

Towards an Understanding of Social Anxiety and Close Friendships: The Role of Expectations,
Negative Self Portrayal Concerns, and the Discrepancy Gap

by

Vanja Vidovic

A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Doctor of Philosophy

in

Psychology

Waterloo, Ontario, Canada, 2025

© Vanja Vidovic 2025

Examining Committee Membership

The following served on the Examining Committee for this thesis. The decision of the Examining Committee is by majority vote.

External Examiner	Meagan MacKenzie, Ph.D.
Supervisor	David Moscovitch, Ph.D.
Internal Members	Allison Kelly, Ph.D.
	Uzma Rehman, Ph.D.
Internal-External Member	Chris Perlman, Ph.D.

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

Past research has demonstrated a robust correlation between higher social anxiety (SA) and lower friendship satisfaction, suggesting that the interpersonal difficulties experienced by socially anxious individuals in anxiety-provoking social situations with evaluative others might extend to their close friendships. My dissertation sought to clarify how symptoms of SA manifest within close friendships, as well as the potential cognitive-behavioural mechanisms by which SA symptoms may influence friendship outcomes. Each research question was first investigated within an undergraduate student sample (Studies 1A and 2A), with SA assessed as a continuous variable across the full spectrum of symptom intensity, followed by replication and extension using a clinical sample (Studies 1B and 2B). First, I developed a measure of adult friendship expectations and assessed variability in how individuals with different levels of trait SA believe their close friends ought to behave. Findings showed that, among undergraduate students, ratings of friendship expectations did not vary by participant level of SA; however, among community participants, diagnosis of Social Anxiety Disorder was predictive of significantly lower expectations related to solidarity and agency, but no differences in expectations of symmetrical reciprocity or communion. To assess the extent to which participants were concerned about negative self-portrayal when in the company of their close friends, I adapted the instructions of the Negative Self Portrayal Scale (Moscovitch & Huyder, 2011) to inquire specifically about the extent to which participants have such concerns within close friendship contexts. Consistent with hypotheses, among both undergraduate and community participants, SA was predictive of greater concern about revealing perceived personal flaws to close friends. Next, I used an experimental study design in which discrepancy threat salience was manipulated as a between-subjects variable, to test how socially anxious individuals respond to potential friendship

ruptures. While all participants reported more interpersonal threat in response to the Threat versus Control condition, this effect was particularly strong for individuals with social anxiety disorder. Consistently across samples, SA was linked to greater negative emotionality regardless of study condition, while results regarding positive emotionality were more varied, highlighting the importance of assessing positive and negative affect as distinct facets of human experience. Effects of perceived interpersonal threat on self-reported behavioural motivation was also surprisingly inconsistent across studies: although SA symptoms predicted motivation for lower approach and greater avoidance among undergraduate students, a clinical diagnosis of social anxiety disorder (SAD) was unrelated to self-reported behavioural motivations within the community sample. Findings are interpreted within the context of cognitive and interpersonal models of SA, highlighting methodological strengths and limitations of my research, and suggesting future research to build on the present studies that may inform interventions that enhance social connection in individuals with SAD.

Acknowledgements

First and foremost, I would like to express my deepest gratitude to Dr. David Moscovitch, my research supervisor and mentor. David, your passion for research is contagious and I am indebted to you for inspiring me to pursue graduate studies in clinical psychology, all those years ago. Thank you for the unwavering support, encouragement, and thoughtful feedback at each stage of this lengthy process. It has truly been a privilege to work with you.

I would also like to extend my sincere appreciation to my internal committee, Dr. Allison Kelly and Dr. Uzma Rehman. Your support, insightful comments, and thoughtful suggestions have greatly enriched this work. The perspectives and encouragement you provided at every stage helped me consider important aspects I might have otherwise overlooked.

This work would not have been possible without the dedication of research assistants Michaela Young and Josh Budge, who were instrumental in the recruitment of my community participants. I would also like to thank Nicole, Rebecca, and Shirley - I will be forever grateful for our cohort and look forward to many more years of consultation and friendship.

Finally, I am profoundly grateful to my friends and family, both near and far. Each of you inspire me every day and I could not have done this without you.

Table of Contents

List of Figures.....	ix
List of Tables.....	x
General Introduction.....	1
Importance of Close Friendships.....	2
Social Anxiety and Friendships: Heightened Sensitivity to Interpersonal Threat.....	4
Interpersonal Risk Regulation.....	14
Activation of SA-Related Negative Beliefs in Response to Threat.....	17
Overview of Research Objective and Studies.....	18
Study 1A - Why Do My Friendships Feel So Unsatisfying? Examining the Effects of Social Anxiety on Appraisals of Self and Expectations of Others in Close Friendships.....	20
Introduction.....	21
Methods.....	29
Results.....	35
Discussion.....	43
Study 1B - Social Anxiety Disorder and Close Friendships: The Role of Negative Self-Portrayal Concerns and Friendship Expectations.....	52
Introduction.....	53
Methods.....	57
Results.....	64
Discussion.....	77
Study 2A - Does Self-Discrepancy Threat Amplify the Negative Effects of Social Anxiety on Responses to Perceived Friendship Ruptures?	86

Introduction.....	87
Methods.....	93
Results.....	104
Discussion.....	118
Study 2B - Effects of Social Anxiety Disorder and Interpersonal Threat Within Close	
Friendships.....	132
Introduction.....	134
Methods.....	139
Results.....	148
Discussion.....	161
General Discussion.....	175
References.....	200
Appendix.....	245

List of Figures

Figure 1. <i>Symmetrical Reciprocity and Communion Expectations Predicted by Concern About Signs of Anxiety</i>	71
Figure 2. <i>Solidarity and Agency Expectations Predicted by Concern About Social Competence</i>	73
Figure 3. <i>Social Anxiety Predicting Friendship-Promoting Goals</i>	112
Figure 4. <i>Social Anxiety Predicting Self-Protective Goals</i>	114
Figure 5. <i>Perceived Interpersonal Threat by Diagnostic Status and Study Condition</i>	151

List of Tables

Table 1. <i>Four Dimensions of Friendship Expectations.</i>	27
Table 2. <i>Friendship Expectations Scale Items.</i>	33
Table 3. <i>Demographic Characteristics of Study 1A Participants.</i>	37
Table 4. <i>Internal Consistency, Means and (Standard Deviations) of Study Measures</i>	38
Table 5. <i>Rotated Factor Loadings from Pattern Matrix for Items of the Friendship Expectations Scale.</i>	40
Table 6. <i>Demographic and Self-Report Social Anxiety Measures Across Participant Groups ..</i>	66
Table 7. <i>Negative Self-Portrayal Scale Responses Across Samples.</i>	76
Table 8. <i>Demographic Characteristics of Study 2A Participants.</i>	106
Table 9. <i>Descriptive Statistics for Affect Variables across Time Points and Conditions.</i>	107
Table 10. <i>Zero-order Correlations Between Perceived Threat and Post-Manipulation Emotionality.</i>	110
Table 11. <i>Zero-order Correlations Between Social Anxiety, Closeness, Threat, and Goals.</i> . .	118
Table 12. <i>Means of Baseline and Post-Manipulation Affect Scores.</i>	156
Table 13. <i>Zero-order Correlations Between Perceived Threat and Post-Manipulation Emotionality.</i>	160

General Introduction

In a world that is increasingly digitally connected, an accumulation of studies is showing decreasing levels of emotional connection (Nie & Hillygus, 2002; Nowland et al., 2018; Stepanikova et al., 2010). Contrary to the perception of hundreds of virtual “friends”, “likes”, and comments within the social media sphere, estimates of loneliness and social isolation are soaring (Cacioppo et al., 2009; Candiottto, 2022). This is concerning, given that formation and maintenance of strong social bonds is widely regarded as one of the most powerful, universal, and influential human needs driving behaviour (Baumeister, 2012; Baumeister & Leary, 1995).

In the current dissertation research, I sought to increase insight into factors that help predict impoverished social connections, and therefore confer an increased risk of adverse physical and psychological outcomes (Dunbar, 2018; Holt-Lunstad et al., 2007; Pezirkianidis et al., 2023; Umberson & Karas Montez, 2010). Previous analyses of two large epidemiological datasets, from the National Survey of American Life (NSAL; Jackson et al., 2004) and the National Comorbidity Survey Replication (NCS-R; Kessler et al., 2004; Kessler & Merikangas, 2004) showed that, of all the mental health disorders included in analyses, social anxiety disorder (SAD) was uniquely predictive of lower perceived friendship quality (Rodebaugh, 2009; Rodebaugh et al., 2012). However, the mechanisms that contribute to this link between SAD and reduced friendship quality are unclear.

My dissertation explores the intersection of close adult friendships and social anxiety, with the aim of increasing our understanding of why socially anxious individuals have difficulty forming and maintaining satisfying friendships. With increased insight into factors that explain the link between social anxiety and close friendship difficulties, the field will be better equipped

to develop interventions that target the relevant factors and help socially anxious individuals access the well-established benefits associated with having satisfying close friendships.

Importance of Close Friendships

Friendships may be conceptualized as voluntary, reciprocal, and informal social bond between two individuals (Fehr & Harasymchuk, 2017; Pezirkianidis et al., 2023; Wrzus et al., 2017). An abundance of research suggests that friendships are vital for physical health, mental well-being, and longevity (Blieszner, 2014; Carmichael et al., 2015; Dunbar, 2018; Holt-Lunstad et al., 2007; Pezirkianidis et al., 2023; Umberson & Karas Montez, 2010). For example, social ties have repeatedly been shown to influence health behaviour, including exercise, smoking habits, alcohol consumption, and adherence to medication regimens (Umberson et al., 2010). Social support is also associated with indirect health benefits via stress reduction and fostering a sense of meaning and purpose in life (Cohen, 2004; Thoits, 1995; Uchino, 2004). It is believed that supportive relationships, such as friendships, reduce blood pressure, heart rate, and stress hormones that promote mental and physical health, as well as decrease unpleasant arousal that promotes risky behaviour (Uchino, 2006; Umberson & Karas Montez, 2010). When it comes to social supports, quality is more important than quantity, with health benefits predicted by one's satisfaction with *close* friendships rather than the size of one's social network or presence of weaker, more superficial social connections (Demir & Weitekamp, 2007; Gillespie et al., 2015; Holt-Lunstad, Robles, & Sbarra, 2017; Lewis et al., 2015).

What makes for happy and healthy friendships?

Expectation fulfillment is a primary factor in determining satisfaction across both social and non-social situations (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002), with the *Ideal Standards Model* proposing that satisfaction within any given situation depends on the

extent to which current circumstances align with one's ideal expectations for the given situation (Fletcher et al., 1999). Daily expectation fulfillment was found to be the strongest predictor of overall friendship satisfaction, with individuals most likely to be satisfied with friends who behaved in ways that met or exceeded their expectations (Hall et al., 2011). In addition, the Ideal Standards Model states that individuals differ from one another in their standards for an ideal interaction partner (Campbell et al., 2001; Fletcher et al., 1999). We were interested in increasing insight into how trait social anxiety affects the nature of close friendship expectations (e.g., beliefs about how friends ought to behave) and how such expectations, in turn, impact emotional and behavioural experiences within close friendships.

In 2011, Hall conducted a meta-analysis of the available literature on friendship expectations, with the aim of categorizing the various types of expectations that had been proposed. Hall (2011) presented the results of five meta-analyses, which included 37 manuscripts with 36 samples, of which only four samples had a mean age above 23 years old. The mean age for the samples included in analyses ($N = 8825$) was 15.7 years old, with a range from 10 to 56.5; as such, the author noted the need for additional research on adult friendship expectations across the lifespan as an important factor limiting the generalizability of meta-analysis results (Hall, 2011). Nonetheless, this analysis provided important insight into people's conceptualizations of friendship expectations. Of greatest relevance for my dissertation is the observation that patterns of friendship expectations proposed within the literature could be sorted into four dimensions, as follows: Symmetrical Reciprocity (e.g., loyalty, genuineness), Communion (e.g., self-disclosure, intimacy), Solidarity (e.g., mutual activities, companionship), and Agency (e.g., physical fitness, status). Despite the relatively young age of the sample in this meta-analysis, this study provided the most comprehensive analysis of the friendship expectation data available and was therefore

used as the framework to structure further exploration of close friendship expectations within adult populations in this line of research.

While relationship difficulties are prominent across various psychological disorder (e.g., social withdrawal typical of major depressive disorder; Veale, 2008), establishment and maintenance of interpersonal connection requires social knowledge and the capacity to cultivate intimacy (Carmichael et al., 2015), which may be particularly difficult for individuals with high levels of trait social anxiety or SAD (Alden & Taylor, 2004). Indeed, epidemiological data has found social anxiety to be uniquely predictive of lower friendship quality (Rodebaugh, 2009; Rodebaugh et al., 2012).

Social Anxiety and Friendships: Heightened Sensitivity to Interpersonal Threat

Social anxiety (SA) is characterized by a fear of scrutiny and evaluation in social situations (e.g., Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). Socially anxious individuals fear that they will be unable to make their desired impression on others (Schlenker & Leary, 1985), at least in part because of the concern that social interaction will expose their personal flaws to interaction partners (Moscovitch, 2009; Moscovitch & Huyder, 2011). At the extreme high end of the SA continuum lies SAD, a disabling problem that affects approximately 12% of the population during their lifetime (Kessler et al, 2005).

Excessive SA and fear of negative evaluation have been shown to predict interpersonal difficulties, including inhibited capacity to establish social connections with others (Alden & Taylor, 2004). Research to date has focused primarily on SA-related challenges associated with developing relationships with new people or establishing interpersonal connections in contexts in which participants fear being evaluated by strangers or relatively unknown audience observers. Although research has also established a link between higher SA and greater loneliness,

interpersonal conflict, and perceived relationship impairment (Cuming & Rapee, 2010; Olatunji et al., 2007; Wittchen et al., 2000), much remains unknown about the impact of SA on close friendships. The small available literature suggests that individuals with high trait SA tend to report having lower quality friendships than their non-anxious counterparts (Rodebaugh, 2009; Rodebaugh et al., 2012; Rodebaugh et al., 2014; Rodebaugh et al., 2015), as well as smaller social networks and poorer social supports (Alden et al. 2014; Cuming & Rapee, 2010; Fernandez & Rodebaugh, 2011; Hur et al., 2020; Piccirillo et al., 2021; Torgrud et al., 2004). Developing a better understanding of how, and under which conditions, SA negatively impacts close friendship quality has the potential to shed new light on this underdeveloped area of work. To this end, we considered the available literature on models of SA and empirical data on close friendships, to develop studies with the potential to elucidate the interaction of these two research areas.

Cognitive models of SA

Among the cognitive factors central to maintenance of SA are negative core beliefs about the self, with views of self as fundamentally flawed and undesirable, and anxiety emerging in situations in which such perceived flaws are perceived to be detectable to others (Moscovitch, 2009). Research on negative self-portrayal concerns has been conducted using both undergraduate (Moscovitch & Huyder, 2011) and clinical (Moscovitch et al., 2013; Moscovitch et al., 2015) samples, with endorsement of such concerns found to be consistency higher among individuals with higher, compared to lower, levels of trait SA and among individuals meeting diagnostic criteria for SAD. Such negative self-portrayal concerns, arising in anxiety-provoking social situations, have been empirically demonstrated to fall into the domains of fear of appearing socially incompetent, physically unattractive, and/or visibly anxious (Moscovitch &

Huyder, 2011; Moscovitch et al., 2013; Moscovitch et al., 2015). Moreover, prominent theories of SA posit that anxiety arises when individuals are uncertain that they will be able to convey their desired impression on others (Clark & Wells, 1995; Leary, 2001; Trower & Gilbert, 1989). Several studies suggest that individuals with SAD experience a discrepancy between perceived social standards and their perceived social abilities (Alden et al., 1994; Alden & Wallace, 1991; Alden & Wallace, 1995), with socially anxious individuals believing their personal attributes fall short of the characteristics that they perceive others to expect of them (Moscovitch & Hofmann, 2007; Strauman, 1989; Weilage & Hope, 1999). It has been shown that state anxiety can increase perceptions of interpersonal standards (Scott & Cervone, 2002), which may suggest that social situations that activate a sense of social threat then maintain anxiety via salient perceptions of one's inability to perform to the perceived lofty standards of their interaction partner (Hofmann, 2007).

The emphasis on self-perception as an important maintaining factor within cognitive models of SA (Clark, 2001; Clark & Wells, 1995; Leary, 2001; Mansell & Clark, 1999; Rapee & Heimberg, 1997) is also supported by research on self-discrepancy theory (e.g. Higgins, 1987; Strauman, 1989; Strauman & Higgins, 1988). This theory examines self-perceptions in terms of three different domains of self: “actual self” (attributes that someone, self or other, believes the individual possesses), “ideal self” (attributes that someone, self or other, desires the individual to possess), and “ought self” (attributes that someone, self or other, expects the individual to possess; Higgins et al., 1985). Self-discrepancy theory posits that perceived discrepancies between domains of the self increases internal discomfort (Higgins et al., 1985). Studies have found that individuals with SAD experience discrepancy between their actual and ought self-

domains, which fuels a sense anxiety via perceptions of failing to meet the expectations of their interaction partners (e.g. Strauman, 1989, Weilage & Hope, 1999).

In addition, one of the hypotheses of self-discrepancy theory is that there is contextual variability, whereby momentary and long-term context shapes perceptions of self across the various domains and therefore contributes to between-person and within-person variability in self-discrepancy (Higgins et al., 1985). As such, it is possible that self-discrepancy among individuals with higher trait SA is generally greater than among individuals with lower trait SA, and that this actual-ought self-discrepancy becomes particularly salient in certain circumstances – for example, when threat of interpersonal rejection is perceived to be high.

Interpersonal models of SA

Whereas cognitive models of SA focus on the role of idiosyncratic beliefs about the self (e.g., flawed) and others (e.g., critical), Alden and Taylor's (2004) interpersonal model of SA proposes that symptoms of SA are maintained via self-perpetuating interpersonal cycles. From the interpersonal perspective, people expect others to treat them as they have been treated in previous relationships, thus prompting individuals to engage in cognitive and behavioural patterns consistent with these expectations (Alden & Taylor, 2004). This, in turn, "pulls" for certain responses from interaction partners (e.g., Blatt & Zuroff, 1992; Coyne, 1976; Kiesler, 1983), which is an interpersonal pattern that typically serves to maintain social assumptions, expectations, and behaviours. For example, individuals who expect positive responses and meaningful connections with others are likely to engage in pro-social behaviour that fosters positive social engagement and facilitates interpersonal connection. In contrast, individuals who anticipate negative responses from others are more likely to engage in self-protective social

behaviour (e.g., avoidance) that inadvertently elicits more negative responses from others, which serve to maintain the cycle (e.g., Curtis & Miller, 1986).

Bielak and Moscovitch (2012) found that high SA individuals failed to demonstrate the positive expectancy bias toward new interaction partners that was observed among individuals with low SA. Moreover, a study by Rodebaugh and colleagues (2016) demonstrated that individuals generally prefer to interact with interpersonally warmer (vs. colder) and submissive (vs. dominant) hypothetical characters; however, participants with higher SA exhibited greater tolerance for potential interaction partners characterized by lower warmth. The finding was accounted for by a tendency for participants to endorse desire to interact with characters they perceived to be similar to themselves; specifically, individuals with higher SA were more likely to rate themselves as being similar to cold and submissive vignette characters (Rodebaugh et al., 2016). This suggests that, while individuals across the SA spectrum may have similar preferences for high warmth, high submissive interaction partners and friends, individuals with higher SA may be tolerant of friends that are less aligned with preferences, especially if they perceive such friends to be similar to them along these interpersonal dimensions. Friendships with less desirable others could then serve to maintain dissatisfaction and perceptions of self as undeserving of high-quality interaction partners. Interpersonal models emphasize that relationships are not only influenced by habitual social behaviour, but also by one's sense of self in relation to others (Alden et al., 2001). Negative beliefs and assumptions about the self promote internal distress and self-protective behaviour, particularly when such core beliefs are activated (e.g., Alden & Taylor, 2004; Higgins et al., 1985). However, given that most of this work has been conducted within the context of meeting or being observed by unfamiliar others, the extent

to which such relational information (e.g., about self as inadequate in relation to the other) is activated within close friendships remains to be empirically tested.

Views of self as undeserving of high quality and desirable interaction partners may also be examined through research on SA and self-evaluations on the interpersonal domains of social rank and affiliation (Aderka et al., 2009; Gilboa-Schechtman et al., 2020). Trower and Gilbert (1989) first proposed a model of SA maintenance that was grounded in two psychological systems, the social rank (defense) system and the safety system, which evolved to maintain social order. The social rank system is thought to be constantly monitoring one's rank in the dominance hierarchy, with the goal of maximizing access to valued resources (e.g., food and mates) by strategic navigation of the social hierarchy (Gilbert, 2000; Gilbert et al., 2002; Gilbert and Trower, 2001; Sloman et al., 1994; Trower & Gilbert, 1989). In contrast, the attachment system concerns itself with safety and affiliation, with attention to opportunities for cooperation and interpersonal connection in one's environment (Ainsworth et al., 1978; Bowlby, 1969; Eng et al., 2001; Hazan & Shaver, 1987). Trower and Gilbert (1989) proposed that socially anxious individuals over-utilize the social rank system and under-utilize the safety system, such that their social world is viewed in terms of competition for power and status in social hierarchies, as well as competition for social desirability and social attractiveness (Gilbert & Trower, 2001). As socially anxious individuals hold negative self-evaluations (Gilboa-Schechtman et al., 2020), they tend to endorse perceptions of low social rank and thus perceive themselves to be unable to compete with higher-ranking others (Aderka et al., 2009). With perceived lack of prospects for increasing their standing on the social hierarchy, socially anxious individuals engage submissive behaviours designed to appease higher-ranking individuals, thereby preventing further harm (e.g., in the form of rejection) to their social standing. Alternatively, if this is not possible,

socially anxious individuals focus on preservation of social rank via escape or outright avoidance of higher-ranking individuals (Aderka et al., 2009; Gilbert & Trower, 2001; Trower & Gilbert, 1989).

It has been demonstrated, using both self-report and behavioural measures, that individuals with SAD perceive themselves to be lacking in the domain of social rank (Gilboa-Schechtman et al., 2017). Above and beyond the interpersonal effects of depression, individuals with SAD have endorsed perceptions of low social rank, being inferior to others, behaving submissively, and having less emotional intimacy with their peers, friends, and romantic partners (Weisman et al., 2011). Moreover, lower implicit self-evaluations of social rank were observed among individuals with SAD even in the absence of social stress activation (de Jong et al., 2012), suggesting that such beliefs are chronically activated rather than dormant until triggered by socially stressful events (de Jong et al., 2012; Gilboa-Schechtman et al., 2017). For people with SAD, struggles relating to perceived social rank may be magnified in close friendships, which are ideally characterized by mutual linking, reciprocity, and two individuals treating each other as equals (Fehr & Harasymchuk, 2017; Pezirkianidis et al., 2023; Wrzus et al., 2017). Therefore, socially anxious individuals' discomfort in close friendships may be fueled by perceptions of social inferiority, even in the company of close friends. Negative self-perceptions and beliefs of inferiority may lead to submissive behaviour by high SA individuals within their friendships, including over-accommodation of friends' desires and suppression of their own personal preferences. While this may achieve the goal of avoiding potential conflict (Davila & Beck, 2002), this approach to friendships is expected to hinder authentic connection, as well as leave one's needs unmet and contribute to decreased satisfaction and increased feelings of resentment over time (Murray et al., 2006; Murray et al., 2008).

In this way, greater tolerance for friendships with less desirable others, who are perceived to be more similar to self (Rodebaugh et al., 2016) may be fruitfully conceptualized as a coping strategy for distress associated with perceived discrepancies of social rank between the self and others. Indeed, when interacting with less desirable friends, a sense of power imbalance and associated distress is minimized. In contrast, when interacting with highly desirable friends, perceived inferiority may motivate people with high SA to monitor the environment constantly for indicators of their social standing within the friendship. This may be achieved through repeated seeking of verbal reassurance from their friends, akin to compulsive checking as an emotion regulation strategy (Casbon et al., 2005; Mennin et al., 2002), with excessive reassurance-seeking potentially leading to less satisfying social interactions (Heerey & Kring, 2007). Fear of social inferiority may also increase sensitivity to signals of potential disapproval or disinterest from friends, which may then be amplified via cognitive distortions such as catastrophizing (e.g., beliefs of impending friendship dissolution), and thereby fuel distress (Kuru et al., 2018; Mobini et al., 2013). Together, focusing on the perceived power imbalance within the friendship has the potential to prevent socially anxious individuals from relating to friends with confidence and ease, perhaps leading to lower perceptions of friendship quality at higher levels of SA (Rodebaugh, 2009; Rodebaugh et al., 2015).

While some researchers have focused on explaining the experience and expression of SA within close relationships in terms of social rank theory (e.g., Trower & Gilbert, 1989), others have emphasized the role of attachment theory. Attachment theory (Bowlby, 1969) proposes that interactions with early caregivers form internal working models for close relationships, including expectations regarding the availability, dependability, and supportiveness of others and beliefs about the extent to which one is worthy of their attention, care, and support (Ainsworth et al.,

1978; Read et al., 2018; Shaver & Mikulincer, 2009). These working models influence how individuals approach interpersonal interactions throughout their life and, although they are malleable to some extent, they remain largely consistent across time (Shaver & Mikulincer, 2009). Individuals with higher trait SA tend to display more insecure attachment styles, characterized either by attachment anxiety (e.g., exaggerated interpersonal threat appraisals; Eng et al., 2001) or attachment avoidance (e.g., views of others as untrustworthy and discomfort with emotional closeness; Read et al., 2018). Although the body of research on adult attachment and SA is relatively small, a review of the literature suggested that anxious attachment tendencies may be particularly predictive of SA symptomatology (Manning et al., 2017). However, Eng and colleagues (2001) found that, although socially anxious individuals were predominantly characterized by anxious attachment, a notable subset of socially anxious individuals endorsed secure attachment patterns comparable to non-anxious individuals. While my dissertation draws primarily from cognitive-behavioural and interpersonal models to conceptualize the links between SA and close friendship processes, these models and attachment frameworks are considered theoretically complementary and intertwined.

