

Social Anxiety and Empathy for Social Pain

by

Karen Wei Auyeung

B.A., Queen's University, 2009

M.A., The University of British Columbia, 2012

A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

The Faculty of Graduate and Postdoctoral Studies

(PSYCHOLOGY)

THE UNIVERSITY OF BRITISH COLUMBIA

(Vancouver)

August 2017

© Karen Wei Auyeung, 2017

Abstract

Social relationships are a vital component of human experience. An important part of developing positive social relationships is the ability to experience and express empathy for other people's emotions (Baron-Cohen & Wheelwright, 2004). Unfortunately, building and maintaining positive relationships does not come easily to everyone. Individuals with social anxiety disorder have particular difficulty with emotion judgment, a central element of empathy. Despite these difficulties, findings from my previous research suggested that, faced with social threat, socially anxious individuals make more accurate judgments of others' negative emotions compared to non-anxious individuals. The current research combined models of empathy, social anxiety, and social exclusion, to examine how social anxiety influenced the accuracy of emotion judgments, and whether social exclusion influenced this relationship. Across three studies, I investigated 1) the relationship between social anxiety and empathic accuracy, 2) potential mechanisms in the relationship between social anxiety and empathic accuracy, 3) the role of social exclusion on these relationships, and 4) the relationship between social anxiety, empathic accuracy, and positive social behaviours. Two studies were conducted in university undergraduate samples and a third study extended this research into a clinical community population. The findings have the potential to contribute to the understanding of socially anxious populations and inform treatments that may improve their interpersonal relationships.

Lay Summary

Social relationships are a vital component of human experience. An important part of developing positive social relationships is the ability to experience and express empathy for other people's emotions. Unfortunately, building and maintaining positive relationships does not come easily to everyone. Individuals with social anxiety disorder have particular difficulty with emotion judgment, a central element of empathy. Across three studies, I investigated 1) the relationship between social anxiety and empathy, 2) factors that explain the relationship between social anxiety and empathy, 3) the role of social exclusion on these relationships, and 4) the relationship between social anxiety, empathy, and positive social behaviours. Two studies were conducted in university undergraduate samples and a third study extended this research into a clinical community population. The findings have the potential to contribute to the understanding of socially anxious populations and inform treatments that may improve their social relationships.

Preface

This dissertation is based on research conducted at the University of British Columbia's Interpersonal lab by Karen Auyeung and Dr. Lynn Alden. In collaboration with Dr. Alden, the author, Karen Auyeung, developed the design and methodology for the study. Karen Auyeung was also responsible for coordinating and conducting the testing of participants and wrote the manuscript in its entirety.

The research design for Studies 1 and 2 received ethics approval from the UBC Behavioural Research Ethics Board ID# H12-03415. Study 3 received ethics approval from the UBC Behavioural Research Ethics Board ID# H15-00275.

Table of Contents

Abstract.....	ii
Lay Summary.....	iii
Preface.....	iv
Table of Contents.....	v
List of Tables	viii
List of Figures	ix
Acknowledgements.....	x
Introduction.....	1
Social Anxiety Disorder	2
Social Anxiety and Social-Emotional Judgments	4
Empathy	7
Threats to Social Belonging and Empathic Responding to Strangers.....	12
Individual Differences in Sensitivity to Social Threat	15
Social Anxiety and Social Threat.....	17
Mediators of Empathic Responses	18
Overview of Studies	19
Study 1: Cyberball	21
Hypotheses.....	23
Method	24
Participants	24
Measures	25
Procedure	27
Results	28
Preliminary Analyses.....	28
Bivariate Correlations.....	31
Main Analysis.....	31
Mediation Analyses	33
Moderated Mediation Analyses	35
Study 1 Discussion	39
Study 2: Social Exclusion, Empathy, and Behavioural Response	42

Hypotheses.....	44
Method	45
Participants	45
Measures	46
Procedure	49
Results	52
Preliminary Analyses.....	52
Bivariate Correlations.....	56
Primary Analyses.....	57
Mediation Analyses	58
Moderated Mediation	59
Advice Analyses	59
Supplemental Video Comparisons	62
Supplemental Empathy versus Projection Analysis	62
Study 2 Discussion	63
Study 3: Clinical Social Anxiety and Empathy	67
Additional Mediators	68
Social Exclusion	71
Social Reconnection	71
Hypotheses.....	72
Method	73
Participants	73
Measures	76
Procedure	80
Results	81
Preliminary Analyses.....	81
Bivariate Correlations.....	87
Main Analyses	87
Mediators	88
Mediation Analysis.....	89
Moderated Mediation Analyses	92
Advice Analyses	93

Supplemental Analysis	96
Study 3 Discussion	96
Mediators	98
Social Exclusion	99
Advice.....	100
General Discussion	102
Social Anxiety and Empathic Accuracy.....	102
Empathy and Perceivers' Emotions	105
Mediators of Empathic Accuracy.....	107
Social Exclusion.....	109
Social Anxiety, Empathic Accuracy, and Positive Social Behaviours	112
Limitations, Strengths, and Future Directions	114
Implications	118
Conclusion.....	120
References	121
Appendix I: I-PANAS-SF Video Rating Form (Study 1 & 3).....	157
Appendix II: Cyberball Manipulation Check Questionnaire (Study 1)	158
Appendix III: Modified I-PANAS-SF Video Rating Form (Study 2)	159
Appendix IV: Advice Questionnaire (Study 2)	160
Appendix V: Personal Questionnaire (Study 2 & 3)	161
Appendix VI: Personal Questionnaire for Partner (Study 2 & 3).....	162
Appendix VII: Exclusion Manipulation Check Questionnaire (Study 2)	163
Appendix VIII: Advice Questionnaire (Study 2).....	164
Appendix IX: Exclusion Manipulation Check Questionnaire (Study 3)	165
Appendix X: Video Rating Questionnaire (Study 3).....	167
Appendix XI: Initial Advice Themes.....	170
Appendix XII: Advice Theme Analyses.....	172

List of Tables

Table 1. Descriptive statistics for participant demographics and main study variables split by experimental condition.....	29
Table 2. Bivariate correlations between variables included in the main analyses.....	31
Table 3. Descriptive statistics for participant demographics and main study variables split by experimental condition.....	53
Table 4. Means and standard deviations from ratings for new exclusion videos	54
Table 5. Means and standard deviations comparing control and experimental conditions on manipulation check questions	56
Table 6. Bivariate correlations between variables included in the main analyses.....	57
Table 7. Bivariate correlations between social anxiety and individual advice items	61
Table 8. Descriptive statistics for participants, split by Group and experimental conditions	83
Table 9. Means, standard deviations, and F-values from two-way between subjects ANOVA of experimental condition and Group predicting manipulation check questions.....	84
Table 10. Bivariate correlations between variables included in the main analyses.....	87
Table 11. Bivariate correlations between potential mediator variables across experimental conditions.....	88
Table 12. Descriptive statistics and correlations between variables involved in mediation analysis	89
Table 13. Means and standard deviations for participants' ratings of how objectively bad the targets' situations were and targets' negative emotions, split by experimental condition.....	93

List of Figures

Figure 1. Significant two-way interaction between condition and social anxiety (SIAS-S) predicting NA Discrepancy.....	32
Figure 2. Model of the indirect effect of self-rated negative affect (NA) on the relationship between condition and NA discrepancy.	35
Figure 3. Theoretical model of moderated mediation relationship between experimental condition, self-rated negative affect, negative affect (NA) discrepancy, and social anxiety.....	36
Figure 4. Three models depicting the relationship between experimental condition and NA discrepancy, mediated by self-rated NA.	38
Figure 5. Model of the indirect effect of self-rated negative affect (NA) on the relationship between social anxiety and NA discrepancy.	59
Figure 6. Model of the indirect effect of self-rated negative affect (NA) on the relationship between Group and NA discrepancy.	90
Figure 7. Model of the indirect effect of state empathy on the relationship between Group and NA discrepancy.....	91
Figure 8. Model of the indirect effect of similarity on the relationship between Group and NA discrepancy.	92
Figure 9. Theoretical model of moderated mediation relationship between Group, interpretation, NA discrepancy, and experimental condition.	92

Acknowledgements

It is with immense gratitude that I acknowledge the faculty, staff, and my fellow students at UBC, who have provided support and inspiration to move forward with work in this field. Thank to my committee members, Dr. Sue Birch and Dr. Frances Chen, for their patience and advice throughout this project. Your expertise and knowledge has helped me to create a dissertation I can be proud of. To my supervisor, Dr. Alden, thank you for all your support, guidance, and for advancing my love of research in this area. I have enjoyed our endless idea sessions and look forward to many more in the future.

I want to extend particular thanks to my fellow students in the Interpersonal Lab, who were integral in helping me to complete my dissertation, particularly Bri Glazier and Klint Fung. Thank you to all of my research assistants, Gurveer, Devon, Veera, Cindy, Jinny, and Susanna, for your constant persistence and hard work throughout the project. I wish you all the best in your future endeavors. I want to send a special acknowledgment to Grace Truong, stats consultant extraordinaire, who put up with my endlessly complicated statistical questions and always went a step beyond to help me out! Thank you for your patience and knowledge, I feel confident in my results because of your assistance!

Thank you to all my friends, both near and far, for your encouragement, entertainment, and laughter; especially when we did all three at the same time. A special thanks to my parents and family for their moral support and for always making me feel good about the work I've done. And finally, a heartfelt and special thanks goes to my best friend and husband, Scott. Thank you for all your unconditional support, enduring patience, and well-timed humour throughout this process. Thank you for pushing me to be the best version of myself and to take advantage of life. I would have gone crazy without you!

Introduction

Social relationships are a vital component of the human experience. Unfortunately, building and maintaining positive relationships does not come easily to everyone. An important part of developing positive social relationships is the ability to experience and express empathy for other people's emotions (Baron-Cohen & Wheelwright, 2004). Although empathy is often thought to be a relatively automatic response, there is evidence that suggests that contextual and individual factors can influence the empathic response. The overarching goal of my research was to examine how social anxiety might influence empathic judgments of others' emotions. Individuals with high social anxiety have particular difficulty with social relationships; however it was not clear whether differences in empathy might play an important role. Similarly, social exclusion is a common human experience. Despite its prevalence, extant research revealed inconsistencies in empirical findings on the consequences of being excluded for empathy.

My dissertation built on my earlier research (Auyeung & Alden, 2016) in which I found that, when faced with social threat, non-anxious individuals tended to underestimate the negative emotions displayed by others, whereas socially anxious individuals remained relatively accurate in their judgments. My goals in this dissertation were to determine whether the same results emerged following *social exclusion* and to extend the study of empathic accuracy to a clinical sample. Accordingly, I conducted three studies that combined models of empathy, social anxiety, and social exclusion to examine how social anxiety was related to the accuracy of emotion judgments, and whether social exclusion influenced this relationship. My primary thesis was that following social exclusion, non-anxious individuals may become less attentive to the negative emotions in others as part of an adaptive response. Although this may decrease their empathic accuracy for others' negative emotions, it may simultaneously allow them to recover

from the negative effects of social exclusion and engage in behaviours to regain their sense of belonging (Hess & Pickett, 2010; Maner, DeWall, Baumeister, & Schaller, 2007). In contrast, due to their sensitivity to social threat cues, socially anxious individuals more readily attend to the negative emotions of others and therefore make more accurate judgments. Despite being more accurate, socially anxious individuals may show maladaptive reactions to others' negative emotions, such as withdrawing or avoiding rather than acting in ways that promote relational repair.

In this introduction, I first consider social anxiety disorder (SAD), followed by a discussion of how SAD affects emotion judgments for different types of stimuli. I then introduce empathy, beginning with an exploration of the various definitional and measurement issues arising from the construct, followed by an exploration of the role that perceivers' own experiences influence the empathic process. As part of this discussion, I review studies indicating that accurate empathy may not be beneficial when individuals are faced with social threat. In addition, I explore how individual differences in sensitivity to social threat might affect empathic accuracy. I end the introduction with an overview of my three studies that examined the effects of social threat on empathic accuracy in socially anxious individuals.

Social Anxiety Disorder

Social anxiety disorder (SAD, or social phobia) is a clinical condition marked by significant anxiety about social or performance situations, which arises from the fear of embarrassing oneself and/or being judged or criticized by others (American Psychiatric Association, 2013). SAD is associated with significant psychological, interpersonal, and functional consequences across multiple domains, with individuals with SAD having poorer outcomes in academic, employment, and social domains, as well as in overall well-being

(Aderka et al., 2012; Eng, Coles, Heimberg, & Safren, 2005; Ruscio et al., 2008; Sherbourne et al., 2010; Stein & Kean, 2000). In the social domain, individuals with SAD tend to have fewer and lower quality intimate relationships and report a lower sense of social connectedness in their friendly and romantic relationships (Cuming & Rapee, 2010; Rodebaugh, 2009; Weisman, Aderka, Marom, Hermesh, & Gilboa-Schechtman, 2011). In addition to increased sensitivity to rejection (Zadro, Boland, & Richardson, 2006), some studies suggested that individuals with SAD are indeed rejected more often than non-anxious individuals (e.g., Blöte & Westenberg, 2007) and that others tend to respond more negatively to them (e.g., Alden & Wallace, 1995; Heerey & Kring, 2007; Voncken, Alden, Bögels, & Roelofs, 2008). Less is known about how social anxiety affects emotion judgments of others' feelings and how this process is influenced by social exclusion.

Studies often use analog samples of individuals with subclinical social anxiety to investigate important questions about social anxiety. Social anxiety is generally seen as a dimensional disorder, with individuals experiencing both a range of symptoms as well as differences in severity (Rapee, 1995). Recent research suggested that individuals with subclinical levels of social anxiety symptoms also experience significant distress and impairment across the life domains (Merikangas, Avenevoli, Acharyya, Zhang, & Angst, 2002; Stein, Walker, & Forde, 1994) as well as impaired quality of life (Fehm, Beesdo, Jacobi, & Fiedler, 2008). The effects of experimental manipulations on both clinical and subclinical populations often yield similar effect sizes (e.g., Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007). In particular, subclinical social anxiety is associated with significant effects across emotional, cognitive, behavioural, and physiological domains in response to social stressors that parallels the reactions of clinical social anxiety (Crişan, Vulturar, Miclea, & Miu, 2016). In the current

study, I investigated questions about social anxiety and empathy in samples of both subclinical and clinical populations. Through the document, I will refer to research using analog samples as “socially anxious individuals” and research using clinical samples as “individuals with SAD”.

Social Anxiety and Social-Emotional Judgments

Positive interpersonal interactions require the ability to recognize the basic emotional expressions of others as well as an understanding of the more complex underlying social-emotional experiences of others. The majority of studies on emotion judgments and social anxiety addressed potential deficits or biases in recognition of basic emotions. These studies often examined perception of facial expressions associated with the six basic, and cross-culturally recognized, emotions (Ekman & Friesen, 1971). A full review of the literature is beyond the scope of this dissertation, but most studies found that social anxiety was associated with attentional and cognitive biases for negative emotional stimuli. For example, socially anxious individuals displayed faster responses and greater attention to negative emotion faces (Miskovic & Schmidt, 2012; Schofield, Johnson, Inhoff, & Coles, 2012), and individuals with SAD correctly identified negative emotional stimuli more often than non-anxious individuals (Foa, Gilboa-Schechtman, Amir, & Freshmen, 2000; Mohlman, Carmin, & Price, 2007; Quadflieg, Wendt, Mohr, Miltner, & Straube, 2007). Other studies found that socially anxious individuals were more likely to negatively interpret ambiguous stimuli (Beard & Amir, 2009; Yoon & Zinbarg, 2008) and to misperceive the intensity of emotions (Button, Lewis, Penton-Voak, & Munafò, 2013). Overall, these studies indicated that social anxiety was associated with selective attention to socially threatening information (Bar-Haim et al., 2007; Staugaard, 2010).

In addition to accurately processing basic emotions, successful social interactions require an ability to understand more complex emotional information. In daily life, it is rare to see

expressions of a “pure” single emotion (e.g., just anger) in social interactions. Therefore, it is important to understand how socially anxious individuals process complex social stimuli, which are usually made up of chains of emotions and require a greater understanding of the emotional, social, and contextual aspects of an event (Griffiths, 1997; Power & Dalgleish, 1997).

Cognitive theorists propose that socially anxious individuals make inaccurate judgments about how they and others perceive their social performance (Rapee & Heimberg, 1997). A large body of work on both subclinical and clinical populations supports this idea (e.g., Niels Christensen, Stein, & Means-Christensen, 2003; Taylor & Alden, 2005). In addition, a recent meta-analysis by O’Toole and colleagues (2013) found that both clinical and subclinical individuals with SAD showed a decreased ability to understand their own emotions, as well as difficulty judging the complex versus basic emotions of others. In terms of social cognition (i.e., understanding social norms, attributing social intentions of others), individuals with SAD performed worse compared to controls and individuals with other anxiety disorders (Hezel & McNally, 2014; Janssen et al., 2014; Summerfeldt, Kloosterman, Antony, McCabe, & Parker, 2010). In general, these findings suggest that socially anxious individuals display a tendency to assign greater and more negative meanings to what others are thinking and feeling, rather than deficits in emotion knowledge, per se (Hezel & McNally, 2014; Plana, Lavoie, Battaglia, & Achim, 2014).

That being said, some studies found that social anxiety was associated with normal performance on tasks assessing mental state attributions (Tibi-Elhanany & Shamay-Tsoory, 2011) and understanding how emotions influence interpersonal interactions (Jacobs et al., 2008). Discrepancies between these sets of studies may be explained by differences in how social and emotional cognition was measured. Studies supporting normal performance in socially anxious

populations used measures that assessed how participants believed they perceived, communicated, and managed emotions, as well as *simple* theory of mind tasks (e.g., judging which item the target wanted based on eye gaze or context). Studies that found evidence of impaired social cognition used measures of emotion judgments and attribution styles that specifically examine the ability to shift between perspectives (e.g., deictic framing; McHugh, Barnes-Holmes, & Barnes-Holmes, 2004), and *complex* measures of social cognition (e.g., Movie for the Assessment of Social Cognition, Reading the Mind in the Eyes Test). In summary, more research is required to understand how social anxiety influences the processing of complex social-emotional information, particularly pertaining to judgments of what others are thinking and feeling.

Cognitive theorists also propose that safety behaviours interfere with the processing of social information in populations with social anxiety and SAD (Clark & Wells, 1995; Rapee & Heimberg, 1997). Safety behaviours are actions intended to increase feelings of security and minimize the risk of social rejection, but which unintentionally lead to increased anxiety and negative interpersonal outcomes (Hampbel et al., 2011; McManus, Sacadura, & Clark, 2008; Taylor & Alden, 2010). Examples include excessive self-monitoring, appearing busy, and avoiding eye contact. These theorists propose that safety behaviours, as well as selective attention to negative information, heighten anxiety and encourage an internal focus, which reduce the resources that individuals with SAD have available to regulate their own emotions and attend to external social information (see Kashdan, 2007). Furthermore, certain safety behaviours may interfere with interpersonal interactions. For example, socially anxious individuals often speak briefly and avoid disclosing information about themselves to reduce the likelihood of saying something awkward or being rejected. Unfortunately, these behaviours are

often perceived negatively and can unintentionally result in negative interpersonal outcomes (see Alden & Taylor, 2004). Although the current study does not focus on safety behaviours, it builds on the idea that socially anxious individuals' internal experience may influence the processing of complex social-emotional information, such as how they judge or *empathize* with others' feelings and then how they respond to those judgments.

Empathy

As humans are social animals, having insight into what others are thinking and feeling is an essential component in interpersonal communication. The term “empathy” is used to cover a broad range of phenomenon related to interpersonal understanding. This includes feelings of concern for others, experiencing emotions that correspond to the emotions experienced by others, knowing what others are thinking and feeling, and even blurring the lines between what one and another are feeling (Batson, 2009; Hodges & Klein, 2001). Despite this variability, most researchers agree that the construct of empathy contains two important processes, 1) an emotion-driven component involving the awareness of another person's emotions that is echoed in the perceiver, and 2) a cognitive component involving the ability to identify and comprehend what the other person is thinking and feeling (Davis, 1994; Ickes, 1997; Singer, 2006). In this dissertation, empathy will be defined as the ability to understand what others are feeling via the experience of a matching emotion.

From this standpoint, empathy is considered to be a “self-conscious” process (Lewis, 2000) as it first requires a certain degree of self-awareness and the ability to reflect on one's own emotions and experiences before being able to place one's self in the place of others (Bischof-Köhler, 1991). A related construct, theory of mind (TOM), is the ability to attribute and understand others' mental states as being different from one's own (Perner & Wimmer, 1985).

Unlike empathy, TOM is viewed as an exclusively cognitive process, whereas empathy additionally involves the affective embodiment of others' emotions and requires awareness of both one's own and others' internal experiences (Lieberman, 2007). In most theoretical models, empathic responding develops following the presence of more basic affect reactions, generally referred to as emotional contagion and mimicry (Batson, 2009), where other people's emotions evoke an emotional echo in the perceiver (Keysers & Gazzola, 2006; Singer & Lamm, 2009). This emotional echo, in combination with the ability to take the target's cognitive perspective (e.g., understand what they are thinking), come together to help the perceiver understand the target's overall experience. Thus, empathy theorists view the perceiver's own emotional response as a partial mediator of empathic responding, i.e., the empathic perceiver will partially feel what the target is feeling.

There has been a sharp increase in studies examining the neurocognitive pathways associated with empathic responding. These studies support the abovementioned theoretical conceptualization of empathy in that regions in the brain associated with processing one's own emotions are also activated when viewing others experiencing the same emotions. For example, viewing emotional responses in others was found to activate the medial prefrontal cortex (mPFC), superior temporal sulcus, anterior and posterior cingulate, amygdala, and thalamus, areas also activated when processing one's own emotions (Hooker, Verosky, Germine, Knight, & D'Esposito, 2008; Krämer, Mohammadi, Doñamayor, Samii, & Münte, 2010; Ochsner et al., 2004; Völlm et al., 2006). In addition, activation in these same areas was associated with greater self-reported empathy (Hooker et al., 2008). Krämer and colleagues (2010) found that activation in the mPFC, which is thought to be specifically related to understanding others' cognitions, was negatively related to participants' self-reported tendency to feel distressed in emotional social

situations. The authors suggested that the mPFC could be related to emotion regulation and an ability to maintain separation between the emotions experienced by the self and others (Decety & Jackson, 2004). The finding that increased personal distress is associated with less activation in the mPFC suggests individuals who become easily distressed may also show difficulties empathizing with others. More research is required to explore these findings; however in general, these results suggested that individual differences in our own emotional experiences might influence how we react to and empathize with others' social experiences.

Empathy is considered one of the basic motivational processes for moral development (Eisenberg & Eggum, 2009). Emotions communicate important information about social interactions and influence the behaviours of those who perceive them (Van Kleef, 2009). In this way, empathy is considered a precursor to positive social behaviour as it influences our own reactions in order to modulate future behaviour, with the aim of maintaining social contact (Fisher & Tangney, 1995; Lewis, 2000). The latter idea, that empathy can help us to change our behaviours in a way that facilitates social relations, led to the development of the concept of *empathic accuracy* (Ickes, Stinson, Bissonnette, & Garcia, 1990; Ickes & Tooke, 1988).

Empathic accuracy. The measurement of empathy has been problematic not only due to the aforementioned variability in the definition of empathy, but also because of the reliance on self-report measures, which do not provide information about the accuracy of emotion judgments (Gerdes, Segel, & Lietz, 2010; Ickes, 2001). Studies by Ickes, Stinson, and colleagues (1990) and by Levenson and Ruef (1992) introduced the method of using an objective referent to measure empathic accuracy. In their technique, target individuals are video-recorded talking about an experience. Targets rate the emotions they experienced at various points of the

recording, as do perceivers. Empathic accuracy is measured by how closely perceivers' ratings are to the targets' ratings (Ickes, 2001).

Accurate empathy is considered an important part of interpersonal functioning, as increased accuracy allows individuals to align themselves with others in a way that facilitates positive interpersonal outcomes (Anderson & Keltner, 2002; Eisenberg, Fabes, & Spinrad, 2006a; Hoffman, 2000). For example, empathic accuracy was found to be associated with successful negotiations (Elfenbein, Maw-Der, White, Hwee-Hoon, & Aik, 2007), leadership effectiveness (Rubin, Munz, & Bommer, 2005), and general social adjustment (Gleason, Jensen-Campbell, & Ickes, 2009). Moreover, populations who have deficits in empathic accuracy, such as individuals with Autism Spectrum Disorder, were found to have poorer social outcomes (Demurie, De Corel, & Roeyers, 2011; Roeyers, Buysse, Ponnet, & Pichal, 2001).

Empathic accuracy is often studied in the context of romantic relationships, given the importance of being able to understand a partner's thoughts, feelings, and motives. In healthy relationships, empathic accuracy is linked to social and concrete (i.e., financial, material goods) support (Verhofstadt, Buysse, Ickes, Davis, & Devoldre, 2008). In addition, accuracy tends to be higher in stable relationships (Simpson, Ickes, & Blackstone, 1995a). There is evidence that men who are aggressive in their romantic relationships are less empathically accurate toward women they don't know, as well as to their partners (Clements, Holtzworth-Munroe, Schweinle, & Ickes, 2007; Schweinle, Ickes, & Bernstein, 2002).

Empathy and social behaviour. Although the above research links accurate empathy to positive relational functioning, some work suggests that the benefits of accurate empathy are not universal. In fact, accuracy may be harmful in situations involving social threat. For example, individuals who underestimated their partner's emotional reactions to attractive alternate

romantic partners (i.e., were inaccurate) were found to experience greater relationship satisfaction (Simpson, Ickes, & Blackstone, 1995; Simpson, Kim, Fillo, Ickes, Rholes, Oriña, & Winterheld, 2011). Conversely, when discussing relationship-threatening problems, greater empathic accuracy on the part of perceivers predicted declines in feelings of closeness to their marital partners (Simpson, Oriña, & Ickes, 2003). Overall, underestimates of others' emotions appear to be beneficial when perceivers are faced with threats to significant relationships. These findings underscore the point that empathy is a multifaceted construct that can be influenced by a variety of individual and situational factors.

In relationships and interactions that are characterized by high levels of distress, the ability to accurately empathize might lead to negative outcomes for the perceiver. For example, empathic responding and “emotion work” (e.g., displaying organizationally desired emotions such as sympathy, sadness, etc.) is considered a necessary component of professions that involve repeated exposure to distressing situations (e.g., first responders such as firefighters, police, doctors, nurses, etc.); however, helping professionals who display higher levels of empathy are at increased risk of experiencing vicarious trauma and burnout in response to their work (Alexander & Klein, 2009; Larson & Yao, 2005; Palm, Polusny, & Follette, 2004; Zapf, Seifert, Schmutte, Mertini, & Holz, 2001). These findings again suggest that there can be costs associated with accurate empathy.

Along similar lines, although empathy in parents is generally seen as a positive trait, the act of being more attuned to their child's needs may come at a greater cost if that child experiences high levels of distress. For example, for mothers of children with depressive symptomatology, mothers who were more empathic showed heightened immune system inflammatory responses (Manczak, Basu, & Chen, 2015). Over a prolonged period of time, over-

activation of this type of immune response can lead to negative health consequences (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). In order to maintain a supportive and non-reactive environment for their children, parents may need to suppress their own feelings of frustration and/or distress. Suppression, however, has been shown to increase physiological activation (Gross & Levenson, 1993) and lead to chronic inflammation (Appelton, Buka, Loucks, Gilman, & Kubzansky, 2013). These results suggest that the relationship between accurate empathy and interpersonal functioning is more complex than previously conceptualized. It also suggests that contextual factors influence how individuals empathize with others.

Threats to Social Belonging and Empathic Responding to Strangers

One factor that might influence empathic responding is social exclusion. Theories addressing interpersonal reactions to social exclusion are in development; however, most researchers agree that exclusion threatens a fundamental need to belong (Baumeister & Leary, 1995; Smart Richman & Leary, 2009). In evolutionary history, threats to social belonging represented a threat to survival (Wesselmann, Nairne, & Williams, 2012). Social exclusion, which includes aversive social experiences such as ostracism, disapproval, criticism, and rejection, produces a host of negative emotional and physiological states (e.g., fear, sadness, hurt feelings) that are collectively referred to as *social pain* (MacDonald & Jensen-Campbell, 2011). Social pain activates many of the same brain circuits and produces many of the same effects on mood and behavior as those involved in physical pain (Eisenberger, 2011). For example, research revealed activation in the anterior insula and dorsal anterior cingulate cortex, two areas associated with affective processing, when individuals experienced physical pain *and* when they viewed others experiencing the same pain (Botvinick et al., 2005; Jackson, Meltzoff, & Decety, 2005; I. Morrison, Lloyd, Di Pellegrino, & Roberts, 2004; Singer et al., 2004).

Although many studies have examined the effects of social exclusion on interpersonal behaviour, empirical findings were inconsistent as to whether exclusion leads to enhanced or reduced empathy. Given the importance of being socially included, theorists suggested that humans possess an internal regulatory system, sometimes referred to as the Social Monitoring System (Pickett & Gardner, 2005), that detects and adaptively responds to prevent future or further exclusion (Powers & Heatherton, 2012). Baumeister and Leary (1995) proposed that following social exclusion, individuals automatically direct their attention towards positive social information as part of an automatic regulatory mechanism (e.g., Social reconnection hypothesis; Baumeister & Leary, 1995a; Maner, DeWall, Baumeister, & Schaller, 2007). This attention shift is hypothesized to help repair excluded individuals' negative mood, restore feelings of belonging, and potentially facilitate social re-affiliation. Although there are studies that support this theory, it is less clear how social reconnection manifests in terms of cognition, perception, and behaviour.

At the attentional level, researchers found that socially excluded individuals were quicker to identify smiling faces in a crowd (DeWall, Maner, & Rouby, 2009), were more fixated and slower to disengage from smiling faces (DeWall, Twenge, et al., 2011), and had better memory for positive social events and words compared to non-excluded individuals (Gardner, Pickett, & Brewer, 2000; Gardner, Pickett, Jefferis, & Knowles, 2005). Exclusion also lead individuals to engage in affiliative behaviours with potential social partners, such as expressing greater interest in making friends, working with others, forming more positive impressions of others, and engaging in more positive social behaviours (Maner et al., 2007; Mallot et al., 2009).

It is not clear how a selective positive focus might influence the accuracy of emotion judgments. On one hand, focusing on positive and inclusion-related stimuli following exclusion

might reduce an ability to judge others' social pain and negative emotion. Given the importance of one's own emotional reactions to empathic responding, turning toward positive social information might reduce the salience of one's own and others' negative emotion cues and subsequently blunt empathy for others' social pain. On the other hand, there is evidence that belonging threats increase the accuracy of emotion judgments. For example, excluded individuals were more accurate at discriminating between happy and angry faces (Sacco, Wirth, Hugenberg, Chen, & Williams, 2011). Moreover, individuals who reported greater need to belong were better at identifying facial emotions and distinguishing between vocal tone and semantic valence (Pickett, Gardner, & Knowles, 2004).

Some researchers suggested that in addition to striving for social reconnection, exclusion promotes avoidance of further social threats, distress, and negative aspects of the social world (Powers & Heatherton, 2012). The dorsomedial prefrontal cortex (dmPFC) is a brain region associated with mentalizing about social information (Lieberman, 2010; Mitchell, 2008) and has been linked to empathic responses to others (Masten, Morelli, & Eisenberger, 2011; Rameson, Morelli, & Lieberman, M. D., 2011). A recent fMRI study found that excluded individuals showed increased dmPFC activity when looking at positive social scenes, but failed to recruit the dmPFC when looking at negative social stimuli (Powers, Wagner, Norris, & Heatherton, 2013). DeWall and colleagues (2009) found a similar result using an eye-tracking paradigm - excluded individuals showed selective attention to signs of social acceptance while concurrently showing decreased attention to negative social stimuli.

Social exclusion and empathy. Fewer studies have examined the effects of social exclusion on empathic responding per se. Several studies indicated that excluded individuals rated scenarios of social exclusion to be more painful, recommended more severe punishment for

bullies, more support for bullying victims, and felt worse watching others who had been excluded in the same manner they were (Masten et al., 2011; Nordgren, MacDonald, & Banas, 2011). Although these findings suggested that social pain might improve empathic responding, empathy was measured on dimensional scales of how “bad” the perceiver felt for the victim rather than as a form of accuracy (e.g., relative to an objective referent). Thus, it is not clear whether perceivers’ perceptions were accurate or simply more negative.

Only a handful of studies assessed *accurate empathy*, and findings have been inconsistent. Nordgren et al. (2011) found that, compared to non-excluded individuals, excluded individuals made more accurate estimates of their partner’s social pain when partners were similarly excluded. In contrast, Picket and colleagues (2004) found that individuals who relieved an experience of rejection were *less* empathically accurate compared to controls. Given the importance of empathic responding and emotion judgments in social relationships, more research is required to explore how social exclusion affects empathic accuracy.

Individual Differences in Sensitivity to Social Threat

As noted earlier, a certain degree of empathic *inaccuracy* can be adaptive when individuals are faced with social threat. Importantly, some work indicated that individual differences in threat sensitivity moderated the relationship between social threat and empathic accuracy. For example, when discussing potentially relationship-threatening situations in romantic relationships, anxiously attached individuals tended to be more accurate than non-anxious individuals (Simpson et al., 2011; Simpson, Ickes, & Grich, 1999a). Interestingly, this accuracy predicted relationship break-up and lower relationship satisfaction (Simpson, Ickes, & Blackstone, 1995b; Simpson, Ickes, & Grich, 1999b). In a similar vein, individuals who were less sensitive to social threat (i.e., low rejection sensitivity (RS)) underestimated the negativity of

ratings from potential dating partners when they believed they were being rated versus when another individual was being rated. In contrast, individuals high in RS perceived equal amounts of negativity in both conditions. Although these ratings might be accurate, threat sensitivity can lead to unnecessary self-protective behaviours that inhibit adaptive social responses (Downey, Freitas, Michaelis, & Khouri, 1998) and unintentionally lead to negative reactions from others (Ayduk, Gyurak, & Luerssen, 2008; Downey, Mougios, Ayduk, London, & Shoda, 2004; Downey, Zaki, & Mitchell, 2008; Romero-Canyas & Downey, 2013; Romero-Canyas, Downey, Berenson, Ayduk, & Kang, 2010). Thus, in early stages of both romantic and non-romantic relationships, it can be adaptive to *underestimate* social threats and downplay negative perceptions (Fletcher & Kerr, 2010; McKay & Dennett, 2009). Giving others the “benefit of the doubt”, particularly in situations that might involve social exclusion, offers the opportunity to establish rapport and engage in behaviours that ultimately facilitate acceptance and friendship (Romero-Canyas & Downey, 2013).

Individuals who are anxious about and sensitive to social threat may be less able to manage their initial reactions to threat and to properly manage their interpersonal responses. For example, in response to social exclusion, individuals who were high in RS were more likely to experience strong, negative affective responses such as anger and hostility (Ayduk, Downey, Testa, & Yen, 1999; Romero-Canyas et al., 2010) and experienced reduced self-concept clarity (Ayduk, Anett, & Luerssen, 2009) compared to individuals low in RS.

