8. | I try to look at everybody's side of a disagreement before I make a decision. | 0 | 1 | 2 | 3 | 4 |
| 9. | When I see someone being taken advantage of, I feel kind of protective towards them. | 0 | 1 | 2 | 3 | 4 |
| 10. | I sometimes feel helpless when I am in the middle of a very emotional situation. | 0 | 1 | 2 | 3 | 4 |
| 11. | I sometimes try to understand my friends better by imagining how things look from their perspective. | 0 | 1 | 2 | 3 | 4 |
| 12. | Becoming extremely involved in a good book or movie is somewhat rare for me. | 0 | 1 | 2 | 3 | 4 |
| 13. | When I see someone get hurt, I tend to remain calm. | 0 | 1 | 2 | 3 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| 14. Other people's misfortunes do not usually disturb me a great deal. | 0 | 1 | 2 | 3 | 4 |
| 15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. | 0 | 1 | 2 | 3 | 4 |
| 16. After seeing a play or movie, I have felt as though I were one of the characters. | 0 | 1 | 2 | 3 | 4 |
| 17. Being in a tense emotional situation scares me. | 0 | 1 | 2 | 3 | 4 |
| 18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. | 0 | 1 | 2 | 3 | 4 |
| 19. I am usually pretty effective in dealing with emergencies. | 0 | 1 | 2 | 3 | 4 |
| 20. I am often quite touched by things that I see happen. | 0 | 1 | 2 | 3 | 4 |
| 21. I believe that there are two sides to every question and try to look at them both. | 0 | 1 | 2 | 3 | 4 |
| 22. I would describe myself as a pretty soft-hearted person. | 0 | 1 | 2 | 3 | 4 |

| | 0 | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 23. When I watch a good movie, I can very easily put myself in the place of a leading character. | 0 | 1 | 2 | 3 | 4 |
| 24. I tend to lose control during emergencies. | 0 | 1 | 2 | 3 | 4 |
| 24. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. | 0 | 1 | 2 | 3 | 4 |
| 26. When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. | 0 | 1 | 2 | 3 | 4 |
| 27. When I see someone who badly needs help in an emergency, I go to pieces. | 0 | 1 | 2 | 3 | 4 |
| 28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. | 0 | 1 | 2 | 3 | 4 |

**Video #__:**

## I-PANAS-SF

Over the length of the video, to what *extent* does the person in the video feel:

|            | *Never* |   |   |   | *Always* |
|------------|:-------:|:-:|:-:|:-:|:--------:|
| Upset      | 1 | 2 | 3 | 4 | 5 |
| Hostile    | 1 | 2 | 3 | 4 | 5 |
| Alert      | 1 | 2 | 3 | 4 | 5 |
| Ashamed    | 1 | 2 | 3 | 4 | 5 |
| Inspired   | 1 | 2 | 3 | 4 | 5 |
| Nervous    | 1 | 2 | 3 | 4 | 5 |
| Determined | 1 | 2 | 3 | 4 | 5 |
| Attentive  | 1 | 2 | 3 | 4 | 5 |
| Afraid     | 1 | 2 | 3 | 4 | 5 |
| Active     | 1 | 2 | 3 | 4 | 5 |