In order to understand the manifestation and maintenance of SA symptoms in close friendship contexts, research is needed to clarify whether the link between higher trait SA and lower friendship satisfaction may be explained, at least in part, by differences in internalized friendship expectations (cognitions) and behavioural patterns within close friendships. Negative beliefs about self that arise from interpersonal challenges that occur during key social developmental periods in life, including experiences of extreme shyness-related social avoidance, bullying, and social exclusion (Crawford & Manassis, 2011; Greco & Morris, 2005), may play important roles in contributing to differences in close friendship expectations and

behaviours among individuals at different ends of the SA spectrum. For example, if individuals with high SA tend to report more difficulty establishing and maintaining friendships during childhood and adolescence (Kashdan & Herbert, 2001), they may expect less connection and more rejection even within adult friendships where evidence of negative interpersonal evaluation is low. These individuals may consequently behave in ways consistent with these implicit interpersonal expectations, which create predictable interpersonal patterns over time. Although these predictions about high SA individuals have not been tested within the context of friendships specifically, laboratory studies have shown that the behaviour of socially anxious individuals within relational contexts, such as dyadic interactions, tends to be rated more negatively across interpersonal dimensions such as warmth, relational competence, and likeability, compared to their non-anxious counterparts (Gough & Thorne, 1986; Heerey & Kring, 2007; Jones & Briggs, 1984). Moreover, individuals with higher trait SA or SAD may be more sensitive to primes of social threat (e.g., social stimuli suggesting a possible friendship rupture or rejection), which then activates negative self-schemas and promotes avoidance behaviours that impede connection. Routine reliance on self-protective strategies in response to potential conflict within close friends has the potential, over time, to thwart feelings of closeness and perceived friendship quality (Murray et al., 2006, 2008).

To this end, a central idea that is examined in this dissertation is that close friendship contexts can become threatening for socially anxious individuals in the face of a perceived friendship rupture or when the potential for a rupture is perceived to be high. A friendship rupture is conceptualized as a state of perceived instability or insecurity introduced into the friendship bond. Given that the perceived discrepancy between personal abilities and others' expectations has been established as a key mechanism driving the experience of SA in social

contexts in which the evaluative audience consists of strangers or acquaintances (e.g., Moscovitch & Huyder, 2011; Schlenker & Leary, 1985), in close friendships it is possible that a similar discrepancy might arise when high SA individuals appraise their behaviour as likely to fall short of a friend's needs and expectations within the friendship.

It is possible that various friendship contexts, including ambiguous and mundane friendship events (e.g., slight disagreements) are more likely to be interpreted as threatening by individuals with high trait SA (e.g., Kingsbury & Coplan, 2016). Since socially anxious individuals view themselves as socially inferior to non-anxious counterparts (Hofmann, 2007; Morrison & Heimberg, 2013), they may feel especially anxious about the possibility of causing or experiencing friendship ruptures, and in turn to experience rejection, within contexts that require them to decipher novel, ambiguous, or complex interpersonal information or to engage in skillful risk regulation processes (Murray et al., 2006, 2008).

Interpersonal Risk Regulation

While research on SA within the context of close friendships ruptures is scarce, literature on interpersonal risk regulation in the context of romantic relationships offers valuable insights that may translate to other types of close relationships and shed light on how SA exerts a negative impact within friendship contexts. Murray and colleagues' (2008) risk regulation model posits that perception of heightened interpersonal risk automatically activates either connectedness or self-protection goals. In order to prioritize relationship-promotion goals over self-protection goals, it is necessary to be confident in the relationship and to trust one's romantic partner, or else the risk of prioritizing the relationship in the face of potential interpersonal threat will likely be evaluated as too great (Murray et al., 2006).

Self-esteem, a construct that overlaps with but is distinct from social anxiety (de Jong, 2012; Kocovski & Endler, 2000; Rasmussen & Ridgdon, 2011), has repeatedly been found to be a significant predictor in models of interpersonal risk regulation within romantic relationship contexts. Specifically, individuals with low self-esteem demonstrate a tendency to prioritize self-protection goals in the face of interpersonal conflict or threat (Murray et al., 2008). They also tend to devalue their partner (e.g., rating them as less desirable across various domains), rather than affirming their partner in the face of threat, and to behave in ways that are consistent with withdrawal and decreased reliance on their partner for emotional support (Murray et al., 2002). Murray and colleagues (2008) argued that these behavioural strategies are designed to minimize pain in the long-term by (1) decreasing reliance on the other individual for emotional support and (2) by decreasing the positivity of one's appraisals with respect to how much the (now risky) individual is valued in their life.

This pattern of devaluing one's romantic partner in the face of perceived rejection was also observed among socially anxious individuals in a single experimental study by Afram and Kashdan (2015), who investigated whether people with greater SA responded defensively when the threat of rejection in a romantic context was made salient. These researchers invited romantic couples into the lab and assigned one member of the dyad to a threat condition and the other member to a neutral condition. In the threat condition, the participant was led to believe that their partner was listing excessive negative characteristics about them, whereas in the neutral condition, the participant was provided with a non-threatening filler task. Ratings of partner attributes (intelligence, physical attractiveness, social skill, athletic ability, and artistic ability) were assessed both before and after the experimental manipulation. Results revealed an association between higher trait SA and greater rejection concerns in the threat condition, even

when controlling for levels of depressive symptoms, rejection sensitivity, attachment styles, and interpersonal trust. In response to perceived threat of rejection, higher SA individuals tended to devalue their romantic partner, such that they provided more negative partner assessments from pre- to post-manipulation. This effect was not observed in the neutral condition, in which individuals with high SA, unexpectedly, provided more positive partner assessments following the innocuous experimental protocol. The authors suggested that socially anxious individuals' are able to prioritize connectedness goals in the absence of threat, but that such a stance may be fragile such that they may be quick to prioritize self-protection strategies when a relational context becomes threatening (Afram & Kashdan, 2015). These results build on prior findings that suggest an exaggerated focus on interpersonal risk regulation among high SA individuals, indicated by behaviours such as self-disclosing less often to their romantic partners (Cumming & Rapee, 2010; Sparrevohn & Rapee, 2009) and being more critical of their romantic partners during negative interactions (Wenzel et al., 2005).

Given the research on emotional intimacy between close friends, and the importance of close friendships for well-being, it is plausible that similar processes as those observed in romantic relationships may characterize the friendships of high SA individuals. As such, models of interpersonal risk regulation (e.g., Murray et al., 2008) may be extended to provide clues for understanding the effects of SA on close relationships. Consistent with findings of Afram and Kashdan (2015), above, as well as the established tendency for individuals with high SA to generally rely on avoidance strategies in situations perceived to be interpersonally threatening (e.g., Cumings & Rapee, 2010; Moscovitch et al., 2013), we expected higher SA to be related to greater reliance on self-protective (over friendship-promoting) behavioural motivations and strategies in the face of potential rupture. Self-protective strategies for interpersonal risk

regulation include behaviours such as emotionally and physically withdrawing from the target individual, decreasing self-disclosure, or shifting conversations to more positive content without addressing any perceived concerns (Gable & Gosnell, 2013; Heimpel et al., 2006; Murray et al., 2003, 2008). In summary, we expected that individuals with higher trait SA would be more prone to becoming distressed by the possibility of ruptures within close friendships and that they would be more likely to respond to perceived ruptures with self-protective, rather than friendship-promoting, strategies.

Activation of SA-Related Negative Beliefs in Response to Threat

When the friendship context becomes threatening for socially anxious individuals, negative core beliefs about self and others may become activated. For example, when the threat of a friendship rupture becomes salient, individuals with high trait SA may endorse beliefs about themselves and others that resemble those that are activated within socially threatening situations with evaluative strangers – that is, that they are fundamentally flawed, inadequate, and/or unlovable, and that their friends are potentially critical, harsh, and rejecting (see Moscovitch, 2009; Rodebaugh, 2009). These beliefs may be triggered when they perceive their own behaviour as having the potential to fall short of their friend’s expectations (e.g., “I’m incapable of satisfying my friend’s needs”). When triggered, such beliefs may fuel anxiety for socially anxious individuals about potential loss of love and support from their close friends via rejection and/or dissolution of their emotional bonds. In line with the risk regulation model outlined above, this perception of heightened risk would be expected to promote self-protective cognitions and behaviours, such as devaluating their friend and withdrawing from the friendship. Thus, for individuals with high trait SA or SAD, close attunement to potential friendship ruptures, followed by repeated pursuit of self-protective goals (over goals that promote

connectedness), may have the unintended consequence of distancing them from their close friends and eroding perceived friendship quality.

Overview of Research Objectives and Studies

What accounts for reduced friendship satisfaction in SAD? Can well-established cognitive and interpersonal models of SAD be extended to understand the mechanisms that link higher SA with lower perceptions of close friendship quality? To address these overarching research questions, I conducted a set of two initial studies in which I examined proposed links between trait SA and concerns individuals might have about potentially revealing perceived personal flaws to their close friends, as well as between trait SA and the nature and importance of the expectations that adults hold for their close friends. For these studies, I adapted the Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011) to assess concerns about appearing socially incompetent, physically unattractive, or visibly anxious specifically in the company of their close friends. I also developed a new measure of adult friendship expectations, designed to capture the empirically supported friendship dimensions from the available literature. These scales were first administered to an undergraduate sample, with participants varying in levels of trait SA (Study 1A), followed by clinical replication using a community sample (Study 1B). In both studies, I was interested in the understanding the association between trait SA and negative self-portrayal concerns within close friendships, as well as how trait SA and/or concerns about negative self-portrayal relate to participants' friendship expectations.

In addition, I wished to better understand sensitivity to, and effects of, possible close friendship ruptures among individuals with varying levels of SA. For this purpose, I designed an experimental paradigm which was administered first to an unselected undergraduate sample with SA symptoms that varied across the normal distribution (Study 2A). Subsequently, the paradigm

was tested in a replication and extension study in individuals with SAD compared to a control group of participants without any mental health difficulties (Study 2B). In both studies, participants were randomly assigned to either a Threat or Control study condition in which discrepancy threat salience was manipulated via hypothetical friendship scenarios. Due to constraints on in-lab research in the context of the COVID-19 pandemic, procedures for all studies comprising this dissertation were adapted to be completed entirely online.

Study 1A - Why Do My Friendships Feel So Unsatisfying? Examining The Effects of Social Anxiety on Appraisals of Self and Expectations of Others in Close Friendships

Abstract

Prior research has shown that people with higher trait SA feel less satisfied in their friendships, but little is known about how trait SA might affect people's views of self and others within a close friendship context. In an online study, 595 undergraduates completed (a) an adapted version of the Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011) that assesses the nature of self-portrayal concerns within close friendships, and (b) the Friendship Expectations Scale, a new self-report measure we developed to assess adult friendship expectations. Correlational analyses on the adapted Negative Self-Portrayal Scale revealed that as SA increased, so did concerns about revealing perceived flaws to close friends across the domains of social competence, physical appearance, and signs of anxiety. An exploratory factor analysis on Friendship Expectations Scale items supported a 2-factor solution representing (a) expectations related to solidarity and agency, and (b) expectations related to symmetrical reciprocity and support, with strong internal consistency for each subscale. However, analyses revealed that trait SA was unrelated to the expectations respondents held of their close friends across either of the Friendship Expectations Scale subscales. Thus, higher trait SA may heighten concerns people have about revealing their perceived self-flaws to close friends, even though it does not impact their friendship expectations. Implications of these results are discussed in relation to friendship satisfaction within the context of cognitive and interpersonal models of SA.

Introduction

Friendship - the intimate emotional bond formed between two individuals (e.g., Dunbar, 2018) – is a critical form of social connection (Baumeister & Leary, 1995; Blieszner, 2014; Demir & Weitekamp, 2007; Lewis et al., 2015; Pietromonaco & Collins, 2017). People are intuitively able to distinguish between individuals in their life across levels of friendship intimacy, from acquaintances to close friends (Blieszner, 2014; Demir & Ozdemir, 2010). Friendship bonds are characterized by certain relational and emotional qualities such as trust, warmth, and empathy (Bigelow, 1977; Hall, 2011; La Gaipa, 1987), as well as predictable interaction patterns and material benefits including joint activities and sharing of resources (Oswald et al., 2004; Vigil, 2007).

The presence and strength of one's friendships have been correlated with several indicators of well-being (Umberson & Karas Montez, 2010). For example, across cultures, individuals with higher perceived friendship quality tend to experience less stress, fewer negative emotions, more positive emotions, and overall higher life satisfaction (Blieszner, 2014; Brannan et al., 2013; Lewis et al., 2015). Benefits of close friendships similarly extend to physical health, with ample research linking higher friendships quality to increased immune functioning, decreased stress-related physiological damage, and improved cardiovascular health (Dunbar, 2018; Holt-Lunstad et al., 2007). Conversely, an absence of high-quality friendships is predictive of more depressive symptoms, greater social isolation and loneliness, higher risk of suicide, and earlier mortality (Azios et al., 2022; Grunebaum et al., 2010; Marver et al., 2017; Wade & Kendler, 2000).

Considering the established link between close friendships and better well-being, it is vital to understand the barriers that people face in both accessing and maintaining close social

connections. One potential barrier is social anxiety (SA). Indeed, prior work has found that adolescents with higher levels of trait SA struggle with the process of friendship formation (Vernberg et al., 1992), while adults with higher SA report reduced satisfaction in existing friendships (Rodebaugh, 2009; Rodebaugh et al., 2012).

Trait SA can be characterized as lying on a continuum ranging from typical shyness to the more extreme clinical expressions of social anxiety disorder (SAD) and avoidant personality disorder (Ruscio et al., 2008). People with SAD, which affects an estimated 12% of the population in their lifetime (Kessler et al., 2005), report strong fears of scrutiny, evaluation, and rejection in social situations (e.g., Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997) and experience lower overall well-being and poorer health outcomes (Dryman et al., 2016; Eng et al., 2005; Stein et al., 2017). Socially anxious individuals tend to view themselves as fundamentally flawed and undesirable, with distress driven by a fear that perceived personal flaws will become apparent to others, who are perceived to be harsh and unforgiving observers (Moscovitch, 2009). These views of self as inadequate and others as having unattainably high standards become reinforced over time via biased information processing both within and between social encounters (Clark & McManus, 2002; Heinrichs & Hofmann, 2001; Hirsch & Clark, 2004; Moscovitch et al., 2018). The discrepancy between perceived demands of others and one's ability to meet those demands promotes the use of behavioural strategies that aim to minimize the perceived gap and reduce the internal experience of distress (Leary & Jongman-Sereno, 2014). Such strategies typically include either overt or subtle forms of avoidance, which may decrease momentary anxiety but serve to maintain and exacerbate symptoms over time (Dabas et al., 2023; Moscovitch et al., 2013).

While research to date has primarily focused on the negative effects of SA symptoms when meeting and interacting with strangers or performing in front of an evaluative audience, a relatively small body of research suggests that the detrimental effects of SA may also extend to impairment within close friendships. For example, in a study reporting on self and friend ratings of various friendship characteristics, participants with SAD provided lower ratings of liking, intimacy, and satisfaction, compared to ratings provided by their friends (Rodebaugh et al., 2014). Data from epidemiological samples offer additional support for the robust relation between SA and friendship impairment, over and above other mental disorders and demographic variables (e.g., La Greca & Harrison, 2005; Rodebaugh, 2009; Rodebaugh et al., 2012).

What factors may impact the perception of friendship quality for people with higher trait SA? The present study examined (a) whether people with higher levels of trait SA tend to worry about revealing perceived self-flaws to close friends, as they do in social contexts with evaluative non-friends, and (b) whether levels of trait SA impact the nature of the friendship expectations people have of their close friends.

According to Moscovitch (2009), symptoms of SA are fueled by concerns about revealing personal flaws to others, and the idiosyncratic nature of such concerns is responsible for the heterogeneity in SA symptom presentation (i.e., between-person variability regarding the specific situations that elicit the greatest anxiety, and which coping strategies are employed). For example, a socially anxious individual with a primary fear of appearing physically unattractive may spend hours assembling the perfect outfit, styling their hair, and covering blemishes with makeup. Alternatively, another socially anxious individual, whose chief concerns relate to appearing socially incompetent, may attempt to cope by excessively preparing and practicing what they will say in the upcoming interaction. To assess these individual differences in self-

portrayal concerns, Moscovitch and Huyder (2011) developed the Negative Self-Portrayal Scale (NSPS). They found that people with elevated symptoms of SA tend to report concern about exposing personal flaws in social situations across three domains: (1) social incompetence (e.g., “I will do something stupid”), (2) physical unattractiveness (e.g., “I will appear ugly”), and (3) visible signs of anxiety (e.g., “My hands will shake”). The scale was initially validated using two large samples of North American undergraduate students (Moscovitch & Huyder, 2011) and later extended to clinical samples (Moscovitch et al., 2013; Moscovitch et al., 2015). The NSPS has demonstrated strong psychometric properties in undergraduate and community samples of participants drawn from both clinical and nonclinical populations. Here, we adapted the NSPS to assess respondents’ concerns about revealing perceived personal flaws to others specifically when in the company of close friends.

In addition to the possibility that higher trait SA may be related to biased views of self within friendships (e.g., viewing the self as fundamentally flawed and undesirable), we also sought to investigate whether levels of trait SA predict differences in friendship expectations. Friendship expectations provide information about the behaviours and qualities of a relationship that people believe to be central to the experience of “friendship.” For example, an individual who endorses the expectation that “friends will share with me” likely holds a prototype of friendship in which friends share resources. Prototypes of friendship are thought to be formed and maintained through personal experience (Fehr, 2004). Since high trait SA is associated with increased social withdrawal and decreased experiences of positivity within social interactions (Biggs et al., 2012; Hudd & Moscovitch, 2022, 2023; Rubin & Burgess, 2001), it is plausible that differences in social learning histories between high and low SAs would be reflected in friendship prototypes that differ by level of trait SA.

In any given situation, expectations are thought to serve as the standards upon which the acceptability of outcomes is evaluated (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002). According to the Ideal Standards Model (Fletcher et al., 1999), ratings of friendship satisfaction are contingent upon the degree to which friends are perceived as meeting or exceeding one's internal framework of ideal standards (Hall et al., 2011). Hall and colleagues (2011) found the strongest predictor of overall friendship satisfaction to be daily expectation fulfillment, with individuals most likely to be satisfied with friends who behaved in ways that met or exceeded their expectations. Importantly, the Ideal Standards Model holds that individuals differ from one another in their standards for an ideal interaction partner (Campbell et al., 2001; Fletcher et al., 1999), raising the question of whether trait SA accounts for variance in personal models of "ideal friends", or friendship prototypes, across individuals.

To date, research regarding friendship expectations has primarily been conducted with children and adolescents. For example, Hall (2011) presented results of five meta-analyses using 36 samples, with only four samples having a mean age over 23 years. Of the samples analyzed ($N = 8825$), participants were on average 15.7 years old, highlighting the need for more research on friendship expectations among adult populations (Hall, 2011). In addition, there has been debate about the number of friendship expectation dimensions that best such social relations, with proposed estimates ranging from two (Zarbatany et al., 2004) to upwards of twenty expectation dimensions (Bigelow, 1977; La Gaipa, 1987). Our framework in the current investigation was informed by Hall's (2011) synthesis of the available literature, which proposed that individual differences in friendship expectations span four domains: (1) symmetrical reciprocity, (2) communion, (3) solidarity, and (4) agency. The dimension of *symmetrical reciprocity* captures friendship expectations related to trust, commitment, and authenticity, as

exemplified by behaviours such as communicating honestly, honouring promises, and keeping secrets that friends confide. These have been proposed as the most prototypical behaviours producing intimacy (Fehr, 2004), such that the symmetrical reciprocity dimension has been suggested to capture the most important features of friendships (Hall, 2011). Closely related to symmetrical reciprocity is the expectation dimension of *communion*, which contains friendship characteristics related to emotional availability, self-disclosure, and empathic understanding that tend to be embodied by behaviours such as sharing personal inadequacies and fears with a friend, as well as offering emotional support when a friend is in distress. Symmetrical reciprocity is often conceptualized as a prerequisite for communion, as without trust and loyalty, disclosure is rarely attempted (Fehr, 1996, Hartup & Stevens, 1997).

Third, expectations of *solidarity* consist of friendship behaviours such as spending time together, engaging in joint activities, and including each other in broader social plans. Such friendship expectations tend to be among the first that are formed in childhood (Bigelow & La Gaipa, 1975) and they remain a key feature of friendship throughout adolescence and beyond (Fehr, 1996). Last, expectations of *agency* refer to the benefits that friendships may confer, in terms of tangible resources, social status, and networking (Bakan, 1966; Hall, 2011). Since friendships are typically understood in terms of emotional bonds and companionship, this expectation dimension is not often reported (e.g., La Gaipa, 1987). However, access to valued support and resources is an important aspect of what makes certain individuals more desirable friends than others (Rawlins, 2009; Zarbatany et al., 2004). The key characteristics of each friendship expectation dimension, along with illustrative examples, are presented in Table 1.

Table 1*Four Dimensions of Friendship Expectations*

Dimension	Primary Markers	Examples
Symmetrical	Trust, loyalty, commitment,	Keeping each other's secrets.
Reciprocity	genuineness	Telling the truth, even when difficult.
Communion	Self-disclosure, intimacy, empathy	Sharing embarrassing events or fears. Offering emotional support.
Solidarity	Companionship, inclusion, mutual activities	Celebrating special events together. Prioritizing spending time together.
Agency	Provision of resources, status, rewards	Helping a friend move. Introducing a friend to new people.

Note. The four dimensions of friendship expectations, as proposed by Hall (2011), that were used as the guiding framework for developing the Friendship Expectations Scale.

To fully understand friendship satisfaction and its relation to SA, it may be relevant to consider the *types* of expectations that adults have within close friendships, as well as the *relative perceived importance* of each expectation dimension. As noted above, the prototype interaction-pattern model of intimacy expectations posits that people possess prototypes of behaviours that increase friendship intimacy, and that these prototypes are refined through personal experience. Across six studies, results of Fehr's (2004) investigation of this model suggested that dimensions of behaviours contributing to friendship intimacy are not weighted equally in people's minds when the information is used to evaluate the state of a friendship. It was proposed that more prototypical behaviours have a greater influence over one's experience within a relationship than behaviours that are less central to the prototype of interpersonal closeness. For example, Fehr (2004) found that, within friendships, people place greater importance on self-disclosure,

emotional expressiveness, and unconditional support, and relatively less importance on physical touch. Similar processes have been demonstrated within romantic relationships, with prototypical romantic relationship features (e.g., love and trust) being more predictive of relationship satisfaction than less prototypical relationship features (e.g., flexibility or having mutual friends; Hassebrauck & Aron, 2001).

We expected that differences in friendship expectations would emerge based on level of SA, due to cognitive biases and differences in social experiences influencing mental representations of friendship prototypes. However, we were unsure whether to predict that higher SA would be associated with higher or lower friendship expectations. Given the previously documented relation between higher SA and lower friendship satisfaction (e.g., Rodebaugh et al., 2014), a hypothesis that higher SA is associated with *higher* expectations would be consistent with the Ideal Standards Model that lower relational satisfaction results from the perception that one's present circumstances fail to meet one's expectations, which leaves people feeling unsatisfied (Fletcher et al., 1999). Simultaneously, we were cognizant of evidence that would suggest an effect in the opposite direction – in other words, that higher SA would be linked with *lower* friendship expectations – on the basis that higher SA tends to correlate with lower self-esteem (Iancu et al., 2015; Murad, 2020) and a tendency to view oneself as inferior to others across multiple domains (Antony et al., 2005). According to cognitive models of SA (Hofmann, 2007; Morrison & Heimberg, 2013), negative self-views serve to maintain symptoms of SA by fueling a discrepancy between perceptions of the self (as inadequate) and the expectations of others (as unattainable), thus leading to greater fear of negative evaluation (Iancu et al., 2015). Thus, we recognized the possibility for such negatively biased views of self to be linked to beliefs that one is less worthy of high friendship standards; however, given that the Ideal

Standards Model served as the framework which guided our understanding of the role of interpersonal expectations in experiences of satisfaction, we ultimately based our hypotheses on this theory.

Aims and Hypotheses

We aimed to investigate, first, whether individuals with higher trait SA endorse greater concerns about revealing perceived personal flaws in the context of close friendships. To this end, we adapted the NSPS (Moscovitch & Huyder, 2011) to inquire about close friendship contexts and hypothesized that (H1) higher SA would be linked to greater concern about revealing perceived personal flaws to close friends, as demonstrated by higher ratings on the adapted NSPS. Second, because existing data on friendship expectations relies heavily on child and adolescent samples, we sought to develop and validate a new measure of adult friendship expectations and test how scores on this scale relate to trait SA. Grounded in the Ideal-Standards and prototype-interaction pattern models of friendship behaviour (Fehr, 2004; Fletcher et al., 1999; Hall et al., 2011), we expected that (H2) higher SA would be associated with (a) endorsement of higher friendship expectations and (b) higher ratings of perceived importance for each expectation dimension.

Methods

Participants

Required sample size estimated using G*Power software revealed that 550 participants would be required to detect small effects. Oversampling to account for the possibility of low-quality data that will need to be excluded from analyses, 595 participants were recruited for the study. Participants were undergraduate students at a Canadian university in a mid-size city

completed a 30-minute online study in exchange for partial course credit. There were no exclusion criteria.

Procedures

Participants completed a series of self-report questionnaires, including measures of trait SA, negative portrayal concerns within the context of friendships, and the nature of their friendship expectations. Procedures related to our adaptation of the original self-portrayal measure and creation of the new friendship expectation measure are outlined below. In addition, participants completed measures of attention, effort, and demographic variables.

Measures

Social Anxiety Interaction Scale

Trait SA was assessed using the straightforward items of the Social Anxiety Interaction Scale (Mattick & Clarke, 1998; Rodebaugh et al., 2007; Rodebaugh et al., 2011), which excludes the three reverse-scored items of the original 20-item scale. In prior studies with undergraduate, community, and clinical samples, the Social Anxiety Interaction Scale – straightforward items has demonstrated superior validity to the version that includes reverse-scored items (Rodebaugh et al., 2011). Questions on the Social Anxiety Interaction Scale – straightforward items assess anxiety related to a variety of social interactions (e.g., “I find it difficult mixing comfortably with the people I work with”), with responses provided on a Likert-type scale from 0 (Not at all characteristic or true of me) to 4 (Extremely characteristic or true of me). Previous studies using this scale have demonstrated excellent internal consistency among student samples comparable to the one used here (e.g., $\alpha = 0.99$; Rodebaugh et al., 2016).

Negative Self-Portrayal Scale – Friendship Version (NSPS-F)

To assess the extent to which participants were concerned about appearing socially incompetent, physically unattractive, and/or visibly anxious to their close friends, we adapted the instructions of the Negative Self-Portrayal Scale (NSPS; Moscovitch & Huyder, 2011). The original scale instructions ask respondents to “indicate the degree to which you are concerned about the following aspects of yourself when you are in *anxiety-provoking social situations (e.g., talking to someone who is a stranger; giving a speech in front of an audience; answering a question in class; etc.)*”. In contrast, the adapted scale instructions read, “Keeping your close (or best) friends in mind, please use the scale provided below to indicate the degree to which you are typically concerned about the following aspects of yourself *when you are in the company of your close (or best) friends*.” The NSPS items consist of 27 negative self-adjectives that reflect different aspects of social competence, physical appearance, and visible signs of anxiety. Participants rate each item on a 5-point scale reflecting their degree of concern that “it will become obvious to other people that I am...” ranging from 1 (not at all concerned) to 5 (extremely concerned). The original NSPS has demonstrated good internal consistency and test-retest reliability, as well as strong convergent and predictive validity and adequate discriminant validity (Moscovitch & Huyder, 2011; Moscovitch et al., 2013; Moscovitch et al., 2015). The same items were used in the NSPS-F in the present study, with the only changes pertaining to the wording of instructions and the referenced evaluator who may notice the various aspects of participants’ appearance and behaviour (in this case, a “close friend” rather than “other people”).