Overall, these findings suggested that when faced with potential social exclusion, threat-sensitive individuals may be more accurate in gauging others’ negative emotions but not necessarily to their benefit. Individuals with psychological or physiological predispositions to negative emotions may experience comparatively stronger reactions to aversive social events.

According to empathy models, the heightened salience of these internal affective cues should facilitate the ability to accurately judge the negative emotions of others. Individuals without such dispositional tendencies may be more likely to allocate attention away from negative social stimuli following social exclusion. They may be better able to dampen socially-induced negative emotions with subsequent lowering of their empathic accuracy for others' negative emotional reactions, yet with more positive social outcomes. Thus, individual differences in threat sensitivity may explain inconsistent previous findings.

Social Anxiety and Social Threat

One dispositional tendency that exerts a strong influence on emotional reactions to social exclusion is social anxiety. Socially anxious individuals display greater and more negative emotional reactions to social threat (Gilbert & Trower, 2001; Goldin, Manber, Hakimi, Canli, & Gross, 2009; Hofmann, Heinrichs, & Moscovitch, 2004). They also exhibit anxious attachment styles (Eng, Heimberg, Hart, Schneier, & Liebowitz, 2001). Leary and his colleagues proposed that social anxiety functions as part of an alarm system that warns individuals to potential threats to social belonging (DeWall, Deckman, Pond, & Bonser, 2011; Leary & Kowalski, 1995). Consistent with this reasoning, socially anxious individuals have difficulty disengaging from threatening stimuli (e.g., Schofield, Johnson, Inhoff, & Coles, 2012) and tend to fixate on emotional social stimuli (Gilboa-Schechtman & Schachar-Lavie, 2013). Furthermore, some work indicated that temperamentally shy children had more intense emotional reactions and poorer vagal regulation in response to exclusion (Gazelle & Druhen, 2009).

Few studies have examined how social anxiety affects reactions to social exclusion. Socially anxious children displayed reductions in state self-esteem following peer disapproval (Reijntjes et al., 2011). Maner and colleagues found that following exclusion, non-socially

anxious individuals displayed increased interest in working with others, more positive interpersonal behaviors, and a tendency to see new partners as more sociable, whereas socially anxious individuals did not (Mallot, Maner, DeWall, & Schmidt, 2009; Maner et al., 2007). Similarly, social anxiety was associated with prolonged recovery following a social exclusion manipulation (Oaten, Williams, Jones, & Andrew, 2008). Together, this research suggested that socially anxious individuals show different reactions to social exclusion and therefore may not experience the same type of recovery as non-anxious individuals.

Mediators of Empathic Responses

As previously mentioned, models of empathy suggest that empathic responding involves understanding another person's situation through the automatic and vicarious experience of similar emotions in the perceiver (Preston & de Waal, 2002), while still maintaining a separation between the self and others (Keen, 2007). The activated emotions are thought to help the perceiver understand the target's experience by activating related conceptual information and feelings, making the observer's emotions an important mediator of empathic experiences. Shared emotions and arousal are particularly relevant for negative emotions and for individuals who are more sensitive to them. For example, although the shared experience of negative emotions may serve as a cue that the other person is in need, the experience of high negative arousal can lead to self-focused attention and distress in the perceiver (Decety & Lamm, C., 2009; Eisenberg et al., 1994). Research is needed to examine whether perceivers' emotions mediate the relationship between individual differences, such as social anxiety, and empathic accuracy, and if so, how, i.e., whether heightened emotions facilitate or impede empathy.

Although the activation of shared affect is thought to be relatively automatic (Bastiaansen, Thioux, & Keysers, 2009), some research suggested that empathic responding can

be influenced by contextual factors. For example, some studies found that individuals showed greater activation in the pain network of the brain when watching individuals they feel close to being socially excluded, compared to when viewing strangers having the same experience (Beeney, Franklin Jr., Levy, & Adams Jr., 2011). Perceived similarity between observer and target is also thought to be an important mediator of accurate empathy (Davis, 1994). Individuals are thought to be more motivated to empathize with those that are more similar to them. Similarity might also facilitate the experience of shared emotions, although some studies suggest that similarity alone might not necessarily lead to empathic *accuracy* (e.g., Hodges, Kiel, Kramer, Veach, & Villanueva, 2010). Hodges and colleagues found that perceivers with similar experiences to the targets reported feeling greater empathic concern; however their ratings were not more accurate. Similarity may even lead perceivers to simply project their own experiences onto the targets (Hodges, Johnsen, & Scott, 2002). Another important factor is that even if there is some degree of perceived similarity between the observer and the target, the perceiver may not always appraise the situation in the same way. This difference could influence how likely the perceiver is to empathize with the target and as well as empathic accuracy. In short, more research is required to understand the mediators of empathic responding.

Overview of Studies

I conducted three studies to investigate the relationship between social anxiety, social exclusion, and empathic accuracy. Study 1 investigated whether Cyberball, an online social exclusion manipulation, influenced how individuals empathize with others emotions. Drawing on models of empathy, I explored the role that perceivers' emotions played in mediating the relationship between social anxiety and empathy. Study 2 extended the research by using a more naturalistic social exclusion manipulation and providing a pilot exploration into the interpersonal

behaviours that follow from empathy. Finally, Study 3 investigated these questions in a clinical population, comparing individuals with SAD to matched community controls.

Study 1: Cyberball

There is extensive research examining the negative cognitive and behavioural processes that mediate the relationship between social anxiety and relationship difficulties. Relatively few studies, however, explore the relationship between social anxiety and the basic social and emotional processes that facilitate *positive* relational functioning. Accordingly, Auyeung and Alden (2016) investigated how socially anxious individuals empathize with others as well as whether social threat affected the relationship between social anxiety and empathic accuracy.

A core fear associated with social anxiety involves being observed and evaluated as these situations contain threats of criticism and rejection (Clark & Wells, 1995; Leary, 1983; Mattick & Clarke, 1998). Drawing on this research, my earlier work used a social scrutiny manipulation in which participants were told that their microexpressions were being observed from behind a two-way mirror. I found a main effect of social anxiety such that socially anxious individuals were more accurate at judging others' negative emotions. This effect was modified by social threat such that socially anxious participants were more accurate when in a state of heightened social threat.

The study, while producing intriguing results, had several limitations. The manipulation check assessed whether participants felt self-conscious and socially anxious but not whether they felt a sense of threat. I therefore could not conclude that the observed changes in empathic accuracy resulted from *social threat* per se rather than self-consciousness or social anxiety. In addition, the scrutiny manipulation involved anticipation of potential negative evaluation. It is possible that the anticipation of negative evaluation leads socially anxious individuals to allocate attention to others' emotion cues, whereas the experience of an actual negative evaluation or exclusion might be more distressing and lead to a different response. For example, in the social

belonging literature, social exclusion led individuals to allocate attention towards positive social information and away from aversive negative emotions (e.g., Hess & Pickett, 2010; Powers & Heatherton, 2012). Socially anxious individuals, however, did not share this response (e.g., Mallot et al., 2009), which may have implications for empathy judgments.

In Study 1, I investigated whether the pattern of findings found in Auyeung and Alden (2016) was observed after an experience of social exclusion, which was hypothesized to create threats to social belonging (e.g., Smart Richman & Leary, 2009). Two possible outcomes were envisioned. First, the experience of more explicit social exclusion might lead to heightened negative affect in individuals with social anxiety. In turn, higher levels of negative affect might promote more accurate empathy for others' experiences of social exclusion. In contrast, previous research suggested that anxiety-provoking situations can lead individuals with social anxiety to turn their attention inward and become less aware of external stimuli (see Bögels & Mansell, 2004 for a review). Thus, an alternative possibility is that socially anxious individuals would be overwhelmed by their own experience of negative affect, which could interfere with empathic processes (e.g., Batson, 1991).

Study 1 also investigated whether perceivers' own emotions mediated the relationship between social anxiety and empathic accuracy. Based on empathy models, I hypothesized that the experience of negative affect would facilitate accurate empathy for others' negative affect. In Auyeung and Alden (2016), I thought it was possible that socially anxious individuals might have experienced more negative affect while watching the videos and therefore perceived more negative affect in the targets, leading to more accurate empathic judgments.

Accordingly, Study 1 participants played Cyberball (Williams & Jarvis, 2006), an online interactive computer game designed to induce feelings of social exclusion from being left out of

a ball toss game. This paradigm was used in other studies to provoke a sense of social exclusion (see Bernstein & Claypool, 2012a; K. D. Williams & Jarvis, 2006). As a manipulation check, participants were explicitly asked to rate feelings of belongingness and connection with the other players, as well as how they felt about playing the game. After playing Cyberball, participants watched videos of target individuals talking about high school events in which they were socially excluded. Participants made ratings of what they thought the target individuals were feeling while discussing the events. To assess empathic accuracy, participants' (i.e., perceivers') ratings of the targets' negative emotions were compared to targets' ratings of the emotions they experienced while discussing the exclusion events. I also investigated the role of participants' emotions as a potential mediator of the relationship between social anxiety and empathic accuracy.

Hypotheses

Findings from my earlier work suggested that there was a relationship between social anxiety and empathic accuracy. Furthermore, this relationship was influenced by the experience of social threat produced by social scrutiny and potential evaluation. Here I addressed whether social *exclusion* produced the same pattern of results. Following Auyeung & Alden (2016), I predicted that: (1) individuals with higher social anxiety would be more empathically accurate; (2) this effect would be modified by a two-way interaction such that this effect would be particularly evident after an experience of social exclusion; and (3) in line with empathy models, the relationship between social anxiety and empathic accuracy would be partially mediated by participants' own emotional reactions (i.e., participants who felt more negative affect would perceive more negative affect in others).

Method

Participants

Participants were recruited from the undergraduate subject pool at the University of British Columbia (UBC) and participated in exchange for course credit. I conducted a power analysis to determine the necessary sample size required to find an effect using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). I based the analysis on a fixed model multiple linear regression with three predictors. Assuming a medium effect size (Cohen's $f = 0.15$) and controlling for an error probability of $\alpha = .05$ and a false negative rate of $\beta = .95$, I aimed for a minimum of 74 subjects but continued to collect participants until the end of the school term.

One hundred and twenty-two undergraduate participants completed the study (73.0% female; mean age = 20.05, $SD = 2.30$; mean years of university education = 2.15, $SD = 1.47$). In terms of cultural background, 50 participants (41.0%) self-identified as Chinese, 26 (21.3%) as Caucasian, 15 (12.3%) as South Asian (e.g., Indian, Pakistani, etc.), seven (5.7%) as South East Asian, six (4.9%) as Central Asian or Middle Eastern, six (4.9%) as Korean, six (4.9%) as being from mixed cultural backgrounds. The remaining five participants (4.0%) identified as either Japanese, South or Latin American, African, Caribbean, or West Indian, or Other.

One participant was excluded as they did not complete the whole experiment. Eight participants were excluded because they either a) reported having previous experience with the Cyberball deception (four participants) or b) reported that they knew they weren't playing with real participants (four participants). Independent samples t -tests revealed that there were no significant differences between these participants and the rest of the sample.

Measures

Social anxiety. The Social Interaction Anxiety Scale-Straightforward Score (SIAS-S; Rodebaugh, Woods, & Heimberg, 2007). The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) is a 20-item inventory that assesses anxiety in social interactions. 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*). Although the SIAS is a reliable, valid, and internally consistent measure of social anxiety, Rodebaugh and colleagues (2007) reported that the 17 straightforward items are more valid indicators of social interaction anxiety than the three reverse-scored items. Removing the three reverse scored items was shown to slightly increase reliability and validity (Rodebaugh et al., 2011). I therefore calculated a total score by summing the 17 straightforward SIAS items to yield a SIAS-Straightforward (SIAS-S) score.

Empathy. Emotion ratings were made using the Negative Affect (NA) subscale of the Positive and Negative Affect Schedule Short Form (I-PANAS-SF; Thompson, 2007). The NA subscale comprises five adjectives reflecting various types of NA that are rated on 5-point scales ranging from 1 (*never*) to 5 (*always*). In previous studies, the NA scale had good construct validity and internal reliability with Cronbach's $\alpha = .87$ (Thompson, 2007). Here, the target individuals in the videos rated the NA they experienced while discussing their high school social experiences. After observing each video, research participants rated their judgments of the emotions the *target* in the video was experiencing (see Appendix I). The I-PANAS-SF is widely used as a self-report measure of affect, but there is less information regarding its use as a rating scale of others' affect. The long form PANAS (Watson, Clark, & Tellegen, 1988) has been used as a rating scale of others' affect in previous studies and had good reliability, Cronbach's $\alpha = .88$ (Watson et al., 2004; Watson, Hubbard, & Wiese, 2000)

Empathy was calculated by taking the discrepancy between participants' and targets' ratings for each individual affect item for each video (e.g., discrepancy = participant ratings – target ratings). The discrepancies were then summed to yield the main dependent variable, *negative affect (NA) discrepancy*. Positive scores indicated that the participant overestimated the negative affect experienced by the target compared to the target, whereas negative scores indicated that the participant underestimated the targets' affect. Scores closer to 0 indicated that the participant was closer to the targets' own ratings of their affect.

Self-rated negative affect. Participants also made ratings of how *they* were feeling after watching each of the videos using the I-PANAS-SF NA scale. As previously mentioned, the NA scale has good reliability for self-rated affect, Cronbach's $\alpha = .87$ (Thompson, 2007).

Video stimuli. The stimuli were comprised of four videos in which two female and two male volunteers in their mid- twenties recounted a real experience of a time when they felt socially excluded in high school. The videos were approximately 1 to 2.5 minutes in length. The videos were presented to participants in random order. Targets rated their own emotions after discussing the events of social exclusion using the same I-PANAS-SF scale.

In a previous study, to validate the stimuli, the exclusion videos were compared to videos in which the targets discussed instances of social inclusion. *T*-tests were conducted to evaluate whether targets and participants rated the negative and positive affect in the videos as significantly different (i.e., with targets displaying more negative affect and less positive affect in the exclusion videos). All analyses were significant in the expected direction, suggesting that the targets' situations of social exclusion were viewed as representing instances of social exclusion (see Auyeung & Alden, 2016).

Manipulation check. Participants made four ratings following the Cyberball game (Appendix II). Following previous research (e.g., Zadro, Williams, & Richardson, 2004), participants were asked two questions assessing their belonging needs (e.g., “I felt poorly accepted by the other participants”, “I felt like an outsider during the game”) on 9-point scales (1 = *not at all* to 9 = *very much so*) such that higher scores indicated less belonging. Following previous research (Nordgren et al., 2011), participants were asked to evaluate their experience playing the game (“How would you describe your experience playing the Cyberball game”, “The Cyberball game made me feel”) on a scale that ranged from -25 (*extremely negative/bad*) and +25 (*extremely positive/good*).

Procedure

All research measures and procedures were approved by the University Behavioral Research Ethics Committee. Participants were informed that the study investigated how computer interactions and mental visualization influenced social judgments. Participants were blind to experimental condition and were randomly assigned to either the experimental (social exclusion) or control condition. Participants played Cyberball (see Experimental Manipulation) and then watched and made ratings of the four video stimuli. They then completed a questionnaire battery that included the SIAS-S.

Experimental manipulation. All participants played Cyberball (Williams, Cheung, & Choi, 2000), a computer ball-tossing task designed to manipulate feelings of social exclusion. They were instructed to mentally visualize the entire experience of playing Cyberball with the rationale that the task was designed to assess how visualization affects social judgments. In the game, participants were told they are playing with three other players over the internet. The other “players” are, in fact, computer generated and the percentage of throws received by participants

is pre-programmed. Participants in the experimental condition received the ball 10% of the time whereas control participants received the ball 75% of the time. The game lasted approximately 5 minutes. Participants filled out a short questionnaire (see Manipulation check) that included filler questions regarding visualization (e.g., “I felt like I could visualize the other participants clearly”) in order to disguise the true nature of the task.

Debriefing. All participants were debriefed about the true nature of the study and were informed about the deception. Participants were asked about how much they believed that the other participants existed. Research assistants talked with the participants to ensure they were not feeling any significant negative emotions following the manipulation.

Results

Preliminary Analyses

Descriptive statistics. The mean level of social anxiety ($M = 27.04$, $SD = 13.47$) for the sample indicated adequate representation of individuals with high levels of social anxiety relative to other undergraduate samples (e.g., Weeks et al., 2008). Compared to the full scale SIAS, Cronbach’s $\alpha = .83$, the internal consistency of the SIAS-S was excellent in this sample, Cronbach’s $\alpha = .92$. There were no significant differences in social anxiety between control ($M = 26.54$, $SD = 13.52$) and experimental ($M = 27.47$, $SD = 13.52$) participants, $t(114) = -.3$, $p = .71$. The two conditions did not differ on demographic characteristics (i.e., age, gender, years of university). The mean and standard deviation for the main dependent variable, NA discrepancy ($M = -7.30$, $SD = 10.26$), suggested that the majority of participants underestimated targets’ negative affect (i.e., negative scores). Therefore, NA Discrepancy was conceptualized as a measure of accuracy. See Table 1 for the means, standard deviations, and ranges for the main study variables and the manipulation check items for each condition. The internal consistency of

the NA scale of the I-PANAS-SF for participants' ratings of their own negative emotions was adequate, Cronbach's $\alpha = .77$.

Table 1

Descriptive statistics for participant demographics and main study variables split by experimental condition.

	Control		Experimental	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	40	75.5	46	73.0
Male	13	24.5	17	27.0
Marital status				
Single	50	94.3	60	95.2
Cohabiting	3	5.7	3	4.8
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	19.72	1.75	20.40	2.67
Years of university	2.13	1.17	2.25	1.71
Social anxiety (SIAS-S)	26.54	13.52	27.47	13.52
Self-rated NA	30.17	10.75	26.67	8.18
NA discrepancy	-4.27	11.24	-9.71	8.78
Belonging needs	7.02	5.33	12.21	3.87
Cyberball experience	4.98	19.36	-1.90	17.35

Note: Social anxiety (SIAS-S; Social Interaction Anxiety Scale – Straightforward); Negative Affect (NA) (I-PANAS-SF; Positive and Negative Affect Scale – International Short Form); Description of Belonging needs and Cyberball experience can be found in the Methods section, Manipulation check.

Stimuli validation. Two undergraduate research assistants independently rated the videos using the I-PANAS-SF. One-way ANOVAs revealed that there were no differences in their ratings of NA between the four exclusion videos, $F(3, 7) = 0.67$, $ps = .62$.

To examine how NA was rated in the current study, I conducted an independent samples *t*-test comparing the total NA ratings made by participants and targets across videos. Levene's test for homogeneity of variances was significant, $F(1, 513) = 4.36$, $p = .04$, so the *t*-test was calculated assuming unequal variances. There was no significant difference between how participants ($M = 13.48$, $SD = 3.98$) and targets ($M = 13.00$, $SD = 1.63$) rated NA, $t(3.29) = -$

0.58, $p = .60$. These results indicated that participants and targets viewed the negative emotion in the video stimuli similarly. For participant ratings, the internal consistency for the NA subscale across the 4 videos was Cronbach's $\alpha = .70$.

Manipulation checks. See Table 1 for means, standard deviations, and ranges for the manipulation check variables split by experimental condition. The two questions assessing participants' belonging needs were combined by adding the items, Cronbach's $\alpha = .94$, and the two questions assessing participants' experience playing Cyberball were also combined by adding the items, Cronbach's $\alpha = .88$. I conducted a multiple linear regression to investigate the effects of the social exclusion manipulation. Social anxiety (SIAS-S), condition, and the interaction were entered as predictors. SIAS-S was mean-centered and condition was categorically coded such that the experimental group was the reference group (i.e., experimental group = 1).

For belonging needs, the overall model was significant, $F(3, 110) = 11.55, p < .001$. There was a significant main effect of condition, $\beta = .49, p < .001$. Participants in the experimental condition ($M = 12.21, SD = 3.87$) reported feeling less belonging compared to participants in the control condition ($M = 7.02, SD = 5.33$). Neither the main effect of social anxiety, $\beta = -.02, p = .86$, nor the interaction, $\beta = .07, p = .53$, were significant.

For the Cyberball experience questions, the overall model was approaching significance, $F(3, 112) = 2.16, p = .097$. The main effect of condition was significant, $\beta = -.20, p = .04$. Participants in the experimental condition ($M = -1.90, SD = 17.35$) reported that their Cyberball experience was significantly worse than participants in the control condition ($M = 4.98, SD = 19.36$), $t(114) = 2.02, p = .046$. Neither the main effect of social anxiety, $\beta = .16, p = .21$, nor the interaction, $\beta = -.17, p = .17$, were significant. It should be noted that due to the nature of the

rating scale for the Cyberball questions (i.e., -50 to + 50), the standard deviation was quite large ($SD = 18.54$).

Bivariate Correlations

I computed bivariate correlations among the main study variables, including experimental condition, social anxiety, self-rated negative affect, and negative affect discrepancy (See Table 2).

Table 2

Bivariate correlations between variables included in the main analyses

	Self-rated NA	NA discrepancy	Social anxiety
Experimental condition	-.18*	-.26**	.06
Self-rated NA		.57***	.07
NA discrepancy			-.02

Note: Negative affect (NA). Social anxiety (SIAS-S; Social Interaction Anxiety Scale – Straightforward Score). * $p < .05$. ** $p < .01$. *** $p < .001$.

Main Analysis

I conducted a multiple linear regression to examine the relationship between social anxiety, condition, their interaction, and empathic accuracy. Social anxiety (SIAS-S), condition, and the interaction were entered as predictors. The dependent variable was NA discrepancy. SIAS-S was mean-centered and condition was categorically coded such that the experimental group was the reference group (i.e., experimental group = 1). All variables were converted to z -scores to produce standardized betas.

The overall model was significant, $F(3, 106) = 3.90, p = .011$. The main effect of social anxiety was not significant, $\beta = -.18, p = .17$. There was significant main effect of condition, $\beta = -.26, p = .007$, revealing that individuals in the experimental condition ($M = -9.71, SD = 8.78$) were more discrepant than individuals in the control condition ($M = -4.27, SD = 11.24$). The condition main effect was modified by a two-way interaction, $\beta = .25, p < .047$, suggesting that social anxiety moderated the relationship between condition and NA discrepancy. See Figure 1.

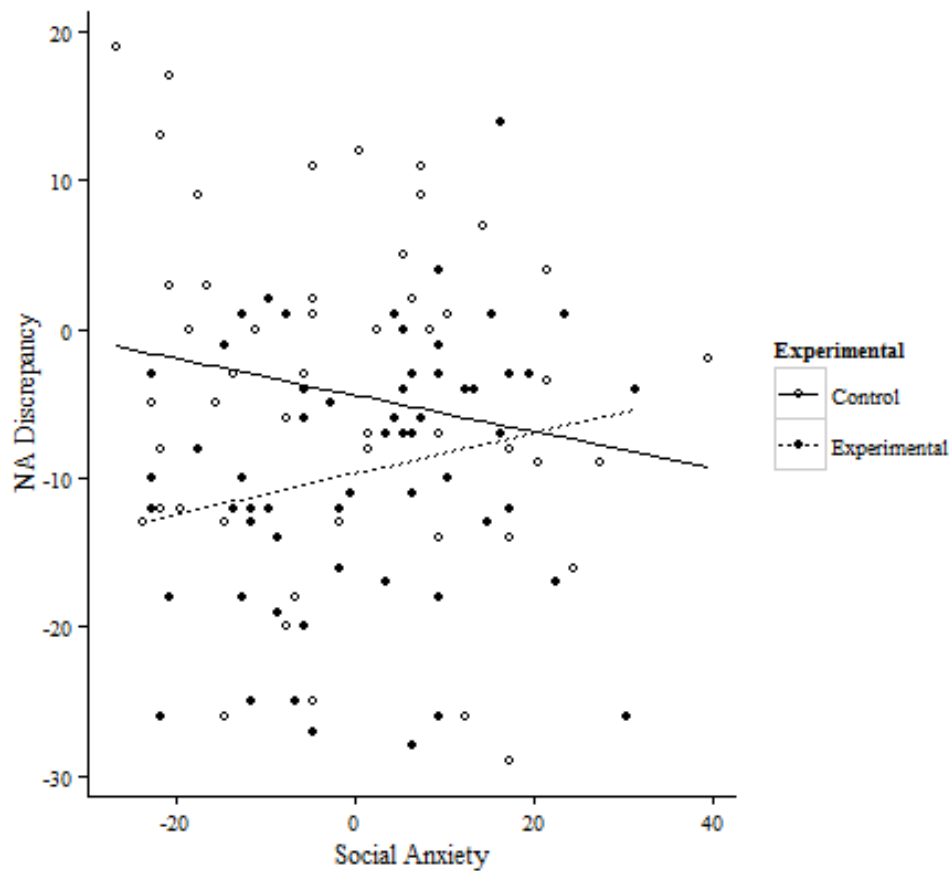


Figure 1. Significant two-way interaction between condition and social anxiety (SIAS-S) predicting NA Discrepancy, $\beta = .25$, $p < .047$.

To follow-up the significant two-way interaction, I conducted simple slopes analyses to examine the relationship between condition and NA discrepancy at different levels of the social anxiety, the moderator. The association between condition and NA discrepancy was tested at low (-1 SD below the mean), moderate (mean), and high (+1 SD above the mean) levels of social anxiety. Each of the analyses revealed a negative association between condition and NA discrepancy; however, the relationship was significant at low ($\beta = -.44$, $p = .001$) and mean ($\beta = -.26$, $p = .007$) social anxiety, but not high social anxiety ($\beta = -.07$, $p = .59$).

Mediation Analyses

Based on models of empathy, I investigated whether perceivers' emotions mediated the relationship between condition and empathic accuracy. The analysis included condition (experimental, control) as the independent variable, NA discrepancy as the dependent variable, and self-rated NA as the mediator. Given that individuals in the experimental condition were more discrepant in their ratings of targets' negative affect, I predicted that socially excluded participants would report feeling less NA and therefore perceive less negative affect in the targets (i.e., more discrepant).

The mediation analysis was conducted using the SPSS macro INDIRECT (Preacher & Hayes, 2004), which utilizes a bootstrapping procedure to compute a confidence interval around the indirect effect (i.e., the path through the mediator). Condition was categorically coded such that the experimental group was the reference group (i.e., experimental group = 1). All variables were converted to *z*-scores to produce standardized betas. For all analyses and discussion, the various mediational pathways will be referred to by their path designations. Path *a* is the relationship between the independent variable (condition) and the mediator (self-rated NA). Path *b* is the relationship between the mediator and the dependent variable (NA discrepancy) controlling for the independent variable. Path *c* is the relationship between the independent and dependent variables, and path *c'* is the relationship between the independent and dependent variables controlling for the mediator. Path *ab* is the indirect effect, i.e., the extent to which the relationship between the independent and the dependent variables is accounted for by the mediator.

Path *c* was examined by regressing condition on NA discrepancy. Condition significantly predicted NA discrepancy ($\beta = -.53$, $SE = .18$, $p = .005$). On average, individuals in

the experimental condition were more discrepant in their ratings and tended to underestimate the negative affect shown by targets ($M = -9.71$, $SD = 8.78$) compared to participants in the control condition ($M = -4.27$, $SD = 11.24$). Condition significantly predicted self-rated NA (Path a; $\beta = .38$, $SE = .19$, $p = .047$), and self-rated NA significantly predicted NA discrepancy (Path b; $\beta = .55$, $SE = 0.08$, $p < .001$). These results are consistent with a mediational hypothesis. To determine whether the indirect (ab) effect was significant (i.e., whether a significant proportion of the c path could be accounted for by the mediator), a bootstrap estimation approach with 1,000 resamples was conducted. The indirect effect was significant ($\beta = -.21$, $SE = .12$, 95% C.I. = -0.47, -0.01, $p < .05$). This is consistent with the hypothesis that a significant proportion of the variance in the relationship between condition and NA discrepancy was accounted for by perceivers' own affect. To investigate the extent to which self-rated NA mediated this relationship (i.e., full or partial mediation), path c was recalculated with self-rated NA in the model (c' path). Condition remained a significant predictor of NA discrepancy after controlling for the mediator, $\beta = -.33$, $SE = .15$, $p = .04$, suggesting only partial mediation. Approximately 39% of the variance in NA discrepancy was accounted for by the predictors ($R^2 = .39$). On average, individuals in the experimental condition experienced less negative affect ($M = 26.68$, $SD = 8.18$) compared to individuals in the control condition ($M = 30.06$, $SD = 11.17$), which partially explained their empathic ratings of the targets' emotions. See Figure 2 for a summary of these relationships.

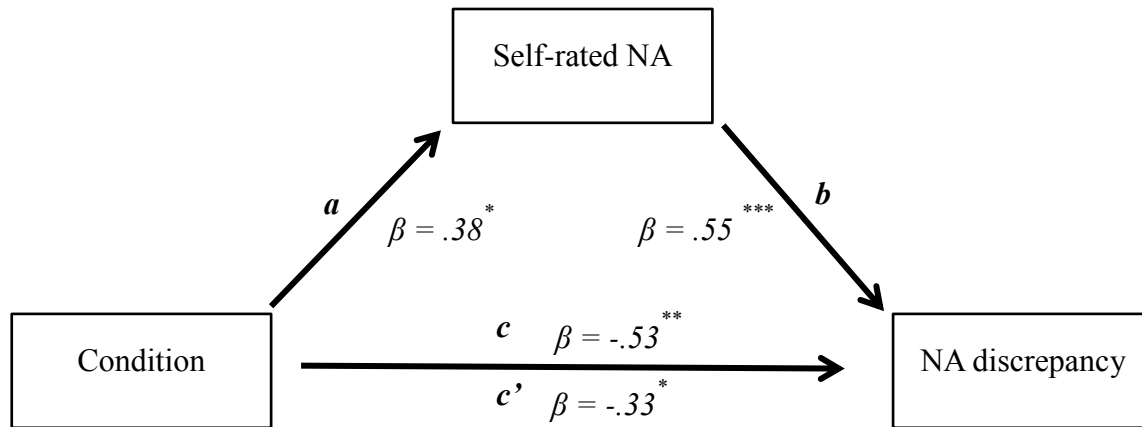


Figure 2. Model of the indirect effect of self-rated negative affect (NA) on the relationship between condition and NA discrepancy. The indirect effect (ab) was significant at $\beta = -.21$, $C.I._{.95\%} = [-.47, -.01]$.

Moderated Mediation Analyses

Given that social anxiety was a significant moderator of the relationship between condition and NA discrepancy, I investigated whether social anxiety might also moderate the mediation relationship between condition, self-rated NA, and NA discrepancy. I therefore conducted a test of moderated mediation (Preacher, Rucker, & Hayes, 2007). Preacher and colleagues (2007) identify this model as “Model 7”, in which the path of the indirect effect is moderated by some other variable. See Figure 3 for a depiction of this model.

For the moderated mediation model, I predicted that participants with higher social anxiety would experience more negative affect across both conditions and would therefore tend to perceive the targets as experiencing more negative affect compared to participants with lower levels of social anxiety, regardless of whether they experienced social exclusion. For individuals with lower levels of social anxiety, I predicted that they would experience less negative affect following social exclusion and consequently perceive less negative affect in the targets, similar to what I found with the overall mediation model. I therefore predicted that self-NA would significantly mediate the relationship between social anxiety and NA discrepancy for participants

with low and mean levels of social anxiety, but not for participants with high levels of social anxiety.

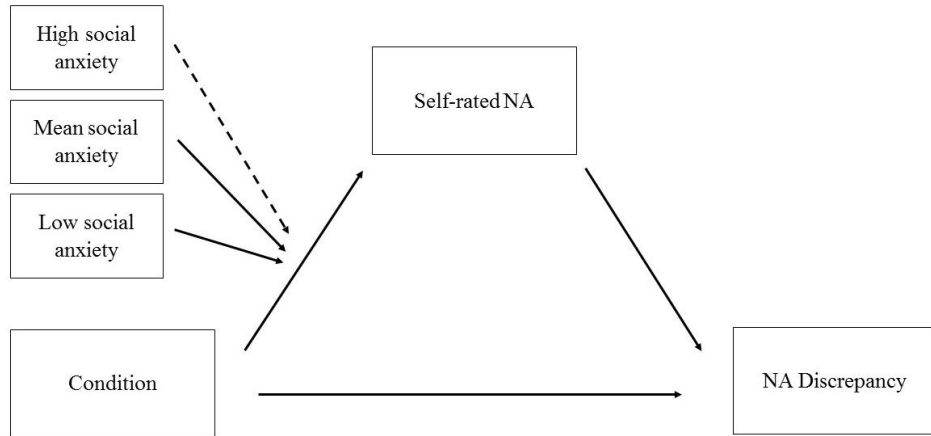
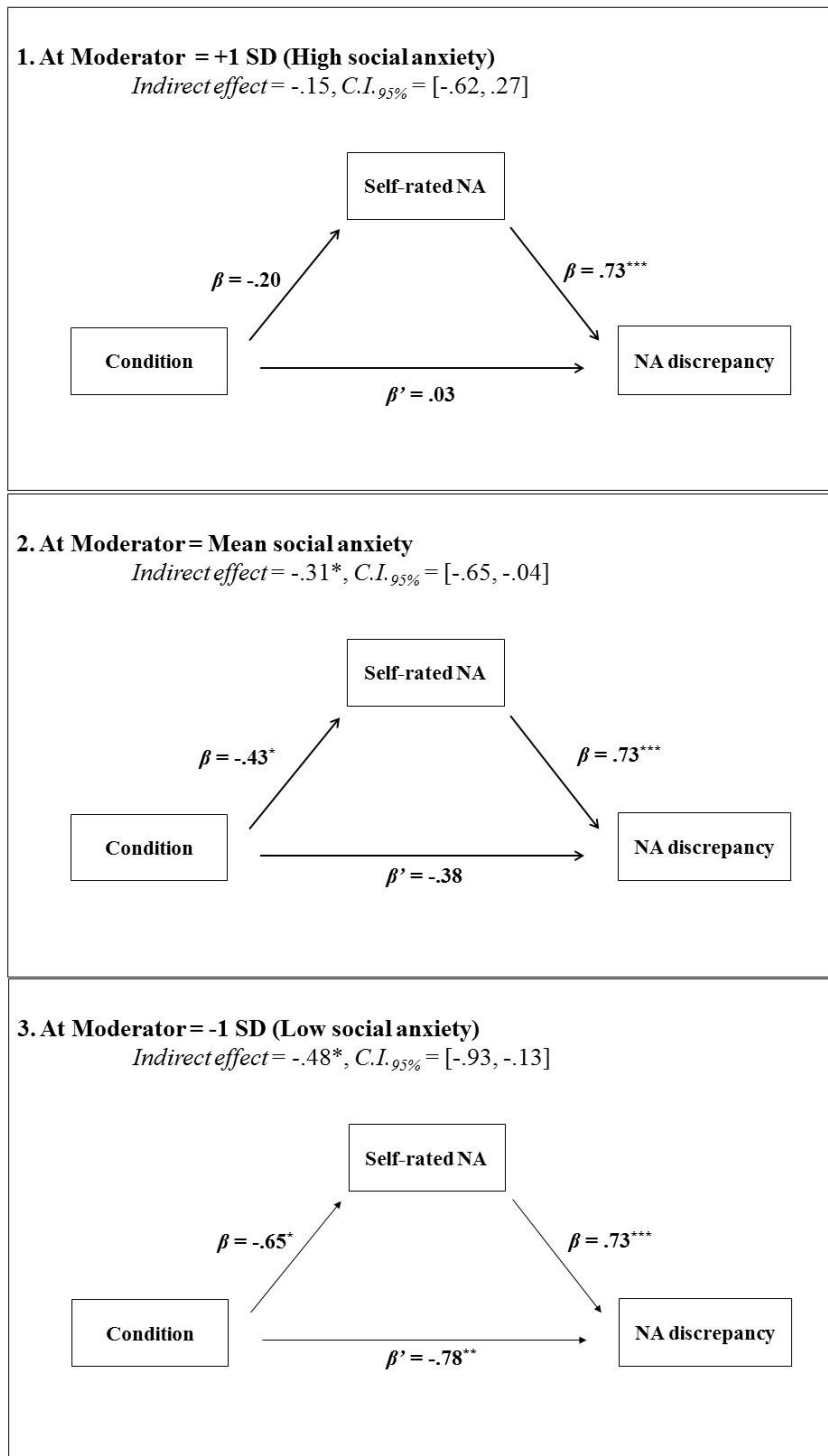


Figure 3. Theoretical model of moderated mediation relationship between experimental condition, self-rated negative affect, negative affect (NA) discrepancy, and social anxiety. I predicted that self-rated NA mediates the relationship between condition and NA discrepancy, but only for individuals with low and mean levels of social anxiety, suggesting that social anxiety moderates the relationship between condition and self-rated NA.