Friendship Expectations Scale - Initial Item Generation

Twelve items were constructed by the authors, designed to capture the four dimensions of friendship expectations put forth by Hall (2011), based on a review of the existing literature. The dimensions were: (1) symmetrical reciprocity (trust, loyalty, commitment, genuineness); (2)

communion (intimacy, self-disclosure, empathy); (3) solidarity (inclusion, mutual activities, companionship); and (4) agency (resources, status, reward). Original scale items were developed in close consultation with members of our laboratory, using key words and concepts that embody each of the four dimensions. For example, to capture the “trust” aspect of symmetrical reciprocity, we created asked participants to rate the extent to which they expect friends to keep secrets that are confided in them. Similarly, for the “inclusion” aspect of solidarity, we created the item “I expect my close (or best) friends to include me in their social plans.” Three items per dimension were created, with response options from 1 (Strongly Disagree: I never expect my friends to do this) to 5 (Strongly Agree: I always expect my friends to do this).

In addition to collecting ratings of agreement for each of the possible friendship expectations, we designed the scale to request ratings of how *important* each of the items is to the respondent, from 1 (It is not at all important that my friends do this) to 5 (It is extremely important that my friends do this). As noted above, the rationale for assessing both agreement and perceived importance of each item was grounded in literature on prototypical interaction patterns, which suggests that interaction patterns considered more central to an individual’s concept of interpersonal intimacy more strongly influence satisfaction within the friendship than interaction patterns considered more peripheral (Fehr, 2004). Thus, participants first rated their agreement with the item, “I expect my close (or best) friends to keep secrets that I confide in them,” and then rated their agreement with the item, “It is important to me that my close (or best) friends keep secrets that I confide in them.” However, ratings of agreement were of primary interest and used as the basis for an exploratory factor analysis on the new scale.

All Friendship Expectations Scale items were created by the two authors, with input from members of our research group consisting of five clinical psychology graduate students, who

provided feedback on item clarity and relevance, which resulted in item editing and pruning. Following this process, the final version of the 12 Friendship Expectations Scale items was compiled. Items are presented in Table 2, organized by dimension of friendship expectations.

Table 2

Friendship Expectations Scale Items

Item Prompt
<i>I expect my close (or best) friends to...</i>
Symmetrical Reciprocity (trust, loyalty, commitment, genuineness)
...keep secrets that I confide in them (i.e., not tell them to other people).
...be reliable, by carrying through with commitments.
...communicate honestly with me and not tell me lies.
Communion (intimacy, self-disclosure, empathy)
...provide emotional support when I need it.
...share with me thoughts and events that are important to them.
...Get in touch (e.g., text or call) just to let me know they are thinking of me and to see how I am doing.
Solidarity (inclusion, mutual activities, companionship)
...make time to engage in activities with me.
...include me in their social plans.
... celebrate important milestones and special occasions with me.
Agency (resources, status, reward)
...offer help when I am having trouble doing something alone.
...share resources with me when I am in need.
... expand my social circle by introducing me to new people.

Note. This table presents items developed to assess adult friendship expectations, across the domains proposed by Hall (2011). Instructions read: *Below are a number of expectations that people could have for their close (or best) friends. Please use the response options below to indicate the extent to which you agree with each statement, and how important each of the listed possible friendship expectations is to you.* Responses on the *agreement* subscale ranged from 1 (Strongly Disagree; I never expect my friends to do this) to 5 (Strongly Agree; I always expect my friends to do this). Responses on the *importance* subscale ranged from 1 (It is not at all

important that my friends do this) to 5 (It is extremely important that my friends do this). Scores were calculated by summing the relevant items.

Demographics

After all study measures, participants were presented with questions asking about demographic variables, including age, gender, country of birth, and ethnicity.

Accuracy and Attention Checks

After the demographic questionnaire, accuracy and attention checks asked about participants' levels of effort during study completion, how clear and understandable they found the study instructions to be, and whether and why they think we should be cautious about including their data in analyses. Effort and clarity of instructions were rated on a scale from 1 (Very minimal effort/Not at all clear and understandable) to 5 (I put in my best effort to answer all questions to the best of my ability/Extremely clear and understandable). The question asking for potential reasons why data should be excluded from analyses was an open-text response. Participants who reported providing low quality data via either open-text responses or via ratings that were lower than 3 out of 5 on the Likert scale, were excluded from analyses.

Data Analytic Approach

Hypothesis 1

To test the hypothesis that SA would be positively correlated with concerns about potentially revealing personal flaws to close friends, bivariate correlations tested the relation between SA assessed via the Social Anxiety Interaction Scale – straightforward items and level of concern about revealing perceived personal flaws to close friends, assessed via the NSPS-F subscale and total scores.

Hypothesis 2

Prior to testing the second hypothesis, we ran an exploratory factor analysis (EFA) on the Friendship Expectations Scale expectation ratings across all Friendship Expectations Scale items. Following the EFA, to test the hypothesis that SA is linked with friendship expectations and their perceived importance, correlational analyses tested the relation between the Social Anxiety Interaction Scale – straightforward items and (a) endorsement of expectations listed on the Friendship Expectations Scale and (b) stated importance of those friendship expectations.

Exploratory Analysis

Correlational analyses explored whether NSPS-F concerns about revealing perceived personal flaws to close friends predicted differences in friendship expectations. In addition, we wished to test whether the relation between negative self-portrayal concerns and friendship expectations was moderated by symptoms of SA, assessed via the Social Phobia Inventory, using linear regression. Last, because of literature suggesting gender differences in friendship expectations (e.g., Hall et al., 2011; Hays, 1984, 1989; Miething et al., 2016; Parker & de Vries, 1993; Selfhout et al., 2009), we ran exploratory independent sample t-tests to compare Friendship Expectations Scale responses between male and female participants. We followed-up on these tests with regression models testing whether gender interacted with SA to predict friendship expectation endorsement and importance.

Results

Preliminary analyses

In total, 595 individuals participated in this online study. From the raw dataset, participants who dropped out of the survey prior to completing any of the three scales of primary interest (Friendship Expectations Scale, Negative Self-Portrayal Scale – Friendship version, Social Anxiety Interaction Scale – straightforward items) or who reported low effort or

inattention during study completion (i.e., either effort or attention rated as less than 3/5) were excluded from analyses ($n = 36$). Therefore, the final sample included in analyses was comprised of 559 participants. For all measures, data that were determined to be missing completely at random (MCAR) using Little's MCAR test (Little, 1988) were imputed using Expectation-Maximization. Percentages of missing data ranged from 0.2% to 0.7% across the measures. Data that were not MCAR were deleted pairwise, such that participants were retained in analyses for which relevant data were available. Outliers falling more than 3 SD above or below the mean were winsorized to be exactly 3SD from the mean. Analysis of skew and kurtosis showed all data used in analyses to be normally distributed, consistent with recommendations of Kline (1998; skew below 3.0 and kurtosis below 10.0).

Descriptive statistics

Demographic information for participants, including age, gender, and ethnicity, is presented in Table 3. Standard deviations and Cronbach's alphas of study measures are presented in Table 4.

Table 3*Demographic Characteristics of Participants*

Demographic Variable	Participant Responses
Age in years (Mean; $N = 556$)	20.26 (SD = 3.02)
Gender (Percentage; $N = 556$)	
Cisgender Man	23.0
Cisgender Woman	75.9
Transgender (Woman to Man)	0.4
Non-binary	0.7
Ethnicity (Percentage; $N = 546$)	
White	33.5
East Asian (e.g., Chinese, Japanese, Korean)	23.3
South Asian (e.g., East Indian, Pakistani)	22.9
Black	4.2
Latinx	2.7
Southeast Asian (e.g., Cambodian, Indonesian, Vietnamese)	2.6
Arab	2.4
West Indian (e.g., Caribbean)	1.8
Filipino	1.6
Other	4.8

Note. Due to some missing data that could not be imputed, N s vary, as indicated

Table 4*Internal Consistency, Means and (Standard Deviations) of Study Measures*

Measure	Cronbach's α	Mean (SD)
SIAS-S ($N = 559$)	.94	28.12 (15.05)
NSPS-F – Social Competence subscale ($N = 559$)	.94	20.92 (9.87)
NSPS-F – Physical Appearance ($N = 559$)	.92	14.11 (6.62)
NSPS-F – Signs of Anxiety ($N = 559$)	.90	13.13 (5.87)
NSPS-F – Total ($N = 559$)	.97	48.14 (20.68)
FES – Solidarity and Agency ($N = 554$)	.86	28.10 (4.98)
FES – Symmetrical Reciprocity and Communion ($N = 556$)	.83	22.48 (2.82)

Note. SIAS-S = Social Anxiety Interaction Scale (Mattick & Clarke, 1998) – Straightforward items (Rodebaugh et al., 2007; Rodebaugh et al., 2011); NSPS-F = Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011)– Friendship version; FES = Friendship Expectations Scale.

Relations Between Social Anxiety and Negative Self-Portrayal Concerns Within Close Friendship Context

A bivariate correlation showed that higher SA was associated with higher endorsement of concern about revealing perceived personal flaws to close friends ($p < .001$). This significant positive correlation between Social Anxiety Interaction Scale – straightforward items and NSPS-F was observed for the NSPS-F total score ($r = .423$), as well as for Social Anxiety Interaction Scale – straightforward items with each of the three NSPS-F subscales individually (social competence concerns $r = .449$; physical appearance concerns $r = .353$; signs of anxiety concerns $r = .332$). Therefore, hypothesis 1 was supported.

Exploratory Factor Analysis for the Friendship Expectations Scale

EFA with principal axis factoring was used to examine the underlying structure of the Friendship Expectations Scale. As the hypothesized factors of the Friendship Expectations Scale were expected to correlate with each other (Hall, 2011), the items were subjected to analysis using an oblique (direct oblimin) rotation. Consistent with recommendations of Tabachnick and Fidell (2007), only rotated factor loadings above .32 were considered statistically meaningful. All Friendship Expectations Scale items had factor loadings greater than .38 on a single factor and less than .30 on other factors, except for one item which cross-loaded onto two factors. The cross-loading item was “I expect close friends to share with me thoughts and events that are important to them,” which had comparable loadings with both factors 1 and 2. The item was retained within factor 2 due to its theoretical relevance to the other items in that subscale. An inspection of the scree plot and all eigenvalues greater than 1 indicated that a two-factor solution provided the best fit. The two factors accounted for 50.60% of the total variance. Interpreting the factor loadings, we labeled the first factor “solidarity and agency,” accounting for 42.75% of the variance. The second factor, accounting for 7.85% of the variance, was labeled “symmetrical reciprocity and communion.” Rotated factor loadings from the EFA pattern matrix for each of the 12 Friendship Expectations Scale items are presented in Table 5.

Table 5*Rotated Factor Loadings from Pattern Matrix for Items of the Friendship Expectations Scale*

Item Prompt	Factor Loading	
“I expect my close (or best) friends to...”	Solidarity and Agency	Symmetrical Reciprocity and Communion
... expand my social circle by introducing me to new people.	.76	
...include me in their social plans.	.72	
...share resources with me when I am in need.	.65	
...make time to engage in activities with me.	.65	
... celebrate important milestones and special occasions with me.	.61	
...offer help when I am having trouble doing something alone.	.57	
...Get in touch (e.g., text or call) just to let me know they are thinking of me and to see how I am doing.	.53	
...share with me thoughts and events that are important to them.	.41	-.39
...be reliable, by carrying through with commitments.		-.79
...communicate honestly with me and not tell me lies.		-.75
...keep secrets I confide in them (i.e., not tell other people).		-.66
...provide emotional support when I need it.		-.55

Note. Friendship Expectations Scale instruction read as follows, “Below are a number of expectations that people could have for their close (or best) friends. Please use the response options below to indicate the extent to which you agree with each statement”. All 12 items listed in the table were continuations of the prompt, “I expect my close (or best) friends to...”.

Response options ranged from 1 “Strongly Disagree; I never expect my friends to do this” to 5 “Strongly Agree; I always expect my friends to do this”. The Friendship Expectations Scale subscale scores are the sum of items within that factor. Factor loadings < .30 are not included in the table, for clarity.

Relations between trait social anxiety and friendship expectations

There was no significant correlation between Social Anxiety Interaction Scale – straightforward items scores and strength of rated friendship expectations, for either the “Solidarity and Agency” dimension ($r = -.02, p = .601$) or the “Symmetrical Reciprocity and Communion” dimension ($r = -.06, p = .182$). Similarly, Social Anxiety Interaction Scale – straightforward items scores were not related to the rated importance of close friendship expectations for either the “Solidarity and Agency” dimension ($r = -.01, p = .862$) or the “Symmetrical Reciprocity and Communion” dimension ($r = -.02, p = .687$). In addition, we found that endorsement of expectations on the “Solidarity and Agency” dimension was significantly correlated with ratings of how important such expectations were believed to be ($r = .72, p < .001$), and a correlation of similar magnitude was observed between endorsement and importance ratings of expectations on the “Symmetrical Reciprocity and Communion” dimension ($r = .70, p < .001$). Therefore, results did not support hypothesis 2 that higher SA will be associated with higher ratings of expectations and importance of those expectations.

Exploratory analyses of relations between friendship expectations and self-portrayal concerns

Although trait SA did not predict friendship expectations, we conducted exploratory analyses to examine whether concerns about negative self-portrayal may be related to friendship expectations. Interestingly, all three NSPS-F subscales were significantly predictive of lower expectations for “Symmetrical Reciprocity and Communion” (social competence: $r = -.19, p < .001$; physical appearance: $r = -.17, p < .001$; signs of anxiety: $r = -.24, p < .001$). Only the social competence domain of the NSPS-F was significantly correlated with expectations of “Solidarity and Agency” as well ($r = -.09, p = .030$). The direction of all correlations was such that higher self-portrayal concerns within close friendships were linked to lower friendship

expectations. We also used linear regression analyses to test whether mean-centered Social Anxiety Interaction Scale – straightforward items scores interacted with any domains of the NSPS-F to predict friendship expectations for either of the subscales, but no interactions were significant (all p 's > .055).

Exploratory analyses of effects of gender on friendship expectations

Independent samples t-tests were used to compare close friendship expectation ratings between participants who identified as men versus those who identified as women. For the purpose of creating the 2-level gender variable, the two transgender participants (female to male) were included with the group of men in these analyses, consistent with their identity. Non-binary participants were excluded from exploratory analyses of gender effects, due to low sample size ($N = 4$). Results revealed statistically significant differences in friendship expectation endorsement and rated importance, on both Friendship Expectations Scale subscales. On the Symmetrical Reciprocity and Communion subscale of the Friendship Expectations Scale, women ($M = 22.79$, $SD = 2.50$) endorsed higher expectations than men ($M = 21.68$, $SD = 2.77$), with a small to medium effect size ($t(547) = 4.31$, $p < .001$, $d = .43$). Similarly, on the Solidarity and Agency subscale of the Friendship Expectations Scale, women ($M = 28.59$, $SD = 4.82$) endorsed higher friendship expectations than men ($M = 26.61$, $SD = 4.83$), with a small to medium effect size ($t(545) = 4.06$, $p < .001$, $d = .41$). Women ($M = 22.87$, $SD = 2.55$), compared to men ($M = 21.43$, $SD = 2.93$), also reported higher ratings of how important it is to them that friends meet their expectations on the Friendship Expectations Scale - Symmetrical Reciprocity and Communion subscale ($t(547) = 5.42$, $p < .001$, $d = .54$). Women ($M = 27.87$, $SD = 5.23$) also provided higher ratings of importance than men ($M = 25.12$, $SD = 4.84$) on the Friendship Expectations Scale – Solidarity and Agency subscale ($t(543) = 5.30$, $p < .001$, $d = .53$).

Finally, exploratory analyses tested whether participant gender interacted with SA to predict endorsement of friendship expectations, as well as the rated importance of those expectations, in four separate hierarchical linear regression models. Mean-centered Social Anxiety Interaction Scale – straightforward items scores and the dummy-coded gender variable (0 = men; 1 = women) were entered in Step 1, and their interaction term added in Step 2, predicting Friendship Expectations Scale scores. The gender by SA interaction term did not significantly predict ratings of friendship expectations for either Friendship Expectations Scale subscale ($ps > .09$). When *importance* ratings were entered as outcome variables, the SA by gender interaction term did not predict Symmetrical Reciprocity and Communion importance ratings ($p = .716$) but it did significantly predict rated importance of Solidarity and Agency expectations. As observed above, on step 1, women tended to rate Solidarity and Agency friendship expectations as more important to them than men ($\beta = .23, p < .001$), whereas SA did not significantly predict ratings of expectation importance ($\beta = -.04, p = .304$). Addition of the SA by gender interaction term in Step 2 of the regression further improved the predictive utility of the model ($\Delta R^2 = .01, F(1, 541) = 4.10, p = .043$). Gender remained a significant predictor ($\beta = .21, p < .001$) and there was a significant SA by gender interaction ($\beta = -.18, p = .043$). Simple effects analysis revealed that the correlation between SA and Solidarity and Agency expectations was in opposite directions for women ($r = -.08; p = .091$) versus men ($r = .09; p = .314$), but neither was statistically significant.

Discussion

The present study sought to explore self-presentation concerns and expectations within adult friendships, and to provide insight about how such experiences vary by individuals' levels of trait SA. To this end, we adapted the Negative Self-Portrayal Scale (NSPS) to focus on self-

portrayal concerns that arise within close friendship contexts, and administered it to a large sample of undergraduate students. We expected higher trait SA to be predictive of greater concern about revealing perceived personal flaws to close friends. We also created a new measure of adult friendship expectations and conducted an exploratory factor analysis.

Responses on the new measure were then used to test the hypothesis that higher SA is linked to higher friendship expectations, as well as greater importance placed on close friends acting in expected ways.

Negative Self-Portrayal Concerns

As hypothesized, higher SA was associated with greater concern about revealing perceived personal flaws to close friends. This suggests that negative beliefs about the self, which maintain symptoms of SA and drive distress (Moscovitch et al., 2013), are active not only under times of increased scrutiny from strangers but also in presumably safe social contexts when interacting with close friends. Thus, even within close friendships, SA is a risk factor for perceiving oneself as flawed and inadequate. Indeed, our results indicate that as levels of SA increase, so does worry that one's negative self-attributes will be exposed for negative evaluation by their close friends.

Such self-portrayal concerns may manifest in ways that meaningfully influence experiences in close friendships. For example, sensitivity to the consequences of having close friends notice perceived personal flaws may promote self-concealment behaviours (e.g., Gray et al., 2019; McManus et al., 2008; Plasencia et al., 2011) and, in ambiguous friendship contexts, could motivate high SA individuals to prioritize avoiding potential rejection over approaching potential social rewards (Blay et al., 2021; Hudd & Moscovitch, 2022, 2023; Taylor & Alden, 2011). Research has shown that demonstrating relational vulnerability is critical for deepening

close interpersonal bonds (Carpenter & Greene, 2015; Clark & Reis, 1988), but social contexts that activate negative self-portrayal concerns tend to have the opposite effect on people with high trait SA, generating self-concealment and avoidance rather than authentic self-expression.

Thus, to the extent that close friendship contexts activate negative self-portrayal concerns, high SA individuals may struggle with feeling unsatisfied in their social relationships, which may be the case even within their close friendships. Whether, and how, persistent concern about revealing perceived personal flaws to close friends is expressed behaviourally in relation to increased use of self-protective behaviours within the friendship remains to be empirically tested in future research and may offer one possible explanation for past findings that individuals with higher SA experience less friendship satisfaction and perceive their close friendships to be of lower quality than those with lower SA (Rodebaugh, 2009; Rodebaugh et al., 2012; Rodebaugh et al., 2014, 2015). As activation of beliefs about being fundamentally flawed or inadequate has been shown to impede effective communication (e.g., Wenzel et al., 2005), in friendship contexts such beliefs may also thwart motivation for individuals with higher SA to reach out for help or support from friends when needed, contributing to feelings of social isolation and loneliness.

Friendship Expectations

The second aim of this study was to develop and validate a measure of adult friendship expectations and examine whether such expectations vary by levels of trait SA. An exploratory factor analysis on the newly developed measure, which we called the Friendship Expectations Scale, supported a two-factor solution with items grouping together in ways that were largely consistent with theory. As previously described, Friendship Expectations Scale items were organized into the friendship expectation dimensions from Hall's (2011) meta-analysis of the literature, primary consisting of studies of children and adolescents. Specifically, it was observed

that items created to represent the expectation dimensions of Solidarity and Agency, which together encompass joint activities, provision of resources, and instrumental support, loaded onto one factor on the new scale. Expectations within this dimension tend to be among the first that are formed as children build their social skills (Bigelow & La Gaipa, 1975) and are present across a range of levels of friendship intimacy (e.g., one may engage in joint activities with both casual and close friends). The second factor was comprised of items intended to capture the dimensions of Symmetrical Reciprocity and Communion, with key features being expectations of trust, loyalty, authenticity, and self-disclosure. These friendship expectations are more abstract, developed later in childhood, and are typically considered the most prototypical of close friendships (e.g., one is more likely to share deep fears with a close than casual friend; Fehr, 2004; Hall et al., 2011). As such, on the Friendship Expectations Scale, Hall's (2011) expectation dimensions are presented by two factors, which were then used for hypothesis testing.

Surprisingly, analyses showed that higher SA was predictive of neither endorsement of friendship expectations nor the rated importance of those expectations. Although our finding is correlational and requires replication and extension in future studies, we found that individuals' explicit understanding of how close friends ought to behave and how important each of the friendship expectations is to them did not depend on levels of trait SA, as hypothesized. In the context of the prototype interaction-pattern model of friendships, and the Ideal Standards Model, results of the present study suggest that individuals with varying levels of SA have similar prototypes of close friends, implying that differences between individuals with higher versus lower trait SA in friendship satisfaction) are unlikely to be driven by differences in the prototype of an "ideal friend" that is used for comparing one's actual friends to internal standards. Said another

way, the kinds of friendship-relevant behaviours one expects from one's close friends does not differ when one is more or less socially anxious.

Consistent with previous literature, showing that people who identify as girls or women generally hold higher friendship expectations than those identifying as boys or men (e.g., Hall, 2011), women in our sample endorsed higher expectations than men across both Friendship Expectations Scale friendship expectation dimensions. Moreover, women reported that it was more important to them that friends adhere to their friendship expectations, compared to ratings provided by men. Consequently, women may be more likely to experience a discrepancy between ideal and actual friendship behaviours, which has the potential to promote feelings of dissatisfaction in friendships, as proposed by the Ideal Standards Model (Fletcher et al., 1999). Indeed, although not assessed in the present study, research on youth has demonstrated that close friendships of dyads consisting of two women are more fragile (i.e., more likely to be terminated over conflict) than similar friendship dyads consisting of men (Benenson & Christakos, 2003). Exploratory analyses also tested for a possible interaction between gender and trait SA in predicting friendship expectations, as well as the rated importance of those expectations, and results showed that the utility of gender in predicting friendship expectations was not moderated by level of trait SA.

Exploratory analyses also suggested that higher degree of overall concern about negative self-portrayal significantly predicted lower friendship expectations for the Friendship Expectations Scale subscale of Symmetrical Reciprocity and Communion. However, concerns about appearing socially incompetent in the eyes of close friends predicted lower expectations on the Friendship Expectations Scale subscale of Solidarity and Agency. These findings suggest that perceiving oneself as an undesirable interaction partner decreases the standards that one holds for

how their friends should behave towards them. It is also intriguing that concerns about all three NSPS domains were significantly correlated specifically with the more abstract friendship expectations (i.e., symmetrical reciprocity and communion dimension) that are formed later in a person's social development, suggesting that as negative self-portrayal concerns are solidified in adolescence and early adulthood, they negatively colour their expectations of their close friends. Instead of deepening their bonds with the people they consider their closest friends, people with higher negative self-portrayal concerns may begin to doubt whether they can rely on their friends to provide the kind of friendship support they crave in order to meet their relational needs, which in turn may erode their feelings of friendship satisfaction. Although these findings are exploratory and remain to be replicated in future well-designed studies, they emphasize the critical link between negative self-perception and insecure attachment relationships with others.

Future studies are needed to understand how and why higher trait SA may be linked to less friendship satisfaction, if not through processes related to lowering or heightening friendship expectations. For example, consistent with the interpersonal theory of SA (Alden & Taylor, 2004), we propose the possibility that, while explicit understanding of the construct of friendship does not vary by one's level of SA, higher SA individuals may be more sensitive to primes of social threat, such as social stimuli suggesting a possible friendship rupture or rejection serve to activate negative self-schemas and promote avoidance behaviours that impede connection. Routine reliance on self-protective strategies in response to potential conflict within close friends has the potential to, over time, thwart feelings of closeness and perceived friendship quality.

Previous studies have shown that individuals with higher SA are more accepting of less desirable interaction partners and view themselves as less worthy of high-quality partners (Alden et al., 2001; Bielak & Moscovitch, 2012; Wilson & Rapee, 2006). This mindset may make higher

SA individuals less selective when establishing friendships and more likely to remain in an unsatisfying friendship rather than seek out new social supports. Moreover, higher concern about negative self-portrayal might motivate individuals to avoid potential conflict in their existing friendships, thereby diminishing opportunities for effective conflict resolution that may ultimately serve to fix perceived problems and increase intimacy.

Drawing on cognitive models of SA, there is ample evidence that individuals with higher SA prioritize negative social information over more positive (or neutral) cues in social contexts (Chen et al., 2020; Huppert et al., 2003; Stopa & Clark, 2000). If individuals with higher SA are concerned about the possibility of revealing perceived flaws to their friends, they will be more likely to engage in self-concealment behaviours and self-focused attention, thus diminishing mental resources available for attending to positive social cues (Kashdan et al., 2011). Over time, such negative biases have the potential to erode friendship satisfaction, regardless of the friend's behavioural patterns that may objectively meet expectations. If this was the case, treatment recommendations for improving satisfaction within friendships could focus on decreasing cognitive biases by teaching socially anxious individuals to attend to a wider range of friendship behaviours, including behaviours that signal connection, acceptance, and belonging and may serve to increase perceptions of friendship quality.

Limitations

Results must be interpreted within the context of the study's methodological limitations. A notable limitation of the present study was that our participant sample, though large, was comprised entirely of undergraduate students, who were primarily young, educated adults who identified as women. Young adulthood is typically associated with many transitions and new stressors (e.g., moving away from home; establishing new friendships) that may contribute to

heightened anxiety in peer relations. It is unknown whether results of this study would generalize to other stages of life, across a broader age range, and across individuals with diverse educational, socioeconomic, and cultural backgrounds.

In addition, it is noteworthy that this study about SA and friendships was conducted during the COVID-19 pandemic. Research has shown that higher pre-pandemic SA was predictive of decreased mental well-being following the initiation of social distancing and other COVID-related restrictions, with more intense endorsement of loneliness and greater fear of negative evaluation (Ho & Moscovitch, 2022). It is therefore possible that the unique global context in which this study took place may have skewed our results, as participants may have been experiencing heightened social isolation and stress due to the COVID context and replication of results outside the context of a global pandemic is warranted.

Although our demographic questionnaire provided options for a broad range of gender identities, small sample sizes of transgender and non-binary individuals necessitated that tests of gender effects rely on a dichotomous categorization. Consequently, as with previous research, the generalizability of our results is limited by a dichotomous categorization of gender. Nonetheless, it suggests that further exploring the role of gender identity and gender composition of friendship dyads would improve the predictive utility of models aiming to understand friendship processes.

Finally, we recognize the limitation that friendship satisfaction was not assessed in the present study, so inferences about the relation between expectations and satisfaction are based on the Ideal Standards Model (Fletcher et al., 1999) and could not be directly tested. Also, we note that it is possible the present findings are due to the specific tools used for assessing the constructs of SA and friendship expectations, such that results might differ if a clinical sample

was used or different methods were employed for indirectly measuring friendship prototypes, which may not normally be consciously accessible.

Conclusion

The present study examined negative self-portrayal concerns and friendship expectations of undergraduate students with varying levels of trait SA, in an effort to extend cognitive models of SA to close friendship contexts. To increase confidence in the generalizability and clinical relevance of study findings, replication of findings with a broader age range and with community participants with and without social anxiety disorder is needed. In addition, given the interpersonal nature of friendship dynamics, we recommend that future research aim to replicate these findings using more ecologically valid assessment tools and measures that rely more on implicit knowledge about self and friends, such as an assessment of friendship expectations via laboratory-based ecologically valid friendship tasks, with data provided by both members of the friendship dyad or an outside observer. We also suggest further examination of self-portrayal concerns within friendships, including how such concerns relate to feelings of interpersonal closeness and sensitivity to perceived threat within a close friendship context (e.g., the threat of failing to meet a close friend's expectations). Ultimately, findings in this line of work have the potential to inform targeted interventions that improve access to close and satisfying friendships for individuals who struggle with clinically significant symptoms of SA.

Study 1B - Social Anxiety Disorder and Close Friendships: The Role of Negative Self-Portrayal Concerns and Friendship Expectations

Abstract

Social anxiety (SA) is characterized by a fear of scrutiny and evaluation in social situations, with distress driven by idiosyncratic concerns about revealing perceived personal flaws to others. Here, we present a clinical replication of Study 1A. We recruited 94 community adults, who either met DSM-5 diagnostic criteria for Social Anxiety Disorder (SAD group) or denied the presence of any psychological difficulties (healthy control, or HC group). All participants completed the Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011), adapted to ask specifically about self-portrayal concerns when in the company of close friends, as well as the Friendship Expectations Scale. As expected, individuals with SAD tended to report greater concern about negative self-portrayal when in the company of close friends than HC participants. However, contrary to hypotheses, we found that HCs and SADs did not differ in friendship expectations on the Friendship Expectations Scale subscale of symmetrical reciprocity and communion; rather, participants with SAD endorsed significantly lower expectations than HC participants on the Friendship Expectations Scale solidarity and agency subscale. Findings suggest that beliefs about the self as fundamentally flawed are salient for individuals with SAD even in relatively safe social contexts, and that the link between SAD and friendship expectations varies by the type of friendship behaviour in question. Potential clinical implications are discussed, in relation to cognitive and interpersonal models of social anxiety.

Introduction

Social anxiety (SA) is characterized by a fear of scrutiny and evaluation in social situations (e.g., Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997), with such experiences ranging in intensity from typical shyness to symptoms that significantly impact mental health (Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). At the extreme high end of the SA spectrum lies social anxiety disorder (SAD), a debilitating psychiatric disorder causing significant distress and/or impaired functioning in daily life (Ruscio et al., 2008). Prominent models of SA posit that beliefs about oneself as fundamentally flawed or inadequate are maintained across time and contexts via both cognitive and behavioural processes (Alden & Taylor, 2004; Clark & McManus, 2002; Heinrichs & Hofmann, 2001; Hirsch & Clark, 2004; Schlenker & Leary, 1985). Furthermore, it has been theorized that idiosyncratic concerns about perceived personal flaws account for the heterogeneity in SA symptom presentation (Moscovitch, 2009).

Negative Self-Portrayal Concerns

Moscovitch and Huyder (2011) developed the Negative Self-Portrayal Scale (NSPS) for the assessment and organization of negative self-portrayal concerns, postulated to be driving symptoms of SA. This scale asked participants with varying levels of SA to report on their level of concern about revealing different types of perceived personal flaws when in anxiety-provoking social situations, with the initial scale validation suggesting that concerns about negative self-portrayal fall into three general domains: social competence, physical appearance, and visible signs of anxiety (Moscovitch & Huyder, 2011). Compared to individuals with lower levels of trait SA, high SA individuals endorsed greater concern about revealing perceived personal flaws across all three NSPS domains when in social situations (Moscovitch & Huyder,

2011). This finding was subsequently extended to clinical contexts, where it was observed that participants who met diagnostic criteria for SAD endorsed greater fear of revealing perceived personal flaws to others than healthy and anxious control participants (Moscovitch et al., 2013, 2015).

Whereas the NSPS was originally created to assess concern about negative self-portrayal within social situations in general, in Study 1A, we tested whether this framework may also provide insight into the friendship experiences of socially anxious individuals. To that end, we adapted the NSPS to ask about the presence and intensity of self-portrayal concerns specifically when in the company of close friends (NSPS-F). For example, participants in Study 1A were asked to indicate the degree to which they are typically concerned about being perceived as socially incompetent (e.g., boring), physically unattractive (e.g., ugly), or visibly anxious (e.g., sweaty) when in the company of their close (or best) friends. The friendship version of the NSPS demonstrated strong psychometric properties and we found higher trait SA to be predictive of greater concern about revealing perceived personal flaws to close friends, across the domains of social competence, physical appearance, and signs of anxiety.

However, the question remained about the extent to which these types of friendship concerns are salient among individuals with clinically significant symptoms of SA, who may be presenting for treatment. Clinical replication was required to assess whether (a) the adapted version of the NSPS is a valid assessment tool for gaining insight into self-portrayal concerns within friendships of clinical participants and (b) the extent to which research and psychological interventions should focus on such concerns within the context of friendships.

Friendships Expectations

Although literature on the relation between SA and friendships is small, the available empirical data suggests a robust relation between SA and impairment in close friendships (La Greca & Harrison, 2005; Starr & Davila, 2008), as well as lower friendship satisfaction (Rodebaugh, 2009; Rodebaugh et al., 2012). The NSPS-F findings from Study 1A suggested that concern about negative self-portrayal may contribute to the previously documented negative experiences within friendships. We wondered what else might contribute to the observed differences in friendship quality between high and low SA individuals and, to that end, also focused on possible differences in expectations.

Expectations are believed to form the standards upon which all circumstances are judged, with dissatisfaction thought to be the consequence of failing to meet one's internal model of a favourable outcome (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002). Proponents of the *Ideal Standards Model* have proposed that individuals hold a mental representation of an "ideal friend," which is then used to judge the behaviour of friends in daily life (Fletcher et al., 1999; Hall et al., 2011). Representations of the ideal friend are thought to be formed, maintained, and updated through social learning, and given that individuals with SAD tend to have negatively biased social learning experiences (e.g., Koban et al., 2023; Moscovitch et al., 2023), it is plausible that these different experiences translate to divergent internal models of friendship. Thus, decreased friendship satisfaction among individuals with higher SA may be a reflection of unmet close friendship expectations.

To test this idea, in Study 1A, we created the Friendship Expectations Scale for the assessment of adult friendship expectations and administered it to a large undergraduate sample. The Friendship Expectations Scale demonstrated strong psychometric properties and an

exploratory factor analysis supported a 2-factor solution, consistent with domains proposed in previous literature (Hall, 2011). Contrary to hypotheses, in the undergraduate sample, self-reported friendship expectations for both Friendship Expectations Scale dimensions did not vary by level of trait SA. However, the generalizability of that study is limited by its use of a non-clinical student sample. To address this shortcoming, in the present study, the Friendship Expectations Scale was administered to a sample of community participants with SAD and HCs. Moreover, although no differences by SA emerged in the initial study, in which SA was examined as a continuous variable that was normally distributed across the entire sample, we expected that a comparison of individuals meeting diagnostic criteria for SAD and individuals without history of psychological difficulties would reveal differences in close friendship expectations.

Research Questions and Primary Hypotheses

This study aimed to establish clinical norms for two scales that have not yet been investigated within a community sample of socially anxious individuals. Research questions and hypotheses were as follows:

1. Do individuals with SAD and HCs differ in endorsement of concern about revealing perceived personal flaws to close friends? We expected that (H1) participants' ratings of their level of concern about appearing socially incompetent, visibly anxious, and physically unattractive in the presence of close friends would be higher for individuals meeting criteria for SAD than for HC participants.
2. Do SADs and HCs differ in their friendship expectations? We hypothesized that, compared to a group of HCs, individuals with SAD would endorse (H2a) higher close

friendship expectations and (H2b) higher rated importance of those expectations, which may set them up for greater distress when expectations are not met.

Methods

Participants

A priori power analyses using G*Power indicated that a total of 80 participants would be required to detect large effects. The power analysis was based on the most power-hungry analysis, associated with data analytic procedures outlined in Study 2B and utilizing this same clinical sample. Large effects were expected based on prior studies showing that emotional and interpersonal responses of individuals with SAD differ markedly from HC participants when they are under social threat with large effects (e.g., Moscovitch et al., 2010), and we expected our threat condition to activate those kinds of differences. A total of 94 individuals participated in this 30-minute online study. From those, 4 HCs and 1 participant with SAD were excluded due to rating their level of attention or effort during study completion as being less than three out of five, or providing open-text responses for why we should not use their data in analyses. Therefore, the final sample included in analyses consisted of 43 HC participants without history of significant mental health concerns and 46 SAD participants meeting criteria for a DSM-5 diagnosis of SAD (American Psychiatric Association, 2013).

Participant Recruitment and Diagnostic Assessment

Clinical participants were recruited via online and community ads targeting individuals with symptoms of anxiety. Interested individuals were invited to complete a brief online symptom questionnaire and a subsequent phone screen, adapted from the Mini International Neuropsychiatric Interview (MINI; Sheehan, 2014), a well-validated semi-structured diagnostic interview (Pinninti, Madison, Musser, & Rissmiller, 2003; Sheehan et al., 1998). Individuals

who endorsed symptoms of SAD on the phone screen were considered potentially eligible and were invited to the lab for a full diagnostic assessment that consisted of the full MINI semi-structured interview, as well as the SAD symptom checklist from the Anxiety Disorders Interview Schedule (ADIS; Brown & Barlow, 2014). All diagnostic interviews were conducted by graduate students in clinical psychology, trained to proficiency in use of these assessment tools, and all cases were reviewed by the team of graduate student assessors and two licensed clinical psychologists, who achieved consensus on the final diagnoses for all participants before inclusion in the study. The principal diagnosis was the one deemed most clinically interfering and/or distressing. When two disorders were judged to be at the same level of clinical severity, they were listed as co-principal diagnoses. Exclusion criteria for the clinical group included endorsement of active and clinically significant suicidality, mania, or psychosis.

Control participants were similarly recruited from the community via online advertisements. Individuals who denied the presence of any potentially clinically significant mental health symptoms on the MINI screening questionnaire were enrolled into the HC group, provided that they did not endorse having any mental health symptoms that were at least moderately distressing and/or impairing in their daily life.

For both SAD and HC participants, if more than one week had passed between the time of initial recruitment and participation in the full study, another symptom screening questionnaire was administered to confirm eligibility at the time of study participation.

Procedures

This study was completed via online self-report questionnaires. All eligible SAD and HC participants completed the Negative Self Portrayal Scale (Moscovitch & Huyder, 2011) – adapted to be friend-specific (NSPS-F), and the Friendship Expectations Scale (see Study 1A).

Then, participants were asked to complete self-report measures of SAD symptoms (Social Interaction Anxiety Scale by Mattick & Clark, 1998; Social Phobia Inventory by Conner et al., 2000) and a measure of SAD symptom interference in daily life over the past week (Sheehan Disability Scale; Sheehan, 1983). Finally, participants completed brief questionnaires measuring demographic variables (age, ethnicity, gender identity), and their levels of attention and effort during study completion. Participants completed additional measures, which are described in Study 2B but not relevant for the current study.

Measures

Social Anxiety

In addition to the MINI assessment, the nature, past week severity, and past week interference and distress of self-reported symptoms of SA were assessed via the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998), Social Phobia Inventory (Connor et al., 2001), and Sheehan Disability Scale (Sheehan, 1983). These measures are described in further detail in Study 1A, and Cronbach's alphas in the present study ranged between good and excellent for the Social Anxiety Interaction Scale – straightforward items ($\alpha = .97$), Social Phobia Inventory ($\alpha = .96$), and Sheehan Disability Scale ($\alpha = .83$).

Negative self-portrayal concerns

To assess the extent to which participants were concerned about revealing perceived personal flaws across the domains of physical appearance, social competence, and visible signs of anxiety, we employed the Negative Self Portrayal Scale (NSPS; Moscovitch & Huyder, 2011). At the time of their original diagnostic assessment in the Anxiety Studies Research Group, clinical participants completed a questionnaire packet that included the original version of the NSPS, asking about negative self-portrayal concerns within anxiety-provoking social situations.

On this scale, individuals were instructed to, “provide ratings to indicate the degree to which you are concerned about the following aspects of yourself when you are in *anxiety-provoking social situations* (e.g., *talking to someone who is a stranger; giving a speech in front of an audience; answering a question in class; etc.*). In social situations (in which I feel anxious), it will become obvious to other people that I am...” (Moscovitch & Huyder, 2011). As part of our analyses, we examined participant responses to this original version of the NSPS in addition to those endorsed on the friendship version of the NSPS (NSPS-F; developed in Study 1A), which enabled us to compare the relative nature and magnitude of negative self-portrayal concerns for individuals with SAD in typical anxiety-provoking social situations versus within friendships. The adapted scale instructions of the NSPS-F asked participants to indicate how much they were typically concerned about various aspects of themselves *when you are in the company of your close (or best) friends*. The two versions of the NSPS were completed no less than 1 week apart for all clinical participants.

Both versions of the NSPS contained the same 27 items, with ratings provided on a 5-point scale from 1 (not at all concerned) to 5 (extremely concerned). The original version of the NSPS, asking about self-portrayal concerns in general, has demonstrated strong psychometric properties among both undergraduate and clinical samples (e.g., Moscovitch & Huyder, 2011; Moscovitch et al., 2013, 2015), and the friend version of this scale demonstrated excellent internal consistency in Study 1A. The original NSPS demonstrated good to excellent internal consistency in the present study, with Cronbach’s alpha scores ranging from 0.87 and 0.92 for the three NSPS domains and total score. Similarly, the NSPS-F demonstrated strong internal consistency in the present study, with Cronbach’s α ranging from 0.88 to 0.96.

Adult Friendship Expectations

Adult friendship expectations were assessed via the Friendship Expectations Scale, which was created and validated in Study 1A. This 12-item scale assessed friendship expectations across two dimensions: (1) Symmetrical Reciprocity and Communion, and (2) Solidarity and Agency, with subscale scores created by summing the six items comprising each of the two subscales. The Friendship Expectations Scale - Symmetrical Reciprocity and Communion dimension included items measuring friendship expectations around trust, loyalty, commitment, genuineness, intimacy, self-disclosure, and empathy (e.g., “*I expect my close (or best) friends to keep secrets I confide in them*”). The Friendship Expectations Scale - Solidarity and Agency dimension consisted of items measuring friendship expectations around inclusion, mutual activities, companionship, sharing of resources, and provision of status and/or rewards. (e.g., “*I expect my close (or best) friends to include me in their social plans*”). For each item, responses were provided on a Likert-type scale from 1 (Strongly Disagree; I never expect my friends to do this) to 5 (Strongly Agree; I always expect my friends to do this). In addition to collecting ratings of agreement for each of the possible friendship expectations, the Friendship Expectations Scale instructed participants to provide a rating of how important each item is to them, from 1 (It is not at all important that my friends do this) to 5 (It is extremely important that my friends do this). Within the original validation sample, the Friendship Expectations Scale demonstrated good internal consistency (see Study 1A). In the present study, internal consistency was satisfactory for endorsement of friendship expectations on both the Friendship Expectations Scale - Symmetrical Reciprocity and Communion subscale (Cronbach’s $\alpha = 0.78$) and Friendship Expectations Scale - Solidarity and Agency subscale (Cronbach’s $\alpha = 0.88$). Internal consistency was strong for the ratings of expectation importance on the Friendship Expectations Scale - Solidarity and Agency subscale (Cronbach’s $\alpha = 0.84$), but was poor for the ratings of

importance on the Friendship Expectations Scale - Symmetrical Reciprocity and Communion subscale (Cronbach's $\alpha = 0.56$).

Demographics and Attention Checks

At the end of the study, participants were presented with a short demographic questionnaire which collected information including age, gender identity, and cultural/ethnic identity. After the demographic questionnaire, effort and attention checks assessed participants' levels of effort during study completion, how clear and understandable they found the instructions to be, and whether there was any reason they would want to caution researchers about including their data in analyses. Participants were assured that responses to these items would have no effect on their remuneration.

Primary Data Analyses

Hypothesis 1

To test hypothesis H1 that participants with SAD would endorse greater self-portrayal concerns in the context of close friendships than HCs, we conducted an independent samples t-test, comparing NSPS total scores of SADs versus HCs. We also used t-tests to examine differences between the groups for each of the NSPS subscales separately. We expected participants with SAD to endorse significantly more concerns across all three NSPS domains.

Hypothesis 2

To test hypothesis H2 that participants with SAD would more strongly endorse (a) friendship expectations and (b) the rated importance of those expectations, we conducted two independent samples t-tests with diagnostic status (SAD vs. HC), predicting ratings on the Friendship Expectations Scale. Based on the 2-factor solution that was suggested by the exploratory factor analysis conducted in Study 1A, the Friendship Expectations Scale was scored

in terms of two subscales, for a total of four t-tests (endorsement and importance ratings for each subscale).

Exploratory Analyses

Friendship expectations by gender. In an attempt to replicate Study 1A findings that, across both subscales, participants identifying as women endorsed higher friendship expectations than participants identifying as men, we conducted 2 (gender: man or woman) by 2 (diagnostic status: SAD or HC) ANOVAs. We ran a separate ANOVA for each of the two Friendship Expectations Scale subscales, as well as separate ANOVAs for ratings of both expectation endorsement and perceived importance of the expectations, for a total of statistical four models.

Negative self-portrayal and friendship expectations. To further shed light on theorized differences in friendship expectations between SADs and HCs, we examined whether negative self-portrayal concerns interacted with diagnostic status to predict friendship expectations. To this end, we ran exploratory analyses in which NSPS-F responses, diagnostic status, and their interaction term were entered as predictors in hierarchical linear regression models, predicting ratings on the (1) Friendship Expectations Scale - Symmetrical Reciprocity and Communion and (2) Friendship Expectations Scale - Solidarity and Agency. The NSPS total score and each NSPS domain were entered as predictors in separate regression models, predicting either Friendship Expectations Scale - Symmetrical Reciprocity and Communion or Friendship Expectations Scale – Solidarity and Agency, for a total of eight regression analyses.

General versus friend-specific self-portrayal concerns. Exploratory analyses sought to compare concern about revealing perceived flaws to close friends to concern about revealing perceived personal flaws in anxiety-provoking social situations (e.g., talking to strangers). This information was available for our clinical sample, as each individual completed the NSPS at the

time of recruitment into our community participant database, and then completed the NSPS-F within the present study. NSPS data were not available for our HC sample, given that these participants did not complete any additional measures at the time of initial recruitment. Paired sample t-tests were employed for comparing responses of our SAD participants on the NSPS-F and original NSPS. Moreover, we sought to situate our findings regarding the NSPS within the broader literature, by using independent samples t-tests to compare NSPS-F responses of our clinical and HC participants to responses on the original version of the NSPS completed by clinical and control participants in past research (Moscovitch et al., 2015).

Results

Preliminary Analyses

Missing data were imputed using Expectation-Maximization for scales for which Little's Missing Completely at Random (MCAR) test was not significant and no more than 2.2% of data were missing. Missing data that were not imputed were excluded pairwise from analyses, such that data were retained in analyses for which all necessary data points were available.

Examination of skewness and kurtosis suggested data were normally distributed, consistent with Kline's (1998) recommendations of skewness below 3.0 and kurtosis below 10.0. Univariate outliers, defined as more than 3 SD above or below the mean, were winsorized to be exactly 3SD from the mean.

Sample Characteristics

Demographic information for participants, including age, gender, and ethnicity, is presented in Table 6. The groups differed in gender identity, with more SAD than HC participants identifying as cisgender women, and fewer identifying as cisgender men. A chi-square test of independence comparing gender composition across the diagnostic groups was

significant, $\chi^2 (3, N = 89) = 11.33, p = .010$, with a Phi Coefficient of .36 indicating a medium effect size. However, the reported ethnic composition between the two groups was relatively balanced, with similar proportions identifying as White/European, but more HC participants identifying as Black/Afro-Caribbean/African and more SAD participants identifying as South Asian. An independent samples t-test showed that participants in the two diagnostic groups did not significantly differ in terms of age ($t(86) = 0.94, p = .348, d = .20$). Within the clinical sample, 18 participants (39.1%) met DSM-5 diagnostic criteria for SAD as their principal diagnosis and an additional 11 participants (23.9%) had SAD as their co-principal diagnosis, with the other co-principal diagnoses recorded as Generalized Anxiety Disorder ($n = 3$; 6.5%), Obsessive Compulsive Disorder ($n = 3$; 6.5%), Persistent Depressive Disorder ($n = 3$; 6.5%), Bulimia Nervosa ($n = 1$; 2.2%), and Major Depressive Disorder ($n = 1$; 2.2%). The remaining 17 clinical participants had SAD as a secondary diagnosis, with principal diagnoses recorded as Generalized Anxiety Disorder ($n = 10$; 21.7%), Persistent Depressive Disorder ($n = 6$; 13.0%), and Agoraphobia ($n = 1$; 2.2%).

Self-reported measures of SA symptoms and related impairment varied between the SAD and HC groups in the expected direction. Specifically, the SAD group endorsed significantly greater symptoms of social anxiety than HC participants on the Social Anxiety Interaction Scale – straightforward items ($t(83) = 10.88, p < .001, 95\% \text{ CI } [-36.39, -25.14], d = 2.36$) and on the Social Phobia Inventory ($t(87) = 9.14, p < .001, 95\% \text{ CI } [-31.59, -20.30], d = 1.94$) and on the Sheehan Disability Scale ($t(84) = 6.65, p < .001, 95\% \text{ CI } [-12.74, -6.88], d = 1.44$). All means and standard deviations are presented in Table 6.

Table 6*Demographic and Self-Report Social Anxiety Measures Across Participant Groups*

Demographic Variable	Participant Responses	
	HC (<i>n</i> = 43)	SAD (<i>n</i> = 46)
Age in years - Mean (<i>SD</i>)	28.65 (10.29)	26.67 (9.44)
Gender (%)		
Cisgender Man	60.5	26.1
Cisgender Woman	37.2	65.2
Transgender (Woman to Man)	0	2.2
Non-binary	2.3	6.5
Ethnicity (<i>n</i>)		
Arab/West Asian/North African	0	1
Black/Afro-Caribbean/African	13	0
East Asian	4	5
First Nations/Métis/Inuit	1	1
Latinx	0	1
South Asian	1	7
Southeast Asian	0	2
White/European	24	29
Other	0	1
Prefer not to answer	2	1
Mean SPIN score (<i>SD</i>)	14.42 (14.81)	40.36 (11.91)
Mean SDS score (<i>SD</i>)	8.74 (6.88)	18.55 (6.79)
Mean SIAS-S score (<i>SD</i>)	14.05 (13.42)	44.81 (12.62)

Note. *SD* = standard deviation. This table presents demographic information for study

participants. For reporting ethnic identity, participants were asked to select all categories that apply. As such, ethnicity data is reported as number of participants rather than percentage, and numbers do not add up to the group size due to some participants selecting multiple ethnic identities. SPIN = Social Phobia Inventory (Connor et al., 2001); SDS = Sheehan Disability Scale (Sheehan, 1983); SIAS-S = Social Interaction Anxiety Scale – straightforward items (Mattick & Clark, 1998; Rodebaugh et al., 2007; Rodebaugh et al., 2011).

Negative Self-Portrayal Concerns

Independent samples t-tests compared NSPS total scores of SADs versus HCs, and for each of the NSPS subscales separately. T-tests showed that SADs ($M = 66.21$, $SD = 21.29$), compared to HCs ($M = 49.40$, $SD = 22.12$), reported greater overall concern about revealing personal flaws to close friends ($t(87) = 3.65$, $p < .001$, 95% CI $[-25.95, -7.66]$, $d = 0.77$). This effect was largest for the NSPS subscale of concern about social competence ($t(87) = 4.51$, $p < .001$, 95% CI $[-13.88, -5.39]$, $d = 0.96$), with SADs ($M = 30.38$, $SD = 10.27$) reporting significantly more concern about appearing socially incompetent in the company of close friends than HCs ($M = 20.74$, $SD = 9.84$). The difference between SADs ($M = 19.48$, $SD = 7.21$) and HCs ($M = 14.61$, $SD = 6.86$) was also significant for the domain of physical appearance concerns ($t(87) = 3.26$, $p = .002$, 95% CI $[-7.83, -1.89]$, $d = 0.69$); however, there was no significant difference between SADs ($M = 16.30$; $SD = 6.70$) and HCs ($M = 14.05$, $SD = 6.17$) in reported concern about close friends noticing visible signs of anxiety ($t(87) = 1.65$, $p = .103$, 95% CI $[-4.97, 0.46]$, $d = .35$). Therefore, hypothesis H1 that individuals with SAD would be more concerned about revealing perceived personal flaws to close friends than HCs was supported for the NSPS total score and for two out of three subscales.