The overall model of mediation was significant at mean levels of the moderator (i.e., social anxiety), $R^2 = .42$, $F(4, 103) = 18.67$, $p < .001$. Figure 4 displays three mediation models: All three models depict the relationship between Condition predicting NA Discrepancy via self-rated NA, with each model displaying the standardized regression coefficients for the mediation paths at low, mean, and high levels of the moderator, social anxiety (i.e. -1 SD, mean, +1 SD). The indirect effect was significant for individuals with low ($\beta = -.48$, $C.I._{95\%} = -0.93, -0.13$, $p < .05$) and mean levels of social anxiety ($\beta = -.31$, $C.I._{95\%} = -0.65, -0.04$, $p < .05$), but not for individuals with high social anxiety ($\beta = -.15$, $C.I._{95\%} = -0.62, 0.27$, $p > .05$). Thus, in the exclusion condition, individuals with low and mean levels of social anxiety displayed the mediating effect of self-NA, i.e., their own negative emotional reactions predicted lower ratings of target negative affect. In contrast, individuals with high levels of social anxiety perceived

similar levels of negative affect in targets, regardless of experimental condition and their emotions did not mediate the relationship between condition and empathic accuracy.

A supplemental moderated mediation analysis was conducted to examine whether social anxiety moderated the relationship between self-rated NA and NA discrepancy (*b* path). Preacher and colleagues (2007) identify this as Model 14. The overall model was not significant.



Indirect effect method: Percentile bootstrap, 9999 resamples
 * $p < .05$, ** $p < .01$, * $p < .001$

Figure 4. Three models depicting the relationship between experimental condition and NA discrepancy, mediated by self-rated NA. Models depict the relationship at low (-1 SD), mean, and high (+1 SD) levels of social anxiety, the moderator.

Study 1 Discussion

Study 1 investigated whether the results of Auyeung and Alden (2016) extended to an explicit experience of social exclusion. Similar to my earlier work, I found an interaction between social anxiety and social exclusion predicting empathic accuracy. In this study, however, social anxiety moderated the link between social exclusion and empathic accuracy rather than having a direct effect. For non-anxious individuals, social exclusion resulted in underestimates of the negative emotions experienced by targets discussing painful social events. In contrast, socially anxious individuals displayed similar levels of empathic accuracy across experimental conditions.

My hypothesis regarding perceiver emotions was partially confirmed in that perceivers' emotional reactions to social exclusion mediated their empathy for others' social pain. This effect, however, was moderated by social anxiety, such that the mediation relationship was found only for individuals with lower social anxiety. Non-anxious participants reported feeling less negative affect watching the videos, particularly following the experience of social exclusion, and their lower negative affect explained their tendency to see less negative affect in the video targets. This finding is consistent with the theories of approach and avoidance (e.g., Powers & Heatherton, 2012), which suggested that after social exclusion individuals simultaneously turn their attention toward positive social information (e.g., look for signals of social reconnection; Maner et al., 2007) while also avoiding mentalizing about negative aspects of their social world. These results are similar to earlier work that found that excluded individuals displayed impaired ability to predict their own emotional responses (i.e., affective forecasting) and showed reduced sympathy for others' physical and social pain (e.g., having a broken leg, being broken up with;

DeWall & Baumeister, 2006). In another study, individuals who recalled instances of social rejection were less accurate at judging others' emotions (Pickett & Gardner, 2004).

Socially anxious individuals, on the other hand, perceived more negative affect in the targets, which is in line with research suggesting that socially anxious individuals selectively attend to negative faces (Amir, Prouvost, & Kuckertz, 2012; Yang, Yoon, Chong, & Oh, 2013). According to cognitive models, socially anxious individuals display both hypervigilance to and difficulty disengaging from negative social stimuli (Klumpp & Amir, 2009; Koster, Crombez, Verschuere, & De Houwer, 2004). Interestingly, socially anxious individuals' ratings were more accurate.

The differences between Study 1 and my earlier work could be due to differences in the nature of the social exclusion task. Auyeung and Alden (2016) manipulated social scrutiny to create a sense of potential threat, which could have resulted in greater variation in the degree of perceived threat than the explicit social exclusion used here. The Cyberball manipulation has a large effect size and is generally perceived as a clear experience of exclusion (Hartgerink, van Beest, Wicherts, & Williams, 2015). Thus, any effects of social anxiety could have been washed out. Consistent with that idea, the manipulation check revealed a main effect for social exclusion, but no social anxiety by exclusion interaction, which indicated that everyone felt excluded. Another possibility is that social anxiety does not influence initial reactions to social exclusion, but rather the recovery process (e.g., Oaten, Williams, Jones, & Andrew, 2008; Zadro et al., 2006; see also Wesselmann et al., 2012); however support for this idea is tenuous (see Hartgerink et al., 2015). Finally, the Cyberball manipulation is hypothesized to be less severe as a social injury because it is relatively impersonal (Bernstein & Claypool, 2012a, 2012b). The participant is engaged in a computer game with faceless "players" who know nothing about the

person and have no specific reason to exclude the participant. Research using other social exclusion manipulations, particularly those that are more naturalistic, are needed.

Study 2: Social Exclusion, Empathy, and Behavioural Response

The first goal of Study 2 was to investigate the relationship between social anxiety and empathic accuracy using a different social exclusion paradigm, one likely to be experienced as more personal and painful than the Study 1 Cyberball task. Berstein and Claypool (2012b) suggested that differences in the severity of social pain (i.e., an event that implies a greater degree and/or more personal form of social disconnection) would result in different responses, similar to how we react to different severities of physical pain. In their studies, participants were socially excluded using Cyberball or the Future-Life paradigm, in which participants filled out a personality questionnaire and were told that their results indicated that their future would be devoid of meaningful relationships (Twenge, Baumeister, Tice, & Stucke, 2001). Participants who received the Future-Life paradigm, which is considered a more severe and socially painful exclusion, reported less sensitivity to and a higher threshold for physical pain. Cyberball participants, in contrast, were sensitized to physical pain. Therefore, in Study 2 of this dissertation, participants were led to believe that another participant did not want to meet them after reading information about them (Mallot et al., 2009; Maner et al., 2007). This social exclusion design was intended to be perceived as more personal compared to Cyberball and therefore, more painful to participants. The question here is whether the results found in Study 1 would extend to this type of social exclusion.

I also sought to further examine the role of perceivers' emotions as a potential mediator. In Study 1, I found evidence consistent with models of empathy in that individuals' negative emotions partially explained the empathic accuracy of non-anxious individuals. Interestingly, that mediational pattern was not found for socially anxious participants; however, their ratings

were more accurate. To determine whether this finding would replicate, the role of perceivers' negative affect as a mediator of accurate empathy was again examined.

Study 2 added a measure of positive affect to examine whether positive- as well as negative- affect would mediate accurate empathy. In Auyeung and Alden (2016), no significant results emerged for positive affect; however, I did not investigate positive affect as a mediator. Some work suggested that positive affect may influence how socially anxious individuals perceive others' emotions. In computerized attention tasks, socially anxious individuals implicitly avoided attention toward positive social cues, such as smiling faces, as these cues indicate the potential for social interaction and rejection (Heuer, Rinck, & Becker, E. S., 2007). Furthermore, there is evidence that socially anxious individuals experience generally diminished positive affect (Kashdan & Breen, 2008). Thus, socially anxious individuals may have difficulty perceiving and empathizing with others' positive emotions. Therefore, new video stimuli were recorded for Study 2 in which targets rated both the negative and positive affect they experienced while discussing instances of social exclusion.

Finally, Study 2 explored a puzzling implication of my findings. Given that socially anxious individuals displayed more accurate empathy, why do they not do better socially? Previous research suggested that individuals make efforts to reconnect and engage in positive social behaviours following social exclusion in order to regain feelings of belonging and acceptance (e.g., DeWall, Twenge, et al., 2011; Maner et al., 2007). It is possible that non-anxious individuals, although less empathically accurate, may be better able to engage in positive interpersonal behaviours aimed at regaining a sense of belonging, whereas anxiety may impede socially anxious individuals' ability to use their accurate perceptions of others' emotions in an effective manner. For example, socially anxious individuals may be overwhelmed by the

negative affect they experience while watching the targets' videos, which could interfere with implementing effective interpersonal behaviours. This speculation is in line with the idea that empathic accuracy is not always associated with positive interpersonal outcomes. As previously mentioned, in the context of certain types of relationships, accurate empathy for distressing or threat-related content can actually lead to worse outcomes (e.g., Manczak et al., 2015; Simpson et al., 2011, 2003).

Avoidance behaviours are both a core symptom and maintenance factor of social anxiety (Clark, 2005; Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). Furthermore, socially anxious individuals are less likely to engage in positive social behaviours, such as self-disclosure (Voncken & Dijk, 2013) and helping behaviours (Rodebaugh et al., 2013; Stoltenberg, Christ, & Carlo, 2013). These avoidant tendencies might be expected to impede the ability of socially anxious individuals to generate effective social responses even if they detect others' negative emotions.

To examine the idea that socially anxious individuals respond less effectively to people who express negative affect, I examined the link between empathic accuracy and subsequent social behavior. When friends talk about difficult topics, it is important for the listener to be able to respond in ways that are empathic and helpful. I therefore included a questionnaire to investigate the types of advice that participants would give to the target individuals in response to their descriptions of social exclusion. The questionnaire was rationally derived to reflect three types of advice: positive and approach-oriented, avoidant, and negative.

Hypotheses

I hypothesized that: (1) In line with my earlier work, individuals with higher social anxiety would be more accurate at judging the negative emotions of the video targets; (2)

socially excluded individuals would be less accurate at judging targets' negative affect; (3) perceivers' emotions would partially explain the relationship between social anxiety and empathic accuracy, such that individuals with higher social anxiety would experience more negative affect and therefore perceive more negative affect in the targets; and (4) socially anxious individuals would provide more avoidant and negative advice to targets and less positive approach-oriented advice compared to non-anxious individuals, particularly following social exclusion. Given my earlier negative findings about positive affect, I had no specific predictions about how positive affect would enter into these relationships.

Method

Participants

Participants were recruited from the undergraduate subject pool at UBC and participated in exchange for course credit. I conducted a power analysis using G*Power (Faul et al., 2007) to determine the necessary sample size required to find an effect. I based the analysis on a fixed model multiple linear regression with three predictors. Assuming a medium effect size (Cohen's $f = 0.15$) and controlling for an error probability of $\alpha = .05$ and a false negative rate of $\beta = .95$, I aimed for a minimum sample of 119 subjects but continued to collect participants until the end of the school term.

One hundred and forty-six participants completed the study (79.8% female; mean age = 20.47, $SD = 2.66$; mean years university education = 2.37, $SD = 1.41$). In terms of cultural background, 48 participants (37.2%) self-identified as Chinese, 42 (32.6%) as Caucasian, 12 (9.3%) as Southeast Asian (e.g., Vietnamese, Thai), 11 (8.5%) as South Asian (e.g., East Indian, Sri Lankan, Pakistani), five (3.9%) as South or Latin American (e.g., Mexican, Brazilian, Chilean), three (2.3%) as Korean, and the remaining eight participants (6.3%) identified as either

Japanese, African, Caribbean, or West Indian, Central Asian or Middle Eastern (e.g., Israeli, Palestinian, Iranian), Fijian, or mixed cultural backgrounds.

During the debriefing, ten participants were excluded because they reported knowing that there was deception and that there was not another participant involved in the study. Most (eight) of the participants reported being skeptical and/or anticipating deception in research studies due to what they learned in undergraduate psychology courses. Two participants reported being skeptical because they did not see other people in the building when they arrived at the lab. One participant was excluded because English was his second language. He reported that he did not understand the social exclusion manipulation and many of the questions in the study.

Independent samples *t*-tests revealed that there were no significant differences between these participants and the rest of the sample in terms of age, $t(143) = -.56, p = .58$, gender, $t(143) = .19, p = .85$, years of university, $t(143) = -1.21, p = .23$, or social anxiety, $t(143) = 1.14, p = .26$. The final sample included one hundred and thirty-four participants.

Measures

Symptom measures. Social anxiety symptoms were assessed using the Social Interaction Anxiety Scale-Straightforward Score (SIAS-S; Rodebaugh, Woods, & Heimberg, 2007). SIAS-S score was calculated by summing the 17 straightforward SIAS items (See Study 1).

Empathy. Emotion ratings were made using the Negative Affect (NA) scale from the I-PANAS-SF (see Study 1) and a modified version of the positive affect (PA) scale (Appendix III). In Auyeung and Alden (2016), I did not find any significant findings for the PA scale and participants generally showed low endorsement of the PA items. Thus, the original PA items from the I-PANAS-SF (e.g., Alert, inspired, determined, attentive, active) did not appear to adequately represent the positive emotions displayed by the targets in the videos. Although the I-

PANAS-SF is one of the most prominent measures of affect, it has been criticized for over-representing arousal-type emotions (Diener, Smith, & Fujita, 1995; Larsen & Diener, 1992) and underestimating the pleasure/valence-type emotions proposed by Russell (1980).

I therefore recorded new videos using five new adjectives that represented both the activation and pleasure dimensions of positive emotion (Barrett & Russell, 1999). The adjectives (Happy, enthusiastic, cheerful, excited, proud) were taken from the 60-item expanded form of the PANAS-X (Watson & Clark, 1994). Three research assistants rated the videos using the adapted PANAS to validate whether the items were relevant to the video content.

Similar to the previous studies, both targets and participants made ratings of the targets' emotions. Empathy ratings were calculated for ratings of discrepancy (i.e., directional difference between participant and target ratings) and summed to create the main dependent variables, *negative affect (NA) discrepancy* and *positive affect (PA) discrepancy*. The discrepancy rating was chosen over the accuracy or absolute value rating (i.e., the absolute difference between participant and target ratings) as it provided information about whether participants over- or underestimated targets' affect in addition to information about accuracy (i.e., scores closer to 0 suggest that participants' ratings are closer to targets' ratings). Positive scores indicated that the participant overestimated the affect experienced by the target, whereas negative scores indicated that the participant underestimated targets' affect.

Self-rated negative affect. Participants also made ratings of how *they* were feeling after watching each of the videos using I-PANAS-SF NA scale (See Study 1 for psychometric information) and the modified PA scale.

Video stimuli. New video stimuli were created for this study given the new positive affect scale. There were four videos in total. Two females and two males in their mid-twenties

recounted real experiences they had in high school when they felt socially excluded. Two of the individuals were volunteers. The remaining two targets were recruited from ads placed around UBC campus and were paid \$20 for their participation. All individuals were fully informed about the use of the stimuli. The video targets were given the same instructions to the targets from Study 1, and were told to avoid explicitly labelling the emotions they were experiencing while discussing the events. Targets rated the emotions they felt while discussing the events directly after being filmed. The videos were approximately 1 to 3 minutes in length. Stimuli were validated by research assistants (see Results).

Manipulation check. Following the experimental manipulation, participants completed a questionnaire rating their first impressions of their supposed conversational partner. The questionnaire included the 10-item modified I-PANAS-SF described above; three questions about their impressions of their partner (e.g., “How likeable was this person?”, “How accepted do you feel by this person?”, “How would you rate your first impression of this individual?”) and three questions related to the study hypothesis (see Procedure) regarding their perceptions of similarity to their partner (e.g., “How similar do you feel to this person?”, “Do you think this person would feel similar to you based on your answers?”, “Do you think you would have similar opinions as this other person?”). All questions were rated on 9-point scales (1 = *not at all* to 9 = *very much so*) such that higher scores indicated a more positive social experience and similarity. Where possible, these questions were combined into single measures of social inclusion and similarity (see Results).

Following previous research (e.g., Nordgren et al., 2011), participants also completed the Faces Pain Scale – Revised (Bieri, Reeve, Champion, Addicoat, & Ziegler, 1990), a common scale for measuring pain intensity. The measure contains six human faces distributed across a 10-

point scale. The faces vary in terms of the magnitude of pain they express, with higher scores indicating greater pain. Participants were asked to “please indicate how you currently feel by circling the faces that best reflects your feelings on the scale below”. The scale was found to be reliable and valid for adults and had good test-retest reliability in previous studies, Cohen’s $\kappa = .61$ (Kim & Buschmann, 2006; Stuppy, 1998).

Advice. To investigate participants’ interpersonal behaviours I piloted an advice questionnaire. After watching the videos, participants were instructed to imagine having a conversation with targets in which targets recounted their social exclusion experience. Participants were asked to rate how likely they would be to give each of 10 different types of advice on a 5-point scale (1 = *not likely* to 5 = *likely*) (Appendix IV). The advice items were derived on a rational basis to tap different advice themes. Specifically, the items reflected advice that would facilitate positive social behavior (i.e., behaviors likely to maintain relationships) (e.g., “I would tell them to try and talk to their friends to find out what went wrong and try to work things out”), negative/aggressive advice (e.g., “I would tell them to try and find a way to get back at their friends in a similar way”), and anxious or avoidant responses (e.g., “I would tell them nothing, I wouldn’t know what to say”).

Procedure

All research measures and procedures were approved by the University Behavioral Research Ethics Committee. Participants were informed that the study investigated how perceptions of similarity influence how individuals judge others’ emotions, and were blind to experimental condition. Participants were then randomly assigned to either the experimental (social exclusion) or control condition using a table of random numbers (www.random.org) and completed the study tasks below.

Study tasks. The experimenter delivered the following instructions:

“To start, you will fill out a short questionnaire with questions about yourself and exchange this information with your partner. You and your partner will meet briefly and then fill out another short questionnaire with ratings of similarity and first impressions. You will then complete the rest of the study separately”.

Participants subsequently filled out a short questionnaire about themselves (e.g., biggest pet peeve, something recent they’re proud of, what they look for in a partner, see Appendix V). This questionnaire was emailed to the “other experimenter” who was allegedly in another room down the hall. Shortly thereafter, the experimenter told the participant that they had received an email with the partner’s questionnaire. Participants were instructed to read through this questionnaire while the experimenter left the room to bring the partner to meet the participant. All information on the partner’s questionnaire was the same across participants, except that the gender/name of the partner was randomized (see Appendix VI). After several minutes, the experimenter returned to deliver the experimental manipulation (see below).

Experimental manipulation. The experimental manipulation procedure was designed to replicate a naturalistic experience of social exclusion and was adapted from previous studies (Mallot et al., 2009; Maner et al., 2007). After participants filled out the personal questionnaire and “received” their partner’s questionnaire, the experimenter left the room to get the participant’s partner. In both conditions however, the experimenter returned to the lab alone. The experimenter delivered the following instructions with conversational variations depending on the participants’ reactions:

Control condition. Participants were told that their partner had left the study prematurely

because they had forgotten about an appointment.

“Apparently the other participant forgot about an appointment/meeting at <time> and had to leave? Yah, they accidentally double booked I guess...I’m so sorry about this!”

Experimental condition. Participants were told that their partner appeared uncomfortable after reading the participant’s questionnaire and stated that they did not want to meet the participant. No specific reasons were provided as to why the partner did not wish to meet the participant.

“So, I’m not really sure why but apparently your partner said they didn’t want to meet you? I’m not sure why, we didn’t want to press them too much, they looked really uncomfortable after reading your questionnaire. I’m so sorry about this!”

Manipulation check. The experimenter stated that, “although you never met your partner, you were only going to meet them briefly. We can still probably use your data from this short questionnaire with your first impressions of your partner so far.” Participants then completed the manipulation check questionnaire (see Measures and Appendix VII) which asked about their first impressions of their partner.

Following the procedure described in Study 1, participants then watched and made ratings of the four video stimuli. They then filled out the advice questionnaire and a questionnaire battery that included the SIAS-S.

Debriefing. Participants were debriefed about the true nature of the study and were informed about the deception. A funnel debriefing was conducted in which participants were asked about suspicion of the manipulation and other procedures. As noted earlier, eight participants expressed suspicion and were eliminated from data analyses. Following the

debriefing, the experimenter talked with the participants to ensure they were not feeling any significant negative emotions.

Results

Preliminary Analyses

Descriptive statistics. The mean level of social anxiety ($M = 23.53$, $SD = 13.78$) indicated adequate representation of individuals with high levels of social anxiety relative to other undergraduate samples (e.g., Weeks et al., 2008). Compared to the full scale SIAS' Cronbach's α of .88, the internal consistency of the SIAS-S in this study was excellent, Cronbach's $\alpha = .94$. There were no significant differences in social anxiety between control ($M = 22.79$, $SD = 13.32$) and experimental ($M = 24.30$, $SD = 14.31$) participants, $t(127) = -.62$, $p = .54$. The two conditions did not differ on gender or years of university, however the experimental condition ($M = 21.01$, $SD = 3.09$) was significantly older than the control condition ($M = 19.93$, $SD = 1.98$), $t(133) = -2.44$, $p = .016$. Although age was not correlated with any of the main study variables (i.e., social anxiety, NA discrepancy), the main analyses were re-conducted using age as a predictor of empathic accuracy. Age did not affect the main results and therefore the analyses without age are reported. The mean and standard deviation for the main dependent variable, NA discrepancy ($M = -4.09$, $SD = 10.12$), suggested that the majority of participants underestimated targets' negative affect (i.e., negative scores). Therefore, NA Discrepancy was conceptualized as a measure of accuracy. See Table 3 for the means, standard deviations, and ranges for the variables for each condition.

Table 3

Descriptive statistics for participant demographics and main study variables split by experimental condition

	Control		Experimental	
	<i>n</i>	%	<i>n</i>	%
Gender				
Female	54	79.4	52	77.6
Male	14	20.6	15	22.4
Marital status				
Single	66	97.1	60	89.6
Cohabiting	2	2.9	5	7.5
Married	0	0	2	3.0
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	19.93	1.98	21.01	3.09
Years of university	2.43	1.27	2.79	1.48
Social anxiety (SIAS-S)	22.79	13.32	24.30	14.31
Self-rated NA	42.55	21.47	42.98	13.92
Self-rated PA	39.50	18.35	39.38	20.83
NA discrepancy	-5.81	24.17	-4.28	16.89
PA discrepancy	6.67	18.58	4.98	14.60

Note: Social anxiety (SIAS-S; Social Interaction Anxiety Scale – Straightforward). Negative Affect (NA) (I-PANAS-SF; Positive and Negative Affect Scale – International Short Form). Positive Affect items taken from PANAS-X.

Stimuli validation. Thirteen undergraduate research assistants independently rated the videos on four questions measuring the visibility of emotions. Two questions assessed how easy it was to detect negative and positive emotions in the videos on a 5-point scale from (1 = *very easy* to 5 = *very difficult*). Participants also rated how much positive emotion was shown by the target (1 = *none* to 5 = *almost completely*) and how distressed the target looked (1 = *not at all* to 5 = *extremely*). The ratings were in the expected directions (see Table 4), such that it was easier to detect negative emotions, harder to detect positive emotions, and targets appeared more distressed and displayed fewer positive emotions in the videos. Similarly, participants rated the video targets as showing more negative emotions and fewer positive emotions.

Table 4

Means and standard deviations from ratings for new exclusion videos

	<i>M</i>	<i>SD</i>
1. How easy was it to detect negative emotions?	1.54	0.8
2. How easy was it to detect positive emotions?	3.67	1.4
3. How distressed does the target look?	3.52	1.2
4. How much positive emotion was displayed by the target?	1.44	0.7
5. Total negative affect	16.93	6.72
6. Total positive affect	9.23	6.09

Note: Ratings of video emotion content were on scales of 1 to 5. For questions 1 and 2, greater scores indicated it is more difficult to detect that emotion. For questions 3 and 4, greater scores indicated that the target appeared more distressed or showed more positive emotion. Negative and positive affect scores were made using new modified I-PANAS-SF (see Measures).

The internal consistency of participants' ratings across the four videos was adequate for the NA subscale, Cronbach's $\alpha = .79$, and the PA subscale, Cronbach's $\alpha = .93$. To examine NA and PA, I conducted independent samples *t*-tests comparing the total NA and PA ratings made by participants and targets across videos. There was no significant difference between how participants ($M = 14.11$, $SD = 4.38$) and targets ($M = 18.25$, $SD = 2.22$) rated targets' NA, $t(133) = 1.88$, $p = .06$. For PA, there was no significant difference between participants' ($M = 9.27$, $SD = 4.22$) and targets' ($M = 7.75$, $SD = 2.63$) ratings, $t(133) = 0.50$, $p = .48$. These results indicated that participants and targets perceived similar positive and negative emotions in the video stimuli.

Manipulation checks. The two social inclusion questions (i.e., "How accepted do you feel by this person?", "How likeable was this person?") were highly correlated, $r = .76$, $p < .001$, had good internal reliability, Cronbach's $\alpha = .86$, and were therefore summed to yield a single score. The three similarity questions were also highly correlated, $r_s = .71$ to $.76$, $p_s < .001$, had good internal consistency, Cronbach's $\alpha = .89$, and were summed to yield a single score. The positive and negative affect ratings were summed to yield PA and NA scores. The first impression question and faces pain scale were treated as single items.

I conducted multiple linear regressions to determine whether the manipulation check had the desired effect. In all analyses, social anxiety (SIAS-S), condition, and the interaction were entered as predictors. SIAS-S was mean-centered and condition was categorically coded such that the experimental group was the reference group (i.e., experimental group = 1). The dependent variables were the social inclusion question, first impression question, faces pain scale, positive and negative affect, and the similarity question. All variables were converted to z -scores to produce standardized betas.

For the inclusion question, the overall model was significant, $F(3, 129) = 8.66, p < .001$. There was a significant main effect of condition, $\beta = -.39, p < .001$, indicating that excluded participants felt less included. Neither the main effect of social anxiety, $\beta = -.19, p = .12$, nor the interaction, $\beta = .12, p = .30$, was significant.

The overall model for participants' first impression of their partners was significant, $F(3, 129) = 6.81, p < .001$. There was a significant main effect of condition, $\beta = .34, p < .001$, indicating that excluded participants had a more negative first impression. Neither the main effect of social anxiety, $\beta = .19, p = .12$, nor the interaction, $\beta = -.09, p = .44$, were significant. The overall model for the faces pain scale was also significant, $F(3, 133) = 8.88, p < .001$. There was a significant main effect of condition, $\beta = .39, p < .001$, indicating that excluded participants felt more pain. Neither the main effect of social anxiety, $\beta = .16, p = .17$, nor the interaction, $\beta = -.14, p = .24$, was significant.

For negative affect, the overall model was significant, $F(3, 129) = 12.52, p < .001$. There was a significant main effect of condition, $\beta = .46, p < .001$, indicating that excluded participants felt more negative affect. Neither the main effect of social anxiety, $\beta = .15, p = .19$, nor the interaction, $\beta = -.05, p = .67$, was significant.

The overall model for positive affect was also significant, $F(3, 129) = 9.38, p < .001$. There was a significant main effect of condition, $\beta = -.39, p < .001$, indicating that excluded participants felt less positive affect, $\beta = -.39, p < .001$. Neither the main effect of social anxiety, $\beta = -.18, p = .12$, nor the interaction, $\beta = .04, p = .73$, was significant.

Finally, the model for the similarity question was significant, $F(3, 129) = 11.29, p < .001$. There was a significant main effect of condition, $\beta = -.37, p < .001$, indicating that excluded participants felt less similar to their partners. There was also a main effect of social anxiety, $\beta = -.34, p = .004$, indicating that socially anxious participants felt less similar to their partners. The interaction, $\beta = .14, p = .24$, was not significant. See Table 5 for the means and standard deviations for the manipulation check questions between conditions.

Table 5
Means and standard deviations comparing control and experimental conditions on manipulation check questions

	Control		Experimental	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Social inclusion questions	11.13	3.13	8.00	3.97
First impression	1.61	.63	2.17	.78
Faces pain scale	0.67	.18	1.93	.19
Negative affect	7.93	.45	11.55	.48
Positive affect	14.51	.45	11.38	.49
Similarity questions	14.30	5.1	9.67	5.3

Note: All results significant $p \leq .001$. For Social inclusion questions, greater scores indicate feeling more included/having more interest in meeting their partner. For First impression question, greater scores indicate a more negative impression. Finally, for Similarity Questions, greater scores indicate feeling more similar to their partner.

Bivariate Correlations

I computed bivariate correlations among the main study variables, including experimental condition, social anxiety, self-rated NA and PA, and NA and PA discrepancy (see Table 6).

Table 6

Bivariate correlations between variables included in the main analyses

	Social anxiety	Self-rated NA	Self-rated PA	NA discrepancy	PA discrepancy
Experimental condition	.07	.02	.01	-.02	.02
Social anxiety		.17	-.10	.23**	-.15
Self-rated NA			-.16	.38***	.30**
Self-rated PA				.23*	.35***
NA discrepancy					.22*

Note: Negative affect (NA), positive affect (PA). Social anxiety (SIAS-S; Social Interaction Anxiety Scale – Straightforward Score). * $p < .05$. ** $p < .01$. *** $p < .001$.

Primary Analyses

I conducted two multiple linear regression analyses to examine the relationship between social anxiety, condition, their interaction, and empathic accuracy. Social anxiety (SIAS-S), condition, and the interaction were entered as predictors. The dependent variables were NA and PA discrepancy. SIAS-S was mean-centered and condition was categorically coded such that the experimental group was the reference group (i.e., experimental group = 1). All variables were converted to z -scores to produce standardized betas.

Negative affect discrepancy. The overall model was significant, $F(3, 128) = 3.20, p = .026, R^2 = .07$. Similar to Auyeung & Alden (2016), there was a significant main effect of social anxiety, $b = .36, t = 2.98, p = .003$. The slope suggested that social anxiety was associated with NA discrepancy; however given that NA discrepancy scores can be negative or positive, it is difficult to interpret the results using only the slope. I conducted exploratory descriptives using a mean split for social anxiety ($M = 23.20, SD = 13.74$). Individuals with higher social anxiety tended to be more accurate at judging the targets' negative emotions ($M = 1.23, SD = 10.99$) compared to individuals with lower social anxiety ($M = -3.52, SD = 8.73$). Neither the main effect of condition ($b = -.06, t = -.37, p = .71$) nor the interaction ($b = -.26, t = -1.50, p = .14$) was significant.

Positive affect discrepancy. The overall model was not significant, $F(3, 127) = 1.52, p = .21, R^2 = .04$. The main effect of social anxiety ($b = -.01, t = -.06, p = .95$), main effect of experimental condition ($b = -.02, t = -.23, p = .82$), and the interaction ($b = -.18, t = -1.42, p = .16$), were all non-significant.

Mediation Analyses

The second primary analysis investigated whether participants' affect mediated the relationship between social anxiety and ratings of targets' emotions. The analysis included social anxiety as the independent variable, NA discrepancy as the dependent variable, and self-rated NA as the mediator. Given the lack of significant findings for PA discrepancy, this model was not analyzed. The mediation analysis was conducted using the SPSS macro PROCESS (Model 4; Hayes, 2013) following the same procedures used in Study 1. In this model, the independent variable was social anxiety, the mediator was self-rated NA, and the dependent variable was NA discrepancy.

Social anxiety significantly predicted NA discrepancy (Path c; $\beta = .23, SE = .09, p = .008$). Social anxiety significantly predicted self-rated NA (Path a; $\beta = .19, SE = .09, p = .03$) and self-rated NA significantly predicted NA discrepancy (Path b; $\beta = .35, SE = .08, p < .001$). These results are consistent with a mediational hypothesis. To determine whether the indirect (ab) effect was significant, a bootstrap estimation approach with 10,000 resamples was conducted. The indirect effect was significant ($\beta = .07, SE = .04, C.I._{95\%} = .01, .18, p < .05$). This is consistent with the hypothesis that a proportion of the variance in the relationship between social anxiety and NA discrepancy was accounted for by perceivers' own affect. To investigate the extent to which self-rated NA mediated this relationship (i.e., full or partial mediation), path c was recalculated with self-rated NA in the model (c' path). Social anxiety remained a significant

predictor of NA discrepancy after controlling for the mediator, $\beta = .17$, $SE = .08$, $p = .04$, suggesting only partial mediation. Approximately 17% of the variance in NA discrepancy was accounted for by the predictors ($R^2 = .17$). These results suggested that individuals with higher social anxiety experienced more negative affect, which partially explained their ratings of the targets' negative affect. See Figure 5 for a summary of these relationships.

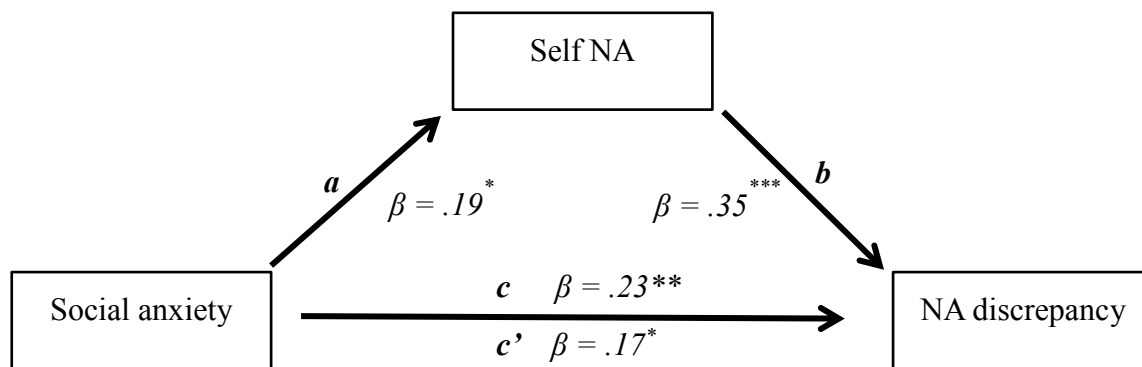


Figure 5. Model of the indirect effect of self-rated negative affect (NA) on the relationship between social anxiety and NA discrepancy. The indirect effect (ab) was significant at $\beta = .50$, $C.I._{95\%} = .01, .18$, $p < .05$.