Friendship Expectations

Next, we tested the Friendship Expectations Scale on a clinical sample and examined the nature of self-reported friendship expectations for SADs versus HCs. It was observed that HCs ($M = 21.08$, $SD = 3.47$) and SADs ($M = 20.52$, $SD = 2.67$) did not significantly differ in their ratings of expectations related to symmetrical reciprocity and communion ($t(87) = 0.86$, $p = .392$, 95% CI $[-0.74, 1.86]$, $d = .18$); however, SADs ($M = 22.97$, $SD = 5.67$) endorsed significantly lower expectations related to solidarity and agency than did HCs ($M = 26.23$, $SD = 6.16$), with a

medium effect size ($t(87) = 2.60, p = .011, 95\% \text{ CI } [0.77, 5.75], d = .55$). There were no group differences in ratings of importance for either Friendship Expectations Scale scale ($ts < .1.59, ps > .116$). The correlation between ratings of expectation endorsement and importance was significant for both the Friendship Expectations Scale - Symmetrical Reciprocity and Communion subscale ($r(89) = .68, p < .001$) and Friendship Expectations Scale - Solidarity and Agency subscale ($r(89) = .80, p < .001$). Overall, Hypothesis 2 that participants with SAD would more strongly endorse (a) friendship expectations and (b) the rated importance of those expectations was not supported.

Exploratory Analyses

Friendship Expectations by Gender

We conducted exploratory analyses to replicate our Study 1A findings that women endorsed higher friendship expectations than men across both subscales, as well as higher importance of those expectations, via 2 (gender: man or woman) by 2 (diagnostic status: SAD or HC) ANOVAs. For these analyses, the participant who identified as transgender (woman to man) was included in the Man group, consistent with their stated gender identity. The three participants who identified as non-binary were excluded from analyses, due to low sample size. We found that endorsement of Friendship Expectations Scale - Symmetrical Reciprocity and Communion expectations was higher among women ($M = 21.38, SD = 2.67$) than men ($M = 20.13, SD = 3.43$) with a medium effect size ($F(1) = 4.70, p = .033, \eta_p^2 = .06$). Similarly, the rated importance of those Friendship Expectations Scale - Symmetrical Reciprocity and Communion expectations tended to be higher among women ($M = 21.61, SD = 2.26$) than men ($M = 19.96, SD = 2.78; F(1) = 6.87, p = .010, \eta_p^2 = .07$), whereas the gender by diagnostic status interaction term did not significantly predict either Friendship Expectations Scale endorsement

or importance ratings ($ps > .077$). Gender was not a significant predictor of either endorsement or rated importance of Friendship Expectations Scale - Solidarity and Agency items ($ps > .093$). There were no significant gender by diagnostic status interactions ($ps > .455$).

Self-Portrayal Concerns and Friendship Expectations

Exploratory analyses were conducted in which the total score and each of the three NSPS-F domains, diagnostic status, and their interaction terms were regressed onto (1) Friendship Expectations Scale – Symmetrical Reciprocity and Communion and (2) Friendship Expectations Scale – Solidarity and Agency, for a total of eight hierarchical linear regression models. Results, detailed below, indicated that concern about revealing certain types of perceived personal flaws to friends may influence friendship expectations among socially anxious individuals.

In the regression model predicting Friendship Expectations Scale - Symmetrical Reciprocity and Communion ratings, there were no significant main effects of NSPS-F total score or participant diagnostic status ($R^2 = .01$, $F(2, 86) = 0.37$, $p = .695$); however, addition of the NSPS-F total score by diagnostic status interaction term in Step 2 was marginally significant in improving the predictive utility of the model ($\Delta R^2 = .04$, $\Delta F(1, 85) = 3.84$, $p = .053$). The nature of the interaction was followed up by simple slope analysis at each level of diagnostic status separately. We found that the NSPS-F total score did not predict friendship expectations of symmetrical reciprocity and communion among either HCs ($R^2 = .04$, $F(1, 41) = 1.56$, $p = .219$) or SADs ($R^2 = .05$, $F(1, 44) = 2.50$, $p = .121$), though the non-significant effects were in opposite directions for the two groups ($B = 0.3$ for HC participants; $B = -.03$ for SAD participants).

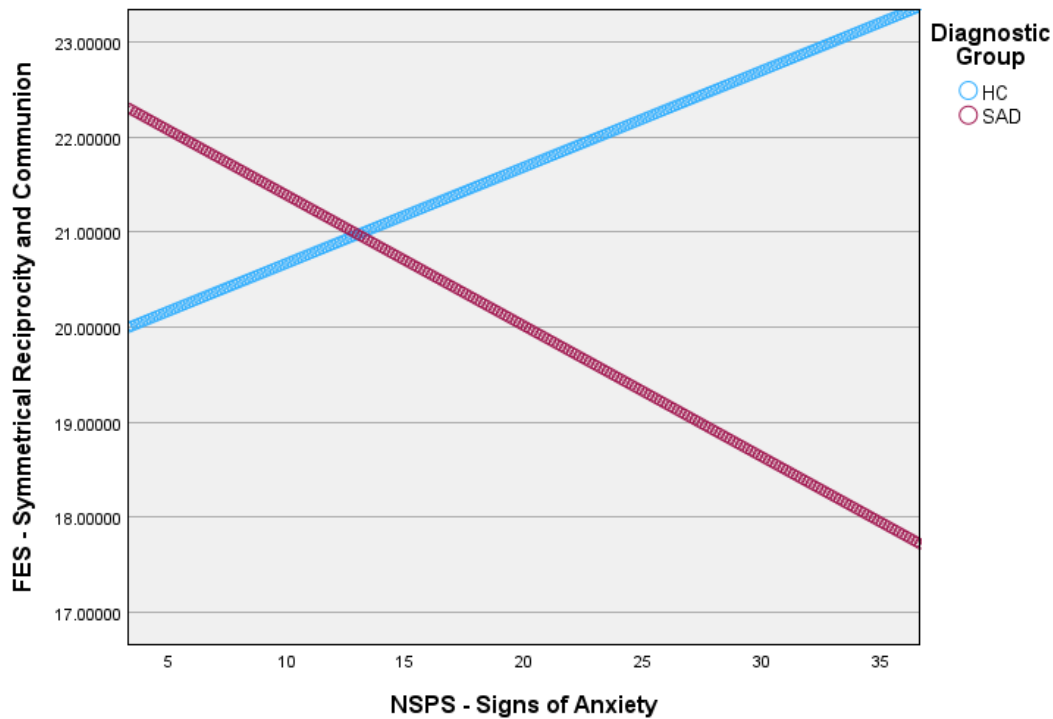
Analyses by NSPS-F subscale clarified which types of self-portrayal concerns were driving the observed effects. The model with NSPS-F Social Competence subscale and

diagnostic status as simultaneous predictors did not significantly predict Friendship Expectations Scale - Symmetrical Reciprocity and Communion scores ($R^2 = .01$, $F(2, 86) = 0.38$, $p = .684$). Addition of their interaction term did not significantly improve the predictive utility of the model ($\Delta R^2 = .04$, $\Delta F(1, 85) = 3.55$, $p = .063$). There were similarly no main effects in the model with NSPS-F Signs of Anxiety and diagnostic status predicting Friendship Expectations Scale - Symmetrical Reciprocity and Communion scores ($R^2 = .01$, $F(2, 86) = 0.58$, $p = .565$), but there was a significant NSPS-F Signs of Anxiety by diagnostic status interaction in predicting expectations of symmetrical reciprocity and communion ($\Delta R^2 = .06$, $F(1, 85) = 5.57$, $p = .021$).

The nature of the interaction effect was such that, among HCs, there was no relationship between NSPS-F Signs of Anxiety ratings and Friendship Expectations Scale - Symmetrical Reciprocity and Communion scores ($R^2 = .03$, $F(1, 41) = 1.37$, $p = .248$, $B = 0.10$, 95% CI [-0.07, .28]). However, among SADs, higher NSPS-F Signs of Anxiety concerns predicted lower Friendship Expectations Scale - Symmetrical Reciprocity and Communion expectations ($R^2 = .12$, $F(1, 44) = 5.94$, $p = .019$, $B = -.14$, 95% CI [-0.25, -.02]; see Figure 1). The NSPS-F Physical Appearance subscale and diagnostic status did not significantly predict Friendship Expectations Scale - Symmetrical Reciprocity and Communion scores, either as independent predictors in Step 1 ($R^2 = .02$, $F(2, 86) = 0.84$, $p = .434$) or when their interaction term was added in Step 2 ($\Delta R^2 = .02$, $F(1, 85) = 1.41$, $p = .239$).

Figure 1

Symmetrical Reciprocity and Communion Expectations Predicted by Concern About Signs of Anxiety



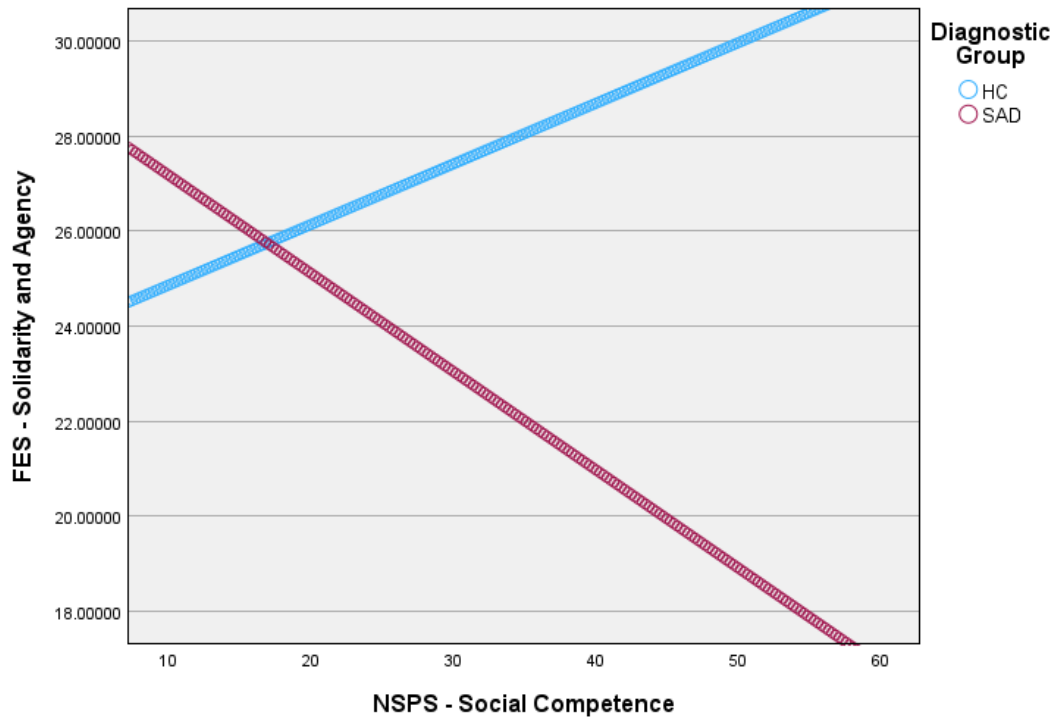
Note. This figure displays the relation between participant concerns about displaying visible signs of anxiety in the company of close friends, and friendship expectations regarding symmetrical reciprocity and communion. The x-axis represents scores on the Negative Self Portrayal Scale (Moscovitch & Huyder, 2011) - Signs of Anxiety subscale. The y-axis represents estimated marginal means on the author-developed Friendship Expectations Scale – Symmetrical Reciprocity and Communion subscale, with possible scores ranging from 6 to 30 and higher scores indicating greater expectations. The separate lines represent participant diagnostic status (HC = Healthy Control; SAD = Social Anxiety Disorder).

In the models predicting Friendship Expectations Scale - Solidarity and Agency ratings, there was consistently a main effect of diagnostic status (as observed in primary analyses, with SADs endorsing significantly lower expectations), though this effect was qualified by level of negative self-portrayal concerns. The NSPS-F total score and diagnostic status were entered in Step 1 ($R^2 = .07$, $F(2, 86) = 3.37$, $p = .039$) and the addition of their interaction term in Step 2 significantly improved the prediction of Friendship Expectations Scale - Solidarity and Agency scores ($\Delta R^2 = .06$, $F(1, 85) = 5.68$, $p = .019$). This interaction was probed by simple slopes analysis, at each level of diagnostic status. It was found that, among HCs, the NSPS-F total score did not predict Friendship Expectations Scale - Solidarity and Agency scores ($R^2 = .05$, $F(1, 41) = 2.08$, $p = .157$, $B = .06$, 95% CI $[-.03, .15]$), whereas higher NSPS-F total scores were nearly significant in predicting lower Friendship Expectations Scale - Solidarity and Agency expectations among SADs ($R^2 = .08$, $F(1, 44) = 3.81$, $p = .057$, $B = -.08$, 95% CI $[-0.15, < 0.01]$).

We also examined this effect for each NSPS subscale separately. The model with NSPS-F Social Competence subscale and diagnostic status significantly predicted Friendship Expectations Scale - Solidarity and Agency ratings ($R^2 = .08$, $F(2, 86) = 3.71$, $p = .028$). Addition of their interaction term further improved the predictive utility of the model ($\Delta R^2 = .08$, $\Delta F(1, 85) = 7.50$, $p = .008$). The significant NSPS-F Social Competence by diagnostic status interaction was followed up with simple slopes analyses, which showed that concerns about social competence did not predict Friendship Expectations Scale – Solidarity and Agency scores among HCs ($R^2 = .04$, $F(1, 41) = 1.78$, $p = .190$, $B = .13$, 95% CI $[-0.07, 0.32]$), but did significantly predict lower Friendship Expectations Scale - Solidarity and Agency scores among SADs ($R^2 = .14$, $F(1, 44) = 7.16$, $p = .010$, $B = -.21$, 95% CI $[-0.36, -0.05]$). The interaction is presented in Figure 2.

Figure 2

Solidarity and Agency Expectations Predicted by Concern About Social Competence



Note. This figure displays the relation between participant concerns about appearing socially incompetent in the company of close friends, and friendship expectations regarding solidarity and agency. The x-axis represents scores on the Negative Self Portrayal Scale (Moscovitch & Huyder, 2011) - Social Competence subscale. The y-axis represents estimated marginal means on the author-developed Friendship Expectations Scale – Solidarity and Agency subscale, with possible scores ranging from 6 to 30 and higher scores indicating greater expectations. The separate lines represent participant diagnostic status (HC = Healthy Control; SAD = Social Anxiety Disorder).

Similarly, the model with NSPS-F Signs of Anxiety subscale and diagnostic status significantly predicted Friendship Expectations Scale - Solidarity and Agency ratings ($R^2 = .07$, $F(2, 86) = 3.43$, $p = .037$). Addition of their interaction term was marginally significant in improving the model ($\Delta R^2 = .04$, $\Delta F(1, 85) = 3.78$, $p = .055$). The nature of this interaction was such that concern about displaying signs of anxiety to close friends did not significantly predict Friendship Expectations Scale - Solidarity and Agency ratings among either HCs ($R^2 = .03$, $F(1, 41) = 1.29$, $p = .262$, $B = .17$, 95% CI [-0.14, 0.48]) or SADs ($R^2 = .06$, $F(1, 44) = 2.79$, $p = .102$, $B = -.20$, 95% CI [-0.45, 0.04]), although the non-significant effects were in opposite directions for the two groups. Finally, although the model with main effects of NSPS-F Physical Appearance and diagnostic status was significant in predicting Friendship Expectations Scale - Solidarity and Agency ratings ($R^2 = .08$, $F(2, 86) = 3.76$, $p = .028$), addition of the interaction term did not significantly improve the model ($\Delta R^2 = .03$, $F(1, 85) = 2.56$, $p = .114$).

General versus Friend-Specific Self-Portrayal Concerns

An independent samples t-test comparison of responses showed that responses of participants with SAD in the original scale validation sample (Moscovitch et al., 2015) and participants with SAD recruited for the present study reported NSPS scores that were similar in magnitude, both for the total score, ($t(103) = 0.08$, $p = .939$), and each of the subscales (all p 's > .307). Means, standard deviations, and sample sizes used in analyses are presented in Table 7.

Responses of SADs in the present study on the general NSPS were significantly higher than responses on the NSPS-F. This was tested via paired sample t-tests comparing responses of SAD participants on the NSPS-F, administered in this study, to responses on the NSPS-general, administered at the time of original diagnostic assessment. Results showed that participants with SAD in the present study endorsed significantly more concern about revealing perceived

personal flaws in anxiety-provoking situations in general than in the company of close friends, across the NSPS domains of social competence ($p < .001$, $d = .79$), signs of anxiety ($p < .001$, $d = .77$), and physical appearance ($p = .012$, $d = .40$).

Although responses of SAD participants varied significantly based on whether they were responding to concerns within anxiety-provoking social situations in general or within close friendship contexts in particular, NSPS versus NSPS-F responses of HCs in the original validation sample to HCs in the current study did not differ significantly ($t(122) = 0.35$, $p = .725$). Mean differences of HCs on the NSPS-general versus NSPS-F subscale scores were also not significant ($ps > .568$).

Table 7*Negative Self-Portrayal Scale Responses Across Samples*

Data Source	NSPS – General Mean (<i>SD</i>)		NSPS – Close Friends Mean (<i>SD</i>)
	Moscovitch et al., 2015 <i>n</i> _{SAD} = 62 <i>n</i> _{HC} = 81	Present Study <i>n</i> _{SAD} = 43	Present Study <i>n</i> _{SAD} = 46 <i>n</i> _{HC} = 43
NSPS - Total			
SAD	83.8 (20.5)	84.1(18.5)	66.21 (21.3)
HC	48.1 (17.9)	--	49.40 (22.12)
NSPS - Social competence			
SAD	36.8 (9.9)	38.7 (8.4)	30.38 (10.3)
HC	19.8 (8.1)	--	20.74 (9.8)
NSPS - Physical Appearance			
SAD	23.8 (7.6)	23.0 (8.3)	19.48 (7.2)
HC	14.5 (6.7)	--	14.61 (6.9)
NSPS - Signs of anxiety			
SAD	SAD: 23.3 (7.1)	22.3 (6.6)	16.3 (6.7)
HC	HC:13.9 (5.5)	--	14.05 (6.2)

Note. *SD* = standard deviation. NSPS - General = Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011), original version which asks about concern within anxiety-provoking situations. NSPS – Close Friend = version of the original NSPS that we adapted to assess concern about negative self-portrayal in the company of close friends (Study 1A). Participants with Social Anxiety Disorder completed the original version of the NSPS as part of their questionnaire packet at the time of recruitment and they completed the friend-specific version of the NSPS during the present study. Although the full UW Anxiety Studies questionnaire packet was not completed by Healthy Control participants, and general NSPS data is consequently unavailable, control participants completed the friendship version of the NSPS as part of the present study. To compare data collected in the present study to prior literature, information from the original NSPS validation sample by Moscovitch and colleagues (2015) was used.

Discussion

The present investigation was undertaken as a clinical replication of Study 1A. To that end, the friend-specific version of the Negative Self-Portrayal Scale (NSPS-F; Moscovitch & Huyder, 2011; Study 1A) and Friendship Expectations Scale (Study 1A) were administered to a sample comprised of community adults with Social Anxiety Disorder (SAD) and healthy controls (HCs). In Study 1A, when the NSPS-F was administered to an undergraduate sample with symptoms of trait SA varying across the normal distribution, self-portrayal concerns were positively related to levels of SA. We expected that results of the present study would be consistent with these initial findings, in that participants in the SAD group would be more concerned about negative self-portrayal across all three NSPS domains, compared to participants in the HC group. In addition, although Study 1A found participant levels of SA to be unrelated to endorsement of friendship expectations on the Friendship Expectations Scale, we expected that differences by SA would emerge when the scale was administered to participants with versus without SAD. Specifically, we expected participants with SAD to endorse higher friendship expectations than HC participants, which would help explain higher rates of friendship dissatisfaction among SADs, in line with the Ideal Standards Model (Fletcher et al., 1999).

Negative self-portrayal concerns

Hypothesis 1 of the present study was largely supported, with participants in the SAD group endorsing significantly greater concern about appearing socially incompetent and physically unattractive when in the company of close friends, compared to participants in the HC group. This was a partial replication of the initial findings based on an undergraduate sample, where higher social anxiety predicted greater concern about revealing perceived personal flaws across all three negative self-portrayal domains. The clinical replication increases confidence in

the relevance of therapeutic attention to negative self-portrayal concerns within the context of close friendships, when working with treatment-seeking individuals. Although most semi-structured clinical interviews and self-report measures of SA prioritize assessment of anxiety in social situations with unfamiliar others or during evaluative social performance contexts, our results suggest that it is advisable for clinicians to inquire in greater detail about fears and beliefs related to friendship contexts. Although not assessed in this study, it is possible that presence of self-presentation concerns in the context of close friendships is less salient for socially anxious individuals than presence of concerns about anxiety related to more stereotypically anxiety-provoking interactions, such that treatment-seeking individuals may be less likely to spontaneously share such fears and beliefs with their treatment provider. Insights offered by increased attention to assessment of friendship functioning could inform treatment by more efficiently revealing underlying personal beliefs and assumptions within close relationships that need to be updated in treatment (e.g., via cognitive restructuring; Clark, 2013), such that individuals access greater friendship satisfaction and emotional closeness more quickly.

We were also curious about the salience of negative self-portrayal concerns within close friendship contexts compared to anxiety-provoking social situations in general. Given that our clinical participants completed both the original and friend-specific versions of the NSPS, we conducted exploratory analyses to test the possibility that friendships of individuals with SAD are associated with greater self-portrayal concerns compared to friendships of HCs, but that SADs' elevations in negative self-portrayal concerns within friendship contexts are not as high as their concern about negative self-portrayal within anxiety-provoking social situations in general. Results showed that this was indeed the case. Within-subject comparisons showed that individuals with SAD reported significantly higher concern about negative self-portrayal within

anxiety-provoking social situations than within friendship contexts, and between-subject comparisons indicated that in both anxiety-provoking and friendship contexts, concern was greater among SADs than HCs.

Furthermore, we found endorsement of concern about revealing perceived personal flaws in anxiety-provoking social situations in the present study to be comparable to responses of participants in the original clinical validation sample (Moscovitch et al., 2015), for all three domains of negative-self portrayal concerns. Although data on general negative self-portrayal concerns was unavailable for the HC participants in our sample, we observed that HCs in the original sample (Moscovitch et al., 2015) reported similar levels of concerns on the NSPS as HCs in the present study reported on the NSPS-F. Therefore, results suggest that HCs are, consistently across contexts, minimally concerned about revealing personal flaws to interaction partners. Participants with SAD, on the other hand, endorsed greatest concern about revealing perceived personal flaws in anxiety-provoking social situations, and continued to endorse such concerns even in the company of close (or best) friends. The insight that NSPS concerns persist, though to a lesser degree, even in the relatively safe social context of close friendships is a novel contribution to the literature. As suggested above, this finding could inform clinical case conceptualizations by emphasizing to clinicians the prevalence of individuals with SAD experiencing elevated self-portrayal concerns even within their close friendships, thereby facilitating assessment of assumptions, perceived social rules, and beliefs about self that maintain symptoms of SA and contribute to perceptions of inadequate social support, interpersonal conflict, and/or relational dissatisfaction. Whether interventions aimed at decreasing negative self-portrayal concerns in general also decrease such concerns within friendship contexts, or

whether directly addressing negative self-portrayal concerns within friendships is warranted, requires empirical testing in future studies.

Friendship expectations

Next, we tested whether community adults with SAD and HCs displayed differences in their close friendship expectations. Given the vital role of expectations in evaluating the acceptability of any given outcome or circumstance, and thus influencing satisfaction (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002), insight into friendship expectations may be important for understanding previous findings of lower friendship satisfaction among individuals with SA (Rodebaugh, 2009; Rodebaugh et al., 2012). Although SADs and HCs in this study did not differ in their ratings of expectations related to symmetrical reciprocity and communion, HCs endorsed significantly higher expectations related to solidarity and agency than did SADs. That is, SADs and HCs had similar expectations on items such as “*I expect my friends to be reliable, by carrying through with commitments*” and “*I expect my friends to communicate honestly with me and not tell me lies*”, whereas HCs more strongly endorsed items such as “*I expect my friends to include me in their social plans*” and “*I expect friends to help when I am having trouble doing something alone*”. The finding that individuals with SAD and HCs have similar expectations related to symmetrical reciprocity and communion within friendships may suggest that they see themselves as being similarly worthy of honest communication and follow-through in friendship interactions, which is at odds with conceptualizations of SA as driven by views of self as fundamentally flawed and warrants clarification in future research. Responses on the friendship expectations scale may also be a reflection of individuals endorsing expectations of others that they believe they would personally be able to fulfill. It is plausible that individuals with SAD are more confident in their ability to engage in friendship behaviours such as keeping secrets and

being reliable with plans than in their ability to integrate themselves into their friends' broader social networks and in being able to effectively offer instrumental support, such that the former are friendship features more prominent in their mental conceptualization of close friends. In summary, although the results are intriguing, our hypothesis relating to differences in friendship expectations by diagnostic status was not supported.

However, while it was hypothesized that friendship expectations would be positively correlated with SA, during scale development (see Study 1A) and in the present study, we also acknowledged the possibility of a negative relation between these two variables. Specifically, in Study 1A, it was outlined that higher SA tends to correlate with lower self-esteem (Iancu et al., 2015; Murad, 2020) and views of self as inferior to others across multiple domains (Antony et al., 2005), which may increase tolerance for a wide range of friendship behaviours and be reflected in lower friendship expectations. That individuals with SAD hold lower expectations specifically for being included in their friends' activities, and have lower expectations of receiving instrumental support, may be a reflection of seeing themselves as inadequate and undeserving of certain interpersonal benefits. If this were the case, we would expect negative self-portrayal concerns might moderate the relations between diagnostic status and friendship expectations, such that those perceiving themselves more negatively would expect less of their friends when it comes to social reciprocity, communion, solidarity, and/or agency. To further explore this possibility, we ran follow-up exploratory analyses in which NSPS domains, diagnostic status, and their interaction terms were entered as predictors in regression models predicting (1) Friendship Expectations Scale - Symmetrical Reciprocity and Communion and (2) Friendship Expectations Scale - Solidarity and Agency.

These follow-up analyses showed that among SADs, greater concern about appearing visibly anxious in the company of close friends predicted lower expectations of symmetrical reciprocity and communion. Although SAD was not in itself associated with lower symmetrical reciprocity and communion friendship expectations, individuals who met diagnostic criteria *and* were concerned about appearing visibly anxious in front of their friends tended to endorse looser expectations of open communication and emotional support from close friends. Friendship interactions involving open communication and emotional support may be associated with vulnerability and increase the possibility of one appearing anxious and/or losing control of their emotions (e.g., becoming tearful or trembling while asking for help with a personal difficulty), thus promoting emotional avoidance (Kashdan et al., 2006). As such, concerns related to displaying visible signs of anxiety may be uniquely predictive of lower Friendship Expectations Scale - Symmetrical Reciprocity and Communion expectations, because interactions related to symmetrical reciprocity and communion may increase the perceived possibility of one's undesirable flaws being exposed to others.

When predicting Friendship Expectations Scale - Solidarity and Agency in the regression analyses, there were main effects of diagnostic status, with SADs endorsing significantly lower expectations, as was shown in the primary analyses; however, the effect of diagnostic status was qualified by a significant interaction with overall level of negative self-portrayal concerns. This effect was primarily driven by the NSPS-F subscale of social competence, for which higher concern about revealing perceived personal flaws to friends was associated with lower expectations of solidarity and agency among individuals with SAD but not among HCs. That is, although a diagnosis of SAD was generally associated with lower Friendship Expectations Scale - Solidarity and Agency expectations, the difference in friendship expectations between SADs

and HCs was especially large for individuals who both met diagnostic criteria for SAD *and* were concerned about appearing socially incompetent in front of their friends. As with Friendship Expectations Scale - Symmetrical Reciprocity and Communion expectations being predicted by concerns about displaying signs of anxiety, it may be that Friendship Expectations Scale - Solidarity and Agency expectations are most closely linked to concerns about social competence because expectations in this domain revolve around quality time, physical support, and access to social networking, which are interpersonal interactions in which perceived personal shortcomings in social competence may be most likely to be put on display.

It is also interesting that the NSPS-F Physical Appearance by diagnostic status interaction term did not predict either friendship expectations domain, despite the significantly elevated endorsement of such concerns among SADs. This was different from the pattern of results observed for the other two NSPS domains (i.e., signs of anxiety and social competence). This may suggest that concerns about revealing perceived flaws in physical appearance to close friends manifest within close friendships in ways not captured by the variables assessed in the present study. For example, whereas concerns about visible signs of anxiety and social competence might influence one's perceptions of how close friends ought to behave, concerns about physical appearance may be linked to beliefs regarding attractiveness and social desirability. It is possible that, while socially anxious individuals with different levels of concern about physical appearance do not differ in friendship expectations, they differ in their confidence to approach potential friends who are viewed as being highly socially desirable. It is similarly possible that concerns about physical appearance are associated with heightened self-focus (e.g., high attention to fashion and grooming; focus on personal physical appearance during social interactions) rather than focus on the friend. As such, negative self-portrayal concerns related to

physical appearance may be implicated in close friendship experiences of socially anxious individuals without being related to friendship expectations. However, none of these possibilities were investigated within the present studies.

Limitations

In addition to notable strengths, including recruitment of a community sample, this study has several important limitations. For one, friendship satisfaction not assessed in the present study, which limits the ability to infer how variables assessed here relate to perceptions of friendship satisfaction within the personal lives of SAD and HC participants. In addition, self-reports of articulated friendship expectations may not reflect more automatic and implicit assumptions about social interactions, including internalized schemas for how close friends should behave toward one another. Moreover, because SAD is characterized by beliefs of personal inadequacy (Moscovitch, 2009), HC versus SAD differences in conceptualizations of close friendships may lie in discrepant beliefs relating to expectations that participants perceive friends have for them, rather than in what one expects from their friends. That is, individuals with SAD may perceive close friends to have exceedingly high expectations, which they feel incapable of meeting, thus fueling insecurity and dissatisfaction within their friendships. Future research assessing variables of the present study alongside friendship satisfaction and utilizing assessment measures beyond self-report (e.g., friend-reports; vignette or behaviour-based measures) is warranted.

Moreover, to increase generalizability of the present findings, larger samples and with greater gender and ethnic diversity are recommended. We recognize the present study's limitation of gender composition not being balanced across the two diagnostic groups (i.e., the SAD group consisted primarily of cisgender women and HC group consisted of primarily

cisgender men). We recommend that future studies address this limitation via recruitment approaches that balance gender composition across diagnostic groups. Cultural diversity is another area for attention in recruitment for future studies. Finally, we acknowledge a narrow age range as a limitation of the present sample, which primarily consisted of young adults. As friendships are a dynamic process, expectations and attitudes within friendships may evolve in meaningful ways during one's lifetime. The extent to which results of the present study generalize to middle-aged and older individuals is unclear. Recruiting across a broader age range, and with a sufficiently large sample to provide statistical power for testing age as a moderator in analyses, is recommended.

Conclusion

The present study extends cognitive models of SAD into the friendship domain and demonstrates the utility of two new scales within a clinical population (NSPS-F and Friendship Expectations Scale). The observed relevance of negative self-portrayal concerns within close friendships suggests that such concerns may require greater attention in assessment and intervention activities than has been commonly discussed in clinical practice to date. Findings also suggest that differences in at least certain types of friendship expectations may contribute to differences in friendship satisfaction between individuals with and without SAD, with the formation of friendship expectations as a potentially fruitful area of future inquiry.

Study 2A - Does Self-Discrepancy Threat Amplify the Negative Effects of Social Anxiety on Responses to Perceived Friendship Ruptures?

Abstract

It is well-documented that trait social anxiety (SA) is associated with a strong fear of negative evaluation by unfamiliar others, with distress driven by a perceived discrepancy between one's personal abilities and the social expectations of others. However, few studies have examined how and under which conditions trait SA affects relational security in close friendships. Here, we present an experimental study in which we tested the hypothesis that SA heightens perceptions of interpersonal threat in response to ambiguous friendship situations. We recruited undergraduate students ($N = 524$) with varying levels of trait SA. Half of the participants were assigned to an interpersonal threat condition in which they imagined a close friend telling them one thing about them they wished was different than it is. The other half were assigned to a no threat (control) condition in which they imagined their close friend describing their typical weekday morning routine. Following this, all participants were presented with a hypothetical scenario in which their close friend requests to meet, with the script suggesting the friend may be upset with them, thus insinuating the possibility of a friendship rupture. We found that participants with higher trait SA endorsed greater interpersonal threat and more negative emotional responses in both conditions, failing to support our hypothesis that such responses would be especially elevated among high SA participants in the threat condition. In support of our hypothesis, however, those with higher SA assigned to the threat condition reported lower motivation to approach their close friend than those in the control condition. Findings are discussed within the context of cognitive and interpersonal models of SA, with attention to how findings may ultimately help socially anxious individuals improve the quality of their close friendships.

Introduction

Friendships are a vital aspect of the human experience that help people satisfy the fundamental need for social connectedness (Baumeister & Leary, 1995). Friendships may be defined as voluntary social bonds, characterized by mutual affection, companionship, trust, and reciprocity (Blieszner, 2014). Consistently across cultures, people are readily able to sort individuals in their life by levels of interpersonal intimacy, from acquaintance to close friend (Blieszner, 2014).

Empirical data suggest that close friendships confer greater mental and physical health benefits than more superficial relationships (Demir & Weitekamp, 2007; Dunbar, 2018; Pietromonaco & Collins, 2017). However, individuals differ in the extent to which they are successful at establishing, maintaining, and benefitting from close friendships (Harris & Vazire, 2016; Wilson et al., 2015). For example, felt security within relationships varies by individual factors, such as trait self-esteem (Leary & Baumeister, 2000). Trait social anxiety (SA) is another construct proposed to affect experiences within close relationships; although the relation between SA and friendship security has rarely been examined empirically, studies suggest a robust relation between higher SA and lower perceptions of friendship quality (e.g., Cuming & Rapee, 2010; Rodebaugh, 2009; Rodebaugh et al., 2012; Rodebaugh et al., 2015).

Levels of trait SA vary across the normal distribution in the population, ranging from typical shyness in novel social situations to social anxiety disorder (SAD), a psychological disorder causing significant distress and impairment in daily life (DiBartolo & Hofmann, 2014). Individuals with SAD tend to view themselves as socially flawed and interpersonally undesirable, with a core fear that their personal flaws will be exposed to others for scrutiny and evaluation, leading to rejection or loss of status (Moscovitch, 2009; Moscovitch & Huyder, 2011;

Ginat-Frolich et al., 2024). SA research has focused primarily on anxiety-provoking social situations in which strangers are the “audience” evaluators (e.g., giving a speech or meeting new people); as such, it remains poorly understood how SA manifests within close friendship contexts.

Cognitive Models of Social Anxiety

According to cognitive models of SA, distress is driven by a perceived discrepancy between demands of the social environment (e.g., expectations of others) and one’s ability to meet those demands (e.g., Ashbaugh et al., 2005; Higgins et al., 1985; Leary & Kowalski, 1995; Moscovitch & Bielak, 2013; Moscovitch & Hofmann, 2007). Negative beliefs about the self in relation to others are believed to be maintained across time via biased information processing both within and between social encounters (Clark & McManus, 2002; Heinrichs & Hofmann, 2001; Hirsch & Clark, 2004). Commonly, SA is also maintained through biased processing of social information, such as allocation of attentional resources toward social stimuli of negative valence and away from social stimuli of positive or neutral valence (Pishyar et al., 2004; Taylor et al., 2010), thus further increasing the salience of perceived interpersonal inadequacy. Between social interactions, individuals with high SA tend to ruminate on perceived social failures (e.g., eliciting a frown from their interaction partner), which has the potential to strengthen the prominence and retrievability of such instances in memory (Mellings & Alden, 2000). Negative rumination, or post-event processing, also increases anticipatory anxiety and correlates with hesitancy to approach similar social situations in the future (Rowa et al., 2016). As such, higher trait SA is predictive of higher attention to interpersonal threat across a range of situations and reinforcement of perceived personal inadequacy between social encounters.

Interpersonal Threat within Friendships

Given results of Studies 1A and 1B, suggesting that individuals with higher levels of trait SA endorse concern about negative self-portrayal even in the company of close friends, coupled with cognitive theories of SA that highlight the role of a perceived discrepancy between expectations of others and personal abilities (Moscovitch & Bielak, 2013; Moscovitch & Hofmann, 2007), we sought to test whether SA predicts increased likelihood of construing ambiguous friendship situations as interpersonally threatening, particularly when the discrepancy gap is made salient.

As literature on SA in the context of close relationship rupture and repair is scarce, our approach was informed by literature on self-esteem and risk regulation models (e.g., Murray et al., 2006). According to the sociometer theory, low self-esteem is characterized by uncertainty about one's social worth and worry about rejection (Leary et al., 1995). Trait self-esteem has been proposed as a construct distinct from, but inversely related to, SA (Iancu et al., 2015; Murad, 2020). Perceived interpersonal threat correlates with increased negative affect, decreased positive affect, and lower feelings of social safeness, particularly among individuals with lower self-esteem (e.g., Gomillion & Murray, 2014).

In response to social threat, lower self-esteem is believed to promote risk-averse behaviour, such as self-protectively avoiding social situations where social pain or rejection are possible (e.g., Baumeister et al., 1989; Heimpel et al., 2006). If individuals with higher trait SA experience ambiguous friendship events as more threatening, they are likely to experience heightened feelings of distress and lowered positive affect and sense of social safeness within their friendships. Constant activation of negative beliefs about self in relation to others (e.g., as unworthy of the relationship) has the potential to erode friendship quality and satisfaction over

time. Therefore, greater susceptibility to experiences of interpersonal threat within close friendships may help explain the negatively biased perceptions of close friendship quality amongst individuals with SAD (Rodebaugh et al., 2012).

Whereas increased susceptibility to perceptions of interpersonal threat within friendships may initially fuel distress, consistent with findings from risk regulation models in the context of romantic relationships (e.g., Murray et al., 2006; Murray et al., 2008; Reis et al., 2004), an avoidance-oriented mindset for coping with discrepancy threat may serve to maintain distress and prevent deepening of friendship bonds (Watson & Nesdale, 2012). An avoidance-oriented mindset is also referred to as a *self-protective* mindset, in that it prioritizes minimization of personal pain over seeking out social connection (Cacioppo et al., 1999; Leary & Baumeister, 2000; MacDonald & Leary, 2005; Murray et al., 2008). Avoidance-oriented strategies for coping with potential or perceived interpersonal threat rob individuals of opportunities to increase emotional intimacy with their friends, as such experiences of heightened threat represent moments of both highest risk (e.g., for rejection) and highest reward (e.g., for increased closeness) with the interaction partner (Murray et al., 2008). Approach-oriented strategies for coping with interpersonal challenges, such as disclosure of personal difficulties, insecurities, or expressing desire to maintain the relationship in the future, have been shown to build closeness in romantic relationships (Cavallo et al., 2013; Murray et al., 2003, 2008; Ogolsky & Bowers, 2012) and we posit that such strategies serve a similar function in friendships.

Indeed, empirical investigations of behaviours that maintain friendship bonds often point to the importance of self-disclosure, honesty, assistance, and expression of commitment (Hays, 1984; Oswald et al., 2004). Friendship maintenance behaviours may be described as approach-oriented, or *friendship-promoting*, rather than avoidance-oriented. In contrast to goals that are

avoidance-oriented, or *self-protective*, approach-oriented goals and behaviours prioritize strengthening of social connections over decreasing risk of personal hurt and rejection (Murray et al., 2006). Studies have found that higher SA is predictive of decreased approach behaviour following experiences of social pain as a result of exclusion by strangers (Hudd & Moscovitch, 2022, 2023), but it is unknown whether similar socially anxious response patterns extend to diminished approach within close friendships.

Within friendships, an approach orientation contributes to effective conflict resolution and serves to build emotional intimacy over time (Nurmi et al., 1996). Propensity toward avoidance over approach behaviours, as may be characteristic of individuals with high trait SA, has the potential to thwart feelings of connection among friends. For example, avoidance strategies such as emotional or physical withdrawal from friends in response to perceived interpersonal threat (e.g., threat of rejection or relationship dissolution) has the potential to leave conflicts unresolved and personal needs unmet (Murray et al., 2008). Preliminary evidence for this possibility was offered by Cumings and Rapee (2010), who found that SA predicted less self-disclosure in both romantic relationships and close friendships, especially among participants who identified as female. Thus, in response to perceived interpersonal threat, people (and especially women) with higher trait SA may rely on avoidance (self-protective) goals over approach (friendship-promoting) goals, which may in turn enhance negative and diminish positive friendship outcomes.

Study Aims

The present study explored the central idea that close friendships represent a safe social context that has the potential to become threatening for socially anxious individuals in the face of a possible friendship rupture. To that end, we examined whether participants' sensitivity to

interpersonal threat varied across levels of trait SA and measured the effects of heightened threat on affective and behavioural responses within a close friendship context in which participants imagined interacting with a close friend from their life. We experimentally manipulated the level of threat salience prior to presenting an ambiguous friendship situation and assessing outcomes of interest.

Research Questions and Hypotheses

The first research question was whether trait SA heightens relational threat sensitivity within close friendships. We manipulated the salience of relational insecurity by directing half of the participants to attend to something their friend would want to change about them, thus enhancing the salience of the discrepancy gap and participants' potential failure to meet a close friend's needs/expectations in a given situation. We expected that (H1a) overall, participants in the threat condition would endorse greater perception of interpersonal threat than participants in the control condition, and that (H1b) levels of perceived interpersonal threat elicited by the threat condition would increase as participants' levels of trait SA increased.

Next, we sought to answer whether SA amplifies the negative emotional and relational consequences associated with the threat of failing to meet a close friend's needs and expectations, including heightening negative affect and emotional arousal, and inhibiting positive affect and a sense of social safeness with the selected friend. We expected that (H2) higher SA would predict more negative affect and emotional arousal, as well as less positive affect and lower state social safeness when discrepancy threat is salient relative to the no-threat condition.

Finally, we sought to understand the motivated behavioural consequences of discrepancy threat and how they vary by level of SA. We expected that (H3a) the Threat condition, compared to No Threat condition, would increase motivation among all participants to restore a sense of

security within the friendship through either approach or avoidance strategies. It was further expected that the nature of this motivation would depend on levels of trait SA such that (H3b) higher trait SA would be predictive of the intent to pursue more self-protective and less friendship-promoting goals, especially in response to the threat condition.

Methods

Participants

A total of 524 undergraduate students participated in this 30-minute online study in exchange for partial course credit. The recruitment target was based on a power analysis using G*Power software, aiming to enable detection of effect sizes ranging from small ($N = 77$) to medium ($N = 550$). Participants across the entire spectrum of trait SA were invited to participate.

Procedures

At the start of the online study, participants were asked to complete a self-report measure of SA symptoms. Then, to induce a neutral mood prior to the experiment, participants were instructed to relax for one minute while viewing a set of neutral images and listening to accompanying music. Consistent with the methodology of Zhang, Yu, and Barrett (2014), participants were instructed to focus on a series of neutral images presented on the screen, one at a time, and to use their imagination to make the experience more personal. Participants were encouraged to allow themselves to experience any feelings that arose. The series of neutrally-valenced, low-arousal images was selected from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 1997). Each was presented on screen for one minute, accompanied by music of similarly neutral valence (*Wind on Water* by Fripp, 1975). This

procedure has previously been used for the purpose of neutral mood induction and was shown to adequately serve this purpose (Barber & Moscovitch, 2023).

After the neutral mood induction, participants completed baseline measures of affect and social safeness. After completion of baseline measures, participants were asked to select a specific close friend from their life and to provide a rating of perceived closeness to their selected friend (Inclusion of Other in the Self Scale; Aron et al., 1992). Although past research has found that most people report having at least one cross-gender friend (e.g., Altmann, 2020), close friendships have been shown to predominantly consist of same-gender members (Altmann, 2022; Baumgarte & Nelson, 2009; Reeder, 2003). While this is especially evident in childhood and adolescence, the available evidence suggests the trend continues into adulthood (Mehta & Smith, 2019). Moreover, women tend to hold higher expectations for their same-gender friends, particularly with regards to intimacy and emotional support (Hall, 2011), and report engaging in more friendship maintenance behaviours with their same-gender friends, compared to men (Oswald et al., 2004). Given the prevalence of same-gender close friendships, and potential for gender composition of friendship dyads to influence processes of friendship formation and maintenance (e.g., Ogolsky & Bowers, 2012; Oswald et al., 2004), we aimed to standardize gender composition of imagined dyads in the present study. Therefore, we asked participants to select a same-gender close friend, if possible. However, we also welcomed participation from individuals unable to think of a same-gender close friend for the purpose of this study. Participants who were unable to envision a same-gender close friend were prompted to select any close friend of their choosing.

Participants were then randomly assigned by the Qualtrics survey platform to either the discrepancy threat or no-threat (control) condition and were led through the experimental

manipulation, accordingly. The experimental manipulation was based on a procedure used in a past study on the effects of SA and romantic relationships (Afram & Kashdan, 2015). The original procedure, which has been shown to effectively generate perceived threat of rejection within romantic relationships (Murray et al., 2002; Murray et al., 2008), consisted of inviting romantic dyads into the laboratory and deceiving one of the partners to believe that the other partner was listing negative attributes about them (threat condition), while the other participant completed an innocuous questionnaire that consisted of listing items in their place of residence (no-threat condition).

Given the online context of the present study, which was conducted on single participants rather than dyads, procedures used for eliciting threat in previous literature were adapted in various ways. First, all participants were asked to bring to mind and envision the close friend they selected at the start of the study. Then, participants who were randomly assigned to the experimental condition were instructed to imagine their selected friend telling them how they wish one thing about them is different than it is. To facilitate engagement with this task, participants were asked to imagine the situation as vividly as possible and were instructed to type into open text boxes what they were imagining, including: (1) describing the one thing their friend would like to change about them; (2) how the friend sounds and appears as they are saying this; and (3) how it makes the participant feel to think about the selected friend telling them this. In contrast, participants randomly assigned to the control condition were asked to imagine their close friend describing their typical weekday morning routine. In the no-threat condition, this was accompanied by prompts to write about: (1) the routine that their friend is describing; (2) how their friend sounds and appears as they are talking about the routine; and (3) how it makes the participant feel to think about their friend telling them this. To facilitate engagement and

adherence with study instructions, in both conditions participants were presented with written instructions on the screen that were accompanied by an audio recording of those instructions. The full script of the experimental manipulation is presented in Appendix A: Experimental Manipulation.

Immediately after the manipulation, via both written instructions and an audio recording, participants in both conditions were presented with an ambiguous situation describing a potential friendship rupture with the friend they were just imagining. The presented scenario was as follows: *Imagine that you hung out with your friend a few days ago but since that time you and your friend haven't been chatting or texting as much as you normally would. You wonder whether your friend may be upset about something. When you look at your phone today, you see that your friend has sent you a message asking if you are available to come over to chat this evening. (It is hard to decipher the tone of their message).* This ambiguous friendship situation had the potential to elicit concerns about negative evaluation, disappointment from or conflict with the friend, or as an opportunity to reaffirm feelings of closeness with the friend. In response to the ambiguous scenario that was presented, participants provided ratings on the primary dependent variables of interest, assessing perceived interpersonal threat, state affect, state social safeness within the friendship, and relationship goals (see Measures section, below).

Following completion of these measures, but before completion of the demographic questionnaire, participants completed an adherence check, consisting of four condition-specific questions that assessed whether participants engaged with the tasks as requested. Administration of the study concluded with a demographic questionnaire, followed by data credibility questions that asked participants about level of effort and attention during study participation. Participants

were assured that study responses, including responses to questions assessing data integrity, would have no effect on study remuneration.

Measures

Social Anxiety Interaction Scale

Trait SA was assessed via the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998) – *straightforward items* (Rodebaugh et al., 2007; Rodebaugh et al., 2011), administered at the start of the study. This version of the original 20-item scale utilizes only the 17 forward-worded items, with the three reverse-scored items excluded from scale score computation.

Across undergraduate, community, and clinical samples, the Social Anxiety Interaction Scale – straightforward items has demonstrated superior validity to the version that includes reverse-scored items (Rodebaugh et al., 2011). The Social Anxiety Interaction Scale – straightforward items asked participants to provide ratings of anxiety typically experienced in various types of social situations (e.g., “I find it difficult mixing comfortably with the people I work with”) and responses were provided on a Likert-type scale from 0 (Not at all characteristic or true of me) to 4 (Extremely characteristic or true of me). Previous studies using the Social Anxiety Interaction Scale – straightforward items have demonstrated excellent internal consistency (e.g., Rodebaugh et al., 2016; Study 1A), and the scale demonstrated similarly excellent internal consistency in the present study ($\alpha = .94$).

Positive and Negative Affect

At baseline and post-manipulation, participants were asked to complete the *Positive and Negative Affect Schedule – state version* (PANAS; Watson et al., 1988) as a measure of positive and negative affect at that moment in time. This scale asked participants to rate their affective experiences at that specific moment, across ten positive (e.g., interested; excited; strong) and ten

negative (e.g., guilty; irritable; afraid) mood adjectives. Ratings were provided on a scale from 1 (Very Slightly or Not at All) to 5 (Extremely), and adjectives within each group were summed to create the two subscale scores. In this study, both subscales demonstrated excellent internal consistency at baseline ($\alpha = .90$ for positive affect; $\alpha = .91$ for negative affect) and good internal consistency following the experimental manipulation ($\alpha = .86$ for both positive affect and negative affect).

In addition to the Positive and Negative Affect Schedule (Watson et al., 1988), state affect was assessed using the *Self-Assessment Manikin* (SAM; Bradley & Lang, 1994), at both baseline and post-manipulation. The Self-Assessment Manikin consisted of two items that assess emotional experiences via graphical representations. The first item assessed emotional valence and the other item assessed emotional arousal. The SAM measure of emotional valence presented participants with nine manikin figures, on a continuum from (1) a figure displaying a sad face to (9) a figure displaying a happy face. The measure of emotional arousal also presented participants with nine manikin figures, but on a continuum from (1) a calm figure with closed eyes and inactive body to (9) an excited figure with open eyes and an active body. For each of the two scales items, participants were asked to select the manikin that best represents how they felt at that particular moment.

Social Safeness

State social safeness was assessed via an adapted version of the *Social Safeness and Pleasure Scale* (Gilbert et al., 2009), administered alongside measures of affect at baseline and post-manipulation. Social safeness, which captures the extent to which an individual perceives their social world to be safe, warm, and soothing, varies both within and between persons, like other affective experiences (e.g., Kelly et al., 2012). Ratings of state social safeness in this study

were completed in relation to the selected close friend, with instructions adapted to ask about how they felt “right now, at this moment” rather than in general. The Social Safeness and Pleasure Scale asked participants to respond to 11 statements concerning feelings of belonging, acceptance, and warmth within their selected friendship (e.g., *I feel secure and wanted*), on a scale ranging from 0 (Strongly Disagree) to 4 (Strongly Agree). Previous use of the Social Safeness and Pleasure Scale has demonstrated excellent internal consistency ($\alpha = 0.91$; Gilbert et al., 2009), and the scale demonstrated similarly excellent internal consistency in the present study at baseline ($\alpha = .94$) and post-manipulation ($\alpha = .96$).

Perceived Closeness with Friend

Alongside the state measures of affect and social safeness, we aimed to capture each participant’s perceived closeness to their selected friend at the time of friend selection (baseline). For this purpose, we employed the *Inclusion of Other in the Self* Scale (Aron et al., 1992), which was shown to be psychometrically sound and to correlate with longer measures of relationship closeness (Gachter et al., 2015). This one-item measure forms a 7-point scale, with participants choosing which of seven increasingly overlapping set of two circles, representing the “self” and “other,” is most representative of the closeness they feel in their relationship with the chosen friend. The approach is based on Levinger and Snoek’s (1972) early work on close relationships and has been used as a measure of closeness in romantic relationships, relationships with family members, and friendships (Aron et al., 1992). The scale has shown good test-retest reliability over a two-week period in relation to friends ($r = .86$; Aron et al., 1992) and has demonstrated convergent validity with other measures of interpersonal closeness (e.g., Subjective Closeness Index, Sternberg Intimacy Scale, and Positive Emotions About Other; Aron et al., 1992).

Threat Perception

After the experimental manipulation and exposure to the ambiguous friendship rupture scenario, interpersonal threat was assessed using a 10-item measure of perceived interpersonal threat, which we created based on previous literature. This measure included statements of both positive and negative possible outcomes associated with the ambiguous friendship situation; participants were asked to rate how likely each outcome was perceived to be.¹ Participants were asked to rate the likelihood of each item on a 5-point scale ranging from 0 (Not at All Likely) to 4 (Extremely Likely). Positively worded items were reverse-coded such that higher scores indicated greater perceived threat. This scale demonstrated good internal consistency in the present study (Cronbach's $\alpha = .83$).

Friendship Goals

An adapted version of the *Relationship Goals Questionnaire: Friendship Version* (Elliot et al., 2006) was used to assess behavioural response motivations following presentation of the ambiguous friendship scenario, including both connectedness (approach) and self-protection (avoidance) goals. This scale was designed for the specific purpose of assessing such goals within a friendship context and has demonstrated good internal consistency ($\alpha = .88$) for the friendship-approach goals subscale and acceptable internal consistency ($\alpha = .75$) for the friendship-avoidance goals subscale (Elliot et al., 2006). The original version of this scale included four items representing approach motivation (e.g., *In general, I try to deepen my relationships with my friends*) and four items measuring avoidance motivation (e.g., *In general, I try to avoid disagreements and conflicts with my friends*). As this study aimed to investigate goals and anticipated behaviours in relation to the specific imagined situation introduced in this study, the scale was adapted accordingly. Participants were asked, “*If you found yourself in the situation presented above, in which your friend asks you to come over to chat, how much would*

you attempt to engage in each of the following behaviours? Please imagine the situation and respond to each of the items by selecting the appropriate response option”. Each of the four approach and four avoidance items was worded to be in reference to the study situation (e.g., *I would try to deepen my friendship with this friend; I would try to avoid disagreements and conflicts with this friend*). Response options were presented on a scale from 1 (Not at all true of me) to 7 (Very true of me), with approach and avoidance goal subscales computed by summing the four relevant items. In this study, internal consistency for the scale ranged from good ($\alpha = .80$ for the Avoidance subscale) to excellent ($\alpha = .90$ for the Approach subscale).