Moderated Mediation

Following the significant partial mediation findings, I conducted a moderated mediation analysis to investigate whether experimental condition might moderate the mediation relationship between social anxiety, self-rated NA, and NA discrepancy. Preacher and colleagues (2007) identify this as “Model 7”, in which the path of the indirect effect is moderated by some other variable. The overall model of moderated mediation was not significant, ($\beta = -.08$, $SE = .08$, $C.I._{95\%} = -.27, .02$, $p > .05$), indicating that experimental condition did not moderate the mediational effect of self-rated NA on social anxiety and NA discrepancy.

Advice Analyses

I computed bivariate correlations between the advice items (see Table 7). I had hypothesized that the advice items would cluster into three themes: 1) Positive social advice

(items 2, 5, 9), 2) Aggressive advice (items 1, 3, 10), and 3) Anxious/avoidant advice (items 5, 6, 7, 8). See Appendix VIII for full length versions of the advice items. The items did not cluster into the hypothesized factors and the correlations were relatively small, so I only examined the items individually. The analyses revealed a few small correlations between advice items. The correlations suggested that individuals with higher social anxiety were more likely to endorse anxious or avoidant advice (e.g., not speaking to friends, there's nothing to be done, people are mean) or to tell off the friends that excluded the targets. There were no significant correlations between the individual items and condition or the condition X social anxiety interaction.

Table 7

Bivariate correlations between social anxiety and individual advice items

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Social anxiety										
2. Never speak to friends again	.31***									
3. Tell friends off	.18*	.31***								
4. Try and get back at friends	.02	.11	.33***							
5. Nothing to be done, people are mean	.21*	.30**	-.09	.00						
6. Nothing to do but move on	.20*	.29**	.04	.06	.21*					
7. Maybe you misunderstood them	.09	-.16	-.10	-.01	.05	-.08				
8. Wouldn't know what to say	.14	-.04	-.03	-.08	.15	-.04	.18*			
9. Find other positive friends	-.04	.37**	.01	-.11	.05	.18*	-.08	-.14		
10. Try to work things out	-.03	-.24**	.13	-.06	-.24**	-.28**	.22*	-.02	.01	
11. Tell friends how hurt you were	-.04	-.19*	.23**	-.10	-.26**	-.37***	.01	-.11	-.05	.53***

Note: * $p \leq .05$; ** $p < .01$. Advice items have been shortened to fit in table. See Appendix VIII for full advice items.

Supplemental Video Comparisons

In the current study, neither condition nor the interaction between social anxiety and condition significantly predicted empathic accuracy. I conducted post hoc analyses to investigate whether the new video stimuli might have influenced the results. I hypothesized that the negative affect displayed by the targets in the new video stimuli was more apparent, which could have facilitated participants' judgments of their emotions and reduced variability in their ratings. The research assistants who validated the new stimuli also made ratings of the videos used in Study 1 using the same ratings described earlier (e.g., ease of detecting negative and positive emotions, amount of positive emotion/distress shown; see Measures). Results indicated that the targets in the new videos ($M = 3.52$, $SD = 1.16$) appeared significantly more distressed than targets in the Study 1 videos ($M = 2.58$, $SD = 1.27$), $t(102) = -3.94$, $p < .001$, which could have made it easier to accurately rate the targets' emotions. This could have limited the variability in the results and reduced the differences in participants' ratings.

Supplemental Empathy versus Projection Analysis

The results of the mediation analysis suggested that socially anxious participants felt more negative affect while watching the videos and that this partially explained their greater empathic accuracy. An alternative possibility is that socially anxious individuals, who are known to experience greater NA than non-anxious individuals, were simply projecting their baseline NA onto targets rather than responding to targets with greater NA, which then increased their empathy. To determine whether the results better fit with an empathy versus projection model, I examined whether social anxiety would predict a greater increase in negative affect while watching the videos, which would suggest observing the targets contributed to NA beyond the baseline NA associated with social anxiety.

Residual change scores on negative affect were calculated by regressing participants' negative affect while watching the videos (NA-2) onto their negative affect prior to watching the videos (NA-1) with greater residualized scores (r-NA) reflecting the degree of change in participants' NA resulting from the videos. I then conducted a multiple linear regression analysis in which social anxiety (SIAS-S), experimental condition (i.e., control condition = 0, experimental condition = 1), and their interaction were entered as predictors of the residualized NA scores. The overall model was significant, $F(3, 125) = 2.67, p = .050$. A significant main effect emerged for social anxiety, $\beta = .25, p = .045$. The main effect of experimental condition was marginally significant, $\beta = -.17, p = .051$. The interaction was not significant, $\beta = -.16, p = .20$. The results suggested that individuals with higher social anxiety experienced a greater increase in negative affect while watching the videos, which was consistent with the empathy model.

Study 2 Discussion

Study 2 investigated whether the results from the previous studies extended to a more naturalistic experience of social exclusion. Similar to Auyeung and Alden (2016), I found a main effect of social anxiety, such that socially anxious individuals were more accurate at judging the negative emotions of others. Unlike previous studies however, this effect was not modified by an interaction between social anxiety and social exclusion. Study 2 also provided further evidence for the mediation model found in Study 1. Perceivers' emotions partially explained the relationship between social anxiety and empathic accuracy. There were no significant findings for positive affect. Finally, I investigated the relationship between social anxiety, empathic accuracy, and interpersonal behaviour. The results suggested tentative connections between social anxiety and avoidant advice.

The accuracy of socially anxious individuals' ratings may be explained by the tendency of socially anxious individuals to selectively attend to negative emotions and social stimuli (e.g., Amir, Prouvost, & Kuckertz, 2012; Yang, Yoon, Chong, & Oh, 2013) as a means to avoid rejection or other feared negative social outcomes (Buckner, Maner, & Schmidt, 2010; Schofield et al., 2012). One consequence of this tendency could be that socially anxious individuals are more accurate at judging the negative emotions of others.

Although the social exclusion manipulation elicited feelings of social pain and rejection, it did not influence how participants rated the videos. In contrast to the Study 1 Cyberball task where participants were clearly excluded, Study 2 used an exclusion manipulation intended to be more naturalistic. As in actual social interactions, however, it was also more ambiguous. For example, in the control condition, participants were told that their partner had to leave because of a forgotten appointment. It is possible that some participants interpreted the control condition as a potential rejection (e.g., "they didn't want to meet me and were lying about the appointment"), which could have reduced the overall impact of condition on the results.

Study 2 provided further evidence for models of empathy, such that socially anxious individuals felt more negative affect while watching the videos and consequently saw the targets as experiencing more negative affect. This finding, combined with the lack of moderation by experimental condition, raised the possibility that socially anxious individuals were projecting their own emotions onto the videos. Projection is a complicated issue in that empathy involves experiencing some of the *targets'* emotional reactions, whereas projection implies that the emotion derives primarily from the *perceiver*. The fact that the empathy ratings of socially anxious participants displayed greater convergence with those of targets argues that socially anxious individuals were indeed more empathic. Furthermore, supplemental analyses suggested

that socially anxious individuals were responding to the video content rather than simply projecting their own emotions, as they showed a greater increase in emotions after watching the videos. Nonetheless, further work is needed to determine whether the negative affect experienced by socially anxious participants reflected empathy per se. One approach to resolving this issue would be to collect more detailed information about participants' subjective responses to the videos.

In Study 2, participants rated how likely they would be to provide certain types of advice to the targets after listening to their stories. Although the items did not conform to the three proposed scales, correlation analyses provided tentative evidence that after being excluded, socially anxious individuals were more likely to tell targets to never speak to the friends that excluded them again and to find new and more positive friends. In light of the low level of these relationships, however, these results should be interpreted with caution. One limitation of the advice measure was that it provided participants with pre-existing pieces of advice, which might have obscured their natural tendencies. For example, socially anxious individuals often worry about saying the wrong thing and/or making situations worse and therefore tend to avoid engaging in positive social behaviours. In real conversations, socially anxious individuals might choose not to say anything or to say very little. Research using a more naturalistic advice measure would be useful to explore the relationship between social anxiety and behavioural responses to others' expressions of distress.

Finally, post hoc analyses indicated that negative affect was easier to detect in the new videos, thus potentially reducing variability in the ratings. In light of differences between the various studies, it would be useful to explore the impact of the new social exclusion manipulation on the video stimuli used in previous studies. This approach would provide

information as to whether a recent exclusion experience is more likely to influence reactions to ambiguous social stimuli.

Study 3: Clinical Social Anxiety and Empathy

The main goal of Study 3 was to explore the relationship between social anxiety, social exclusion, and empathic accuracy in a clinical sample of individuals with social anxiety disorder (SAD). In addition, I examined several potential mediators of the link between social anxiety and empathic accuracy, including perceivers' emotions, as in Studies 1 and 2, and perceivers' appraisals of the targets. Finally, I examined whether individuals with SAD displayed distinctive patterns of interpersonal responses to distressed individuals, as reflected in the advice offered to targets.

As discussed above, empathic accuracy has received little scrutiny in clinical samples. In addition, previous research produced mixed findings on the relationship between social anxiety and judgments of complex emotional stimuli. A recent meta-analysis by O'Toole and colleagues (2013) found an association between social anxiety and poor *intrapersonal* emotion knowledge, with a larger effect size for clinical versus non-clinical socially anxious samples. Notably, clinical status did not influence the effect size for *interpersonal* emotion knowledge. The authors suggested that the findings for interpersonal emotion judgments could have been influenced by a lack of consistency in measures used across the studies and that more research was required. Similarly, a recent study found that a clinical sample of individuals with SAD were less accurate on two theory of mind tasks but that the effect was weaker for negative emotions (Washburn, Wilson, Roes, Rnic, & Harkness, 2016). This was in contrast to an earlier study, in which individuals with SAD performed worse on the same tasks when the stimuli involved negative emotions (Hezel & McNally, 2014). Across both studies, the authors noted that individuals with SAD showed a tendency to “*over-mentalize*” on theory of mind tasks, attributing more intense emotions and greater meaning to what others were thinking and feeling. The authors suggested

that although individuals with SAD were inaccurate, the results also indicated an increased motivation to empathize and read into the mind of others.

In Studies 1 and 2 of this dissertation, socially anxious individuals also perceived more negative affect in the targets. In contrast to the above studies, however, their ratings were also more accurate. Study 3 explored whether this pattern of results would generalize to a sample of individuals with SAD. The participant sample was recruited from the community to increase ecological validity and generalizability outside of undergraduate university populations.

Additional Mediators

The mediation results from my previous studies were consistent with models of empathy, where the perceiver is hypothesized to experience some degree of shared affect with the target (Davis, 1994; Ickes, 1997; Singer, 2006). Study 2 indicated that negative emotions partially explained the relationship between social anxiety and empathic accuracy. Given that individuals with social anxiety are prone to experiencing negative emotions, (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997), I wanted to determine whether the findings from Study 2 reflected true empathy as I hypothesized, as opposed to the projection of their own emotions onto others. Following the empathy literature, I proposed that true empathy should be marked by the perceivers' ability to take the target's perspective, view targets as similar to themselves, and share the targets' interpretation of the distressing event. All of these factors provide a window into how perceivers are processing information about the target and the event itself.

Perspective-taking. According to empathy models, an important indicator of true empathy is that the perceiver attempts to take the target's perspective and cognitively understand the target's experience (Davis, 1994). This cognitive component distinguishes empathy from simple emotional contagion or projection. I therefore included a measure of state empathy that

assessed whether participants were attempting to take the perceivers' perspective in addition to feeling shared affect.

Perceived similarity and closeness. There is some evidence that perceptions of similarity between a target and perceiver influences empathic judgments; however, the nature of this relationship is unclear. In one study, participants discussed bad study habits with a partner and were later asked to recall how many bad habits their partner had reported (Hodges et al., 2002). Participants' ratings of their own bad habits robustly predicted their ratings of their partners' habits. The actual number of bad habits mentioned by their partner had no significant effect on these ratings. The authors theorized that the conversation increased perceptions of similarity between the perceiver and their partner, leading participants to project their own habits onto their partner. Another study examined perceived empathy between new mothers, pregnant mothers, and women who had never been mothers (Hodges et al., 2010). Women that had experienced the same life events as the targets reported greater empathic concern and perceived empathy, but similarity did not predict accuracy. Feelings of similarity only predicted accuracy for stereotypical attitudes towards pregnancy and motherhood, not the targets' actual feelings.

Other evidence, however, suggests that feelings of similarity can promote empathy because similarity encourages the perceiver to see the target as an individual (e.g., someone like me), rather than as part of a group (Galinsky & Moskowitz, 2000). Furthermore, perceived similarity can also increase the perception of closeness between individuals, which is another factor that facilitates empathy with others (Aron, Aron, & Smollan, 1992; Beeney et al., 2011). The act of engaging in empathy is thought to lead to greater overlap in mental representations of the self and the target (Galinsky & Moskowitz, 2000). Individuals who perceived greater overlap

between the self and the target were found to experience greater empathy (Galinsky, Ku, & Wang, 2005).

In Studies 1 and 2 here, non-anxious individuals experienced less negative affect while watching videos, which predicted less accurate ratings. It is possible that non-anxious individuals perceived the video targets to be less similar and close, and were therefore less accurate in evaluating their emotions. Similarly, previous research suggested that individuals with SAD report a greater history of social exclusion (e.g., Gren-Landell, Aho, Andersson, & Svedin, 2011; McCabe, Antony, Summerfeldt, Liss, & Swinson, 2003). As a result, socially anxious individuals might have felt more similar to others who reported experiencing social exclusion. In Study 3, I therefore assessed participants' feelings of similarity towards the video target to investigate whether such perceptions partially mediated the relationship between social anxiety and empathic accuracy.

Interpretation of events. Although empathy is generally thought to be an automatic process, perceivers' appraisals of a situation can interfere with the empathic process (Zaki & Cikara, 2015). Factors such as perceived differences in social or cultural group, pre-existing beliefs about the situation, or emotions prior to an encounter, can motivate or hamper the tendency to engage in empathic processes. In my previous studies, it was possible that participants' interpretations of the social exclusion events discussed by targets influenced whether they empathized with the targets. For example, whereas high socially anxious individuals might have shared the interpretation of the social exclusion events as highly distressing, individuals with low social anxiety could have interpreted the situations as more manageable. In Study 3, I therefore included questions to assess participants' interpretation of the events discussed in the videos.

Social Exclusion

Research in non-clinical samples suggested that social anxiety was associated with distinct responses to social exclusion (Buckner et al., 2010; Mallot et al., 2009; Maner et al., 2007); however, little research has examined individuals with SAD. A few recent studies investigated the effects of Cyberball on individuals with SAD. One such study found that individuals with SAD reported an increase in self-focused negative emotions, internal negative attributions such as self-blame, along with a decrease in feelings of control and the intent to engage in pleasant activities, compared to healthy controls (Gutz, Roepke, & Renneberg, 2016). Two other studies however, found no differences between individuals with SAD and healthy controls (Gutz, Renneberg, Roepke, & Niedeggen, 2015; Iffland, Sansen, Catani, & Neuner, 2014). Given the relationship between SAD and previous experiences of social exclusion, it is important to investigate the effects of experimental social exclusion paradigms in clinical populations. In Study 3, I utilized the same naturalistic social exclusion manipulation used in Study 2 to investigate whether it would influence the empathic accuracy of individuals with SAD.

Social Reconnection

Following an acute experience of social exclusion, some researchers suggested that individuals are motivated to try and regain a sense of social connection and belonging. For example, following social exclusion, individuals looked for signs of positive social content and engage in more positive social behaviours (DeWall, Twenge, et al., 2011; Smart Richman & Leary, 2009; Williams, 2007). Individuals with social anxiety may have difficulty regaining a sense of social connection. They often say very little and avoid self-disclosure in social situations (McManus, Sacadura, & Clark, 2008b; Plasencia, Alden, & Taylor, 2011). A recent study found

that social anxiety partially mediated the relationship between the serotonin transporter gene regulatory region (5-HTTLPR) and helping behaviours, such that individuals who carried the short allele reported higher levels of social anxiety and avoidance, as well as lower rates of helping others (Stoltenberg et al., 2013). These findings suggested that following exclusion, individuals with social anxiety may be more hesitant to engage in helping behaviours due to fears that they may experience further social harm.

Study 3 therefore explored the relationship between social exclusion, social anxiety, and positive social behavior. Given that social anxiety is associated with avoidance of positive interpersonal behaviours and saying less, I derived a measure in which participants were given the option to provide open-ended advice to the targets, but were instructed to only do so if they felt comfortable. I examined the amount of advice provided, the tendency to provide no advice, and conducted a preliminary qualitative analysis of advice themes.

Hypotheses

Based on the previous studies, I predicted that (1) participants with SAD would be more empathically accurate; (2) the relationship between social anxiety and empathic accuracy would be mediated by participants' perceptions of similarity, empathy, and perceptions of targets' exclusion events, in addition to their own emotions; and (3) healthy control participants would underestimate targets' negative affect following social exclusion. Furthermore, (4) I predicted that healthy control participants would be more willing to socially re-connect and provide positive advice to targets, whereas individuals with SAD would provide no advice or say very little, and be less likely to provide advice to socially re-connect, particularly after being socially excluded.

Method

Participants

Participants were recruited from the community and participated in exchange for payment (see below). I conducted a power analysis using G*Power (Faul et al., 2007) to determine the necessary sample size required to find an effect. The standardized regression coefficient from Study 2 was $b = .36$, representing a large effect size (Cohen's $f = .39$). I therefore assumed a large effect size and based the analysis on a fixed effects ANOVA model (two main effects and interaction). I controlled for an error probability of $\alpha = .05$ and a false negative rate of $\beta = .95$. Based on the analysis, I aimed for a minimum sample of 117 subjects to obtain adequate power but continued to collect participants until the end of the school term.

Recruitment. Participants were recruited from the community through (1) posters around the community, (2) online ads on Craigslist and Kijiji, and (3) the UBC Paid Participants website (<http://gsc.psych.ubc.ca/resources/paid-studies-list/>). Separate advertisements were posted recruiting adult participants for healthy controls (HC; i.e., no social anxiety) and SAD participants. Both posters stated that the study was recruiting participants between 18 to 65 years of age with no severe depression, recent suicidality, bipolar disorder, schizophrenia, current/recent drug use, or cognitive problems. Potential participants had to be residents of British Columbia and fluent in English. The study was described as investigating how perceptions of similarity affect the way people judge others' emotions. The HC posters stated that participants should not have social anxiety. The SAD posters stated that potential participants should have clinically significant social anxiety disorder. All prospective participants completed a 10-15 minute telephone screening interview with a trained research

assistant (see Procedure). Participants were told they would be compensated \$35 for their participation in the lab session.

Clinical status. Participants were assessed using sections of the Anxiety Disorders Interview Schedule for DSM-IV (Brown, Di Nardo, & Barlow, 1994), including Panic Disorder, Social Anxiety Disorder, General Anxiety Disorder, Obsessive Compulsive Disorder, Post-Traumatic Stress Disorder, Major Depressive Disorder, and Dysthymia. The ADIS-IV is a semi-structured interview protocol that has demonstrated high inter-rater reliability and good concurrent validity (Brown et al., 1994). Diagnostic interviews were conducted by three Ph.D.-level clinical psychology graduate students who had training and experience administering the ADIS-IV. All participants in the SAD group met the following criteria: (1) A primary DSM-V diagnosis of GSAD (American Psychiatric Association, 2013), (2) No current major depressive disorder, psychosis, substance abuse, or severe self-reported suicidal ideation and/or non-suicidal self-injury, and (3) Fluent in English. Participants in the control group met the following criteria: (1) No diagnosis of SAD, current major depressive disorder, psychosis, substance abuse, or severe self-reported suicidal ideation and/or non-suicidal self-injury, and (2) fluent in English. To assess inter-rater reliability, we had Ph.D. doctoral students review 15% of the interviews. There was good agreement with the original principal diagnosis of SAD ($\kappa = .90, p < .001$).

One hundred and fifty-four participants completed the study. After completing the clinical interview, eleven participants were excluded from the HC group because they a) had significant social anxiety symptoms and/or met criteria for SAD ($n = 2$), b) were experiencing a current or recent depressive episode (within the last year; $n = 4$), and/or c) met criteria for other disorders (e.g., substance abuse, post-traumatic stress disorder, etc.; $n = 5$). In the SAD group, 15 participants were excluded either because a) they did not meet criteria for social anxiety disorder

($n = 6$), b) they were experiencing a current or recent depressive episode ($n = 6$), and/or c) social anxiety disorder was not their primary concern ($n = 3$). During the debriefing, two participants were excluded because they reported knowing that there was deception, i.e., there was not another participant involved in the study.

I conducted independent samples t -tests to investigate whether there were any significant differences between the removed and retained participants within the respective samples (i.e., SAD; HC). Within the HC group, there were no significant differences in terms of age, $t(72) = .20$, $p = .84$, gender, $t(72) = -.68$, $p = .50$, or years of university completed, $t(70) = 1.06$, $p = .29$. Removed participants reported significantly higher social anxiety symptoms on the SIAS-S ($M = 30.64$, $SD = 13.37$) compared to those that were retained ($M = 10.22$, $SD = 6.39$), $t(11) = -4.97$, $p < .001$. This result was expected given that most of the removed participants were excluded because they displayed sub-threshold or significant social anxiety symptoms. Within the SAD group, there were no significant differences between participants in terms of age, $t(77) = -1.66$, $p = .10$, gender, $t(77) = .29$, $p = .77$, years of university completed, $t(74) = .26$, $p = .80$, or social anxiety symptoms, $t(76) = .74$, $p = .46$.

The final sample included 126 participants. There were 63 HC participants (61.9% female; mean age = 29.90, $SD = 12.51$; mean years of university/college education = 3.98, $SD = 2.53$). In terms of cultural background, 26 participants (41.3%) self-identified as Caucasian, 17 (27.0%) as Chinese, four (6.3%) as First Nations, four (6.3%) as Southeast Asian, three (4.8%) as Japanese, three (4.8%) as Latin American, and the remaining six participants (9.5%) identified as either African/Caribbean, Middle Eastern, Korean, or South Asian.

There were 63 SAD participants (60.3% female; mean age = 29.30, $SD = 9.19$; mean years of university/college education = 3.37, $SD = 2.50$). In terms of cultural background, 31

participants (49.2%) self-identified as Caucasian, 11 (17.5%) as Chinese, six (9.5%) as First Nations, six (9.5%) as South Asian, three (4.8%) as Southeast Asian, and the remaining six (9.5%) identified as either Middle Eastern, Korean, Latin American, or Mixed.

Measures

Symptom measures. In addition to the clinical interview, social anxiety symptoms were also assessed using the Social Interaction Anxiety Scale-Straightforward Score (SIAS-S; Rodebaugh et al., 2007). SIAS-S score was calculated by summing the 17 straightforward SIAS items (See Study 1). Participants were emailed the SIAS-S prior to their lab session and were instructed to complete the measure before participating in the study.

Depression. Given the high comorbidity between SAD and major depressive disorder (MDD) (e.g., Ohayon & Schatzberg, 2010), participants also completed the Beck Depression Inventory – Second Edition (BDI-II; Beck, Steer, & Brown, 1996). The BDI-II is a 21-item self-report instrument widely used to assess depressive symptoms over the past two weeks. Items are rated on four-point scales ranging from 0 (*symptom not present*) to 3 (*symptom very intense*). The total score was calculated by summing the items. The BDI-II has been validated across multiple samples and has high internal consistency, Cronbach's $\alpha = .90$ (see Wang & Gorenstein, 2013)

Empathy. As in study 1, emotion ratings were made using the NA and PA scales of the I-PANAS-SF (Thompson, 2007). The procedure for making empathy ratings and calculating NA and PA discrepancy was the same as in previous studies. The PA scale has been used as a rating scale of others' affect in a previous study and demonstrated good internal reliability, Cronbach's $\alpha = .85$ (Watson et al., 2000). See Study 1 for NA scale psychometric information.

Self-rated affect. Participants also made ratings of how they were feeling after watching each of the videos using the NA and PA scales of the I-PANAS-SF scale. The PA scale of the I-

PANAS-SF scale has good reliability, Cronbach's $\alpha = .80$ (Thompson, 2007). See Study 1 for NA scale psychometric information.

Video stimuli. Post hoc analyses revealed that the targets in the Study 2 video stimuli appeared more distressed compared to the targets in the Study 1 stimuli, which may have affected the results. Therefore, Study 3 participants were shown the video stimuli from Study 1. As previously described, the videos were approximately 1 to 3 minutes in length.

Manipulation check. Following the experimental manipulation, participants completed a questionnaire rating their feelings towards their supposed conversational partners. Similar to Study 2, the questionnaires included measures of social inclusion, affect, social pain, and perceived similarity to the partner who either allegedly “rejected” them or left for a benign reason. Participants were also asked about state self-esteem. Where possible, these questions were combined into single measures (see Results). See Appendix IX for the full set of manipulation check questions.

Social inclusion. Participants were asked three questions about their impressions of their partner (e.g., “How likeable is this person?”, “How accepted do you feel by this person?”, “Do you think this other person likes you?”). The questions were rated on a 9-point scale (1 = *not at all* to 9 = *very much so*). Participants were also asked to rate their first impression of their partner, on a 5-point scale (1 = *very positive* to 5 = *very negative*).

Affect and social pain. Participants filled out the NA and PA scales of the I-PANAS-SF and rated their experience of pain on the Faces Pain Scale – Revised.

Similarity. Participants were asked three questions about how similar they felt to their partner (e.g., “How similar do you feel to this person?”, “Do you think this person would feel similar to you based on your answers?”, “Do you think you would have similar opinions as this

other person?”) and one question about social connection (“How socially connected do you feel to this person?”). All questions were rated on a 9-point scale (1 = *not at all* to 9 = *very much so*).

Participants also completed the Inclusion of Other in Self Scale (IOS; Aron et al., 1992) which is a single-item measure of perceived relationship closeness with seven pairs of overlapping circles differing in the degree to which the circles overlap. One circle represented the self, and the other circle represented, in this case, their partner. Participants were asked, “How close or similar do you feel to your partner?” and were instructed to indicate which set of overlapping circles best represented how similar or close they felt to their partner. There were seven options to choose from. The IOS has shown good convergent validity with other measures of interpersonal closeness (Aron et al., 1992; Gächter, Starmer, & Tufano, 2015).

Potential mediators. In addition to self-rated affect, I explored whether measures of state empathy, similarity, and how participants interpreted the events would mediate the relationship between social anxiety, social exclusion, and empathic accuracy (see Appendix IX). Note that the mediator variables were rated in reference to the video targets in contrast to the manipulation checks above, which were rated in reference to the “partner” they didn’t meet.

Self-rated affect. Similar to previous studies, participants made ratings of how *they* were feeling while watching each of the videos, using the NA and PA scales of the I-PANAS-SF.

Measures of perspective-taking and empathy. I included four questions that represented the two main facets of empathy: 1) Perspective-taking or cognitive empathy, and 2) Empathic concern, which includes emotion shared self-other overlap (e.g., Davis, 1983).

1) Perspective taking. Participants were asked two questions assessing cognitive empathy in reference to the video targets (e.g., “I imagined how I would feel in this person’s place”, “I was able to imagine how things looked from his/her perspective”). Questions were rated on a 4-

point scale (0 = *not at all* to 4 = *very much so*). These questions were similar to those used in other studies measuring state empathy (e.g., Devlin, Zaki, Ong, & Gruber, 2014).

2) *Empathic concern*. Participants were asked how *sympathetic* and *compassionate* they felt towards the targets in the videos on a 7-point scale (1 = *very slightly or not at all* to 7 = *extremely*). The two adjectives were taken from previous studies assessing empathy-related constructs (e.g., Batson, 1991; Batson, Klein, Highberger, & Shaw, 1995; DeWall & Baumeister, 2006).

Similarity and self-other overlap. First, participants were asked “how similar do you feel to the person in the video?” on a 7-point scale (1 = *very slightly or not at all* to 7 = *quite a bit*). They then completed the IOS. In this case, one circle represented the self and the other circle represented the target in the video. There were seven options. Participants were asked, “How close or similar do you feel to the person in the video? Which of the following images best represents how close or similar you feel?”

Interpretation of exclusion events. Participants were asked two questions about their interpretation of the social exclusion events discussed by the targets. Participants were asked, “From an objective perspective, how bad is the event described by the person in the video?” on a 4-point scale (0 = *only slightly/not at all bad* to 4 = *extremely bad*), and “In your opinion, to what extent was the person in the video responsible for the outcome of this situation?” on a 4-point scale (0 = *not at all responsible* to 4 = *completely responsible*).

Advice. After each of the four videos, participants were asked, “What advice would you give this individual? If you feel comfortable, write it below. You can write as much or as little as you like. Otherwise, please type “no advice”.” The question was open-ended and there was no limit on word length.

Procedure

All research measures and procedures were approved by the University Behavioral Research Ethics Committee. Participants were informed that the study investigated how perceptions of similarity influence how individuals judge others' emotions. Participants were blind to experimental condition. Participants were randomly assigned to either the experimental (social exclusion) or control condition using a table of random numbers (www.random.org) and completed the study tasks below.

Phone screen. The phone screens were conducted by four trained research assistants. At the start of the call, participants were informed about the study tasks, time commitment, and reimbursement. On average, the phone screens lasted between 15 to 25 minutes. The research assistant assessed participants' social anxiety and depressive symptoms, as well as appropriateness for the study (e.g., presence of exclusion criteria). Prospective participants who reported the aforementioned exclusion criteria (e.g., depressed mood, substance abuse, etc.) were not included in the study. Similarly, participants who responded to the SAD advertisement that did not report significant social anxiety were excluded. Eligible participants were invited to participate in the lab portion of the study.

Study tasks. Prior to coming to the lab, participants were sent an online questionnaire containing the SIAS-S and were instructed to complete the questionnaire before attending their lab session. The lab study tasks were the same as those described in Study 2.

Experimental manipulation. The experimental manipulation procedure and manipulation check were the same as those used in Study 2.

Debriefing. Participants were debriefed about the true nature of the study and were informed about the deception. A funnel debriefing was conducted in which participants were

asked about suspicion of the manipulation and other procedures. As noted earlier, eight participants expressed suspicion and were eliminated from data analyses. Following the debriefing, the experimenter talked with the participants to ensure they were not feeling any significant negative emotions.

Clinical interview. Following the debriefing process, participants completed a 30-minute clinical interview with one of three Ph.D.-level clinical psychology graduate students. Participants were assessed using the ADIS-IV to assess their clinical status and confirm their eligibility for the study. Following the clinical interview, the graduate students also talked with participants to ensure participants were no longer experiencing negative emotions related to the experimental manipulation, watching the videos, and/or discussing information during the clinical interview. If appropriate, participants were sent an email with relevant mental health resources.

Results

Preliminary Analyses

Descriptive statistics. The mean level of social anxiety for the SAD group ($M = 40.70$, $SD = 10.32$) was similar to individuals seeking treatment for SAD (e.g., Kashdan et al., 2013; Rodebaugh et al., 2011). The internal consistency of the SIAS-S was good, Cronbach's $\alpha = .97$. I conducted independent samples t -tests to compare the descriptive statistics between the SAD and HC groups. The mean level of social anxiety for the SAD group was significantly higher than the HC group ($M = 10.22$, $SD = 6.39$), $t(1045) = -19.93$, $p < .001$.

The SAD group ($M = 18.68$, $SD = 9.53$) reported significantly higher levels of depression than the HC group, ($M = 5.54$, $SD = 4.54$), $t(89) = -9.89$, $p < .001$, which is to be expected given the comorbidity between social anxiety and depression. Despite these differences, none of the

participants in either group met criteria for a current or recent major depressive episode during the clinical interview. The main analyses were re-conducted using depression as a covariate. Depression did not affect the main results and was not a significant predictor of empathic accuracy. Therefore, the main analyses without depression were reported. There were no significant differences between groups in terms of age, $t(124) = .31, p = .76$, gender, $t(124) = .18, p = .86$, or years of university, $t(122) = 1.37, p = .17$.

I also conducted independent t-tests between control and experimental participants. There were no significant differences between groups in terms of social anxiety, $t(124) = -.85, p = .40$, depression, $t(124) = -.34, p = .74$, age, $t(124) = -.18, p = .86$, gender, $t(124) = .55, p = .59$, or years of university, $t(122) = -1.30, p = .20$. The mean and standard deviation for the main dependent variable, NA discrepancy ($M = -8.16, SD = 10.902$), suggested that the majority of participants underestimated targets' negative affect (i.e., negative scores). Therefore, NA Discrepancy was conceptualized as a measure of accuracy. See Table 8 for descriptive statistics.

Table 8
Descriptive statistics for participants, split by Group and experimental conditions

	Healthy control group						Social anxiety disorder group					
	Control		Experimental		Total		Control		Experimental		Total	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>		<i>n</i>	%	<i>n</i>	%	<i>N</i>	
Gender												
Female	20	64.5	19	59.4	39		20	62.5	18	58.1	38	
Male	11	35.5	13	40.6	24		12	37.5	13	41.9	25	
Marital status												
Single	21	67.7	22	68.8	43		17	53.1	21	67.7	38	
Cohabiting	5	16.1	6	18.8	11		9	28.1	4	12.9	13	
Married	5	16.1	4	12.5	9		5	15.6	4	12.9	9	
Separated or Divorced	0	0	0	0	0		1	3.1	2	6.5	3	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	29.16	12.27	30.63	12.90	29.90	12.51	29.69	9.68	28.90	8.81	29.30	9.19
Years of university	3.81	1.83	3.17	3.16	3.98	2.53	2.97	2.61	3.77	2.36	3.37	2.50
Social anxiety	9.23	6.46	11.19	6.27	10.22	6.39	38.56	12.12	42.90	7.63	40.70	10.32
Depression	5.90	5.24	5.19	3.81	5.54	4.54	17.53	7.91	19.87	10.95	18.68	9.53
Self-rated NA	27.84	6.74	25.41	7.21	26.60	7.03	40.91	16.40	40.58	11.95	40.75	14.27
Self-rated PA	46.97	18.28	41.66	14.72	44.27	16.65	50.16	15.72	46.29	14.49	48.25	15.13
NA Discrepancy	-11.32	8.63	-10.66	11.91	-10.98	10.35	-5.31	12.46	-5.35	8.94	-5.33	10.78
PA Discrepancy	0.36	14.73	-2.38	13.55	-1.03	14.10	2.94	12.08	-0.97	12.06	1.02	12.14

Note: Social anxiety (SIAS-S; Social Interaction Anxiety Scale - Straightforward). Depression (BDI-II; Beck Depression Inventory – 2nd Edition).