Demographics

At the end of the study, participants were presented with a short demographic questionnaire that collected information on age, gender identity, and cultural/ethnic identity.

Accuracy and Attention Checks

After the demographic questionnaire, accuracy and attention checks asked about participants’ levels of effort during study completion, how clear and understandable they found the study instructions to be, and whether they thought we should be cautious about including their data in analyses. Effort and clarity of instructions were rated on a scale from 1 (Very minimal effort/Not at all clear and understandable) to 5 (I put in my best effort to answer all questions to the best of my ability/Extremely clear and understandable). The question asking for potential reasons why data should be excluded from analyses was an open-text response. Participants who reported providing low quality data via either text responses or ratings lower than 3 out of 5 on the Likert scale were excluded from analyses.

Data Analytic Approach

Hypothesis 1

The first hypothesis was tested using hierarchical linear regression. Study condition (dummy coded: 0 = Control; 1 = Threat) and grand mean-centered Social Anxiety Interaction Scale – straightforward items scores were entered as predictors in Step 1 of a regression model in which scores on the perception of interpersonal threat measure were the dependent variable. A main effect of condition would support H1a, that assignment to the threat condition was associated with increased perceptions of threat, serving as well as a manipulation check. Next, the condition by Social Anxiety Interaction Scale – straightforward items interaction term was entered in Step 2 of the regression model. A significant interaction, with SA predicting greater perceived threat when assigned to the discrepancy threat condition would support hypothesis H1b.

Hypothesis 2

Regression analyses were used to test the hypothesis that higher trait SA would predict more negative affect and emotional arousal/valence as well as less positive affect and state social safeness in the threat condition relative to the no-threat condition. To that end, Social Anxiety Interaction Scale – straightforward items scores (continuous, grand mean-centered), study condition (dummy coded; 0 = Control; 1 = Threat), and their interaction term were entered as predictors into five separate linear regression models, with the outcome variables across the five models being (1) PANAS-negative affect, (2) Self-Assessment Manikin – arousal rating, (3) Self-Assessment Manikin – valence, (4) PANAS – positive affect, and (5) state social safeness. Each model controlled for baseline levels of the outcome being tested (with control variables measured prior to the introduction of the experimental manipulation). Support for hypothesis 2 would be reflected in a significant interaction between SA and study condition, such that SA would be associated with higher PANAS negative affect scores, heightened Self-Assessment

Manikin arousal ratings, as well as lower (more negative) Self-Assessment Manikin valence scores, lower PANAS positive affect scores, and diminished feelings of state social safeness in the threat condition relative to the no-threat condition for each of the five models.

Hypothesis 3

We hypothesized (H3a) the threat condition, relative to no threat, would increase motivation among all participants to restore a sense of security within the friendship through either approach or avoidance strategies but that the nature of this motivation would vary by levels of trait SA, such that (H3b) higher trait SA would be predictive of intention to pursue more self-protective, and less friendship-promoting, goals in response to the threat condition. We tested these hypotheses using two hierarchical linear regression models. In each regression analysis, SA (assessed via the Social Anxiety Interaction Scale – straightforward items; grand mean-centered) and study condition (dummy coded; 0 = Control; 1 = Threat) were entered as simultaneous predictors in Step 1 of the model, and their interaction term was entered in Step 2. Type of goal endorsement on the Relationship Goals Questionnaire: Friendship Version was entered as the outcome variable (self-protective goals in one model and friendship-promoting goals in the other model). A main effect of study condition, such that discrepancy threat is predictive of higher goal endorsement in both models, would indicate that H3a was supported. The presence of a study condition by SA interaction would provide support for hypothesis for H3b, that the effect of condition on motivational goals varies by SA.

Exploratory Analyses

Perceived closeness and sensitivity to threat. For a more comprehensive understanding of factors that may contribute to perceptions of interpersonal threat, we also examined whether the relation between trait SA and amount of interpersonal threat (post-manipulation) was

moderated by perceived closeness to the selected friend (pre-manipulation), via hierarchical linear regression. In a regression analysis predicting scores on the interpersonal threat scale, mean-centered Social Anxiety Interaction Scale – straightforward items (trait SA) scores and Inclusion of Other in the Self Scale (relationship closeness) scores, along with the dummy coded condition variable (0 = Control; 1 = Threat), were entered as predictors in Step 1 of the model. Two-way interaction terms were entered in Step 2, and the three-way interaction was added in Step 3 of the model predicting perceived threat. In addition, we calculated the bivariate correlation between SA and reported closeness to the selected friend.

Perceived closeness and friendship goals. We also examined whether perceived closeness to the selected friend moderated relations between SA, condition, and motivated behavioural outcomes. Two hierarchical linear regressions were used, with mean-centered individual predictors (trait SA, perceived closeness) and study condition (dummy-coded) entered in Step 1, two-way interaction terms entered in Step 2, and the three-way interaction entered in Step 3. Endorsement of approach goals was the dependent variable in one regression model and endorsement of avoidance goals was the outcome in the second mode.

Correlates of increased threat salience. To better understand the emotional effects of increase threat salience, we examined bivariate correlations between continuous ratings of perceived threat on the interpersonal threat scale and the five outcomes outlined in hypothesis 2.

Results

Preliminary Analyses

A total of 524 individuals participated in this study. Of those, 52 participants were filtered out prior to analyses, due to self-reported low effort or poor understanding of instructions (i.e., as indicated by a rating of less than 3 out of 5), nonsensical responses to open text items, or

leaving the open-text response portion of the experimental manipulation blank (i.e., not providing descriptions of the imagined exercises), such that engagement with study tasks could not be confirmed. Therefore, the final sample included in analyses was comprised of 472 participants (234 in the Discrepancy Threat condition and 238 in the Control condition). For all measures, data that were determined to be missing completely at random (MCAR) using Little's MCAR test (Little, 1988) were imputed using Expectation-Maximization (EM). Data that were not MCAR were deleted pairwise, such that participants were still retained in analyses for which relevant data were available. Missing data ranged from 0.2 % to 1.8% across the study measures. Outliers falling more than 3SD above or below the mean were winsorized to be exactly 3SD from the mean. Analysis of skew and kurtosis showed all data used in analyses to be normally distributed, consistent with recommendations of Kline (1998; skew below 3.0 and kurtosis below 10.0).

Sample Characteristics

Demographic information for participants, including age, gender, and ethnicity, is presented in Table 8. This sample presented with normally distributed scores of SA, with a SIAS-S mean score of 30.22 ($SD = 15.35$).

Table 8*Demographic Characteristics of Study 2A Participants*

Demographic Variable	Participant Responses
Age (Mean; $N = 467$)	20.26 (SD = 3.65)
Gender ($N = 469$)	
Cisgender Man	83
Cisgender Woman	377
Transgender (Woman to Man)	1
Non-binary	5
Genderqueer	2
Gender fluid	1
Ethnicity ($N = 472$)	
Arab/West Asian/North African	2.8%
Black/Afro-Caribbean/African	4.0%
East Asian	19.9 %
First Nations/Métis/Inuit	0.4 %
Latinx	2.3 %
South Asian	20.8 %
Southeast Asian	4.9 %
White/European	39.8 %
Other	2.1 %
Prefer not to answer	3.0 %

Note. Due to some missing data that could not be imputed, N s vary, as indicated.

Hypothesis 1: Sensitivity to Interpersonal Threat

When perceived interpersonal threat was regressed onto condition and SA, two main effects emerged and the model explained 9.2% of the variance in interpersonal threat ratings ($F(2, 469) = 23.72, p < .001$). Assignment to the threat condition ($M = 12.02; SD = 7.31$), compared to control ($M = 10.39; SD = 6.52$), was associated with greater perceived interpersonal threat ($p = .021, B = 1.42, 95\% \text{ CI } [0.21, 2.62]$). Therefore, hypothesis 1a was supported, validating our experimental manipulation.

Results also showed a main effect of SA, with higher SA predicting higher perceived threat ($p < .001$, $B = 0.13$, 95% CI [0.09, 0.17]). Adding the condition by SA interaction term in Step 2 did not improve the predictive utility of the model ($\Delta R^2 < .01$, $\Delta F(1, 468) = 0.02$, $p = .901$). Therefore, the hypothesis that higher SA would be associated with increased threat perception after discrepancy threat was made salient (H1b) was not supported.

Hypothesis 2: Valence and Intensity of Affect

Analyses testing hypothesis 2 are described below. Overall, the hypothesis that SA would be related to outcomes especially in the threat condition was not supported. Means for affect scores pre- and post-experimental manipulation, across conditions, are presented in Table 9.

Table 9

Descriptive Statistics for Affect Variables across Time Points and Conditions

	Baseline		Post-Manipulation	
	Control condition	Threat condition	Control condition	Threat condition
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
PANAS-NA	15.74 (6.71)	16.43 (7.38)	20.56 (8.53)	23.29 (10.10)
SAM arousal	3.77 (1.95)	3.94 (2.07)	5.23 (1.95)	5.84 (1.97)
PANAS-PA	20.53 (7.45)	20.72 (8.07)	22.60 (7.42)	21.61 (7.13)
SAM affect	5.43 (1.41)	5.50 (1.27)	4.52 (1.63)	4.15 (1.58)
Social safeness	37.35 (6.52)	38.01 (6.48)	33.45 (9.25)	32.49 (10.26)

Note. *Ns* varied from 233 to 238 in the control condition and from 225 to 234 in the threat

condition. PANAS = Positive and Negative Affect Schedule – state version (Watson et al., 1988); NA = Negative Affect; PA = Positive Affect; SAM = Self-Assessment Manikin (Bradley & Lang, 1994); Social Safeness was assessed via the Social Safeness and Pleasure Scale – state version (Gilbert et al., 2009).

To control for baseline affect, in Step 1 of a hierarchical linear regression model predicting negative affect, baseline PANAS – negative affect was included as the sole predictor

of post-manipulation PANAS – negative affect ($R^2 = .22$, $F(1, 458) = 125.11$, $p < .001$). Study condition and trait SA were added as simultaneous predicts in Step 2 of the model ($\Delta R^2 = .05$, $\Delta F(2, 456) = 16.77$, $p < .001$). There was a significant main effect of study condition on post-manipulation PANAS – negative affect, such that the discrepancy threat condition was associated with greater negative affect ($p = .004$, $B = 2.21$, 95% CI [0.73, 3.69]). Additionally, there was a significant main effect of trait SA on PANAS – negative affect, such that higher SA was also associated with higher negative affect ($p < .001$, $B = 0.13$, 95% CI [0.08, 0.18]). There was no significant interaction effect between study condition and participant trait SA on post-manipulation PANAS – negative affect, ($\Delta R^2 < .01$, $\Delta F(1, 455) = 0.62$, $p = .431$).

Similarly, to control for baseline Self-Assessment Manikin anxious arousal, in Step 1 of a hierarchical linear regression model predicting anxious arousal, baseline SAM arousal was included as the sole predictor of post-manipulation Self-Assessment Manikin arousal ($R^2 = .14$, $F(1, 470) = 79.26$, $p < .001$). Addition of study condition and trait SA as simultaneous predictors in Step 2 significantly improved the predictive utility of the model ($\Delta R^2 = .04$, $\Delta F(2, 468) = 11.73$, $p < .001$). Predictive utility of the model was further improved by addition of the condition by SA interaction term in Step 3 ($\Delta R^2 = .01$, $\Delta F(1, 467) = 4.90$, $p = .027$). The interaction was followed up with simple slopes analysis. Unexpectedly, within the discrepancy threat condition, SA did not predict Self-Assessment Manikin arousal ($p = .330$, $B = 0.01$, 95% CI [-0.01, 0.02]), whereas in the control condition, SA significantly predicted more anxious arousal ($p < .001$, $B = 0.03$, 95% CI [0.02, 0.05]).

The next hierarchical linear regression model, predicting post-manipulation positive affect, controlled for baseline PANAS – positive affect, in Step 1 ($R^2 = .34$, $F(1, 457) = 238.19$, $p < .001$). Condition and trait SA were added in Step 2 of the model ($\Delta R^2 = .01$, $\Delta F(2, 455) = 3.96$,

$p = .020$), with Condition emerging as the only significant predictor of PANAS – positive affect. The discrepancy threat condition was associated with lower positive affect than the control condition ($p = .027$, $B = -1.20$, 95% CI [-2.27, -0.14]), and trait SA was marginally significant in predicting more positive affect ($p = .064$, $B = 0.03$, 95% CI [< -0.01 , 0.07]). Inclusion of the condition by SA interaction term did not improve the predictive utility of the model with PANAS – positive affect, as the dependent variable ($\Delta R^2 < .01$, $\Delta F(1, 454) = 0.08$, $p = .784$).

In a hierarchical linear regression predicting post-manipulation emotional valence on the Self-Assessment Manikin, baseline emotional valence was first entered in Step 1 ($R^2 = .06$, $F(1, 470) = 28.00$, $p < .001$), with condition and SA scores added as simultaneous predictors in Step 2 ($\Delta R^2 = .04$, $\Delta F(2, 468) = 10.69$, $p < .001$). Being in the discrepancy threat condition was associated with less positive/more negative Self-Assessment Manikin emotional valence ($p = .012$, $B = -0.36$, 95% CI [-0.64, -0.08]), and higher SA was also associated with less positive/more negative emotional valence on the Self-Assessment Manikin ($p < .001$, $B = -0.02$, 95% CI [-0.03, -0.01]). Condition and trait SA did not interact to predict emotional valence ($\Delta R^2 < .01$, $\Delta F(1, 467) = 2.11$, $p = .147$).

We also tested the utility of condition and trait SA in predicting post-manipulation social safeness. Post-manipulation Social Safeness and Pleasure Scale scores were first regressed onto baseline social safeness scores ($R^2 = .35$, $F(1, 456) = 247.58$, $p < .001$), to control for social safeness with the selected friend prior to experimental manipulation. Controlling for baseline social safeness, condition and SA significantly predicted post-manipulation social safeness with the selected friend ($\Delta R^2 = .02$, $\Delta F(2, 454) = 6.44$, $p = .002$), and there was no significant condition by SA interaction ($\Delta R^2 < .01$, $\Delta F(1, 453) = 2.75$, $p = .098$). There was a significant main effect of SA, such that higher SA was associated with lower social safeness ($p = .004$, $B = -$

0.07, 95% CI [- 0.12, - 0.02]), and being in the discrepancy condition was marginally significant in predicting lower reported social safeness ($p = .061$, $B = - 1.38$, 95% CI [- 2.81, 0.06]).

For additional context, we tested for correlations between the continuous measure of perceived interpersonal threat and all affect variables (see Table 10).

Table 10

Zero-order Correlations Between Perceived Threat and Post-Manipulation Emotionality

	Perceived Threat	PANAS - NA	SAM arousal	PANAS - PA	SAM affect	SSPS
Perceived Threat	1					
PANAS -NA	.36**	1				
SAM arousal	.26**	.60**	1			
PANAS - PA	-.11*	.26**	.09	1		
SAM affect	-.27**	-.47**	-.52**	.20**	1	
SSPS	-.56**	-.36**	-.27**	.17**	.32**	1

Note. Missing data that were not imputed because they were not MCAR were deleted pairwise;

therefore, N s ranged from 451 to 472. Numbers represent Person correlation coefficients with state variables following the experimental manipulation (e.g., post-manipulation emotionality).

PANAS = Positive and Negative Affect Schedule – state version (Watson et al., 1988); NA = Negative Affect; PA = Positive Affect; SAM = Self-Assessment Manikin (Bradley & Lang, 1994); SSPS = Social Safeness and Pleasure Scale – state version (Gilbert et al., 2009).

* $p < .05$

** $p < .001$

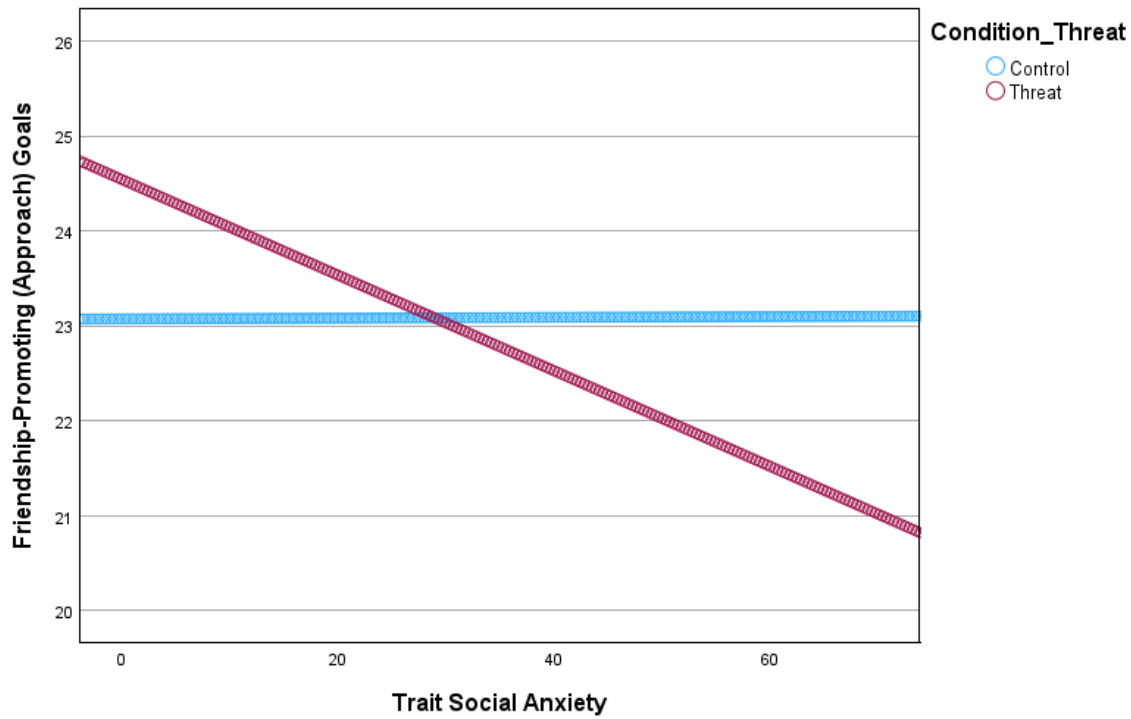
Hypothesis 3: Approach versus Avoidance Goals

In the hierarchical linear regression predicting approach-oriented behavioural motivation, the model with condition and SA as simultaneous predictors was not significant ($R^2 = .01$, $F(2,$

469) = 1.97, $p = .141$). However, with the addition of their interaction term in the next step, the regression model was marginally significant in predicting approach-oriented friendship goals ($\Delta R^2 < .01$, $\Delta F(1, 468) = 3.84$, $p = .051$). The interaction was followed up with simple slopes analysis, examining the effect of SA at each level of condition (see Figure 3). Results showed that, in the no threat (control) condition, SA had no effect on ratings of friendship-promoting goals in response to the ambiguous situation ($R^2 < .01$, $F(1, 236) < .01$, $p = .985$). However, for participants assigned to the discrepancy threat condition, SA significantly predicted endorsement of friendship-promoting goals ($R^2 = .03$, $F(1, 232) = 7.12$, $p = .008$), with higher SA predicting lower approach motivation ($B = -0.05$, 95% CI [-0.09, -0.01]).

Figure 3

Social Anxiety Predicting Friendship-Promoting Goals

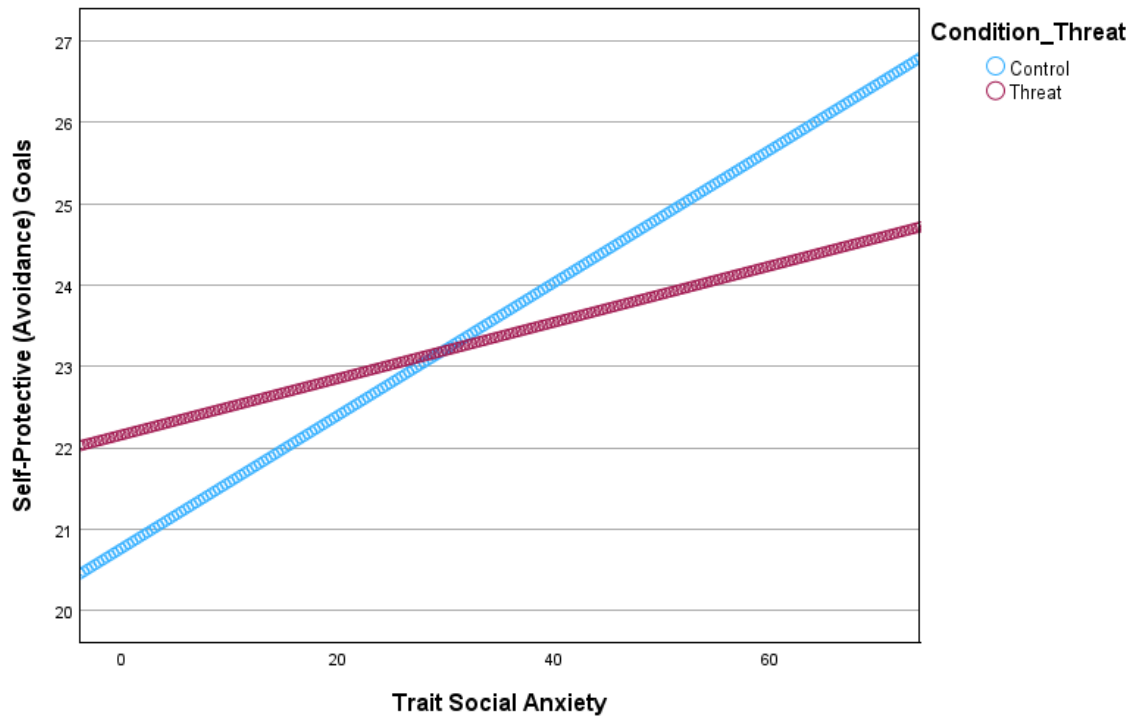


Note. This figure displays the simple slopes analysis of trait social anxiety, assessed via the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998) – straightforward items (SIAS-S; Rodebaugh et al., 2007; Rodebaugh et al., 2011) predicting friendship-promoting (approach) goals, assessed via an adapted version of the Relationship Goals Questionnaire: Friendship Version (Elliot et al., 2006), within each of the two study conditions separately. The y-axis represents the unstandardized predicted values of friendship-promoting goals, with the possible scores ranging from 4 to 28. The interaction between social anxiety and study condition in predicting friendship-promoting goals was marginally statistically significant ($p = .051$)

In a separate hierarchical linear regression analysis, we found that the model with study condition and trait SA significantly predicted avoidance (self-protective) goals ($R^2 = .05$, $F(2, 469) = 11.48$, $p < .001$). Specifically, SA significantly predicted higher self-protective goals ($p < .001$, $B = 0.06$, 95% CI [0.34, 0.08]) but condition was not a significant predictor ($p = .942$, $B = -0.03$, 95% CI [-0.75, 0.70]). Addition of the condition by SA interaction term was again marginally significant in improving the prediction of behavioural goals ($\Delta R^2 = .01$, $\Delta F(1, 468) = 3.85$, $p = .050$). The interaction was probed via simple slope analyses, with SA predicting self-protective goals at each level of condition separately (see Figure 4). Contrary to expectations, we found that higher SA was only marginally significant in predicting more self-protective goals ($B = 0.03$, 95% CI [< -0.01 , 0.07]) within the discrepancy threat condition ($R^2 = .02$, $F(1, 232) = 3.68$, $p = .056$), whereas SA significantly predicted more self-protective goals ($B = 0.08$, 95% CI [0.05, 0.11]) among participants in the control condition ($R^2 = .10$, $F(1, 236) = 26.36$, $p < .001$).

Figure 4

Social Anxiety Predicting Self-Protective Goals



Note. This figure displays the simple slopes analysis of trait social anxiety, assessed via the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998) – straightforward items (SIAS-S; Rodebaugh et al., 2007; Rodebaugh et al., 2011) predicting self-protective (avoidance) goals, assessed via an adapted version of the Relationship Goals Questionnaire: Friendship Version (Elliot et al., 2006), within each of the two study conditions separately. The y-axis represents the unstandardized predicted values of self-protective goals, with the possible scores ranging from 4 to 28. The interaction between social anxiety and study condition in predicting self-protective goals was marginally statistically significant ($p = .050$)

Therefore, H3a was not supported, as condition assignment did not predict an increase in either approach or avoidance friendship goals. However, H3b was partially supported. As expected, higher SA was associated with lower endorsement of approach (friendship-promoting) goals, but only in the discrepancy threat condition. For avoidance (self-protective) goals, SA predicted marginally more self-protective goals within the discrepancy threat condition but significantly more self-protective goals within the control condition.

Exploratory Analyses

Perceived closeness and sensitivity to threat. A bivariate correlational analysis showed that SA was unrelated to ratings of perceived closeness, $r(472) = -.02, p = .302$. We next examined whether the relation between trait SA and higher perceptions of interpersonal threat was moderated by perceived closeness to the selected friend, via hierarchical linear regression. The model with three simultaneous predictors (SA, perceived closeness, and study condition) was significant, accounting for 13.0% of the variance in perceived interpersonal threat ($F(3, 468) = 23.21, p < .001$). Addition of all two-way interactions in Step 2 did not significantly add to the predictive utility of the model ($\Delta R^2 = .01, \Delta F(3, 465) = 0.98, p = .403$). However, addition of the three way-interaction term in Step 3 significantly added to the utility of the model predicting perceived threat ($\Delta R^2 = .01, \Delta F(1, 464) = 4.15, p = .042$). The significant three-way interaction was probed by examining the SA by friendship closeness interaction in predicting perceived threat in each condition separately.

In the control condition, trait SA and friendship closeness significantly predicted endorsement of interpersonal threat ($R^2 = .12, F(2, 235) = 15.98, p < .001$), such that higher SA predicted higher perceived threat ($p < .001, B = 0.13, 95\% \text{ CI } [0.08, 0.19]$) and higher closeness to the selected friend predicted lower perceived threat ($p = .006, B = -0.69, 95\% \text{ CI } [-1.17, -$

0.20]). Addition of the SA by closeness interaction term in Step 2 of the hierarchical linear regression did not improve the predictive utility of the model ($\Delta R^2 < .01$, $\Delta F(1, 234) = 0.37$, $p = .546$).