Stimuli validation. The video stimuli were validated in Study 1. The internal consistency of participants' ratings across the four videos for the current study was adequate for the NA scale, Cronbach's $\alpha = .68$ (α 's = .70, .65, .62, and .73), and the PA subscale, Cronbach's $\alpha = .78$ (α 's = .77, .81, .76, and .78).

Manipulation checks. Where appropriate, the manipulation check questions were combined by adding the items (see below). I conducted a two-way between subjects ANOVA to determine whether Group (SAD, HC) and experimental condition (control, experimental) predicted participants' reactions to the experimental social exclusion manipulation. The dependent variables were the social inclusion measure, participants' first impression, negative and positive affect, faces pain, and the similarity measure. See Table 9 for a summary of the manipulation check analyses including the means, standard deviations, and the F -values. The details of the individual ANOVA models, including main effect and interaction results, are discussed below.

Table 9
Means, standard deviations, and F-values from two-way between subjects ANOVA of experimental condition and Group predicting manipulation check questions

	Control		Experimental		F	HC		SAD		F
	M	SD	M	SD		M	SD	M	SD	
Social inclusion questions	13.74	5.1	9.05	3.6	37.65**	12.08	5.2	10.70	4.5	3.80*
First impression	1.84	0.7	2.18	.8	6.86*	1.88	0.7	2.13	0.8	3.59
Negative affect	8.03	3.2	9.03	3.7	3.83*	6.82	2.6	10.17	3.5	37.79**
Positive affect	14.48	4.3	12.32	3.9	8.47**	13.60	4.1	13.19	4.5	0.39
Faces pain	1.25	1.6	2.06	2.1	7.30**	0.93	1.5	2.35	2.0	21.01**
Similarity questions	17.93	7.7	14.92	5.1	7.74**	17.88	7.4	15.02	5.6	6.88**

Note: * $p \leq .05$; ** $p < .01$. Degrees of freedom for all analyses $df = 1, 119$, except for state self-esteem where $df = 1, 72$. HC = Healthy control group. SAD = Social anxiety disorder group. For Social inclusion questions, greater scores indicated feeling more accepted/liked by their partner. For First impression question, greater scores indicated a more negative impression. Finally, for Similarity questions, greater scores indicated feelings of greater similarity between the participant and their partner.

Social inclusion. The three social inclusion questions (i.e., “How accepted do you feel by this person?”, “Do you think this other person likes you?”, “How likeable is this person?”) were summed to yield a total score. The items were positively correlated, $r = .49$ to $.75$, $p < .001$, and had good internal reliability, Cronbach’s $\alpha = .80$. The overall two-way ANOVA was significant, $F(3, 119) = 13.63$, $p < .001$. There was a significant main effect for experimental condition, $F(1, 119) = 37.65$, $p = .001$, and Group, $F(1, 119) = 3.80$, $p = .05$, but the interaction was not significant, $F(1, 119) = 0.55$, $p = .82$. The results indicated that participants in the experimental condition and SAD participants felt less social inclusion compared to participants in the control condition and HC participants, respectively.

For participants’ first impression of their partner, the overall two-way ANOVA was also significant, $F(3, 119) = 3.53$, $p = .02$. There was a significant main effect for experimental condition, $F(1, 119) = 6.86$, $p = .01$. The main effect for Group was trending towards significance, $F(1, 119) = 3.59$, $p = .06$, and the interaction was not significant, $F(1, 119) = .47$, $p = .49$. The results indicated that participants in the experimental condition had a more negative impression of their partners compared to participants in the control condition.

Affect and social pain. The NA and PA scales for the manipulation check had adequate internal reliability, Cronbach’s $\alpha = .76$ and $.78$, respectively. For NA, the overall two-way ANOVA was significant, $F(3, 119) = 13.77$, $p < .001$. There was a significant main effect for experimental condition, $F(1, 119) = 3.83$, $p = .05$, and a significant main effect for Group, $F(1, 119) = 37.79$, $p < .001$. The interaction was not significant, $F(1, 119) = .18$, $p = .68$. The results suggested that individuals in the experimental condition and SAD participants felt more NA compared to individuals in the control condition and HC participants, respectively.

For PA, the overall two-way ANOVA was also significant, $F(3, 119) = 3.25, p = .02$. There was a significant main effect for experimental condition, $F(1, 119) = 8.47, p = .004$, indicating that individuals in the experimental condition felt lower PA after the manipulation compared to individuals in the control condition. Neither the main effect for Group, $F(1, 119) = 0.39, p = .53$, nor the interaction, $F(1, 119) = 1.12, p = .29$, was significant.

For the Faces Pain Scale, the overall model was significant, $F(3, 119) = 9.80, p < .001$. There was a significant main effect for experimental condition, $F(1, 119) = 7.30, p = .008$, and a significant main effect for Group, $F(1, 119) = 21.01, p < .001$. The interaction was not significant, $F(1, 119) = 1.42, p = .24$. The results indicated that individuals in the experimental condition and SAD participants felt more pain compared to individuals in the control condition and HC participants, respectively.

Similarity. The five similarity and closeness questions (i.e., “How similar do you feel to this person?”, “Do you think this person would feel similar to you based on your answers?”, “Do you think you would have similar opinions as this other person?”, “How socially connected do you feel to this person?”, and “How close or similar do you feel to this person?”) were rescaled so that all items were on the same 7-point scale. The items were significantly and positively correlated, $r = .20$ to $.53, p = .027$ to $< .001$, and were summed to yield a total score such that higher scores indicated participants felt more similar to their partner. The resulting scale had adequate internal consistency, Cronbach’s $\alpha = .74$. I then conducted a social anxiety by condition ANOVA. The overall ANOVA was significant, $F(3, 119) = 6.00, p < .001$. Significant main effects for experimental condition, $F(1, 119) = 7.73, p = .006$, and Group, $F(1, 119) = 6.88, p = .01$, were qualified by a significant two-way interaction, $F(1, 119) = 4.10, p = .045$. The results indicated that in the control condition, HC participants felt more similar to their partner

compared to the SAD participants; however, for socially excluded participants, HC participants felt less similar to their partners.

Bivariate Correlations

I computed bivariate correlations among the main study variables, including experimental condition, social anxiety, self-rated NA and PA, and NA and PA discrepancy (see Table 10).

Table 10

Bivariate correlations between variables included in the main analyses

	Social anxiety	Self-rated NA	Self-rated PA	NA discrepancy	PA discrepancy
Experimental condition	-.02	-.06	-.15	.01	-.13
Social anxiety		.54***	.13	.26**	.08
Self-rated NA			.31***	.54***	.24**
Self-rated PA				.17	.78***
NA discrepancy					.20*

Note: Negative affect (NA), positive affect (PA). Social anxiety (SIAS-S; Social Interaction Anxiety Scale – Straightforward Score). * $p < .05$. ** $p < .01$. *** $p < .001$.

Main Analyses

I conducted two, two-way between subjects ANOVAS to examine the relationship between Group, condition, their interaction, and empathic accuracy. Group, condition, and the interaction were entered as fixed factors. The dependent variables were NA and PA discrepancy. Group was categorically coded such that the SAD group was the reference group (i.e., HC = 0, SAD = 1), and experimental condition was categorically coded such that experimental group was the reference group (i.e., control condition = 0, experimental condition = 1).

Negative affect discrepancy. The overall two-way ANOVA was significant, $F(3, 122) = 2.98$, $p = .034$, partial $\eta^2 = .07$. There was a significant main effect for Group, $F(1, 122) = 8.88$, $p = .003$, partial $\eta^2 = .07$. The slope indicated that overall, individuals with SAD were less likely to underestimate the NA shown by the video targets ($M = -5.33$, $SD = 10.78$) compared to the HC participants ($M = -10.98$, $SD = 10.35$). Neither the main effect for experimental condition, $F(1,$

122) = .03, $p = .87$, nor the interaction, $F(1, 122) = .04$, $p = .85$, was significant.

Positive affect discrepancy. The overall two-way ANOVA of Group and experimental condition predicting PA discrepancy was not significant, $F(3, 122) = .94$, $p = .42$. The main effect for Group, $F(1, 122) = .73$, $p = .40$, condition, $F(1, 122) = 2.01$, $p = .16$, and the interaction, $F(1, 122) = .06$, $p = .80$, were all non-significant.

Mediators

I conducted bivariate correlations to determine whether mediators that shared conceptual overlap could be combined into single measures. Table 11 shows the correlations between the mediator variables across the experimental conditions.

Table 11

Bivariate correlations between potential mediator variables across experimental conditions

	1.	2.	3.	4.	5.	6.	7.	8.
1. Self-rated NA								
2. Self-rated PA	.31***							
3. Perspective-taking	.34***	.24**						
4. Imagined self	.29**	.31***	.81***					
5. Sympathy	.18*	.06	.60***	.59***				
6. Compassion	.22*	.12	.50***	.46***	.80***			
7. Similarity	.44***	.07	.59***	.52***	.59***	.69***		
8. Self-in-other	.30**	.14	.45***	.41***	.53***	.51***	.74***	
9. Interpretation	.33***	.01	.26**	.19*	.36***	.33***	.33***	.24**

Note: * $p < .05$. ** $p < .01$. *** $p < .001$. Interpretation refers to the question asking “In your opinion, how objectively bad is the situation described by the target?” It will be referred to in this manner for the following analyses

State empathy. The four empathy and perspective-taking items (i.e., Perspective-taking, imagined self, compassion, and sympathy) were significantly and positively correlated, $r = .46$ to $r = .81$. The questions were standardized into a 7-point scale and summed to yield a total measure of state empathy such that higher scores indicated greater empathy. The measure had good internal reliability, Cronbach’s $\alpha = .87$.

Similarity. The two similarity and closeness variables were highly correlated ($r = .74$) and were summed to yield a total similarity score such that higher scores indicated feeling more similar to the targets. The measure had good internal reliability, Cronbach's $\alpha = .85$.

Correlations with main variables. I conducted bivariate correlations between the mediators, social anxiety, and NA discrepancy, to determine which mediators should be used in the mediation analyses (see Table 12). Self-rated PA was not correlated with Group ($r = .116, p = .20$) or NA discrepancy ($r = .17, p = .06$). These variables were therefore not included in the mediation analysis.

Table 12

Descriptive statistics and correlations between variables involved in mediation analysis

	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.	6.
1. Group	-	-						
2. Condition	-	-						
3. NA discrepancy	-8.16	10.90	.26**	.01				
4. Self-rated NA	33.67	13.26	.54***	-.06	.54***			
5. State empathy	82.38	16.46	.30**	.01	.33***	.31**		
6. Similarity	31.30	9.72	.42***	.19*	.33***	.40***	.66***	
7. Interpretation	7.95	2.93	.34***	-.11	.34***	.33***	.34***	.31***

Note: * $p < .05$. ** $p < .01$. *** $p < .001$.

Mediation Analysis

The second main analysis investigated mediators of the relationship between social anxiety and empathic accuracy. The analyses included Group (HC, SAD) as the independent variable and NA discrepancy as the dependent variable. I conducted three mediation models with self-rated NA, state empathy, and similarity as the mediators. The mediation analyses were conducted using the SPSS macro PROCESS (Model 4; Hayes, 2013) following the same procedures used in Studies 1 and 2.

Self-rated NA. Group significantly predicted NA discrepancy (Path c; $\beta = .39$, $SE = .13$, $p = .003$). Group significantly predicted self-rated NA (Path a; $\beta = 1.08$, $SE = .15$, $p < .001$) and self-rated NA significantly predicting NA discrepancy (Path b; $\beta = .42$, $SE = .07$, $p < .001$). These results are consistent with a mediational hypothesis. To determine whether the indirect (ab) effect was significant, a bootstrap estimation approach with 10,000 resamples was conducted. The indirect effect was significant ($\beta = .45$, $SE = .09$, $C.I._{95\%} = .28, .62$, $p < .05$). This is consistent with the hypothesis that a proportion of the variance in the relationship between Group and NA discrepancy was accounted for by perceivers' own affect. To investigate the extent to which self-rated NA mediate this relationship (i.e., full or partial mediation), path c was recalculated with self-rated NA in the model (c' path). Group was no longer a significant predictor of NA discrepancy after controlling for the mediator, $\beta = -.06$, $SE = .14$, $p = .67$, consistent with full mediation. Approximately 29% of the variance in NA discrepancy was accounted for by the predictors ($R^2 = .29$). See Figure 6 for a summary of these relationships.

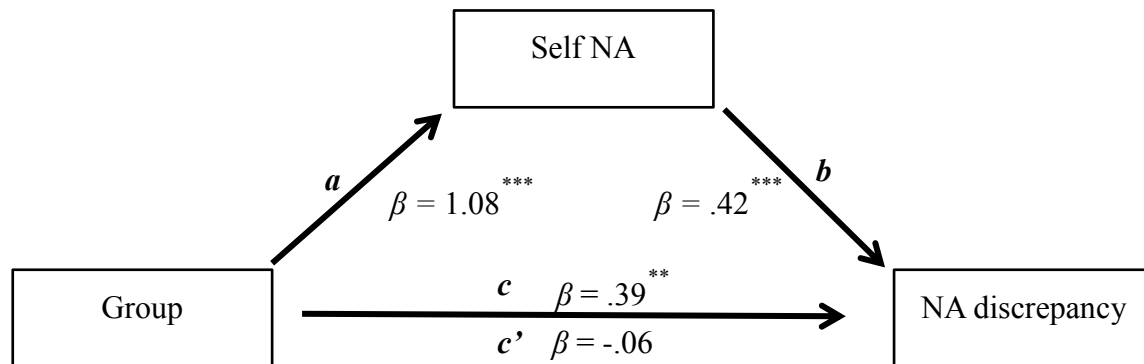


Figure 6. Model of the indirect effect of self-rated negative affect (NA) on the relationship between Group and NA discrepancy. The indirect effect (ab) was significant at $\beta = .45$, $SE = .09$, $C.I._{95\%} = .28, .62$.

State empathy. As in the previous analysis, path c (Group predicting NA discrepancy) was significant. Group significantly predicted state empathy (Path a; $\beta = .49$, $SE = .14$, $p < .001$)

and state empathy significantly predicted NA discrepancy (Path b; $\beta = .26$, $SE = .08$, $p = .002$). These results are consistent with a mediational hypothesis. The bootstrap estimation approach determined that the indirect (ab) effect of Group on NA discrepancy via state empathy was significant ($\beta = .13$, $SE = .06$, $C.I._{95\%} = .05, .28$, $p < .05$). To investigate whether state empathy fully or partially mediated the relationship, path c was recalculated with state empathy in the model (c' path). Group was still a significant predictor of NA discrepancy after controlling for the mediator, $\beta = .27$, $SE = .13$, $p = .05$, consistent with partial mediation. Approximately 14% of the variance in NA discrepancy was accounted for by the predictors ($R^2 = .14$). See Figure 7 for a summary of these relationships.

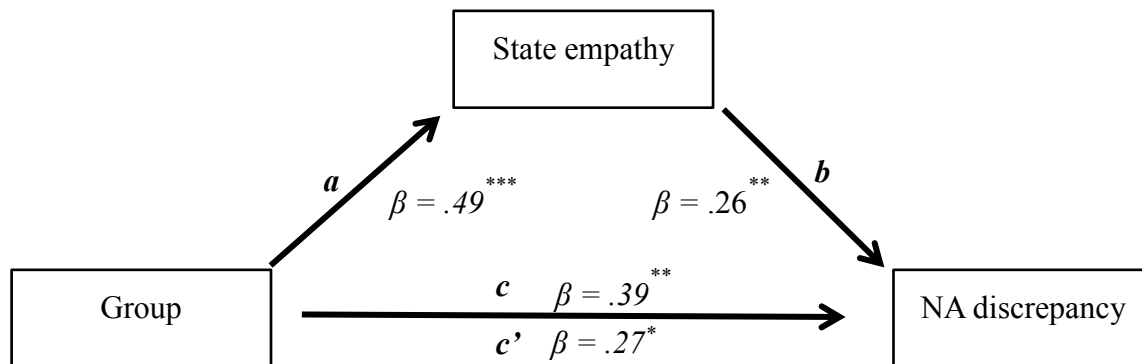


Figure 7. Model of the indirect effect of state empathy on the relationship between Group and NA discrepancy. The indirect effect (ab) was significant at $\beta = .13$, $SE = .06$, $C.I._{95\%} = .05, .28$.

Similarity. Group significantly predicted similarity (Path a; $\beta = .81$, $SE = .16$, $p < .001$) and similarity significantly predicted NA discrepancy (Path b; $\beta = .21$, $SE = .08$, $p = .005$). These results are consistent with a mediational hypothesis. The bootstrap estimation approach determined that the indirect (ab) effect of Group on NA discrepancy accounted for by similarity was significant ($\beta = .17$, $SE = .07$, $C.I._{95\%} = .07, .33$, $p < .05$). Group was no longer a significant predictor of NA discrepancy after controlling for the mediator (c' path), $\beta = .22$, $SE = .14$, $p =$

.12, consistent with full mediation. Approximately 13% of the variance in NA discrepancy was accounted for by the predictors ($R^2 = .13$). See Figure 8 for a summary of these relationships

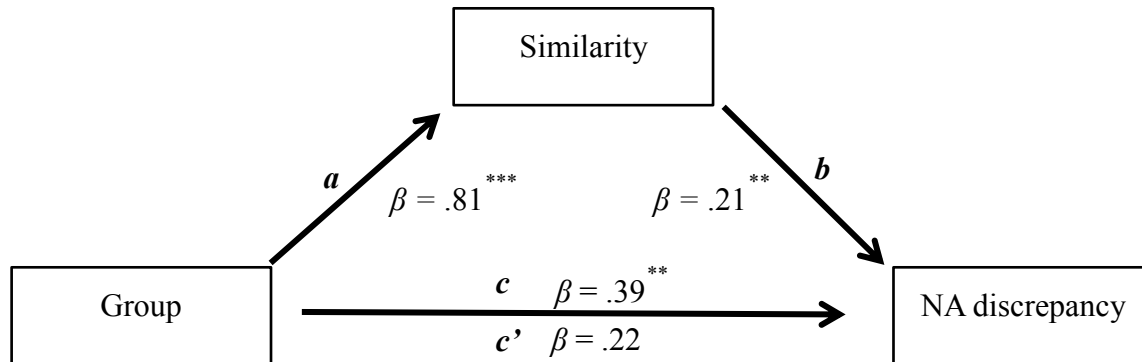


Figure 8. Model of the indirect effect of similarity on the relationship between Group and NA discrepancy. The indirect effect (ab) was significant at $\beta = .17$, $SE = .07$, $C.I._{95\%} = .07, .33$.

Moderated Mediation Analyses

The preliminary two-way ANOVA indicated that the interaction of Group and condition significantly predicted the interpretation variable, indicating the potential for moderated mediation (Preacher et al., 2007). Preacher and colleagues (2007) identify this as “Model 7”, in which the path of the indirect effect is moderated by some other variable. See Figure 9 for a depiction of this model.

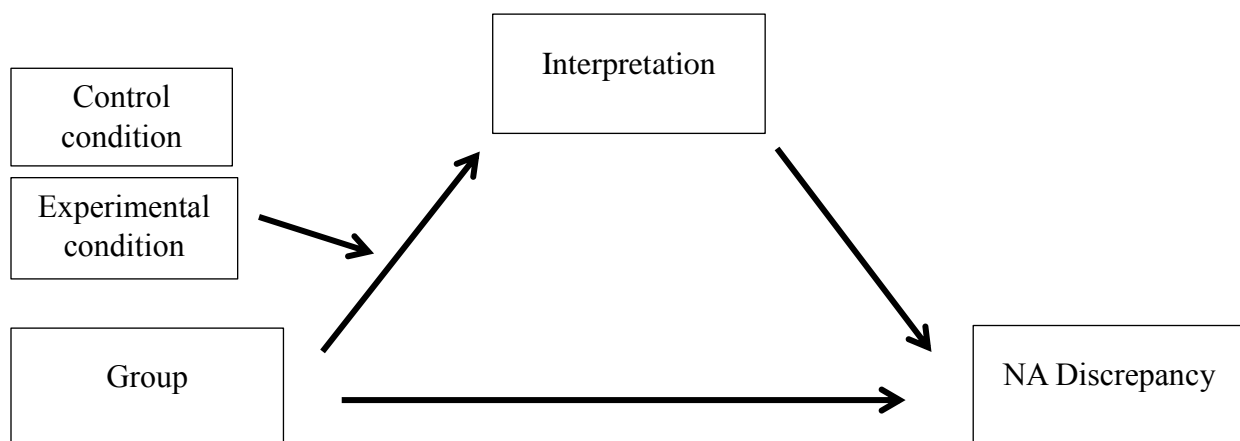


Figure 9. Theoretical model of moderated mediation relationship between Group, interpretation, NA discrepancy, and experimental condition. I predicted that interpretation mediates the relationship between Group and NA discrepancy, but only for individuals in the experimental condition, suggesting that condition moderates the relationship between Group and interpretation.

The overall model of moderated mediation was not significant, ($\beta = .14$, $SE = .09$, $C.I._{95\%} = -.01, .34$, $p > .05$), indicating that experimental condition did not moderate the mediational effect of interpretation on Group and NA discrepancy. It should be noted that the indirect effect of interpretation on the relationship between Group on NA discrepancy was significant in the experimental condition ($\beta = .21$, $SE = .10$, $C.I._{95\%} = .06, .45$, $p < .05$) but not the control condition ($\beta = .07$, $SE = .06$, $C.I._{95\%} = -.008, .24$, $p > .05$). In the experimental condition, non-anxious participants interpreted the targets' exclusion situations as more aversive compared to SAD participants and non-anxious participants in the control conditions. See Table 13 for a summary of the means and standard deviations for these variables.

Table 13

Means and standard deviations for participants' interpretations of the targets' situations and targets' negative emotions, split by experimental condition

	Control		Experimental	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Non-anxious				
NA discrepancy	-11.32	8.63	-10.66	11.91
Interpretation	7.77	2.65	6.19	3.26
SAD				
NA discrepancy	-5.31	12.46	-5.35	8.94
Interpretation	8.78	2.65	9.10	2.26

Advice Analyses

All participants were provided the opportunity to give open-ended advice to the targets in the videos. Participants were told that this advice would be shared with the targets to help them respond to this or similar situations. Participants had the option to type "no advice". Two main analyses were conducted. The first analysis examined the amount of advice (i.e., word count) provided by participants. The second analysis provided a preliminary qualitative analysis of the content themes represented in the advice, including analyzing how likely participants were to provide "no advice".

Advice word count. I conducted a two-way between subjects ANOVA to investigate the relationship between Group, condition, the interaction, and the quantity of advice participants provided to targets. Group, condition, and the interaction, were entered as predictors with total word count as the dependent variable. The overall model approached significance, $F(3, 121) = 2.34, p = .077$. Although the overall model was not significant, it should be noted that the main effect of Group was significant, $F(1, 121) = 4.79, p = .031$, such that SAD participants ($M = 74.73, SD = 82.30$) provided less advice compared to HC participants ($M = 104.06, SD = 81.85$).

Advice content. I conducted exploratory analyses to investigate whether there were any predictors of the type of advice provided by participants. I initially conducted a qualitative analysis to identify five major themes in the advice provided by participants, however there were no significant results and neither social anxiety nor experimental condition was significantly related to any of the categories of advice. See Appendix XI for more information about these analyses.

I therefore used the qualitative ratings to code the advice data into three categories based on the potential relational effects of the advice (i.e., positive, negative, or no advice). "Positive" advice referred to advice that encouraged the target to engage in positive social behaviours to help restore feelings of inclusion and/or re-establish the target's relationship with the rejecting party (Sample items: *"Try to join activities such as clubs, sports, volunteer. Anything that gets you involved and able to meet people."*; *"If it's still a painful memory, don't be afraid to share those feelings with your close friends."*). "Negative" advice referred to advice that was judgmental of the targets' actions and/or dismissive of the severity of the events discussed (Sample item: *"It doesn't really matter. Move on."*; *"I would tell this guy to not take things so personal."*). "No advice" was assigned to answers where participants chose not to provide advice

to the targets in the videos.

Three variables were created to count the number of times a participant provided no advice, positive advice, or negative advice across the four videos. The scores for each variable ranged from 0-4. I conducted three two-way between subjects ANOVAs to investigate the relationship between Group, condition, their interaction, and types of advice. The three dependent variables were no advice, positive advice, and negative advice. Group, condition, and the interaction were entered as fixed factors. As in previous analyses, Group and experimental condition were both categorically coded such that the SAD and experimental condition groups were the reference groups.

No advice. The overall two-way ANOVA was significant, $F(3, 121) = 3.42, p = .024$, partial $\eta^2 = .08$. There was a significant main effect for Group, $F(1, 121) = 8.31, p = .005$, partial $\eta^2 = .06$. The slope indicated that overall, individuals with SAD ($M = 1.29, SD = .15$) more often provided no advice to the targets compared to non-anxious participants ($M = 0.67, SD = .15$). Neither the main effect for experimental condition, $F(1, 121) = .42, p = .52$, nor the interaction, $F(1, 121) = 1.69, p = .20$, was significant.

Positive advice. The overall two-way ANOVA was significant, $F(3, 121) = 3.07, p = .030$, partial $\eta^2 = .07$. There was a significant main effect for Group, $F(1, 121) = 7.93, p = .006$, partial $\eta^2 = .06$. The slope indicated that overall, individuals with SAD ($M = 2.08, SD = .16$) provided positive advice to targets less often than non-anxious participants ($M = 2.70, SD = .16$). Neither the main effect for experimental condition, $F(1, 121) = .57, p = .45$, nor the interaction, $F(1, 121) = .04, p = .84$, was significant.

Negative advice. The overall two-way ANOVA approached significance, $F(3, 121) = 2.41, p = .070$, partial $\eta^2 = .06$. The main effect of experimental condition was significant, $F(1,$

121) = 4.56, $p = .04$, partial $\eta^2 = .04$. The slope indicated that overall, individuals in the control condition ($M = .78$, $SD = .10$) provided negative advice to the targets more often than individuals in the experimental condition ($M = .47$, $SD = .10$), however the means are quite low. Neither the main effect of Group, $F(1, 121) = .00$, $p = .96$, nor the interaction, $F(1, 121) = 2.26$, $p = .11$, was significant.

Supplemental Analysis

As in Study 2, I conducted a supplemental analysis to investigate change in participants' negative emotions. To fit with an empathy versus projection model, participants with SAD should show a greater increase in negative affect while watching the videos. Following the same procedure as in Study 2, I computed residual change scores (r-NA) by regressing participants' negative affect while observing the videos on their prior NA. I then conducted a two-way ANOVA with Group (i.e., HC = 0, SAD = 1), experimental condition, and their interaction as predictors with the residualized change scores as the dependent variable. The overall model was significant, $F(3, 121) = 5.76$, $p = .001$. A significant main effect emerged for Group, $F(1, 121) = 13.04$, $p < .001$. As in Study 2, the main effect of experimental condition did not quite reach significance $F(1, 121) = 3.85$, $p = .052$. The interaction was not significant, $F(1, 121) = .051$, $p = .82$. Consistent with the empathy model, the results again suggested that individuals with SAD experienced a greater increase in negative affect from watching the videos.

Study 3 Discussion

Study 3 revealed that individuals with SAD were more accurate at judging others' negative emotions, whereas healthy control participants underestimated them. In addition, the results indicated that the SAD group displayed a greater increase in negative emotions from watching the videos than did the Control group. Thus, the results provided further evidence for

models of empathy as perceivers' emotional reactions to the videos fully explained the relationship between social anxiety and empathic accuracy. Furthermore, although individuals with SAD tended to experience more negative emotions, they also were more likely to take the targets' perspective, perceived themselves to be more similar to targets, and shared the targets' interpretation of the exclusion events as more aversive. These findings support the hypothesis that greater accuracy reflected genuine empathy in that the SAD participants' judgments reflected use of target-related information. Finally, the advice results suggested that even though individuals with SAD more accurately evaluated targets' emotions, they were less likely to provide targets with advice that would promote positive social behaviours and relationship maintenance.

Although samples of socially anxious individuals can provide important information about clinical populations (Crişan et al., 2016), recent evidence suggested that there may be meaningful differences in how clinically socially anxious individuals judge complex emotional stimuli (O'Toole et al., 2013). That being said, there was general convergence between these results and those found in the social anxiety populations in Studies 1 and 2. All three studies indicated that social anxiety/SAD affects empathic accuracy. Specifically that these individuals are sensitive to others' thoughts and feelings. Some writers have argued that socially anxious individuals tend to "over-mentalize" when making judgments about the thoughts and feelings of authors (see Hezel & McNally, 2014) because they are monitoring for social threats. These results raise the possibility that "over-mentalization" also may reflect a greater ability to take others' perspectives (Tibi-Elhanany & Shamay-Tsoory, 2011).

Mediators

Similar to Studies 1 and 2, perceivers' emotions were found to mediate participants' ratings of the targets' emotions. Unlike the previous studies however, support was found for full mediation. It is possible that clinically socially anxious individuals' emotions play a more prominent role in their perceptions of others. This finding supports the role of shared emotions proposed by empathy theorists, as do the previous results. Similar to the previous study, supplemental analyses suggested that individuals with SAD experienced greater negative emotions in response to the video content, rather than simply projecting their pre-existing emotions.

Because targets and participants made ratings using the I-PANAS-SF, I reasoned that shared method variance might partially explain this finding. To more fully understand the processes that mediate the link between social anxiety and empathy, I also examined state empathy, perceived similarity, and participants' interpretations of the targets' situations. The results revealed that all three variables influenced the social anxiety-empathy association.

The state empathy measure included items to assess both cognitive and emotional aspects of empathy. I found that individuals with SAD reported greater state empathy while watching the videos, which partially mediated the accuracy of their empathic judgments. Participants' perception of similarity to video targets fully mediated the relationship between social anxiety and empathic accuracy. More specifically, socially anxious participants saw themselves as more similar to the targets and were therefore more accurate at judging the targets' negative emotions. This result is in line with previous findings indicating that perceptions of similarity predicted the level of understanding felt by the perceiver (Hodges, 2005) and that similarity was related to accuracy (Letzring, 2010). Although similarity between perceiver and target is likely not a

required component to empathize with others, it could help the perceiver feel closer to the target and therefore facilitate empathic processes (Aron et al., 1992). This might be particularly relevant when individuals are empathizing with social exclusion experiences (e.g., Beeney et al., 2011; Meyer et al., 2012).

Finally, participants' interpretations of how aversive they thought the targets' social exclusion situations were partially mediated the relationship between social anxiety and empathy. Interestingly, after being rejected, non-anxious individuals viewed the targets' exclusion experiences as less aversive, and these judgments partially mediated their underestimation of targets' negative emotions. This finding is consistent with previous research indicating that factors such as perceivers' appraisal of the situation, perceived fairness, features of the target, and the perceivers' previous experiences can influence empathic responses (e.g., Adams Jr. et al., 2010; Hein & Singer, 2008; Singer et al., 2006; Zaki & Cikara, 2015).

Social Exclusion

In Study 3, a recent experience of social exclusion did not influence how individuals empathized with others. As in Study 2, it is also possible that the manipulation was not as direct as Cyberball and therefore did not have strong effects on participants' behaviour. As previously mentioned, the control condition could have been interpreted as a type of social exclusion, particularly by socially anxious individuals.

It is also possible that the inclusion of a clinically socially anxious population might have reduced the overall impact of the social exclusion manipulation. In addition to the main effect of experimental condition, there was also a significant main effect of social anxiety for the manipulation check questions (e.g., participants with SAD felt more excluded regardless of experimental condition). By definition, individuals with social anxiety are more sensitive to

social evaluation and social threats (Goldin et al., 2009; Hofmann et al., 2004). In the control condition, although participants were told that their partner had to leave because they forgot an appointment, it is possible that individuals with SAD could have perceived this as a form of social exclusion. Anecdotally, several participants with SAD reported that despite being told that their partner had forgotten an appointment, they nonetheless wondered whether their partner just did not want to meet with them. This is in line with previous research that found socially anxious individuals interpreted neutral and ambiguous stimuli as more threatening than non-anxious individuals (Beard & Amir, 2009; Constans, Penn, Ihen, & Hope, 1999), and showed more neurological reactivity in the amygdala (e.g., Cooney, Atlas, Joormann, Eugene, & Gotlib, 2006), suggesting that they experienced more fear in response to neutral stimuli. Furthermore, studies have also found that socially anxious failed to show the positive interpretation of ambiguous events found in non-anxious individuals (Constans et al., 1999).

Advice

I also investigated social behaviours related to social anxiety by offering participants the option to provide written advice to the video targets. I found that individuals with SAD showed a tendency to write less advice (e.g., fewer words) and were more likely to not give any advice to the targets. These findings may help to consolidate the counter-intuitive findings that socially anxious individuals were more accurate at judging others' emotions. Despite their accuracy, socially anxious individuals may not be able to use this information to facilitate their social interactions.

The latter finding is consistent with a large body of literature indicating that individuals with SAD engage in social avoidance, withdrawal, and constraint. They display lower self-disclosure, even with friends or romantic partners, relative to non-anxious individuals

(Sparrevohn & Rapee, 2009; Stoltenberg et al., 2013). In addition, they are constrained in displaying warm and positive social behaviours (Eisenberg, Fabes, & Spinrad, 2006b; Rodebaugh et al., 2013; Zoccola, Green, Karoutsos, Katona, & Sabini, 2011). As a result, they are perceived by others to be less warm and friendly (Inderbitzen-Nolan, Andersen, & Johnson, 2007). To take the current situation, if individuals with SAD fail to respond to a peer's disclosure of a painful event, one would expect that the relationship would be weakened. Further implications of these findings are explored in the general discussion.

General Discussion

In the social anxiety literature, there has been a lack of research about the relationship between social anxiety and positive interpersonal processes, such as empathy. Accordingly, I explored the relationship between social anxiety, social exclusion, empathic accuracy for others' emotions, and positive social behaviours. Across three studies, I discovered novel relationships between these variables: 1) Social anxiety was consistently associated with greater empathic accuracy; 2) Perceivers' emotions mediated the relationship between social anxiety and accurate empathy; and 3) Further mediation analyses revealed that socially anxious individuals' emotion judgments were based on empathy processes. The role of social exclusion varied across the studies depending on the nature of the exclusion paradigm. Earlier studies using Cyberball appeared to influence how individuals empathized with others, where more subtle exclusion tasks did not. Finally, this dissertation also provided preliminary evidence about the relationship between empathic accuracy and positive social behavior in socially anxious individuals.

Social Anxiety and Empathic Accuracy

The studies described in this dissertation suggested that social anxiety was consistently associated with *greater* empathic accuracy for others' negative emotions. This relationship was evident in samples of individuals with both clinically significant and non-clinical social anxiety. These are novel findings and add to the growing literature examining social anxiety and elements of psychological functioning that facilitate positive outcomes (e.g., positive psychology; see Seligman & Csikszentmihalyi, 2000). Empathic accuracy is one such element that could play an important role in the social functioning of socially anxious individuals.

These results are in line with cognitive models of social anxiety that suggested that socially anxious individuals may have attention and perceptual biases towards signs of social

threat (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). As previously discussed, numerous studies have found that social anxiety was associated with faster processing of threat-relevant information, such as angry faces or words related to social threat (Amir, Bower, Briks, & Freshmen, 2003; Mogg, Philippot, & Bradley, 2004; Pishyar, Harris, & Menzies, 2004), and socially anxious individuals displayed difficulty disengaging attention from threat-related social information (see Amir, Bower, Briks, & Freshmen, 2003; Buckner et al., 2010; Schofield et al., 2012). None of these studies however, explored emotion judgments as an interpersonal process, such as empathy.

The results of these studies suggested that the attentional biases found in social anxiety might actually facilitate the *accurate* perception of others' emotions. Individuals who worry about social judgments and rejection often prioritize detecting and managing social information in their environment, possibly at the cost to other important goals (e.g., rejection sensitivity; Berenson et al., 2009). As previously explored in the introduction, research findings have been mixed as to whether social anxiety is associated with greater accuracy for judging others' emotions (Mohlman et al., 2007; Hezel & McNally, 2014; Tibi-Elhanany & Shamay-Tsoory, 2011). In contrast, two studies found that social anxiety was associated with an elevated tendency to take others' perspectives, although this tendency was not necessarily associated with accuracy (Hezel & McNally, 2014; Tibi-Elhanany & Shamay-Tsoory, 2011). A recent meta-analysis found that individuals with both clinical and subclinical social anxiety had difficulty understanding complex interpersonal emotions (O'Toole et al., 2013). Closer examination of the measures included in this study revealed that complex interpersonal emotion knowledge was not necessarily conceptualized as empathic accuracy, but rather the recognition of specific behaviours in others (e.g., lying; negative or positive behaviours while giving a speech; Banerjee

& Henderson, 2001; Velijaca & Rapee, R. M., 1998) or understanding of social norms and attributions (e.g., Janssen et al., 2014; Summerfeldt et al., 2010).

The stimuli used in my dissertation utilized individuals discussing real instances of social exclusion and consequently allowed for an assessment of empathy for complex social content. Although all the scenarios discussed in the video stimuli were about instances of social exclusion, the content and the emotions conveyed by the targets was not always straightforward (e.g., not obviously positive or negative). The stimuli used in previous studies of social anxiety and social emotional judgments have used basic emotion stimuli (e.g., emotion faces or words) or actors discussing common social situations, which may not fully represent the complexity of real interpersonal interactions. Comprehension of the stimuli used in my dissertation required perceivers to understand the emotional, social, and contextual aspects of the events (e.g., Griffiths, 1997; Power & Dalgleish, 1997).

Since the research was conducted, another group followed up on my original study. Morrison and colleagues (2016) did not find that social anxiety was associated with more accurate empathy for negative affect. In fact, they found that socially anxious individuals were less able to empathize with others' positive emotions. Although they did assess empathic accuracy, there are a range of differences in methodologies between the studies that could have explained the differences in findings. For example, Morrison and colleagues used an online emotion rating procedure, focused on valence as opposed to specific emotions, and their stimuli represented a range of negative and positive events (i.e., not specific to social exclusion). Despite these differences, the findings from their study, in conjunction with mine, might both provide evidence for models of empathy. More specifically, individuals might more accurately empathize with those they perceive as similar to them or who have similar experiences. In my study,

socially anxious individuals' previous experiences with social exclusion may have facilitated their judgments of others' social exclusion.

Low social anxiety and empathic accuracy. Interestingly, across three studies, individuals with low social anxiety were *less* empathically accurate and consistently underestimated the negative emotions of others. As previously discussed in the introduction, my initial hypotheses predicted that a certain level of *inaccuracy* may be beneficial for the perceiver, particularly in the presence of distress and negative emotions (e.g., Manczak et al., 2015; Simpson et al., 2011). In this study, individuals with low social anxiety reported feeling fewer negative emotions while watching the videos. Consistent with theories of exclusion, individuals with low social anxiety may have turned their attention away from negative information and towards positive social information, which is theorized to help individuals recover from the effects of social exclusion and facilitate the restoration of feelings of social inclusion (e.g., engaging in positive social behaviours; Powers, Wagner, Norris, & Heatherton, 2013).

Empathy and Perceivers' Emotions

Consistent with models of empathy, participants' own experiences of negative emotions partially explained the accuracy of their ratings of others' emotions. Across three studies, socially anxious individuals reported feeling greater negative emotions, which partially explained the accuracy of their ratings of targets' negative emotions. Furthermore, in Study 3, perceivers' emotions *fully* mediated the relationship between social anxiety and empathic accuracy. Models of empathy would suggest that the perception of others' emotions automatically triggered a similar emotion state in the observer, helping them to understand the experience of the target (Preston & de Waal, 2002). These studies provide valuable information regarding the mechanisms of empathic processes and add to the literature that suggested that

perceivers' reactions might be particularly important in the perception of others' pain (Botvinick et al., 2005; Keysers, Kaas, & Gazzola, 2010; Singer et al., 2004).

Interestingly, the mediation effect of perceivers' emotion was evident regardless of whether participants were socially excluded or not. Previous literature would suggest that socially excluded participants should have been more accurate at empathizing with the targets' experiences of social exclusion, and vice versa (e.g., Loewenstein, 1996). The results of the mediation analyses suggested that perhaps the fact that socially anxious individuals experienced greater negative affect, they were able to empathize more accurately with the targets, regardless of the experimental manipulation.

Given these findings, it was important to investigate whether participants, particularly those with social anxiety, were not simply projecting their own emotions onto the targets (e.g., I feel very negative, so I believe they are feeling very negative as well). To rule out the alternative possibility that socially anxious participants were simply projecting their baseline negative emotion onto the targets, I conducted supplemental analyses to investigate the relationship between social anxiety and change in negative emotions. The results from both Studies 2 and 3 suggested that both socially anxious participants and participants with SAD experienced a greater increase in negative emotions after watching the videos compared to non-anxious participants. This supports the idea that socially anxious participants and participants with SAD were responding to the video content rather than projecting their pre-existing negative emotions onto the targets.

Beyond this, it was important to then investigate whether socially anxious participants were truly empathizing with the targets. For example, one study found that the simple observation of someone being excluded can cause a certain degree of negative affect and distress

in the perceiver (Wesselmann, Bagg, & Williams, 2009). This shared affect however, doesn't necessarily imply that participants were engaging in a full empathic response (e.g., participating in others' emotions without becoming a part of them; Keen, 2007). Consequently, I further investigated the mechanisms underlying participants' emotion judgments in Study 3.

Mediators of Empathic Accuracy

The results of Study 3 suggested that socially anxious individuals' ratings were both more accurate and reflected true empathic processes. Firstly, participants' *state empathy*, measuring both the empathic concern and perspective-taking components of empathy (e.g., Davis, 1994; Ickes, 1997; Singer, 2006), partially explained the relationship between social anxiety and empathic accuracy. The results suggested that socially anxious individuals were taking the perspective of and experiencing compassion towards the targets, which partially explained the accuracy of their empathic judgments.

Although empathy is a largely automatic process, the strength of empathic responses can vary depending on a variety of factors (Hein & Singer, 2008; Singer et al., 2006). In Study 3, participants' *perceived similarity* to the targets fully mediated the relationship between social anxiety and empathy. Currently, empathy has been mixed as to whether perceived similarity predicts *accurate* empathy. As previously explored in the Study 3 introduction, perceived similarity can result in the perceiver feeling like they understand the target and can encourage the likelihood of engaging in empathy (e.g., Batson et al., 1996; Hodges et al., 2010). Additionally, similarity is related to feelings of closeness, which has been found to increase empathy and even facilitate the neural processing of others' experiences of social exclusion (Aron et al., 1992; Beeney et al., 2011; Meyer et al., 2012). At the opposite end of this spectrum, perceived *dissimilarity* is thought to lead to decreased empathy. For example, individuals tend to feel less

empathy for individuals from cultural outgroups (e.g., Mathur, Harada, Lipke, & Chiao, 2010; Xu, Zuo, Wang, & Han, 2009), and tend to attribute fewer complex or secondary emotions (e.g., anguish; Cuddy, Rock, & Norton, 2007).

Socially anxious participants perceived greater similarity to the targets. It is possible that socially anxious individuals experienced more and/or perceived greater salience of social exclusion compared to their non-anxious counterparts. Although similarity is not required for empathy, similarity is theorized to increase the likelihood of an empathic response because it provides a basis for knowing that an empathic response was required in the first place (see Batson, Lishner, Cook, & Sawyer, 2005). Certain models of empathy suggest that the perception of other individuals' thoughts and emotions activates not only similar emotions, but also representations of any relevant concepts (e.g., Perception-action model (PAM); Preston & de Waal, 2002). For example, while listening to someone discuss instances of being bullied, relevant conceptual knowledge might be evoked in the perceiver, such as associative concepts related to the bullying, similarities in their own personal experience, what it means and how it feels to be bullied, etc. Theoretically, this knowledge could also facilitate the accuracy of emotion judgments.

Finally, participants' appraisals of the targets' situations also partially explained the relationship between social anxiety and empathy. Overall, non-anxious participants saw the situations as being less objectively bad, particularly after being socially excluded themselves, and consequently underestimated the negative affect displayed by the targets. This finding is also in line with recent empathy models, which suggested that the automaticity of empathy can be influenced by the way the perceiver appraises the situation (e.g., Zaki & Cikara, 2015). These appraisals can influence how individuals empathize with others even with shared experiences

(e.g., Hein & Singer, 2008; Singer et al., 2006). For example, a recent study found that individuals who had recently been social excluded were actually *more* harsh in their judgments of another individuals' failure to endure similar social exclusion events (Ruttan, McDonnell, & Nordgren, 2015). In the current study, non-anxious participants might have been less likely to believe the targets were experiencing negative emotions because they had recently experienced an instance of social exclusion and were able to overcome it.

That abovementioned PAM also suggested that similarity of previous experiences can influence appraisals of others' experiences. Individuals who lack previous experiences similar to the targets might be able to use top-down processes to create a theoretical representation of the situation, but in the end may lack a true understanding of how it feels to fully relate to the target. Non-anxious participants who did not experience social exclusion similar to the situations described by the targets, may have been unable to fully relate and therefore did not perceive the situation to be as bad. Other individuals might have had similar rejection experiences, but did not place the same significance and/or salience on the situations. As a result, these individuals might be able to understand that person's pain without truly "feeling their pain" (Preston & Hofelich, 2012). Overall, the results of the current study suggested that although perceiver's own emotions play an important role in empathic processes, it is equally important to examine perceivers' previous experiences and appraisals.

Social Exclusion

Overall, a recent experience of social exclusion did not appear to have a strong influence on participants' empathic ratings across the studies. Despite the fact that the social exclusion manipulations did produce the desired effect of making participants feel excluded (e.g., participants in the experimental conditions generally felt worse and less accepted in response to

the manipulations), experimental condition only influenced how participants empathized with others in Study 1. In that study, participants with lower levels of social anxiety who were socially excluded via the Cyberball manipulation tended to underestimate the negative emotions of others. There was no effect of social exclusion using a more subtle social exclusion manipulation where participants were told that their partner did not want to meet them.

Previous studies have found that differences in the directness and severity of social exclusion manipulations can lead to different behavioural and emotional responses (e.g., Bernstein & Claypool, 2012). For example, social exclusion that is less painful is thought to lead to sensitization to pain, where more severe social exclusions are thought to lead to more of a numbing response. Previous research found that the Cyberball social exclusion manipulation was experienced as less painful and less personally hurtful compared to the Future Alone manipulation (Twenge et al., 2001), but it is unclear how it would compare to the manipulation used in Studies 2 and 3. Furthermore, there has been little research that has explored how severity of social exclusion might influence empathic responses.

The social exclusion manipulation used in Studies 2 and 3 technically left room for variation in interpretations. Socially anxious participants might have perceived the fact that they did not meet their partner as a type of rejection across both conditions (e.g., their partner actually didn't want to meet the participant and that's why they said they forgot an appointment). As previously discussed, these results are in line with previous findings that suggested that socially anxious individuals tend to misinterpret ambiguous stimuli in a more negative and socially threatening manner (e.g., Constans et al., 1999; Stopa & Clark, 2000; Voncken, Bögels, & de Vries, 2003), as well as fail to positively interpret ambiguous events (Constans et al., 1999; Hirsch & Mathews, 2000). Low socially anxious participants could have also reframed the social

exclusion condition to be less severe and hurtful. Anecdotally, certain participants told the experimenters that they believed their partner had been shy and/or anxious and did not “take it personally” that they did not want to meet them. These differences might have been particularly evident in Study 3, where the sample was made up of clinically socially anxious individuals and non-anxious healthy controls.

Alternatively, the effectiveness of the manipulation might have been influenced by processes related to social comparisons. Across both studies, participants in the experimental condition indicated that they felt more rejected by their “partners”, and felt more negative affect and social pain. Theories of social comparison suggested that when individuals experience threats towards the self, they may compare themselves with individuals who are “worse off” than themselves (e.g., downward social comparisons) as a strategy to enhance their own sense of well-being and regain a more positive self-evaluation (e.g., Taylor & Lobel, 1989; see Buunk & Gibbons, 2007, for reviews). In the current study, the social exclusion scenarios discussed by the video targets were of a more serious and personally-threatening nature. It is possible that excluded participants may have compared their own experience of social exclusion with those of the targets in the videos, and consequently reappraised their own experience of social exclusion as less painful and diluted the impact of the exclusion manipulation.

As discussed, these findings are in line with models of social exclusion, where individuals systematically underestimate how their own experiences, attitudes, and feelings influence their perception of others’ (Van Boven, Loewenstein, Dunning, & Nordgren, 2013). As a result, individuals will underestimate the pain of others’ social suffering when they aren’t actively experiencing social exclusion themselves (e.g., empathy gap; Nordgren et al., 2011).

Social Anxiety, Empathic Accuracy, and Positive Social Behaviours

Finally, this dissertation provided an important initial examination of the relationship between social anxiety, empathic accuracy, and positive social behaviours. The results suggested that although socially anxious individuals are more empathically accurate, they may still be less likely to engage in positive social behaviours that help maintain relationships. In Study 2, there was some initial evidence that social anxiety was associated with providing avoidant-themed advice (e.g., never speak to friends again, there's nothing to be done because people are mean). In Study 3, socially anxious individuals were more likely to provide no advice to the targets, and when they did choose to give advice, they tended to write less. Furthermore, socially anxious individuals were less likely to provide advice with positive themes, i.e., advice more likely to promote relational repair rather than disruption. As previously mentioned, these findings are consistent with previous research that found that socially anxious individuals tend to constrain their behaviours in social situations, engage in fewer positive (social approach) behaviours, are less likely to self-disclose (e.g., safety behaviours; Rodebaugh et al., 2013; Stoltenberg et al., 2013; Voncken & Dijk, 2013).

Socially anxious individuals might be less likely to engage in positive social behaviours as a way to avoid possible rejection and disapproval (Hofmann & Barlow, 2002; Meleshko & Alden, 1993). Although helping others can generally lead to positive outcomes, socially anxious individuals might perceive that their behaviours could be taken the wrong way or somehow lead to exclusion. Many of the fears experienced by socially anxious individuals involve concerns and doubts about their ability to perform in social situations and how they will be perceived (e.g., whether they will do something that will lead to humiliation, have nothing to say, accidentally insult others; Schlenker & Leary, 1985). In adolescents, studies have found that individuals who

had experienced social exclusion in the past were more likely to show socially helpless behaviours and kept a larger distance from others as a way to avoid further rejection (Gazelle & Rudolph, 2004; Rinck et al., 2010). Along similar lines, socially anxious individuals tend to engage in self-focused attention in social situations, which not only works to maintain feelings of social anxiety, but can also negatively influence their social performance (Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). In my studies, although socially anxious individuals were more accurate at judging others' emotions, this might have caused them to turn their attention inwards, increasing perceptions of anxiety, negative thoughts, and potentially decreasing their ability to engage in positive social behaviours (e.g., Voncken, Dijk, de Jong, & Roelofs, 2010)

These studies add to the literature that suggest empathy on its own does not necessarily lead to positive outcomes (Zaki & Cikara, 2015) and that there may be certain costs to empathizing with others. On one hand, empathy for others' positive emotions has few costs and in fact, could lead to an improvement in the perceivers' mood (Duan, 2000). On the other hand, certain theories of empathy suggested that individuals may, at times, be less likely to empathize with others in order to maintain their current emotion state (Hirt, Devers, & McCrea, 2008; Isen & Simmonds, 1978). As discussed in the introduction, previous studies have found that when interpersonal relationships and situations are characterized by high negative emotions, accurate empathy can actually be detrimental (Alexander & Klein, 2009; Manczak et al., 2015; Palm et al., 2004; Simpson et al., 2011, 2003). A recent study found that individuals with borderline personality disorder, who strongly fear and are sensitive to signs of rejection (e.g., Staebler, Helbing, Rosenbach, & Renneberg, 2011) were more empathically accurate when discussing relationship-threatening situations (Miano, Dziobek, & Roepke, 2017). The authors suggested

that a certain amount of empathic *inaccuracy* can be protective as it reduces the likelihood of the perceiver experiencing strong negative emotions and engaging in potentially non-adaptive interpersonal behaviours.

Socially anxious individuals may have a particular tendency to become overwhelmed when empathizing with others' negative emotions. Recent findings suggested that social anxiety disorder is characterized by difficulty with emotion regulation processes (e.g., influencing what, when, and how emotions are experienced; see Jazaieri et al., 2015), which would be particularly relevant when empathizing with others' distress. In the current dissertation, socially anxious individuals may have found the targets' stories of social exclusion particularly salient, leading them to experience greater personal distress. This is in line with research that suggested that individuals who have a history of greater adversity (e.g., injury, relationship events, social-environmental stress, etc.) often show increased perspective taking and empathic concern (Lim & DeSteno, 2016). Only empathic concern predicted helping behaviours, suggesting that the ability to take others' perspectives is not sufficient to predict helping behaviours. Models of empathy also suggested that the experience of personal distress can lead the perceiver to focus on alleviating their own negative emotions, reducing the likelihood they would engage in helping behaviours (Batson, 2011; Eisenberg & Eggum, 2009). Socially anxious individuals in particular, may become inhibited by their emotional reactions to engaging in uncertain social situations because of the potential for future unpleasantness and/or rejection.

Limitations, Strengths, and Future Directions

Several limitations should be acknowledged concerning the current research. The studies used laboratory manipulations to examine social exclusion and therefore may be lacking in real-world validity. Given that this was a novel question regarding the intersection between social

anxiety, social exclusion, and empathic accuracy, it was important to first investigate the findings in a laboratory setting so that the experimental exclusion is controlled and consistent across participants. In addition, laboratory studies allow for prospective examination of the effects of exclusion on empathy. Much of the extant research on social exclusion in socially anxious populations has utilized retrospective designs to determine how exclusion is related to current behaviours (i.e., asking participants about how often they have been excluded in the past). These designs, while representing real experiences of social exclusion, do not allow for the direct examination of the relationship between social exclusion and current behaviours. Other studies often utilize manipulations in which individuals are asked to write about a particular and/or recent social exclusion experience. In these designs, there is no way to equate the severity or frequency of previous exclusion experiences across participants. Future studies could potentially use a combination and/or comparison of retroactive and laboratory manipulations for social exclusion.

Along similar lines, this study found that two different types of social exclusion manipulations led to somewhat different results. Previous studies using the social exclusion manipulation used in Studies 2 and 3 found that socially anxious individuals displayed different responses to exclusion compared to non-anxious individuals (Mallot et al., 2009; Maner et al., 2007). The current studies did not; however, the current studies are the first to investigate empathic accuracy using the manipulation. It is possible that future studies on empathy and social anxiety might find more of an effect of social exclusion using a more direct and/or more severe social exclusion paradigm. For example, the Future Alone manipulation has been found to be experienced as more severe and socially painful, and might have a stronger effect on empathic accuracy (e.g., Bernstein & Claypool, 2012).

The video stimuli used across the studies provided consistency in targets' expressions and emotions, which are ideal for a preliminary investigation. However, there are limitations with these stimuli that can be explored in future studies. Firstly, participants made ratings of targets' emotions at the end of the video. Future studies could utilize Ickes' (2001) empathic accuracy paradigm of having targets and participants make ratings at multiple points throughout the videos to get a more nuanced measure of empathic accuracy. A recent article used a variation of this procedure, in which participants made a continuous rating of the valence of emotion experienced/displayed (e.g., positive or negative) and found that socially anxious individuals were *less* accurate at judging positive emotions (Morrison et al., 2016). It is possible that the "offline" ratings made in the current study provided less interference or were less overwhelming compared to "online" ratings.

Accuracy might have also been influenced by the type of information being rated by participants. In this dissertation, there were no significant findings related to the perception of positive emotions. Previous studies have found an association between social anxiety and greater accuracy at identifying negative emotions such as fear (Foa et al., 2000; Hirsch & Clark, 2004) . It is also possible that the previously mentioned difference in rating procedures could lead to findings related to positive emotions.

Along similar lines, the next step beyond this procedure would be to attempt to answer these questions using ecologically valid social events. For example, future studies could investigate whether the effect of social exclusion on empathic accuracy holds for real-life conversations with confederates. It is possible that in-person interactions might pose greater emotional and cognitive demands. The experience of anxiety and personal distress might overwhelm empathic processes (see Eisenberger, 2011), particularly for individuals with social

anxiety. Alternatively, we may see a completely different pattern of results as participants might be more motivated to engage in empathic processes and be accurate when interacting with a real individual. Despite the limitations of the videos, the use of standard stimuli allowed for consistency across studies that is difficult to achieve with a confederate. For example, although a real conversation with a confederate would allow for a more ecologically valid study of interpersonal behaviours, it would be difficult to maintain consistency across conversations and for confederates to remain genuine in their conversations about social exclusion.

Across Studies 2 and 3, I began a preliminary investigation into the types of advice given by participants to the targets. I developed my own questionnaire containing different types of advice based on a rational basis. This measure produced small correlations between social anxiety and positive social advice. Although the results were illuminating, it was also important to investigate advice-giving in a more naturalistic manner. Given the tendency for socially anxious individuals to avoid disclosure and say little in interactions, it was important to investigate advice-giving in an open-ended manner in Study 3. More research is required to further investigate the relationship between social anxiety and advice-giving in interpersonal interactions. Furthermore, future research could also investigate how empathic accuracy in socially anxious individuals guides actual interpersonal behaviour (e.g., comforting others, providing advice, etc.) rather than predicted behaviour (i.e., advice) used here. These studies could also utilize experimental manipulations designed to measure helping behaviours unrelated to the videos (e.g., measuring helping behaviours towards the research experimenter).

In spite of possible limitations, the current research presented a novel contribution to the literature. This research brought together different sets of literature to answer important questions regarding social anxiety, empathy, social exclusion, and positive interpersonal

behaviours. Previous studies examining social anxiety and empathy have mostly used self-report measures to assess trait empathy, however self-report measures do not assess how an individual may act in any specific situation. These studies used a more rigorous test of empathic judgments by having participants rate what they believe an individual is feeling using standardized stimuli. Similarly, I also used a measure of state empathy in Study 3 in addition to the empathic accuracy ratings. Many of the previous studies of social anxiety and interpersonal processes have focused on either attention or reaction time to emotion stimuli, theory of mind, or judgments of their own emotions. Fewer studies have examined empathic judgments. These studies provided important information about the empathic processes in socially anxious populations.

Across studies, I found that socially anxious individuals were more accurate at making judgments of others' negative emotions. There was general replication across the studies using standard stimuli. The three studies also demonstrated a progression in terms of research design by exploring multiple mechanisms, potential links between variables, a preliminary exploration into the effects on interpersonal behaviours, and using a combination of lab methods, self-report, qualitative, and quantitative measures. Most importantly, this dissertation began to investigate these processes in a clinical population. A lot of research on social anxiety utilized university or college samples and only self-report measures of social anxiety. This study not only contained a clinical interview, but used individuals from a diverse community population.

Implications

The results of the study are in line with the current direction towards positive psychology in clinical populations and have important implications for ways to augment current treatments. Understanding the effects of empathic processes and positive social behaviours could help improve social functioning and overall quality of life in socially anxious populations. In these

studies, although socially anxious individuals were more accurate at judging negative emotions, Study 3 demonstrated that they are unable to engage in productive social behaviours that might aid in social reconnection. Often times, socially anxious individuals report being unsure of how to properly respond when others discuss negative events and emotions (e.g., discussing a break-up, difficulty at work, losing a loved one). They may worry that they will say the wrong thing and/or make the situation worse, and as a result may say nothing or very little. Given the findings that socially anxious individuals may indeed be more accurate in their judgments of others' negative emotions, therapeutic work could focus on validating these initial judgments and devising ways to act appropriately on these judgments. Although social skills training is an intervention that is more commonly used with children and adolescents, it could be useful to role play ways to respond empathically to others, such as providing validation, positive encouragement, and potentially engaging in self-disclosure. Furthermore, it may be helpful for therapists to test out individuals' negative predictions about saying something in the situation (e.g., behavioural experiment).

Furthermore, it might be useful to provide information about empathy and its processes, validating that empathy is often an automatic process and it is normal to experience shared emotions with someone who is discussing a negative situation. It is equally important however, to remain focused on the other individual and not allow any potential feelings of distress to overcome one's attention. Many therapeutic interventions for social anxiety already focus on helping individuals to turn attention away from one's own internal sensations and negative thoughts and focus on external stimuli. This could be combined with empathy training to focus on what the other person might be thinking and feeling, as well as ways to express that they are feeling empathy for that person's experience.

Conclusion

The three studies included in this dissertation provided an important examination of the complex relationships between social exclusion, social anxiety, empathic accuracy, and positive social behaviours. The main relationship that emerged was between social anxiety and empathy. Individuals with higher levels of social anxiety, including individuals with clinically significant social anxiety, were more accurate at judging the negative emotions of others. Individuals with low social anxiety tended to underestimate others' negative emotions. In line with models of empathy, the accuracy of individuals' empathic ratings were partially explained by the tendency for individuals with high social anxiety to feel more negative emotions, take the targets' perspectives, see themselves as more similar to the targets, and perceive the targets' situations to be objectively worse. Despite underestimating the negative emotions of the targets, individuals with lower social anxiety were more likely to provide advice to the targets, suggesting that although socially anxious individuals were more accurate, they may be unable to act on their empathic judgments to engage in positive social behaviours.

References

- Adams Jr., R. B., Rule, N. O., Franklin Jr., R. G., Wang, E., Stevenson, M. T., Yoshikawa, S., ... Ambady, N. (2010). Cross-cultural reading the mind in the eyes: an fMRI investigation. *Journal of Cognitive Neuroscience*, 22, 97–108.
<https://doi.org/10.1162/jocn.2009.21187>.
- Aderka, I. M., Hofmann, S. G., Nickerson, A., Hermesh, H., Gilboa-Schechtman, E., & Marom, S. (2012). Functional impairment in social anxiety disorder. *Journal of Anxiety Disorders*, 26, 393–400. <https://doi.org/10.1016/j.janxdis.2012.01.003>
- Alden, L. E., & Taylor, C. T. (2004). Interpersonal processes in social phobia. Special Issue. *Clinical Psychology Review*, 24, 857–882. <https://doi.org/10.1016/j.cpr.2004.07.006>
- Alden, L. E., & Wallace, S. T. (1995). Social phobia and social appraisal in successful and unsuccessful social interactions. *Behaviour Research and Therapy*, 33(5), 497–505.
[https://doi.org/10.1016/0005-7967\(94\)00088-2](https://doi.org/10.1016/0005-7967(94)00088-2)
- Alexander, D. A., & Klein, S. (2009). First responders after disasters: A review of stress reactions, at-risk, vulnerability, and resilience factors. *Prehospital and Disaster Medicine*, 24, 87–94. <https://doi.org/10.1017/S1049023X00006610>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Amir, N., Bower, E., Briks, J., & Freshmen, M. (2003). Implicit memory for negative and positive social information in individuals with and without social anxiety. *Cognition & Emotion*, 17, 567–583. <https://doi.org/10.1080/02699930302300>

- Amir, N., Prouvost, C., & Kuckertz, J. M. (2012). Lack of a benign interpretation bias in social anxiety disorder. *Cognitive Behaviour Therapy*, *41*, 119–129.
<https://doi.org/10.1080/16506073.2012.662655>
- Anderson, C., & Keltner, D. (2002). The role of empathy in the formation and maintenance of social bonds. *Behavioral and Brain Sciences*, *25*(1), 21–22.
<https://doi.org/10.1017/S0140525X02230010>
- Appelton, A. A., Buka, S. L., Loucks, E. B., Gilman, S. E., & Kubzansky, L. D. (2013). Divergent associations of adaptive and maladaptive emotion regulation strategies with inflammation. *Health Psychology*, *32*, 748–756. <https://doi.org/10.1037/a0030068>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Interpersonal Relations and Group Processes*, *63*, 596–612.
- Auyeung, K. W., & Alden, L. E. (2016). Social anxiety and empathy for social pain. *Cognitive Therapy and Research*, *40*, 38–45. <https://doi.org/10.1007/s10608-015-9718-0>
- Ayduk, O., Anett, G., & Luerssen, A. (2009). Rejection sensitivity moderates the impact of rejection on self-concept clarity. *Personality and Social Psychology Bulletin*, *35*, 1467–1478. <https://doi.org/10.1177/0146167209343969>
- Ayduk, O., Downey, G., Testa, A., & Yen, Y. (1999). Does rejection elicit hostility in rejection sensitive women? *Social Cognition*, *17*, 245–271.
- Ayduk, O., Gyurak, A., & Luerssen, A. (2008). Individual differences in the rejection-aggression link in the hot sauce paradigm: The case of Rejection Sensitivity. *Journal of Experimental Social Psychology*, *44*, 775–782.
- Banerjee, R., & Henderson, L. (2001). Social-cognitive factors in childhood social anxiety: A preliminary investigation. *Social Development*, *10*, 558–572.

- Bar-Haim, Y., Lamy, D., Pergamin, L., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2007). Threat-related attentional bias in anxious and nonanxious individuals: A meta-analytic study. *Psychological Bulletin*, 133, 1–24. <https://doi.org/10.1037/0033-2909.133.1.1>
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: An investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of Autism and Developmental Disorders*, 34, 163–175.
- Barrett, L. F., & Russell, J. A. (1999). The structure of current affect: Controversies and emerging consensus. *Current Directions in Psychological Science*, 8, 10–14. <https://doi.org/10.1111/1467-8721.00003>
- Bastiaansen, J. A. C. J., Thioux, M., & Keysers, C. (2009). Evidence for mirror systems in emotions. *Philosophical Transactions of the Royal Society B*, 364, 2391–2404. <https://doi.org/10.1098/rstb.2009.0058>
- Batson, C. D. (1991). *The altruism question: Toward a social-psychological answer*. Hillsdale, NJ: Erlbaum.
- Batson, C. D. (2009). These things called empathy: Eight related but distinct phenomena. In J. Decety & W. Ickes (Eds.), *The Social Neuroscience of Empathy* (pp. 3–15). Cambridge, MA: MIT Press.
- Batson, C. D. (2011). *Altruism in humans*. New York: Oxford University Press.
- Batson, C. D., Klein, T. R., Highberger, L., & Shaw, L. L. (1995). Immorality from empathy-induced altruism: When compassion and justice conflict. *Journal of Personality and Social Psychology*, 68, 1042–1054. <https://doi.org/10.1037/0022-3514.68.6.1042>

- Batson, C. D., Lishner, D. A., Cook, J., & Sawyer, S. (2005). Similarity and nurturance: Two possible sources of empathy for strangers. *Basic and Applied Social Psychology*, 27, 15–25. https://doi.org/10.1207/s15324834basp2701_2
- Batson, C. D., Sympson, S. C., Hindman, J. L., Decruz, P., Todd, R. M., Weeks, J. L., ... Burns, C. T. (1996). “I’ve been there, too’: Effect on empathy of prior experience with a need. *Personality and Social Psychology Bulletin*, 22, 474–482. <https://doi.org/10.1177/0146167296225005>
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117, 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Beard, C., & Amir, N. (2009). Interpretation in social anxiety: When meaning precedes ambiguity. *Cognitive Therapy and Research*, 33, 406–415. <https://doi.org/10.1007/s10608-009-9235-0>
- Beeney, J. E., Franklin Jr., R. G., Levy, K. N., & Adams Jr., R. B. (2011). I feel your pain: Emotional closeness modulates neural responses to empathically experienced rejection. *Social Neuroscience*, 6, 369–376. <https://doi.org/10.1080/17470919.2011.557245>
- Berenson, K. R., Gyurak, A., Ayduk, O., Downey, G., Garner, M. J., Mogg, K., ... Pine, D. S. (2009). Rejection sensitivity and disruption of attention by social threat cues. *Journal of Research in Personality*, 43, 1064–1072. <https://doi.org/10.1016/j.jrp.2009.07.007>
- Bernstein, M. J., & Claypool, H. M. (2012a). Not all social exclusions are created equal: Emotional distress following social exclusion is moderated by exclusion paradigm. *Social Influence*, 7, 113–130. <https://doi.org/10.1080/15534510.2012.664326>

- Bernstein, M. J., & Claypool, H. M. (2012b). Social exclusion and pain sensitivity: Why exclusion sometimes hurts and sometimes numbs. *Personality and Social Psychology Bulletin*, 38, 185–196. <https://doi.org/10.1177/0146167211422449>
- Bieri, D., Reeve, R. A., Champion, G. D., Addicoat, L., & Ziegler, J. (1990). The Faces Pain Scale for the self-assessment of the severity of pain experienced by children: Development, initial validation, and preliminary investigation for ratio scale properties. *Pain*, 41, 139–150. [https://doi.org/10.1016/0304-3959\(90\)90018-9](https://doi.org/10.1016/0304-3959(90)90018-9)
- Bischof-Köhler, D. (1991). The development of empathy in infants. In M. E. Lamb & Keller (Eds.), *Infant development: Perspectives from German-speaking countries* (pp. 245–273). Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.
- Blöte, A., & Westenberg, P. M. (2007). Socially anxious adolescents' perception of treatment by classmates. *Behaviour Research and Therapy*, 45, 189–198. <https://doi.org/10.1016/j.brat.2006.02.002>
- Bögels, S. M., & Mansell, W. (2004). Attention processes in the maintenance and treatment of social phobia: Hypervigilance, avoidance and self-focused attention. *Clinical Psychology Review*, 24, 827–856. <https://doi.org/10.1016/j.cpr.2004.06.005>
- Botvinick, M., Jha, A. P., Bylsma, L. M., Fabian, S. A., Solomon, P. E., & Prkachin, K. M. (2005). Viewing facial expressions of pain engages cortical areas involved in the direct experience of pain. *NeuroImage*, 25, 312–319. <https://doi.org/10.1016/j.neuroimage.2004.11.043>
- Brown, T. A., Di Nardo, P. A., & Barlow, D. H. (1994). *Anxiety Disorders Interview Schedule for DSM-IV*. Albany, NY, US: Graywind Publications.

- Buckner, J. D., Maner, J. K., & Schmidt, N. B. (2010). Difficulty disengaging attention from social threat in social anxiety. *Cognitive Therapy and Research*, 32(1), 99–105.
<https://doi.org/10.1007/s10608-008-9205-y>
- Buunk, A. P. & Gibbons, F. X. (2007). Social comparison: The end of a theory and the emergence of a field. *Organizational Behavior and Human Decision Processes*, 102, 3–21. doi: 10.1016/j.obhdp.2006.09.007
- Button, K., Lewis, G., Penton-Voak, I., & Munafò, M. (2013). Social anxiety is associated with general but not specific biases in emotion recognition. *Psychiatry Research*, 210, 199–207. <https://doi.org/10.1016/j.psychres.2013.06.005>
- Clark, D. M. (2005). A cognitive perspective on social phobia. In W. R. Crozier & L. E. Alden (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness* (pp. 405–430). New York, NY: John Wiley & Sons Ltd.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social Phobia: Diagnosis, Assessment, and Treatment* (pp. 69–93). New York, NY: Guilford Press.
- Clements, K., Holtzworth-Munroe, A., Schweinle, W., & Ickes, W. (2007). Empathic accuracy of intimate partners in violent versus nonviolent relationships. *Personal Relationships*, 14, 369–388. <https://doi.org/10.1111/j.1475-6811.2007.00161.x>
- Constans, J. I., Penn, D. L., Ihen, G. H., & Hope, D. A. (1999). Interpretive biases for ambiguous stimuli in social anxiety. *Behaviour Research and Therapy*, 37, 643–651.
- Cooney, R. E., Atlas, L. Y., Joormann, J., Eugene, F., & Gotlib, I. H. (2006). Amygdala activation in the processing of neutral faces in social anxiety disorder: Is neutral really

- neutral? *Psychiatry Research: Neuroimaging*, 148, 55–59.
<https://doi.org/10.1016/j.psychresns.2006.05.003>
- Crişan, L. G., Vulturar, R., Miclea, M., & Miu, A. C. (2016). Reactivity to social stress in subclinical social anxiety: Emotional experience, cognitive appraisals, behavior, and physiology. *Front Psychiatry*, 7, 1–10. <https://doi.org/10.3389/fpsyt.2016.00005>
- Cuddy, A. J. C., Rock, M. S., & Norton, M. I. (2007). Aid in the aftermath of Hurricane Katrina: Inferences of secondary emotions and intergroup helping. *Group Processes & Intergroup Relations*, 10, 107–118. <https://doi.org/10.1177/1368430207071344>
- Cuming, S., & Rapee, R. M. (2010). Social anxiety and self-protective communication style in close relationships. *Behaviour Research*, 48, 87–96.
<https://doi.org/10.1016/j.brat.2009.09.010>
- Davis, M. H. (1994). *Empathy: A social psychological approach*. Madison, WI: Brown & Benchmark.
- Decety, J., & Jackson, P. L. (2004). The functional architecture of human empathy. *Behavioral and Cognitive Neuroscience Reviews*, 3, 71–100.
<https://doi.org/10.1177/1534582304267187>
- Decety, J., & Lamm, C. (2009). The biological basis of empathy. In J. T. Cacioppo & G. G. Berntson (Eds.), *Handbook of Neuroscience for the Behavioral Sciences*. New York: John Wiley & Sons Ltd.
- Demurie, E., De Corel, M., & Roeyers, H. (2011). Empathic accuracy in adolescents with autism spectrum disorders and adolescents with attention-deficit/hyperactivity disorder. *Research in Autism Spectrum Disorders*, 5(1), 126–134.
<https://doi.org/10.1016/j.rasd.2010.03.002>

- Devlin, H. C., Zaki, J., Ong, D. C., & Gruber, J. (2014). Not as good as you think? Trait positive emotion is associated with increased self-reported empathy but decreased empathic performance. *PLoS One*, 9, e110470. <https://doi.org/10.1371/journal.pone.0110470>
- DeWall, C. N., & Baumeister, R. F. (2006). Alone but feeling no pain: Effects of social exclusion on physical pain tolerance and pain threshold, affective forecasting, and interpersonal empathy. *Attitudes and Social Cognition*, 91, 1–15. <https://doi.org/10.1037/0022-3514.91.1.1>
- DeWall, C. N., Deckman, T., Pond, R. S., & Bonser, I. (2011). Belongingness as a core personality trait: How social exclusion influences social functioning and personality expression. *Journal of Personality*, 79, 1281–1314. <https://doi.org/10.1111/j.1467-6494.2010.00695.x>
- DeWall, C. N., Maner, J. K., & Rouby, D. A. (2009). Social exclusion and early-stage interpersonal perception: Selective attention to signs of acceptance. *Journal of Personality and Social Psychology*, 96, 729–741. <https://doi.org/10.1037/a0014634>
- DeWall, C. N., Twenge, J. M., Koole, S. L., Baumeister, R. F., Marquez, A., & Reid, M. W. (2011). Automatic emotion regulation after social exclusion: Tuning to positivity. *Emotion*, 11, 623–636. <https://doi.org/10.1037/a0023534>
- Diener, E., Smith, H., & Fujita, F. (1995). The personality structure of affect. *Journal of Personality and Social Psychology*, 69, 130–141. <https://doi.org/10.1037/0022-3514.69.1.130>
- Downey, G., Freitas, A. L., Michaelis, B., & Khouri, H. (1998). The self-fulfilling prophecy in close relationships: Rejection sensitivity and rejection by romantic partners. *Journal of*

- Personality and Social Psychology*, 75, 545–560. <https://doi.org/10.1037/0022-3514.75.2.545>
- Downey, G., Mougios, V., Ayduk, O., London, B. E., & Shoda, Y. (2004). Rejection sensitivity and the defensive motivational system: Insights from the startle response to rejection cues. *Psychological Science*, 15, 668–673. <https://doi.org/10.1111/j.0956-7976.2004.00738.x>
- Downey, G., Zaki, J., & Mitchell, J. (2008). Different toolkits for different mind readers: A social-cognitive neuroscience perspective on personality and social relationships. In F. Rhodewalt (Ed.), *Personality and social behavior*. New York, NY: Psychology Press.
- Duan, C. (2000). Being empathic: The role of motivation to empathize and the nature of target emotions. *Motivation and Emotion*, 24, 29–49. <https://doi.org/10.1023/A:1005587525609>
- Eisenberg, N., & Eggum, N. D. (2009). Empathic responding: Sympathy and personal distress. In J. Decety & W. Ickes (Eds.), *The Social Neuroscience of Empathy*. Cambridge, MA: MIT Press.
- Eisenberg, N., Fabes, R. A., Murphy, B., Karbon, M., Maszk, P., Smith, M., ... Suh, K. (1994). The relations of emotionality and regulation to dispositional and situational empathy-related responding. *Journal of Personality and Social Psychology*, 66, 776–797. <https://doi.org/10.1037/0022-3514.66.4.776>
- Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006a). Prosocial Development. In N. Eisenberger & W. Damon (Eds.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 646–718). Hoboken, NJ, US: John Wiley & Sons Ltd.

- Eisenberg, N., Fabes, R. A., & Spinrad, T. L. (2006b). Prosocial Development. In N. Eisenberger & W. Damon (Eds.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (6th ed., pp. 646–718). Hoboken, NJ, US: John Wiley & Sons Ltd.
- Eisenberger, N. I. (2011). Social pain: Experiential, neurocognitive, and genetic correlates. In A. Todorov, S. T. Fiske, & D. A. Prentice (Eds.), *Social neuroscience: Toward understanding the underpinnings of the social mind* (pp. 229–248). New York, NY: Oxford University Press.
- Ekman, P., & Friesen, W. V. (1971). Constants across cultures in the face and emotion. *Journal of Personality and Social Psychology*, *17*, 124–129.
<https://doi.org/http://dx.doi.org/10.1037/h0030377>
- Elfenbein, H. A., Maw-Der, F., White, J., Hwee-Hoon, T., & Aik, V. C. (2007). Reading your counterpart: The benefit of emotion recognition accuracy for effectiveness in negotiation. *Journal of Nonverbal Behavior*, *31*, 205–223. <https://doi.org/10.1007/s10919-007-0033-7>
- Eng, W., Coles, M. E., Heimberg, R. G., & Safren, S. A. (2005). Domains of life satisfaction in social anxiety disorder: Relation to symptoms and response to cognitive-behavioral therapy. *Anxiety Disorders*, *19*, 143–156. <https://doi.org/10.1016/j.janxdis.2004.01.007>
- Eng, W., Heimberg, R. G., Hart, T. A., Schneier, F. R., & Liebowitz, M. R. (2001). Attachment in individuals with social anxiety disorder: The relationship among adult attachment styles, social anxiety, and depression. *Emotion*, *1*, 365–380. <https://doi.org/10.1037/1528-3542.1.4.365>

- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191.
- Fehm, L., Beesdo, K., Jacobi, F., & Fiedler, A. (2008). Social anxiety disorder above and below the diagnostic threshold: Prevalence, comorbidity and impairment in the general population. *Social Psychiatry and Psychiatric Epidemiology*, 43, 257–265.
<https://doi.org/10.1007/s00127-007-0299-4>
- Fisher, K. W., & Tangney, J. P. (1995). Self-conscious emotions and the affect revolution: Framework and overview. In J. P. Tangney & K. W. Fisher (Eds.), *Self Conscious Emotions* (pp. 3–24). New York: Guilford Press.
- Fletcher, G. J. O., & Kerr, P. S. G. (2010). Through the eyes of love: Reality and illusion in intimate relationships. *Psychological Bulletin*, 136, 627–658.
- Foa, E. B., Gilboa-Schechtman, E., Amir, N., & Freshmen, M. (2000). Memory bias in generalized social phobia: Remembering negative emotional expressions. *Journal of Anxiety Disorders*, 14, 501–519.
- Gächter, S., Starmer, C., & Tufano, F. (2015). Measuring the closeness of relationships: A comprehensive evaluation of the “Inclusion of the Other in the Self” Scale. *PLoS One*, 10, e0129478.
- Galinsky, A. D., Ku, G., & Wang, C. S. (2005). Perspective-taking and self-other overlap: Fostering social bonds and facilitating social coordination. *Group Processes & Intergroup Relations*, 8, 109–124. <https://doi.org/10.1177/1368430205051060>

- Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: Decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of Personality and Social Psychology*, 78, 708–724. <https://doi.org/10.1037/0022-3514.78.4.708>
- Gardner, W. L., Pickett, C. L., & Brewer, M. B. (2000). Social exclusion and selective memory: How the need to belong influences memory for social events. *Personality and Social Psychology Bulletin*, 26, 486–496. <https://doi.org/doi:10.1177/0146167200266007>
- Gardner, W. L., Pickett, C. L., Jefferis, V., & Knowles, M. L. (2005). On the outside looking in: Loneliness and social monitoring. *Personality and Social Psychology Bulletin*, 31, 1549–1560. <https://doi.org/10.1177/0146167205277208>
- Gazelle, H., & Druhen, M. J. (2009). Anxious solitude and peer exclusion predict social helplessness, upset affect, and vagal regulation in response to behavioral rejection by a friend. *Developmental Psychology*, 45, 1077–1096. <https://doi.org/10.1037/a0016165>
- Gazelle, H., & Rudolph, K. D. (2004). Moving toward and away from the world: Social approach and avoidance trajectories in anxious solitary youth. *Child Development*, 75, 829–849. <https://doi.org/10.1111/j.1467-8624.2004.00709.x>
- Gerdes, K. E., Segel, E. A., & Lietz, C. A. (2010). Conceptualising and measuring empathy. *British Journal of Social Work*, 40, 2326–2343. <https://doi.org/10.1093/bjsw/bcq048>
- Gilbert, P., & Trower, P. (2001). *Evolution and Processes in Social Anxiety*. New York, NY: John Wiley & Sons Ltd.
- Gilboa-Schechtman, E., & Schachar-Lavie, I. (2013). More than a face: A unified theoretical perspective on nonverbal social cue processing in social anxiety. *Frontiers in Human Neuroscience*, 7, 1–14. <https://doi.org/10.3389/fnhum.2013.00904>

- Gleason, K. A., Jensen-Campbell, L. A., & Ickes, W. (2009). The role of empathic accuracy in adolescents' peer relations and adjustment. *Personality and Social Psychology Bulletin*, 35, 997–1011. <https://doi.org/10.1177/0146167209336605>
- Goldin, P. R., Manber, T., Hakimi, S., Canli, T., & Gross, J. J. (2009). Neural bases of social anxiety disorder: Emotional reactivity and cognitive regulation during social and physical threat. *Archives of General Psychiatry*, 66(2), 170–180.
- Gren-Landell, M., Aho, N., Andersson, G., & Svedin, C. G. (2011). Social anxiety disorder and victimization in a community sample of adolescents. *Journal of Adolescence*, 34, 569–577. <https://doi.org/10.1016/j.adolescence.2010.03.007>
- Griffiths, P. E. (1997). *What emotions really are: The problem of psychological categories*. Chicago: University of Chicago Press.
- Gross, J. J., & Levenson, R. W. (1993). Emotional suppression: Physiology, self-report, and expressive behavior. *Journal of Personality and Social Psychology*, 64, 970–986. <https://doi.org/10.1037/0022-3514.64.6.970>
- Gutz, L., Renneberg, B., Roepke, S., & Niedeggen, M. (2015). Neural processing of social participation in borderline personality disorder and social anxiety disorder. *Journal of Abnormal Psychology*, 124, 421–431. <https://doi.org/10.1037/a0038614>
- Gutz, L., Roepke, S., & Renneberg, B. (2016). Cognitive and affective processing of social exclusion in borderline personality disorder and social anxiety disorder. *Behaviour Research and Therapy*. <https://doi.org/10.1016/j.brat.2016.08.020>
- Hartgerink, C. H. J., van Beest, I., Wicherts, J. M., & Williams, K. D. (2015). The ordinal effects of ostracism: A meta-analysis of 120 Cyberball studies. *PLoS One*, 10, e012700. <https://doi.org/10.1371/journal.pone.0127002>

- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process: A regression-based approach*. New York: Guilford Press.
- Heerey, E. A., & Kring, A. M. (2007). Interpersonal consequences of social anxiety. *Journal of Abnormal Psychology, 116*(1), 125–134. <https://doi.org/10.1037/0021-843X.116.1.125>
- Hein, G., & Singer, T. (2008). I feel how you feel but not always: The empathic brain and its modulation. *Current Opinion in Neurobiology, 18*, 153–158.
<https://doi.org/10.1016/j.conb.2008.07.012>
- Hess, Y. D., & Pickett, C. L. (2010). Social rejection and self-versus other-awareness. *Journal of Experimental Social Psychology, 46*, 453–456. <https://doi.org/10.1016/j.jesp.2009.12.004>
- Heuer, K., Rinck, M., & Becker, E. S. (2007). Avoidance of emotional facial expressions in social anxiety: The Approach-Avoidance Task. *Behaviour Research and Therapy, 45*, 2990–3001. <https://doi.org/10.1016/j.brat.2007.08.010>
- Hezel, D. M., & McNally, R. J. (2014). Theory of mind impairments in social anxiety disorder. *Behavior Therapy, 45*, 530–540. <https://doi.org/10.1016/j.beth.2014.02.010>
- Hirsch, C. R., & Clark, D. M. (2004). Information-processing bias in social phobia. *Clinical Psychology Review, 24*, 799–825. <https://doi.org/10.1016/j.cpr.2004.07.005>
- Hirsch, C. R., & Mathews, A. (2000). Impaired positive inferential bias in social phobia. *Journal of Abnormal Psychology, 109*, 705–712. <https://doi.org/10.1037/0021-843X.109.4.705>
- Hirt, E. R., Devers, E. E., & McCrea, S. M. (2008). I want to be creative: Exploring the role of hedonic contingency theory in the positive mood-cognitive flexibility link. *Journal of Personality and Social Psychology, 94*, 214–230. <https://doi.org/10.1037/0022-3514.94.2.94.2.214>

- Hodges, S. D. (2005). Is how much you understand me in your head or mine? In B. F. Malle & S. D. Hodges (Eds.), *Other minds: How humans bridge the divide between self and others* (pp. 298–309). New York: Guilford.
- Hodges, S. D., Johnsen, A. T., & Scott, N. S. (2002). You're like me, no matter what you say: Self projection in self-other comparisons. *Psychologica Belgica*, 42, 107–112.
- Hodges, S. D., Kiel, K. J., Kramer, A. D. I., Veach, D., & Villanueva, B. R. (2010). Giving birth to empathy: The effects of similar experience on empathic accuracy, empathic concern, and perceived empathy. *Personality and Social Psychology Bulletin*, 36, 398–409.
<https://doi.org/10.1177/0146167209350326>
- Hodges, S. D., & Klein, K. J. K. (2001). Regulating the costs of empathy: The price of being human. *Journal of Socio-Economics*, 30, 437–452.
- Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and justice*. New York: Cambridge University Press.
- Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive Behaviour Therapy*, 36, 193–209.
<https://doi.org/10.1080/16506070701421313>
- Hofmann, S. G., & Barlow, D. H. (2002). Social phobia (social anxiety disorder). In D. H. Barlow (Ed.), *Anxiety and Irs Disorders: The Nature and Treatment of Anxiety and Panic* (2nd ed., pp. 454–476). New York: Guilford Press.
- Hofmann, S. G., Heinrichs, N., & Moscovitch, D. A. (2004). The nature and expression of social phobia: Toward a new classification. *Clinical Psychology Review*, 24, 769–797.
<https://doi.org/10.1016/j.cpr.2004.07.004>

- Hooker, C. I., Verosky, S. C., Germine, L. T., Knight, R. T., & D'Esposito, M. (2008). Mentalizing about emotion and its relationship to empathy. *Social Cognitive and Affective Neuroscience*, 3, 204–217. <https://doi.org/10.1093/scan/nsn019>
- Ickes, W. (1997). *Empathic accuracy*. New York, NY: Guilford Press.
- Ickes, W. (2001). Measuring empathic accuracy. In J. A. Hall & F. J. Bernieri (Eds.), *Interpersonal sensitivity: Theory and measurement* (pp. 219–241). Mahwah, NJ: Lawrence Erlbaum Associates Publishers.
- Ickes, W., Stinson, L., Bissonnette, V., & Garcia, S. (1990). Naturalistic social cognition: Empathic accuracy in mixed-sex dyads. *Journal of Personality and Social Psychology*, 59, 730–742. <https://doi.org/10.1037/0022-3514.59.4.730>
- Ickes, W., & Tooke, W. (1988). The observational method: Studying the interaction of minds and bodies. In S. Duck, D. F. Hay, S. E. Hobfoll, W. Ickes, & B. M. Montgomery (Eds.), *Handbook of personal relationships: Theory, research and interventions* (pp. 79–97). Oxford, England: John Wiley & Sons Ltd.
- Iffland, B., Sansen, L. M., Catani, C., & Neuner, F. (2014). The trauma of peer abuse: effects of relational peer victimization and social anxiety disorder on physiological and affective reactions to social exclusion. *Frontier in Psychiatry*, 18, 5–26. <https://doi.org/10.3389/fpsy.2014.00026>
- Isen, A. M., & Simmonds, S. F. (1978). The effect of feeling good on a helping task that is incompatible with good mood. *Social Psychology*, 41, 346–349. <https://doi.org/10.2307/3033588>

- Jackson, P. L., Meltzoff, A. N., & Decety, J. (2005). How do we perceive the pain of others? A window into the neural processes involved in empathy. *NeuroImage*, 24, 771–779.
<https://doi.org/10.1016/j.neuroimage.2004.09.006>
- Jacobs, M., Snow, J., Geraci, M., Vythilingam, M., Blair, R. J. R., Charney, D. S., ... Blair, K. S. (2008). Association between level of emotional intelligence and severity of anxiety in generalized social phobia. *Journal of Anxiety Disorders*, 22, 1487–1495.
<https://doi.org/10.1016/j.janxdis.2008.03.003>
- Janssen, G., De Mey, H., Hendriks, A., Koppers, A., Kaarsemaker, M., Witteman, C., & Egger, J. (2014). Assessing deictic relational responding in individuals with social anxiety disorder: Evidence of perspective-taking difficulties. *The Psychological Record*, 64, 21–29. <https://doi.org/10.1007/s40732-014-0013-3>
- Kashdan, T. (2007). Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. *Clinical Psychology Review*, 27, 348–365.
<https://doi.org/10.1016/j.cpr.2006.12.003>,
- Kashdan, T., & Breen, W. E. (2008). Social anxiety and positive emotions: A prospective examination of a self-regulatory model with tendencies to suppress or express emotions as a moderating variable. *Behavior Therapy*, 39, 1–12.
<https://doi.org/10.1016/j.beth.2007.02.003>
- Kashdan, T., Farmer, A. S., Adams, L. M., Ferssizidis, P., McKnight, P. E., & Nezlek, J. B. (2013). Distinguishing healthy adults from people with social anxiety disorder: Evidence for the value of experiential avoidance and positive emotions in everyday social interactions. *Journal of Abnormal Psychology*, 122, 645–655.
<https://doi.org/10.1037/a0032733>

- Keen, S. (2007). *Empathy and the novel*. New York: Oxford University Press.
- Keysers, C., & Gazzola, V. (2006). Towards a unifying neural theory of social cognition. *Progress in Brain Research*, 156, 379–401.
- Keysers, C., Kaas, J. H., & Gazzola, V. (2010). Somatosensation in social perception. *Nature Reviews Neuroscience*, 11, 417–428. <https://doi.org/10.1038/nrn2833>
- Kiecolt-Glaser, J. K., McGuire, L., Robles, T. F., & Glaser, R. (2002). Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Annual Review of Psychology*, 53, 83–107. <https://doi.org/10.1146/annurev.psych.53.100901.135217>
- Kim, E. J., & Buschmann, M. B. T. (2006). Reliability and validity of the Faces Pain Scale with older adults. *International Journal of Nursing Studies*, 43, 447–456.
- Klumpp, H., & Amir, N. (2009). Examination of vigilance and disengagement of threat in social anxiety with a probe detection task. *Anxiety, Stress & Coping*, 22, 283–296. <https://doi.org/10.1080/10615800802449602>
- Koster, E. H. W., Crombez, G., Verschuere, B., & De Houwer, J. (2004). Selective attention to threat in the dot probe paradigm: Differentiating vigilance and difficulty to disengage. *Behaviour Research and Therapy*, 42, 1183–1192. <https://doi.org/10.1016/j.brat.2003.08.001>
- Krämer, U. M., Mohammadi, B., Doñamayor, N., Samii, A., & Münte, T. F. (2010). Emotional and cognitive aspects of empathy and their relation to social cognition—an fMRI-study. *Brain Research*, 1311, 110–120.
- Larsen, R. J., & Diener, E. (1992). Promises and problems with the circumplex model of emotion. In M. S. Clark (Ed.), *Emotion. Review of Personality and Social Psychology* (Vol. 13, pp. 22–59). Thousand Oaks, CA, USA: Sage Publications, Inc.

- Leary, M. R. (1983). A brief version of the Fear of Negative Evaluation Scale. *Personality and Social Psychology Bulletin*, 9, 371–375. <https://doi.org/10.1177/0146167283093007>
- Leary, M. R., & Kowalski, R. M. (1995). *Social anxiety*. New York, NY: Guilford Press.
- Letzring, T. D. (2010). The effects of judge-target gender and ethnicity similarity on the accuracy of personality judgments. *Social Psychology*, 41, 42–51.
<https://doi.org/10.1027/1864-9335/a000007>
- Levenson, R. W., & Ruef, A. M. (1992). Empathy: A physiological substrate. *Journal of Personality and Social Psychology*, 63, 234–246.
- Lewis, M. (2000). Self-conscious emotions: Embarrassment, pride, shame, and guilt. In M. Lewis & Haviland-Jones (Eds.), *Handbook of Emotions* (2nd ed., pp. 573–691). New York; London: Guilford Press.
- Lieberman, M. D. (2007). Social cognitive neuroscience: A review of core processes. *Annual Review of Psychology*, 58, 259–289.
<https://doi.org/10.1146/annurev.psych.58.110405.085654>
- Lieberman, M. D. (2010). Social cognitive neuroscience. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of Social Psychology* (5th ed., pp. 143–193). New York: McGraw-Hill.
- Lim, D., & DeSteno, D. (2016). Suffering and compassion: The links among adverse life experiences, empathy, compassion, and prosocial behavior. *Emotion*, 16, 175–182.
<https://doi.org/10.1037/emo0000144>
- Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes*, 65, 272–292.
<https://doi.org/10.1006/obhd.1996.0028>

- MacDonald, G., & Jensen-Campbell, L. A. (Eds.). (2011). *Social Pain: Neuropsychological and Health Implications of Loss and Exclusion*. Washington, DC.
- Mallot, M. A., Maner, J. K., DeWall, C. N., & Schmidt, N. B. (2009). Compensatory deficits following rejection: The role of social anxiety in disrupting affiliative behavior. *Depression and Anxiety*, (26), 438–446.
- Manczak, E. M., Basu, D., & Chen, E. (2015). The price of perspective taking: Child depressive symptoms interact with parental empathy to predict immune functioning in parents. *Clinical Psychological Science*, 4, 1–8. <https://doi.org/10.1177/2167702615595001>
- Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the “Porcupine Problem.” *Journal of Personality and Social Psychology*, 92(1), 42–55. <https://doi.org/10.1037/0022-3514.92.1.42>
- Masten, C. L., Morelli, S. A., & Eisenberger, N. I. (2011). An fMRI investigation of empathy for “social pain” and subsequent prosocial behavior. *NeuroImage*, 55, 381–388. <https://doi.org/10.1016/j.neuroimage.2010.11.060>
- Mathur, V. A., Harada, T., Lipke, T., & Chiao, J. Y. (2010). Neural basis of extraordinary empathy and altruistic motivation. *NeuroImage*, 51, 1468–1475. <https://doi.org/10.1016/j.neuroimage.2010.03.025>
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, 36, 455–470. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- McCabe, R. E., Antony, M. M., Summerfeldt, L. J., Liss, A., & Swinson, R. P. (2003). Preliminary examination of the relationship between anxiety disorders in adults and self-

- reported history of teasing of bullying experiences. *Cognitive Behaviour Therapy*, 32, 187–193. <https://doi.org/10.1080/16506070310005051>
- McHugh, L., Barnes-Holmes, Y., & Barnes-Holmes, D. (2004). Perspective-taking as relational responding: A developmental profile. *The Psychological Record*, 54, 115–144.
- McKay, R. T., & Dennett, D. C. (2009). The evolution of misbelief. *Behavioural and Brain Sciences*, 32, 493–510. <https://doi.org/10.1017/S0140525X09990975>
- McManus, F., Sacadura, C., & Clark, D. M. (2008a). Why social anxiety persists: An experimental investigation of the role of safety behaviours as a maintaining factor. *Journal of Behavior Therapy and Experimental Psychiatry*, 29, 147–161. <https://doi.org/10.1016/j.jbtep.2006.12.002>
- McManus, F., Sacadura, C., & Clark, D. M. (2008b). Why social anxiety persists: An experimental investigation of the role of safety behaviours as a maintaining factor. *Journal of Behavior Therapy and Experimental Psychiatry*, 29, 147–161. <https://doi.org/10.1016/j.jbtep.2006.12.002>
- Meleshko, K. G., & Alden, L. E. (1993). Anxiety and self-disclosure: Toward a motivational model. *Journal of Personality and Social Psychology*, 64, 1000–1009. <https://doi.org/10.1037/0022-3514.64.6.1000>
- Merikangas, K. R., Avenevoli, S., Acharyya, S., Zhang, H., & Angst, J. (2002). The spectrum of social phobia in the Zurich cohort study of young adults. *Biological Psychiatry*, 51, 81–91.
- Meyer, M. L., Masten, C. L., Ma, Y., Wang, C., Shi, Z., Eisenberger, N. I., & Han, S. (2012). Empathy for the social suffering of friends and strangers recruits distinct patterns of brain

- activation. *Social Cognitive and Affective Neuroscience*, 8, 446–454.
<https://doi.org/10.1093/scan/nss019>
- Miano, A., Dziobek, I., & Roepke, S. (2017). Understanding interpersonal dysfunction in borderline personality disorder: A naturalistic dyadic study reveals absence of relationship-protective empathic inaccuracy. *Clinical Psychological Science*, 5, 355–366.
<https://doi.org/10.1177/2167702616683505>
- Miskovic, V., & Schmidt, L. A. (2012). Social fearfulness in the human brain. *Neuroscience & Biobehavioral Reviews*, 36, 459–478.
- Mitchell, J. (2008). Contributions of functional neuroimaging to the study of social cognition. *Current Directions in Psychological Science*, 17, 142–146.
- Mogg, K., Philippot, P., & Bradley, B. P. (2004). Selective attention to angry faces in clinical social phobia. *Journal of Abnormal Psychology*, 113, 160–165.
<https://doi.org/10.1037/0021-843X.113.1.160>
- Mohlman, J., Carmin, C. N., & Price, R. B. (2007). Jumping to interpretations: Social anxiety disorder and the identification of emotional facial expressions. *Behaviour Research and Therapy*, 45, 591–599. <https://doi.org/10.1016/j.brat.2006.03.007>
- Morrison, A. S., Mateen, M. A., Brozovich, F. A., Zaki, J., Goldin, P. R., Heimberg, R. G., & Gross, J. J. (2016). Empathy for positive and negative emotions in social anxiety disorder. *Behaviour Research and Therapy*, 87, 232–242.
<https://doi.org/10.1016/j.brat.2016.10.005>
- Morrison, I., Lloyd, D., Di Pellegrino, G., & Roberts, N. (2004). Vicarious responses to pain in anterior cingulate cortex: Is empathy a multisensory issue? *Cognitive, Affective & Behavioral Neuroscience*, 4, 270–278. <https://doi.org/10.3758/CABN.4.2.270>

- Niels Christensen, P., Stein, M. B., & Means-Christensen, A. (2003). Social anxiety and interpersonal perception: a social relations model analysis. *Behaviour Research and Therapy*, 41, 1355–1371. [https://doi.org/10.1016/S0005-7967\(03\)00064-0](https://doi.org/10.1016/S0005-7967(03)00064-0)
- Nordgren, L. F., MacDonald, G., & Banas, K. (2011). Empathy gaps for social pain: Why people underestimate the pain of social suffering. *Journal of Personality and Social Psychology*, 100, 120–128. <https://doi.org/10.1037/a0020938>
- Oaten, M., Williams, K. D., Jones, A., & Andrew, L. (2008). The effects of ostracism on self-regulation in the socially anxious. *Journal of Social and Clinical Psychology*, 27, 471–504.
- Ochsner, K. N., Ray, R. D., Cooper, J. C., Robertson, E. R., Chopra, S., Gabrieli, J. D. E., & Gross, J. J. (2004). For better or for worse: neural systems supporting the cognitive down- and up-regulation of negative emotion. *NeuroImage*, 23, 483–499. <https://doi.org/10.1016/j.neuroimage.2004.06.030>
- Ohayon, M. M., & Schatzberg, A. F. (2010). Social phobia and depression: Prevalence and comorbidity. *Journal of Psychosomatic Research*, 68, 235–243. <https://doi.org/10.1016/j.jpsychores.2009.07.018>.
- O'Toole, M. S., Hougaard, E., & Mennin, D. S. (2013). Social anxiety and emotion knowledge: A meta-analysis. *Journal of Anxiety Disorders*, 27, 98–108. <https://doi.org/dx.doi.org/10.1016/j.janxdis.2012.09.005>
- Palm, K. M., Polusny, M. A., & Follette, V. M. (2004). Vicarious traumatization: Potential hazards and interventions for disaster and trauma workers. *Prehospital and Disaster Medicine*, 19, 73–78.

- Perner, J., & Wimmer, H. (1985). "John thinks that Mary thinks that..." attribution of second-order beliefs by 5- to 10-year-old children. *Journal of Experimental Child Psychology*, 39, 437–471.
- Pickett, C. L., & Gardner, W. L. (2005). The Social Monitoring System: Enhanced sensitivity to social cues as an adaptive response to social exclusion. In K. D. Williams, J. P. Forgas, & von Hippel (Eds.), *The Social Outcast: Ostracism, Social Exclusion, Rejection, and Bullying* (pp. 213–226). New York: US Psychology Press.
- Pickett, C. L., Gardner, W. L., & Knowles, M. (2004). Getting a cue: The need to belong and enhanced sensitivity to social cues. *Personality and Social Psychology Bulletin*, 30, 1095–1107. <https://doi.org/10.1177/0146167203262085>
- Pishyar, R., Harris, L. M., & Menzies, R. G. (2004). Attentional bias for words and faces in social anxiety. *Anxiety, Stress & Coping*, 17, 23–36.
<https://doi.org/10.1080/10615800310001601458>
- Plana, I., Lavoie, M.-A., Battaglia, M., & Achim, E. M. (2014). A meta-analysis and scoping review of social cognition performance in social phobia, posttraumatic stress disorder and other anxiety disorders. *Journal of Anxiety Disorders*, 28, 169–177.
<https://doi.org/10.1016/j.janxdis.2013.09.005>
- Plasencia, M. L., Alden, L. E., & Taylor, C. T. (2011). Differential effects of safety behaviour subtypes in social anxiety disorder. *Behaviour Research and Therapy*, 49, 665–675.
<https://doi.org/10.1016/j.brat.2011.07.005>
- Power, M., & Dalgleish, T. (1997). *Cognition and Emotion: From Order to Disorder*. East Sussex, England: Psychology Press.

- Powers, K. E., & Heatherton, T. F. (2012). Characterizing socially avoidant and affiliative responses to social exclusion. *Frontiers in Integrative Neuroscience*, 6, 46.
<https://doi.org/10.3389/fnint.2012.00046>
- Powers, K. E., Wagner, D. D., Norris, C. J., & Heatherton, T. F. (2013). Socially excluded individuals fail to recruit medial prefrontal cortex for negative social scenes. *Social Cognitive and Affective Neuroscience*, 8, 151–157. <https://doi.org/10.1093/scan/nsr079>
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods*, 36, 717–731.
<https://doi.org/10.3758/BF03206553>
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*, 42, 185–227. <https://doi.org/10.1080/00273170701341316>
- Preston, S. D., & de Waal, F. B. M. (2002). Empathy: Its ultimate and proximate bases. *Behavioural and Brain Sciences*, 25, 1–20. <https://doi.org/10.1017/S0140525X02000018>
- Preston, S. D., & Hofelich, A. J. (2012). The many faces of empathy: Parsing empathic phenomena through a proximate, dynamic-systems view of representing the other in the self. *Emotion Review*, 4, 24–33. <https://doi.org/10.1177/1754073911421378>
- Quadflieg, S., Wendt, B., Mohr, A., Miltner, W. H. R., & Straube, T. (2007). Recognition and evaluation of emotional prosody in individuals with generalized social phobia: A pilot study. *Behaviour Research and Therapy*, 45, 3096–3103.
<https://doi.org/10.1016/j.brat.2007.08.003>

- Rameson, L. T., Morelli, S. A., & Lieberman, M. D. (2011). The neural correlates of empathy: Experience, automaticity, and prosocial behavior. *Journal of Cognitive Neuroscience*, 24, 235–245. https://doi.org/10.1162/jocn_a_00130
- Rapee, R. M. (1995). Descriptive psychopathology of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 41–66). New York: Guilford Press.
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, 35, 741–756. [https://doi.org/10.1016/S0005-7967\(97\)00022-3](https://doi.org/10.1016/S0005-7967(97)00022-3)
- Reijntjes, A., Thomaes, S., Boelen, P. A., van der Schoot, M., Orbio de Castro, B., & Telch, M. J. (2011). Delighted when approved by others, to pieces when rejected: Children’s social anxiety magnifies the linkage between self- and other-evaluations. *Journal of Child Psychology and Psychiatry*, 52, 774–781. <https://doi.org/10.1111/j.1469-7610.2010.02325.x>
- Rinck, M., Rörtgen, T., Lange, W.-G., Dotsch, R., Wigboldus, D. H. J., & Becker, E. S. (2010). Social anxiety predicts avoidance behaviour in virtual encounters. *Cognition & Emotion*, 24, 1269–1276. <https://doi.org/10.1080/02699930903309268>
- Rodebaugh, T. L. (2009). Social phobia and perceived friendship quality. *Journal of Anxiety Disorders*, 23, 872–878. <https://doi.org/10.1016/j.janxdis.2009.05.001>
- Rodebaugh, T. L., Heimberg, R. G., Brown, P. J., Fernandez, K. C., Blanco, C., Schneier, F. R., & Liebowitz, M. R. (2011). More reasons to be straightforward: Findings and norms for two scales relevant to social anxiety. *Journal of Anxiety Disorders*, 25, 623–630. <https://doi.org/10.1016/j.janxdis.2011.02.002>

- Rodebaugh, T. L., Shumaker, E. A., Levinson, C. A., Fernandez, K. C., Langer, J. K., Lim, M., & Yarkoni, T. (2013). Interpersonal constraint conferred by generalized social anxiety disorder is evident on a behavioral economics task. *Journal of Abnormal Psychology*, 122, 39–44. <https://doi.org/10.1037/a0030975>
- Rodebaugh, T. L., Woods, C. M., & Heimberg, R. G. (2007). The reverse of social anxiety is not always the opposite: The reverse-scored items of the Social Interaction Anxiety Scale do not belong. *Behavior Therapy*, 38, 192–206.
- Roeyers, H., Buysse, A., Ponnet, K., & Pichal, B. (2001). Advancing advanced mind-reading tests: Empathic accuracy in adults with a pervasive developmental disorder. *The Journal of Child Psychology and Psychiatry*, 42, 271–278. <https://doi.org/10.1111/1469-7610.00718>
- Romero-Canyas, R., & Downey, G. (2013). What I see when I think it's about me: People low in rejection-sensitivity downplay cues of rejection in self-relevant interpersonal situations. *Emotion*, 13(1), 104–117. <https://doi.org/10.1037/a0029786>
- Romero-Canyas, R., Downey, G., Berenson, K., Ayduk, O., & Kang, N. J. (2010). Rejection sensitivity and the rejection-hostility link in romantic relationships. *Journal of Personality*, 78(1), 119–148. <https://doi.org/10.1111/j.1467-6494.2009.00611.x>
- Rubin, R. S., Munz, D. C., & Bommer, W. H. (2005). Leading from within: The effects of emotion recognition and personality on transformational leadership behavior. *The Academy of Management Journal*, 48, 845–858.
- Ruscio, A. M., Brown, T. A., Chiu, W. T., Sareen, J., Stein, M. B., & Kessler, R. C. (2008). Social fears and social phobia in the United States: Results from the National

- Comorbidity Survey Replication. *Psychological Medicine*, 38(1), 15–28.
<https://doi.org/10.1017/S0033291707001699>
- Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology*, 39, 1161–1178. <https://doi.org/10.1037/h0077714>
- Ruttan, R. L., McDonnell, M.-H., & Nordgren, L. F. (2015). Having “been there” doesn’t mean I care: When prior experience reduces compassion for emotional distress. *Journal of Personality and Social Psychology*, 108, 610–622. <https://doi.org/10.1037/pspi0000012>
- Sacco, D. F., Wirth, J. H., Hugenberg, K., Chen, Z., & Williams, K. D. (2011). The world in black and white: Ostracism enhances the categorical perception of social information. *Journal of Experimental Social Psychology*, 47, 836–842.
<https://doi.org/10.1016/j.jesp.2011.03.001>
- Schlenker, B. R., & Leary, M. R. (1985). Social anxiety and communication about the self. *Journal of Language and Social Psychology*, 4, 171–192.
<https://doi.org/10.1177/0261927X8543002>
- Schofield, C. A., Johnson, A. L., Inhoff, A. W., & Coles, M. E. (2012). Social anxiety and difficulty disengaging threat: Evidence from eye-tracking. *Cognition and Emotion*, 26, 300–311. <https://doi.org/10.1080/02699931.2011.602050>
- Schweinle, W. E., Ickes, W., & Bernstein, I. H. (2002). Emphatic inaccuracy in husband to wife aggression: The overattribution bias. *Personal Relationships*, 9, 141–158.
<https://doi.org/10.1111/1475-6811.00009>
- Seligman, M. E., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist*, 55, 5–14. <https://doi.org/10.1037//0003-066X.55.1.5>

- Sherbourne, C. D., Sullivan, G., Craske, M. G., Roy-Byrne, P., Golinelli, D., Rose, R. D., ...
 Stein, M. B. (2010). Functioning and disability levels in primary care out-patients with
 one or more anxiety disorders. *Psychological Medicine*, 40, 2059–2068.
<https://doi.org/10.1017/S0033291710000176>
- Simpson, J. A., Ickes, W., & Blackstone, T. (1995a). When the head protects the heart: Empathic
 accuracy in dating relationships. *Journal of Personality and Social Psychology*, 69, 629–
 641.
- Simpson, J. A., Ickes, W., & Blackstone, T. (1995b). When the head protects the heart: Empathic
 accuracy in dating relationships. *Journal of Personality and Social Psychology*, 69, 629–
 641. <https://doi.org/10.1037/0022-3514.69.4.629>
- Simpson, J. A., Ickes, W., & Grich, J. (1999a). When accuracy hurts: Reactions of anxious-
 uncertain individuals to a relationship-threatening situation. *Journal of Personality and
 Social Psychology*, 76, 754–769.
- Simpson, J. A., Ickes, W., & Grich, J. (1999b). When accuracy hurts: Reactions of anxious-
 uncertain individuals to a relationship-threatening situation. *Journal of Personality and
 Social Psychology*, 76, 754–769.
- Simpson, J. A., Kim, J. S., Fillo, J., Ickes, W., Rholes, W. S., Oriña, M., & Winterheld, H. A.
 (2011). Attachment and the management of empathic accuracy in relationship-threatening
 situations. *Personality and Social Psychology Bulletin*, 37, 242–254.
<https://doi.org/10.1177/0146167210394368>
- Simpson, J. A., Oriña, M., & Ickes, W. (2003). When accuracy hurts, and when it helps: A test of
 the empathic accuracy model in marital interactions. *Journal of Personality and Social
 Psychology*, 85, 881–893. <https://doi.org/10.1037/0022-3514.85.5.881>

- Singer, T. (2006). The neuronal basis and ontogeny of empathy and mind reading: Review of literature and implications for future research. *Neuroscience and Biobehavioral Reviews*, 30, 855–863. <https://doi.org/10.1016/j.neubiorev.2006.06.011>
- Singer, T., & Lamm, C. (2009). The social neuroscience of empathy. *The Year in Cognitive Neuroscience*, 1156, 81–96. <https://doi.org/10.1111/j.1749-6632.2009.04418.x>
- Singer, T., Seymour, B., O’Doherty, J., Kaube, H., Dolan, R. J., & Frith, C. D. (2004). Empathy for pain involves the affective but not sensory components of pain. *Science*, 303, 1157–1162.
- Singer, T., Seymour, B., O’Doherty, J. P., Klaas, E. S., Dolan, R. J., & Frith, C. D. (2006). Empathic neural responses are modulated by the perceived fairness of others. *Nature*, 439, 466–469. <https://doi.org/10.1038/nature04271>
- Smart Richman, L., & Leary, M. R. (2009). Reactions to discrimination, stigmatization, ostracism, and other forms of interpersonal rejection: A multimotive model. *Psychological Review*, 116, 365–383. <https://doi.org/10.1037/a0015250>
- Sparrevohn, R. M., & Rapee, R. M. (2009). Self-disclosure, emotional expression and intimacy within romantic relationships of people with social phobia. *Behaviour Research and Therapy*, 47, 1074–1078.
- Staebler, K., Helbing, E., Rosenbach, C., & Renneberg, B. (2011). Rejection sensitivity and borderline personality disorder. *Clinical Psychology and Psychotherapy*, 18, 275–283. <https://doi.org/10.1002/cpp.705>
- Staugaard, S. R. (2010). Threatening faces and social anxiety: A literature review. *Clinical Psychology Review*, 30, 669–690. <https://doi.org/10.1016/j.cpr.2010.05.001>

- Stein, M. B., & Kean, Y. M. (2000). Disability and quality of life in social phobia: Epidemiologic findings. *American Journal of Psychiatry*, 157, 1606–1613.
- Stein, M. B., Walker, J. R., & Forde, D. R. (1994). Setting diagnostic thresholds for social phobia: Considerations from a community survey of social anxiety. *American Journal of Psychiatry*, 151, 408–412.
- Stoltenberg, S. F., Christ, C. C., & Carlo, G. (2013). Afraid to help: social anxiety partially mediates the association between 5-HTTLPR triallelic genotype and prosocial behavior. *Social Neuroscience*, 8, 400–406.
- Stopa, L., & Clark, D. M. (2000). Social phobia and interpretation of social events. *Behaviour Research and Therapy*, 38, 273–283.
- Stuppy, D. J. (1998). The faces pain scale: Reliability and validity with mature adults. *Applied Nursing Research*, 11, 84–89.
- Summerfeldt, L. J., Kloosterman, P. H., Antony, M. M., McCabe, R. E., & Parker, J. D. A. (2010). Emotional intelligence in social phobia and other anxiety disorders. *Journal of Psychopathology and Behavioral Assessment*, 33, 69–78. <https://doi.org/10.1007/s10862-010-9199-0>
- Taylor, C. T., & Alden, L. E. (2005). Social interpretation bias and generalized social phobia: The influence of developmental experiences. *Behaviour Research and Therapy*, 43, 759–777. <https://doi.org/10.1016/j.brat.2004.06.006>
- Taylor, C. T., & Alden, L. E. (2010). Safety behaviors and judgmental biases in social anxiety disorder. *Behaviour Research and Therapy*, 48, 226–237. <https://doi.org/10.1016/j.brat.2009.11.005>
- Taylor, S. E. & Lobel, M. (198). Social comparison activity under threat: Downward evaluation

- and upward contacts. *Psychological Review*, 96, 569-575. doi: 10.1037/0033-295X.96.4.569
- Thompson, E. R. (2007). Development and validation of an internationally reliable short-form of the Positive and Negative Affect Schedule (PANAS). *Journal of Cross-Cultural Psychology*, 38, 227–242. <https://doi.org/10.1177/0022022106297301>
- Tibi-Elhanany, Y., & Shamay-Tsoory, S. G. (2011). Social cognition in social anxiety: first evidence for increased empathic abilities. - PubMed - NCBI. *The Israel Journal of Psychiatry and Related Sciences*, 48, 98–106.
- Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology*, 81, 1058–1079. <https://doi.org/10.1037//0022-3514.81.6.1058>
- Van Kleef, G. A. (2009). How emotions regulate social life: The Emotions as Social Information (EASI) model. *Current Directions in Psychological Science*, 18, 184–188. <https://doi.org/10.1111/j.1467-8721.2009.01633.x>
- Velijaca, K. A., & Rapee, R. M. (1998). Detection of negative and positive audience behaviours by socially anxious subjects. *Behavior Research and Therapy*, 36, 311–321.
- Verhofstadt, L. L., Buysse, A., Ickes, W., Davis, M. H., & Devoldre, I. (2008). Support provision in marriage: The role of emotional similarity and empathic accuracy. *Emotion*, 8, 792–802. <https://doi.org/10.1037/a0013976>
- Völlm, B. A., Taylor, A. N. W., Richardson, P., Corcoran, R., Stirling, J., McKie, S., ... Elliot, R. (2006). Neuronal correlates of theory of mind and empathy: A functional magnetic resonance imaging study in a nonverbal task. *NeuroImage*, 29, 90–98. <https://doi.org/10.1016/j.neuroimage.2005.07.022>

- Voncken, M. J., Alden, L. E., Bögels, S. M., & Roelofs, J. (2008). Social rejection in social anxiety disorder: The role of performance deficits, evoked negative emotions and dissimilarity. *British Journal of Clinical Psychology, 47*, 439–450.
<https://doi.org/10.1348/014466508X334745>
- Voncken, M. J., Bögels, S. M., & de Vries, K. (2003). Interpretation and judgmental biases in social phobia. *Behaviour Research and Therapy, 41*, 1481–1488.
- Voncken, M. J., Dijk, C., de Jong, P. J., & Roelofs, J. (2010). Not self-focused attention but negative beliefs affect poor social performance in social anxiety: An investigation of pathways in the social anxiety-social rejection relationship. *Behaviour Research and Therapy, 48*, 984–991. <https://doi.org/10.1016/j.brat.2010.06.004>
- Voncken, M. J., & Dijk, K. F. L. (2013). Socially anxious individuals get a second chance after being disliked at first sight: The role of self-disclosure in the development of likeability in sequential social contact. *Cognitive Therapy and Research, 37*, 7–17.
<https://doi.org/10.1007/s10608-012-9449-4>
- Wang, Y.-P., & Gorenstein, C. (2013). Psychometric properties of the Beck Depression Inventory-II: A comprehensive review. *Revista Brasileira de Psiquiatria, 35*, 416–431.
- Washburn, D., Wilson, G., Roes, M., Rnic, K., & Harkness, K. L. (2016). Theory of mind in social anxiety disorder, depression, and comorbid conditions. *Journal of Anxiety Disorders, 37*, 71–77. <https://doi.org/10.1016/j.janxdis.2015.11.004>
- Watson, D., & Clark, L. A. (1994). *The PANAS-X: Manual for the Positive and Negative Affect Schedule-Expanded Form*. Ames: The University of Iowa.

- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of P*, 54, 1063–1070.
<https://doi.org/10.1037/0022-3514.54.6.1063>
- Watson, D., Hubbard, B., & Wiese, D. (2000). Self–other agreement in personality and affectivity: The role of acquaintanceship, trait visibility, and assumed similarity. *Journal of Personality and Social Psychology*, 78, 546–558. <https://doi.org/10.1037/0022-3514.78.3.546>
- Watson, D., Klohnen, E. C., Casillas, A., Simms, E. N., Haig, J., & Berry, D. S. (2004). Match makers and deal breakers: Analysis of assortative mating in newlywed couples. *Journal of Personality*, 72, 1029–1068. <https://doi.org/10.1111/j.0022-3506.2004.00289.x>
- Weeks, J. W., Heimberg, R. G., Rodebaugh, T. L., & Norton, P. J. (2008). Exploring the relationship between fear of positive evaluation and social anxiety. *Journal of Anxiety Disorders*, 22, 386–400. <https://doi.org/10.1016/j.janxdis.2007.04.009>
- Weisman, O., Aderka, I. M., Marom, S., Hermesh, H., & Gilboa-Schechtman. (2011). Social rank and affiliation in social anxiety disorder. *Behaviour Research and Therapy*, 49, 399–405. <https://doi.org/10.1016/j.brat.2011.03.010>
- Wesselmann, E. D., Bagg, D., & Williams, K. D. (2009). “I Feel Your Pain”: The effects of observing ostracism on the ostracism detection system. *Journal of Experimental Social Psychology*, 45, 1308–1311. <https://doi.org/10.1016/j.jesp.2009.08.003>
- Wesselmann, E. D., Nairne, J. S., & Williams, K. D. (2012). An evolutionary social psychological approach to studying the effects of ostracism. *Journal of Social, Evolutionary, and Cultural Psychology*, 6, 309–328.

- Williams, K. D. (2007). Ostracism. *Annual Review of Psychology*, 58, 425–452.
<https://doi.org/10.1146/annurev.psych.58.110405.085641>
- Williams, K. D., Cheung, C. K., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology*, 79, 748–762.
<https://doi.org/10.1037/0022-3514.79.5.748>
- Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior Research Methods*, 38, 174–180.
<https://doi.org/10.3758/BF03192765>
- Xu, X., Zuo, X., Wang, X., & Han, S. (2009). Do you feel my pain? Racial group membership modulates empathic neural responses. *The Journal of Neuroscience*, 29, 8525–8529.
<https://doi.org/10.1523/JNEUROSCI.2418-09.2009>
- Yang, J.-W., Yoon, K. L., Chong, S. C., & Oh, K. J. (2013). Accurate but pathological: Social anxiety and ensemble coding of emotion. *Cognitive Therapy and Research*, 37, 572–578.
<https://doi.org/10.1007/s10608-012-9500-5>
- Yoon, K. L., & Zinbarg, R. E. (2008). Interpreting neutral faces as threatening is a default mode for socially anxious individuals. *Journal of Abnormal Psychology*, 117, 680–685.
<https://doi.org/10.1037/0021-843X.117.3.680>
- Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology*, 42, 692–697. <https://doi.org/10.1016/j.jesp.2005.10.007>
- Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and

meaningful existence. *Journal of Experimental Social Psychology*, 40, 560–567.

<https://doi.org/10.1016/j.jesp.2003.11.006>

Zaki, J., & Cikara, M. (2015). Addressing empathic failures. *Current Directions in Psychological Science*, 24, 471–476. <https://doi.org/10.1177/0963721415599978>

Zoccola, P. M., Green, M. C., Karoutsos, E., Katona, S. M., & Sabini, J. (2011). The embarrassed bystander: Embarrassability and the inhibition of helping. *Personality and Individual Differences*, 51, 925–929. <https://doi.org/10.1016/j.paid.2011.07.026>

Appendix I: I-PANAS-SF Video Rating Form (Study 1 & 3)

This scale consists of a number of words that describe different feelings and emotions.
Over the length of the video, to what *extent* does the **person in the video** feel:

	<i>Never</i>				<i>Quite a bit</i>
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

Please indicate to what extent **you** *currently* feel:

Very slightly or not at all			Quite a bit			Very slightly or not at all			Quite a bit		
1. Upset	1	2	3	4	5	6. Nervous	1	2	3	4	5
2. Hostile	1	2	3	4	5	7. Determined	1	2	3	4	5
3. Alert	1	2	3	4	5	8. Attentive	1	2	3	4	5
4. Ashamed	1	2	3	4	5	9. Afraid	1	2	3	4	5
5. Inspired	1	2	3	4	5	10. Active	1	2	3	4	5

Appendix II: Cyberball Manipulation Check Questionnaire (Study 1)

Please indicate the degree to which you feel the statements below reflect your experience playing the Cyberball game. Circle the number indicating the answer option that best answers the question for you.

	Not at all							Very much so	
1. I felt like I could visualize the other participants clearly	1	2	3	4	5	6	7	8	9
2. I felt poorly accepted by the other participants.	1	2	3	4	5	6	7	8	9
3. I found that I could visualize the context around me during the game.	1	2	3	4	5	6	7	8	9
4. I felt like an outsider during the game.	1	2	3	4	5	6	7	8	9
5. I had trouble waiting for the ball to be thrown.	1	2	3	4	5	6	7	8	9
6. I imagined that the other participants in the game were nice.	1	2	3	4	5	6	7	8	9
7. I could visualize myself throwing and catching the ball during the game.	1	2	3	4	5	6	7	8	9
8. I felt as though I had made a "connection" or bonded with one or more of the participants" during the game.	1	2	3	4	5	6	7	8	9

Please answer the following questions on a scale from -25 (*extremely negative/bad*) to +25 (*Extremely positive/good*) where 0 indicates that neither option describes your experience. Write the number that best describes your feelings in the box next to the questions.

1. How would you describe your experience playing the Cyberball game?"	-25 (<i>Extremely negative</i>) to +25 (<i>Extremely positive</i>)	<input type="text"/>
2. The Cyberball game made me feel:	-25 (<i>Extremely bad</i>) to +25 (<i>Extremely good</i>)	<input type="text"/>

Appendix III: Modified I-PANAS-SF Video Rating Form (Study 2)

Video #

I-PANAS-SF

This scale consists of a number of words that describe different feelings and emotions.
Over the length of the video, to what *extent* does the **person in the video** feel:

	<i>Very slightly or not at all</i>			<i>Moderately</i>			<i>Quite a bit</i>
Happy	1	2	3	4	5	6	7
Hostile	1	2	3	4	5	6	7
Upset	1	2	3	4	5	6	7
Ashamed	1	2	3	4	5	6	7
Enthusiastic	1	2	3	4	5	6	7
Nervous	1	2	3	4	5	6	7
Cheerful	1	2	3	4	5	6	7
Excited	1	2	3	4	5	6	7
Afraid	1	2	3	4	5	6	7
Proud	1	2	3	4	5	6	7

Please indicate to what extent **you** *currently* feel:

	Very slightly or not at all			Moderately			Quite a bit				Very slightly or not at all			Moderately			Quite a bit		
6. Happy	1	2	3	4	5	6	7		11. Nervous	1	2	3	4	5	6	7			
7. Hostile	1	2	3	4	5	6	7		12. Cheerful	1	2	3	4	5	6	7			
8. Upset	1	2	3	4	5	6	7		13. Excited	1	2	3	4	5	6	7			
9. Ashamed	1	2	3	4	5	6	7		14. Afraid	1	2	3	4	5	6	7			
10. Enthusiastic	1	2	3	4	5	6	7		15. Proud	1	2	3	4	5	6	7			

Appendix IV: Advice Questionnaire (Study 2)

Imagine that you were going to meet the individuals in the videos you just watched. If these individuals were to ask you for advice about how to handle the **exclusion** situations they discussed, how *likely* would you be to give them the following pieces of advice:

<i>I would tell them ...</i>	<i>Not likely</i>	<i>Somewhat likely</i>			<i>Likely</i>
To never speak to those friends again	1	2	3	4	5
To try and find other friends who are more positive	1	2	3	4	5
To tell those friends off! Tell them how angry you feel.	1	2	3	4	5
There's not much you can really do in these situations but accept it and move on.	1	2	3	4	5
To try and talk to their friends to find out what went wrong and try to work things out.	1	2	3	4	5
Nothing, I wouldn't know what to say to them.	1	2	3	4	5
There's nothing to be done as some people are mean and this is just a part of life.	1	2	3	4	5
That maybe they misunderstood the others.	1	2	3	4	5
To tell their friends how hurt they were.	1	2	3	4	5
To try and find a way to get back at their friends in a similar way.					

Appendix V: Personal Questionnaire (Study 2 & 3)

Please fill out the following information about yourself. When you are finished, we will share this document with the other participant. Please try to answer as honestly as possible and there are no right or wrong answers. When you are finished, please let the experimenter know.

1. What is your first name?
2. How old are you?
3. Where were you born?
4. What year of university in and what is your major? If you have not yet declared a major, what do you think you might major in?
5. Please list 3-4 hobbies or activities that you really like to do in your free time
6. What is one of your biggest pet peeves (something that bothers you about other people)?
7. What is one recent accomplishment, big or small, that you are proud of?
8. What is one thing that is stressing you out right now?
9. What are some of the important qualities you look for in an ideal partner?

Appendix VI: Personal Questionnaire for Partner (Study 2 & 3)

Please fill out the following information about yourself. When you are finished, we will share this document with the other participant. Please try to answer as honestly as possible and there are no right or wrong answers. When you are finished, please let the experimenter know.

1. What is your first name?
Matt/Jenn
2. How old are you?
18
3. Where were you born?
Toronto
4. What year of university in and what is your major? If you have not yet declared a major, what do you think you might major in?
1st year and I want to major in economics, minor in psych
5. Please list 3-4 hobbies or activities that you really like to do in your free time
Running, playing soccer, volunteering
6. What is one of your biggest pet peeves (something that bothers you about other people)?
People that are dull and uninteresting
7. What is one recent accomplishment, big or small, that you are proud of?
I never got my driver's license in high school, never really needed to, but I finally passed my test a few weeks ago
8. What is one thing that is stressing you out right now?
I'm currently living with 2 roommates, and a couple issues have come up that are causing some tension, mostly political stuff, and it's making things pretty uncomfortable
9. What are some of the important qualities you look for in an ideal partner?
Smart, athletic, family oriented

Appendix VII: Exclusion Manipulation Check Questionnaire (Study 2)

This scale consists of a number of words that describe different feelings and emotions. Please indicate to what extent you *currently* feel:

	<i>Very slightly or not at all</i>		<i>Moderately</i>			<i>Quite a bit</i>	
Happy	1	2	3	4	5	6	7
Hostile	1	2	3	4	5	6	7
Upset	1	2	3	4	5	6	7
Ashamed	1	2	3	4	5	6	7
Enthusiastic	1	2	3	4	5	6	7
Nervous	1	2	3	4	5	6	7
Cheerful	1	2	3	4	5	6	7
Excited	1	2	3	4	5	6	7
Afraid	1	2	3	4	5	6	7
Proud	1	2	3	4	5	6	7

Please indicate the degree to which you feel the statements below reflect your opinions regarding the other participant. Circle the number indicating the answer option that best answers the question for you.

	Not at all						Very much so		
1. How interested were you in meeting this individual?	1	2	3	4	5	6	7	8	9
2. How likeable is this person?	1	2	3	4	5	6	7	8	9
3. How similar do you feel to this person?	1	2	3	4	5	6	7	8	9
4. Do you think this person would feel similar to you based on your answers?	1	2	3	4	5	6	7	8	9
5. Do you think you would have similar opinions as this other person?	1	2	3	4	5	6	7	8	9
6. How accepted do you feel by this person?	1	2	3	4	5	6	7	8	9
7. How would you rate your first impression of this individual?	Very positive		Positive		Neither positive nor negative		Negative		Very Negative

1. Please indicate how the you currently feel by circling the face the best reflects your feelings on the scale below:



Appendix VIII: Advice Questionnaire (Study 2)

Imagine that you were going to meet the individuals in the videos you just watched. If these individuals were to ask you for advice about how to handle the **exclusion** situations they discussed, how *likely* would you be to give them the following pieces of advice:

<i>I would tell them ...</i>	<i>Not likely</i>	<i>Somewhat likely</i>			<i>Likely</i>
1. To never speak to those friends again	1	2	3	4	5
2. To try and find other friends who are more positive	1	2	3	4	5
3. To tell those friends off! Tell them how angry you feel.	1	2	3	4	5
4. There's not much you can really do in these situations but accept it and move on.	1	2	3	4	5
5. To try and talk to their friends to find out what went wrong and try to work things out.	1	2	3	4	5
6. Nothing, I wouldn't know what to say to them.	1	2	3	4	5
7. There's nothing to be done as some people are mean and this is just a part of life.	1	2	3	4	5
8. That maybe they misunderstood the others.	1	2	3	4	5
9. To tell their friends how hurt they were.	1	2	3	4	5
10. To try and find a way to get back at their friends in a similar way.	1	2	3	4	5

Appendix IX: Exclusion Manipulation Check Questionnaire (Study 3)

- 1. This scale consists of a number of words that describe different feelings and emotions. Please indicate to what extent you *currently* feel:**








Very slightly or not at all						Quite a bit					
11. Upset	1	2	3	4	5	16. Nervous	1	2	3	4	5
12. Hostile	1	2	3	4	5	17. Determined	1	2	3	4	5
13. Alert	1	2	3	4	5	18. Attentive	1	2	3	4	5
14. Ashamed	1	2	3	4	5	19. Afraid	1	2	3	4	5
15. Inspired	1	2	3	4	5	20. Active	1	2	3	4	5

- 2. Please indicate the degree to which you feel the statements below reflect your opinions regarding the other participant. Circle the number indicating the answer option that best answers the question for you.**

	Not at all					Very much so				
1. How similar do you feel to this person?	1	2	3	4	5	6	7	8	9	
2. How likeable is this person?	1	2	3	4	5	6	7	8	9	
3. How accepted do you feel by this person?	1	2	3	4	5	6	7	8	9	
4. Do you think this person would feel similar to you based on your answers?	1	2	3	4	5	6	7	8	9	
5. Do you think you would have similar opinions as this other person?	1	2	3	4	5	6	7	8	9	
6. Do you think this other person likes you?	1	2	3	4	5	6	7	8	9	
7. How socially connected do you feel to this person?										

Appendix IX: Exclusion Manipulation Check Questionnaire continued (Study 3)

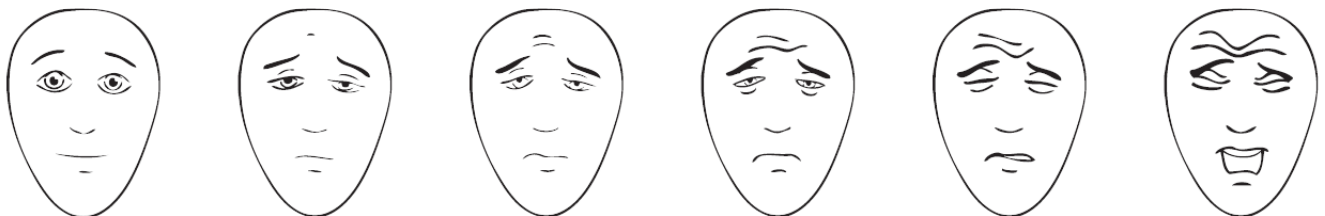
3. How close or similar do you feel to this person? If the circles below represent you and your partner, which of the following images best represents how close or similar you feel?

1	2	3	
			
4	5	6	7
			

4. How would you rate your first impression of this individual?

Very Positive	Positive	Neither positive nor negative	Negative	Very negative
---------------	----------	----------------------------------	----------	---------------

5. Please indicate how the you currently feel by circling the face the best reflects your feelings on the scale below:



Appendix X: Video Rating Questionnaire (Study 3)

I-PANAS-SF

This scale consists of a number of words that describe different feelings and emotions.
Over the length of the video, to what *extent* does the **person in the video** feel:

	<i>Never</i>				<i>Quite a bit</i>
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

Please indicate to what extent **you** *currently* feel:








Very slightly or not at all						Extremely					
Upset	1	2	3	4	5	Nervous	1	2	3	4	5
Hostile	1	2	3	4	5	Determined	1	2	3	4	5
Alert	1	2	3	4	5	Attentive	1	2	3	4	5
Ashamed	1	2	3	4	5	Afraid	1	2	3	4	5
Inspired	1	2	3	4	5	Active	1	2	3	4	5

Appendix X: Video Rating Questionnaire continued (Study 3)

How much do the following statements describe your experience while watching this video?

	Not at all	Slightly	Somewhat	Mostly	Very much so
I imagined how I would feel in this person's place	0	1	2	3	4
I was able to imagine how things looked from his/her perspective	0	1	2	3	4

How close or similar do you feel to this person? If the circles below represent you and the person in the video, which of the following images best represents how close or similar you feel?

1	2	3	
			
4	5	6	7
			

	Very slightly or not at all		Somewhat			Quite a bit	
How similar do you feel to the person in the video?	1	2	3	4	5	6	7
How sympathetic do you feel towards the person in the video?	1	2	3	4	5	6	7
How compassionate do you feel towards the person in the video?	1	2	3	4	5	6	7

What advice would you give this individual? If you feel comfortable, write it below. You can write as much or as little as you like. Otherwise, please type "no advice". Thank you!

Appendix X: Video Rating Questionnaire continued (Study 3)

	Only slightly or not at all bad	A little bad	Somewhat bad	Very bad	Extremely bad
From an objective perspective, how bad is the event described by the person in the video?	0	1	2	3	4
	Not at all responsible	A little responsible	Somewhat responsible	Very responsible	Completely responsible
In your opinion, to what extent was the person in the video responsible for the outcome of this situation?	0	1	2	3	4

Appendix XI: Initial Advice Themes

Three research assistants were instructed to identify themes reflected in the advice content. They were blind to experimental condition and social anxiety group status. The assistants were instructed to identify a maximum of five general themes. The assistants' converged on five similar themes: "Move on/don't worry;" "Positive encouragement;" "Approach/active advice;" Learn from the experience; and Judgmental/dismissive advice.

Four research assistants then coded whether each of the five themes were present in each piece of advice (i.e., 0 = not present, 1 = present). Two reliability analyses were conducted to determine 1) inter-rater reliability of the four raters and 2) reliability between the four videos. The reliability was excellent for both the raters, Cronbach's $\alpha = .91$, and between the videos, Cronbach's $\alpha = .89$. Given the high reliability across raters, I calculated a majority rating across raters such that, if three or more of the raters agreed that a theme was present or absent, it was coded as such (0 = absent, 1 = present). Rating that were split (i.e., two raters thought it was present, two raters thought it was absent) were excluded. The amount of excluded ratings ranged from 5.3% to 9.7% (mean = 6.85%).

Table 14

Advice themes generated by blind raters

Final theme	Rater 1	Rater 2	Rater 3
Move on/don't worry	Move on, don't dwell on it	Don't worry too much about it and move forward	"Move on" – Learn from the experience, be patient, wait for the future
Positive encouragement	Positive encouragement – be happy with yourself	Be true to yourself, your values, and morals	Self-improvement/self-reflection – Be yourself, you're awesome. Being alone can be ok
Approach/active	Active approach advice	Take the initiative to reconnect/make new friends and new activities	Approach behaviour/reconciliation – Talk to others, seek new friends, fix the situation with those involved
Learn from the experience	Use this experience as a learning experience	Use the experience as a lesson to learn from your mistakes	Distancing behaviours – You don't need to associated with these type of people, it was the other person's fault
Judgmental or dismissive	Judgmental advice	Dismissive/Judgmental	-
No advice	No advice	No advice	No advice

Appendix XII: Advice Theme Analyses

Table 15

Multi-level logistic regression of experimental condition and social anxiety predicting the five advice themes.

	<i>B</i>	<i>SE</i>	<i>z</i>	<i>p</i>
Move on/don't worry				
Intercept	-2.17	0.44	-4.98	< .001
Social anxiety	0.18	0.35	0.49	.63
Condition	0.05	0.38	0.13	.89
Interaction	-0.64	0.48	-1.10	.27
Positive encouragement				
Intercept	-1.08	0.33	-3.26	.001
Social anxiety	-0.53	0.39	-1.36	.17
Condition	-0.13	0.38	-0.34	.73
Interaction	0.41	0.59	0.49	.49
Approach advice				
Intercept	-1.90	0.43	-4.44	< .001
Social anxiety	-0.46	0.39	-1.16	.25
Condition	0.17	0.37	0.47	.64
Interaction	0.26	0.58	0.45	.66
Learn from the experience				
Intercept	-2.07	0.80	-2.58	.01
Social anxiety	-0.54	0.39	-1.38	.17
Condition	-0.39	0.41	-0.97	.33
Interaction	0.81	0.60	1.35	.18
Judgmental/dismissive				
Intercept	-4.28	0.79	-5.38	< .001
Social anxiety	0.74	0.67	1.11	.27
Condition	-0.04	0.75	-0.06	.95
Interaction	-0.80	1.08	-0.74	.46