Within the discrepancy threat condition, SA and friendship closeness significantly predicted endorsement of interpersonal threat ($R^2 = .19$, $F(2, 231) = 15.44$, $p < .001$), and addition of their interaction term further improved the model ($\Delta R^2 = .02$, $\Delta F(1, 230) = 5.46$, $p = .020$). To examine the nature of the interaction between perceived closeness (Inclusion of Other in the Self Scale) and SA (Social Anxiety Interaction Scale – straightforward items), we conducted a simple slopes analysis at different levels of perceived closeness to the selected friend. The effect of SA on post-manipulation interpersonal threat was significant at the mean level of perceived friendship closeness ($t(230) = 3.83$, $p < .001$, $B = 0.11$, $d = 3.83$). At one standard deviation below the mean of perceived closeness, the effect of SA on interpersonal threat was significant and stronger ($t(230) = 4.32$, $p < .001$, $B = 0.17$, $d = 4.32$). However, at one standard deviation above the mean of perceived closeness, the effect of SA on interpersonal threat was not significant ($t(230) = 1.23$, $p = .22$, $B = 0.05$, $d = 1.23$). These results suggest that the relationship between SA and interpersonal threat was moderated by perceived closeness to the selected friend, but only within the discrepancy threat condition.

Perceived closeness and friendship goals. Two hierarchical linear regressions were used to test whether condition, SA, and perceived closeness to the selected friend interacted to predict approach and avoidance goals in response to the ambiguous friendship situation. A regression model with study condition (dummy coded; 0 = control, 1 = Threat), SA measured via the SIAS-S, and closeness assessed via the Inclusion of Other in the Self Scale entered as simultaneous predictors significantly predicted approach (friendship-promoting) goals ($R^2 = .06$, $F(3, 468) =$

10. 320, $p < .001$). In that model, perceived closeness to the selected friend was the only significant predictor, with greater closeness predicting more approach goals ($p < .001$, $B = 0.60$, 95% CI [0.37, 0.83]). The main effect of SA was nearly significant, with higher SA predicting less approach ($p = .059$, $B = -0.02$, 95% CI [-0.05, 0.01]) and there was no effect of condition ($p = .860$, $B = -0.07$, 95% CI [-0.83, 0.70]). Addition of two-way interactions in Step 2 of the hierarchical linear regression did not improve the predictive utility of the model ($\Delta R^2 = .01$, $\Delta F(3, 465) = 1.11$, $p = .347$), and neither did addition of the three-way interactions in Step 3 ($\Delta R^2 < .01$, $\Delta F(1, 464) = 1.00$, $p = .319$).

Similarly, in the exploratory hierarchical linear regression predicting avoidance (self-protective) goals, the model with SA, condition, and perceived closeness to the selected friend significantly predicted outcomes ($R^2 = .11$, $F(3, 468) = 18.37$, $p < .001$). Whereas greater closeness was the only significant predictor of approach goals in the analysis above, greater endorsement of avoidance goals was also predicted by higher reported closeness to the selected friend in the current analysis ($p < .001$, $B = 0.59$, 95% CI [0.38, 0.80]) and higher SA ($p < .001$, $B = 0.06$, 95% CI [0.04, 0.08]). Thus, across the two analyses, higher reported closeness to the selected friend was predictive of more friendship-promoting *and* more self-protecting goals. Condition assignment was not a significant predictor of avoidance friendship goals ($p = .933$, $B = -0.03$, 95% CI [-0.73, 0.67]). The model was not improved by addition of two-way interactions ($\Delta R^2 = .01$, $\Delta F(3, 465) = 0.84$, $p = .474$) or the three-way interaction ($\Delta R^2 < .01$, $\Delta F(1, 464) = 1.86$, $p = .173$). Zero-order correlations between SA, closeness, perceived interpersonal threat, approach goals, and avoidance goals are presented in Table 11.

Table 11*Zero-order Correlations Between Social Anxiety, Closeness, Threat, and Goals*

	SIAS-S	IOS	Perceived Threat	Approach Goals	Avoidance Goals
SIAS-S	1				
IOS	-.02	1			
Perceived Threat	.29**	-.20**	1		
Approach Goals	-.09*	.23**	-.38**	1	
Avoidance Goals	.22**	.24**	-.15*	.41**	1

Note. $N = 472$. Numbers represent Pearson correlation coefficients. SIAS-S = Social Interaction

Anxiety Scale (Mattick & Clark, 1998) – straightforward items (Rodebaugh et al., 2007;

Rodebaugh et al., 2011); IOS = Inclusion of Other in the Self Scale (Aron, Aron, & Smollan,

1992); Perceived Threat was assessed using the scale created for this study (see Measures

section); Approach and avoidance goals were assessed via the two subscales of the Relationship

Goals Questionnaire: Friendship Version (Elliot et al., 2006), adapted to ask about the specific

friendship selected for this study.

** $p < .001$

* $p < .05$

Discussion

Following up on the results of Studies 1A and 1B, Study 2A aimed to increase our understanding of how SA influences processes within close friendships, via an experimental design.

Sensitivity to Interpersonal Threat

Although the effect was small, we found support for H1a, in that our experimental manipulation significantly increased perceptions of interpersonal threat among participants

randomly assigned to the threat condition. This also served as a manipulation check, demonstrating that the experimental manipulation had the intended effect of manipulating perceptions of interpersonal threat, thus increasing confidence in findings related to the effects of condition in the present study. In this study, interpersonal threat was conceptualized as concern about negative evaluation, rejection, and/or relationship dissolution, as was reflected on items comprising the scale we created to assess threat in this study. The hypothesis (H1b) that higher trait SA would be associated with increased sensitivity to manipulation of interpersonal threat was, however, not supported. Results showed that higher SA was linked to generally greater perceptions of threat in close friendships, without differential sensitivity to the experimental manipulation. This suggests that a sense of interpersonal threat may be ever-present among individuals at the higher end of the SA spectrum, consistent with cognitive theories of SA, which emphasize the importance of deeply held negative beliefs about the self in relation to others (Hofmann, 2007; Moscovitch, 2009).

The unexpected finding that SA was not especially predictive of perceived threat within close friendships when discrepancy threat was made salient may indicate that core beliefs about the self in relation to friends are firmly rooted and less sensitive to activation via external factors (e.g., interaction with friend at present) than we had expected. This suggests that interventions targeting SA-related problems within close friendships may benefit from emphasis on general core beliefs about the self in relation to close others, rather than reactions to specific events. As is already common in interventions such as cognitive-behavioural therapy (Gregory & Peters, 2017), it would likely be most beneficial to explore interpretations of, and reactions to, specific instances of discrepancy threat within friendships in terms of underlying belief structures and broader self-schema.

Alternatively, the consistently higher sense of threat among higher SA individuals may be an artifact of our study design, in that it is possible both study conditions had unintended negative effects on highly anxious individuals. Although the control condition was designed to be neutral, all participants were exposed to the same potentially distressing ambiguous scenario after the manipulation exercise, which may have raised threat for all participants and minimized differential effects of the two conditions. It is also possible that simply imagining a close friend in detail, even in the control condition, contributed to heightened interpersonal stress for individuals with higher levels of trait SA, as they may have been automatically primed to associate thoughts of friends with beliefs of self as potentially inferior to, or undeserving of, their valued friend. Moreover, an elevated sense of threat at higher levels of SA, regardless of study condition, may reflect the sample used and not necessarily generalize to clinical samples of individuals with SAD. In the present study, participants were undergraduate students whose symptoms of SA were distributed across the entire SA spectrum, rather than individuals with clinically significant levels of SA. The hypothesized sensitivity to interpersonal threat salience, in the context of generally greater vulnerability to threat within close friendships, might only emerge within clinical populations. Therefore, clinical replication is required to help clarify the nature of these results.

We also investigated the correlates of increased threat perceptions, as was observed among individuals with higher levels of trait SA across both conditions. Bivariate correlations showed that perceptions of threat were positively related to all measures of negative affect and inversely related to all measures of positive affect, including state social safeness. Therefore, pervasive perceptions of interpersonal threat may fuel ongoing experiences of more negative affect, and less positive affect, within friendships. An individual who routinely feels unhappy,

unenergized, or fearful within a certain friendship is likely to have a general sense of being less satisfied within that friendship than an individual who experiences more instances of positive emotions within a given friendship. This idea is supported by existing research, which has found that experiences from various points in time are utilized by individuals to establish estimates of overall friendship satisfaction (Wilson et al., 2015). As such, an accumulation of more negative affective experiences and fewer positive affective experiences within close friendships is believed to lead to lower ratings of global friendship satisfaction over time, as has been observed among socially anxious individuals (Rodebaugh et al., 2012; Rodebaugh et al., 2015). Thus, our results suggest persistent feelings of interpersonal threat may play a role in the emotional experiences of socially anxious individuals within their close friendships.

Negative Emotional Outcomes

Overall, H2 was not supported, given that higher SA did not consistently predict more negative affect and arousal, and less positive affect and social safeness, specifically in the discrepancy threat condition. However, several interesting effects emerged.

We tested the effect of our experimental manipulation (threat vs. no threat) on state affect and sense of social safeness within the friendships that participants envisioned for this study. We found that negative affect was generally higher in the threat condition than in the control condition and that higher SA was associated with greater post-manipulation negative affect regardless of condition assignment. The finding that negative affect was generally higher among socially anxious individuals is consistent with a large body of literature on SA and propensity towards negative emotions. It has been found that SA is linked to more negative cognitions and emotions, less positivity in daily life, and impaired emotion regulation following a stressful event (Blanco & Joormann, 2017; Jazaieri et al., 2015; Kashdan, 2007). If proneness to negative affect

extends to close friendships contexts, it may have important implications for thoughts and behaviours of socially anxious individuals within friendships, as stipulated by cognitive-behavioural models of anxiety symptom maintenance (Heimberg, 2002; Jazaieri et al., 2015). For example, the concept of mood congruent thinking is central to cognitive-behavioural therapy (CBT), and postulates that negative affect (e.g., sadness, fear, anger, guilt) would bias the perception of friendship events towards more negative interpretations (e.g., interpretations of deliberate rejection, inability to meet friendship standards, anticipation of upcoming rejection, etc.). Negatively valenced cognitions would then be expected to further amplify negative affect, and this cycle would promote behaviours that are consistent with the emotional state and one's interpretations of events (e.g., emotional distancing from friends, reassurance-seeking, defensiveness, or criticizing the friend in self-defence). Evidently, such behaviours serve to amplify the cycle, such that feelings, thoughts, and behaviours reinforce each other over time (Heimberg, 2002; Heimberg et al., 2010). Our finding of heightened negative affect in close friendships of socially anxious individuals therefore suggests that exploration of cognitive and behavioural correlates of negative emotions within friendships may be a fruitful avenue for further exploration and possible treatment interventions.

In addition, we found that study condition and SA interacted to predict anxious arousal, with SA predicting more arousal, but only in the control condition. It is difficult to conceptualize why SA may be related to greater anxious arousal when imagining a friend's daily routine than when imagining something about the self that a friend wishes to change, especially when the latter is appraised as more interpersonally threatening by people with more SA, as described above. As SA is associated with low tolerance for uncertainty (Boelen & Reijntjes, 2009; Carleton, 2012; Carleton et al., 2010), one possible explanation for this finding is that the

ambiguity of the no-threat exercise may have left participants wondering about its purpose and whether something more anxiety-provoking awaits. The unexpected effect of the control condition on anxious arousal was an outlier result in the present study and remains to be replicated in future research.

Positive Emotional Outcomes

In the present study, condition assignment was the only significant predictor of positive affect on the PANAS, with the threat condition eliciting less positive affect than the control condition. It was surprising that the often-documented positivity deficits in people with higher trait SA (e.g., Kashdan, 2007) did not emerge within the context of friendships, as assessed here. There were, however, effects of both study condition and SA on affect as assessed via the SAM, in the expected directions (i.e., threat condition and higher SA each predicting less positive/more negative affect on the SAM). As the one-item Self-Assessment Manikin assesses affect as a unidimensional construct, with response options ranging from negative to positive, it is possible that this effect was driven by either more negative or less positive affect.

Positive emotionality in the present study was also assessed in terms of social safeness within the selected friendship, at both baseline and post-manipulation. Results showed that the threat condition predicted marginally lower perceptions of post-manipulation social safeness, and that higher SA significantly predicted lower post-manipulation feelings of social safeness with the selected friend. Although social safeness is a construct that may be measured as a trait, to reflect one's perceived safety and security within their social networks (Gilbert et al., 2009; Gilbert & Simos, 2022; Gilbert, 2024; Kelly et al., 2012), in the present study, it was assessed as a state variable capturing a sense of emotional safety and security within the specified friendship. Moreover, social safeness is believed to uniquely protect against psychosocial suffering (Kelly et

al., 2012), such that lower social safeness may be expected within contexts in which individuals experience higher interpersonal distress. It is therefore not surprising that lower feelings of social safeness were observed alongside higher perceptions of interpersonal threat among individuals with higher trait SA in both conditions, as described above. In addition, previous studies have shown that perceptions of trust and emotional safety are necessary for interpersonal risk-taking, such as disclosing personal vulnerabilities that have the potential to deepen emotional connections with others (Gilbert & Simos, 2022; Murray et al., 2008). Although theorized to be part of the soothing system, rather than either the approach or avoidance system (Alavi, 2021), a sense of social safeness may promote the perception of trust necessary to share one's needs or desires, express feelings of hurt or concern, and voice appreciation for the friendship in question (Murray et al., 2006; Murray et al., 2008). Therefore, we suspect that a decreased sense of social safeness among socially anxious individuals might contribute to decreased engagement in the types of behaviours that deepen friendships, leading to decreased closeness and satisfaction over time. Findings of the present study elucidate the experiences of socially anxious individuals and point to decreased social safeness as a potentially fruitful treatment target in psychological interventions. However, our specific hypothesis relating to social safeness was not supported, in that effects were not unique to the discrepancy threat condition.

Approach versus Avoidance Goals

Finally, this study examined friendship goals as an indicator of behavioural motivations in the context of increased interpersonal threat salience within friendships. Given that people are social animals who are highly motivated to maintain social bonds (e.g., Leary & Baumeister, 2000), heightened interpersonal distress signals a need to implement strategies to re-establish a sense of social security (Murray et al., 2006; Murray et al., 2008). Whereas individuals generally

cope with the social pain of rejection or exclusion by aiming to strengthen social connections that have the potential to boost positive affect (i.e., social approach behaviour), such a tendency has been shown to be diminished among socially anxious individuals (Hudd & Moscovitch, 2022, 2023). Consistent with past results, we found that greater SA predicted less friendship-promoting (approach) and more self-protective (avoidance) goals and, although there was no main effect of study condition for either type of behavioural motivation, condition did interact with participant trait SA to predict friendship goals, in both expected and unexpected ways. The observation that higher SA predicted lower endorsement of friendship-promoting goals, but only in the discrepancy threat condition, was consistent with hypothesis 3b. This finding also aligns with literature on decreased approach motivation among socially anxious individuals, particularly in the face of social pain or rejection (Hudd & Moscovitch 2022, 2023). As approach behaviour is typically required for conflict resolution and fostering of increased closeness (Murray et al., 2008), the observed tendency towards decreased approach among higher SA individuals faced with a potential friendship rupture is likely to have the effect of leaving negative feelings unaddressed and unresolved, with the potential to contribute to dissatisfaction within the friendship over time.

In addition, the finding that SA was predictive of greater endorsement of self-protective (avoidance) goals within the friendship context is consistent with literature linking trait SA to widespread use of self-protective strategies across social situations (e.g., Moscovitch et al., 2013). Given that close friendships are characterized by close social bonds with high emotional intimacy, open communication, and trust, people typically expect their close friends to communicate openly with them, engage in reciprocal disclosures, include them in social plans and provide them with instrumental support (Hall et al., 2011; see Studies 1A & 1B). Therefore,

prioritization of self-protective over friendship-promoting goals has the potential to interfere with the behaviours deemed essential for close friendship formation and maintenance. Consequently, a pattern of social interaction that is characterized by avoidance may leave one or both partners feeling unsatisfied. We speculate that this may have a greater effect on the individual doing the self-protection than on their interaction partner, as the partner may be unaware of the self-protective individual's unmet needs or desires. In other words, results of this study suggest that socially anxious individuals may be more likely to engage in behavioural avoidance at times of increased interpersonal threat and lower perceived social safeness, potentially fuelled by fear of revealing perceived personal flaws to others, which may result in feelings of rejection. As this internal process is not readily apparent to the anxious individual's interaction partner, this may help explain previous findings of differing perceptions of friendship quality among dyads rating the same friendship, with social anxiety disorder predicting lower reported friendship quality (Rodebaugh et al., 2014). However, contrary to expectations, the association between SA and avoidance was particularly strong in the control condition rather than the interpersonal threat condition. The control condition was also associated with increased anxious arousal among higher SA participants, despite endorsement of lower interpersonal threat in that condition. The observations of increased anxious arousal and self-protective friendship goals in response to a friend describing their morning routine are unexpected and may be due to unmeasured or unanticipated variables such as increased uncertainty in the control condition, as noted above. These effects must be interpreted cautiously and they warrant replication, ideally with a clinical sample of participants with SAD.

Perceptions of Friendship Closeness

We ran exploratory analyses to better understand the nature of friendships at different levels of SA, and how additional variables may affect the outcomes of interest. Although SA was found to be unrelated to how close participants reported feeling to the friend they selected for this study, perceived closeness was found to protect against feelings of interpersonal threat among individuals with higher SA who were assigned to the experimental condition. Because friend selection and ratings of perceived closeness took place prior to random assignment to study condition, these observed differences in initial ratings of closeness could not be attributed to the effects of the experimental manipulation. Overall, results suggested that perceived closeness to a close friend may buffer socially anxious individuals against the threatening effects of discrepancy salience. That is, whereas higher SA predicted greater interpersonal threat in response to an ambiguous friendship situation at low and average levels of closeness to the selected friend, SA was not predictive of perceived threat at higher levels of perceived friendship closeness. We recommend that future research examine factors that contribute to assessment of interpersonal closeness, and whether factors influencing perceived closeness vary by level of trait SA. Given the relation between interpersonal threat and heightened negative affect, which is theorized to be linked to negative cognitions and behaviours that serve to maintain and amplify distress within the cognitive-behavioural model of SA (Heimberg et al, 2010), interventions aimed at increasing perceived closeness have the potential to positively affect all components of the cognitive-behavioural cycle. For example, increased friendship closeness may help decrease perceived threat, as suggested by the present study, which may have downstream effects on decreasing negative affect and promoting approach-oriented behaviour within friendships.

We also found that perceived closeness to the selected friend was predictive of higher self-protective (avoidance) friendship goals, as well as higher friendship-promoting (approach) goals. This may suggest that increased closeness to the selected friend increases motivation to restore a sense of security within the friendship, such that all available types of risk regulation strategies are employed, including both approach (e.g., moving toward growth and development in the friendship) and avoidance (e.g., preventing harm to the friendship bond). Interestingly, in the present study, perceived closeness did not interact with SA and/or condition to predict variance in behavioural outcomes. Moreover, whereas interpersonal closeness was the only significant predictor of approach goals in the model that included both SA and condition as well, greater endorsement of avoidance goals was predicted by both higher SA and higher reported closeness to the selected friend. In other words, perceived closeness and SA each explained a unique portion of the variance in avoidance goals. Additional research is needed to clarify relevant individual differences, as well as characteristics of the interaction partner, that may influence perceptions of closeness and reliance on various types of coping strategies.

Limitations and Future Directions

The present study had several limitations, including reliance on an undergraduate sample that limits generalizability of results to treatment-seeking individuals in clinical settings. Limitations associated with use of undergraduate samples are discussed in Study 1A. Given our interest in ultimately utilizing information about threat perception, affect, and behavioural motivation to inform intervention approaches aimed at strengthening the social supports of socially anxious individuals, we sought to address this limitation in Study 2B, by recruiting a clinical sample. Generalizability of the present study is also limited by participants being instructed to envision a same-gender close friend for the purpose of our experimental

manipulation. Although this was useful for standardizing procedures across participants, we recommend that future research include both same- and mixed-gender friendships and test whether gender composition of the dyads plays a significant role in perception of interpersonal threat and downstream responses to perceived threat. Moreover, the use of hypothetical friendship scenarios limited the ecological validity of this study. Although between-condition effects were observed, it is possible that these imaginal exercises did not accurately reflect real-life friendship interactions. Replication of these results is required, ideally with participation from both the target participants and their selected close friends. This would allow for more ecologically valid manipulation of threat (e.g., using paradigms such as the one developed by Kashdan & Afram, 2015), as well as assessment of behavioural outcomes, rather than reliance on behavioural motivation as a proxy for action. In addition, to parse out within-subject and between-subject effects in sensitivity to interpersonal threat within close friendships as well as behavioural motivation in response to threat, constructs of interest would ideally be sampled across multiple friendships for each participant.

Additionally, we did not assess how representative the selected friendship was of each participant's close friendships more generally. Insight into how experiences with the selected friend compare to the participant's broader friendship network could provide additional context for the results and inform subsequent research designs. For example, the type of friend selected for the imaginal exercises in this study may vary by one's level of SA, and this may have implications for responses on the outcome variables of interest. One possibility is that socially anxious individuals are more likely to engage in self-protective behaviours only in the company of friends who possess certain characteristics (e.g., high social desirability, dominance, etc.; e.g., Rodebaugh et al., 2016), such that collection of additional information about the selected friend

has the potential to clarify factors contributing to our observed effects. Beyond limitations associated with the study design, results of the present study must also be interpreted within the context of the measures utilized. Although reliance on self-report data is often preferred for assessing psychological constructs such as affective experiences, it would be ideal for such data to be accompanied by objective observer ratings and/or physiological measures of the relevant constructs. For example, self-report ratings of affect and emotional arousal could be supplemented with assessment of salivary or plasma cortisol levels (Grace et al., 2022; Petrowski et al., 2021), skin conductance (Moscovitch et al., 2010), or heart rate (Moscovitch et al., 2010), which are methods that have been previously used for these purposes and demonstrated to provide unique additional information about the constructs in question (Edelmann & Baker, 2002; Mauss et al., 2004; Moscovitch et al., 2010). Existing literature also suggests that, while motivation can be a strong predictor of behaviour, behavioural motivation or intention does not always align with actual behavioural outcomes (Ajzen, 1991; Fishbein & Ajzen, 2010; Deci & Ryan, 2000). As such, behavioural goals and responses to perceived threat would ideally have been analyzed via in-lab experimental manipulation and observation of behavioural responses in a subsequent friendship interaction, that is coded by trained observers on parameters of interest. In addition, this study did not allow for exploration of how friendship expectations and concerns about negative self-portrayal may relate to experiences within ambiguous close friendship situations. This issue was addressed in Study 2B, by incorporating both correlational and experimental elements into the study design.

Conclusion

The present study demonstrated the effectiveness of a novel experimental paradigm, aimed at manipulating interpersonal threat salience within close friendships, within a virtual

single-participant format. Findings suggest that interpersonal threat salience and risk regulation strategies play an important role in the friendship experiences of socially anxious individuals and warrant increased research attention.

Study 2B - Effects of Social Anxiety Disorder and Interpersonal Threat Within Close Friendships

Abstract

Social anxiety (SA) is characterized by a fear of scrutiny and evaluation in social situations, with emerging evidence of impairment extending to close friendship contexts. The present study sought to replicate and extend the findings of Study 2A, by manipulating threat salience among a sample of 94 community adults who either had a clinical diagnosis of Social Anxiety Disorder (SAD) or reported no history of psychological dysfunction (Healthy Controls; HCs). Participants were randomly assigned to a threat condition or a neutral control condition. As in study 2A, participants in the threat condition imagined a close friend describing one thing they wish to change about them, while those assigned to the neutral (control) condition imagined their close friend describing their morning routine. Following the manipulation, all participants imagined an ambiguous situation that described a possible friendship rupture. Finally, they completed measures of perceived interpersonal threat, state affect, and friendship goals. Participants also completed various trait measures, including the friendship version of the Negative Self-Portrayal Scale (Moscovitch & Huyder, 2011; Study 1A, 1B) and a measure in which they rated their closeness to their selected friend. We found that participants with SAD reported higher perceptions of threat than HCs within the threat condition, specifically, as well as a tendency irrespective of condition to experience more negative affect and less positive affect. In addition, negative self-portrayal concerns about social competence, physical appearance, and visible signs of anxiety were positively correlated with perceptions of interpersonal threat. Friendship closeness did not predict threat in the control condition but greater closeness to the selected friend was predictive of lower perceptions of threat in the discrepancy threat condition,

suggesting a potential buffering effect of friendship closeness on discrepancy threat salience. Contrary to expectations, neither study condition nor diagnostic status predicted behavioural motivations to approach or avoid when presented with an ambiguous friendship situation requiring action. Findings are discussed in the context of cognitive and interpersonal models of SA, with emphasis on implications for treatments aimed at helping individuals with SAD access high quality social supports.

Introduction

As was reviewed in the introduction for Study 2A, individuals with elevated levels of social anxiety (SA) tend to be concerned about the possibility of revealing perceived personal flaws to others, whom they expect will evaluate them harshly (Moscovitch, 2009; Moscovitch & Huyder, 2011). Whereas this idea was initially supported within the context of anxiety-provoking social situations when the evaluative audience consists of unknown strangers, we found that heightened concerns about negative self-portrayal among socially anxious individuals also extend to close friendship contexts (see Studies 1A and 1B).

Moreover, a tenet of cognitive and interpersonal models of SA is that distress is often driven by a perceived discrepancy between the demands of the social environment (e.g., expectations of others) and one's ability to meet those perceived social demands (e.g., Ashbaugh et al., 2005; Higgins et al., 1985; Leary & Kowalski, 1995; Moscovitch & Bielak, 2013; Moscovitch & Hofmann, 2007). In Study 2A, we found evidence of heightened sensitivity to discrepancy threat among individuals with higher trait SA within their close friendships, which was endorsed regardless of whether participants underwent a threat-induction exercise or a neutral condition. Although Study 2A had notable strengths, its generalizability to treatment-seeking populations with clinically diagnosed SAD was limited by the use of an undergraduate student sample with normally distributed scores of SA. To increase the clinical utility of the findings from our initial study, the present study recruited adults with SAD and healthy control (HC) participants without significant psychological difficulties. Participants of the present study underwent experimental procedures that were largely consistent with procedures completed by undergraduate students in Study 2A.

Sensitivity to Threat: Potential Role of Negative Self-Portrayal Concerns

In Study 1A, to test the idea that socially anxious individuals experience concerns about negative self-portrayal even in the relatively safe context of close friendships, we adapted the original Negative Self-Portrayal Scale (NSPS; Moscovitch & Huyder, 2011) to ask about the presence of negative self-portrayal concerns when in the company of close (or best) friends (NSPS-F; see Study 1A). We found that the NSPS-F had strong psychometric properties and, as expected, that higher SA was predictive of greater NSPS-F concerns in our sample of undergraduate participants with varying levels of trait SA. The relation between symptoms of SA and higher NSPS-F concerns was later replicated using a clinical sample (see Study 1B).

Here, we build on these previous findings by suggesting that concern about negative self-portrayal has the potential to make individuals with higher SA more sensitive to interpersonal threat (i.e., perception of negative evaluation and/or rejection) within close friendships. Moreover, we posit that such increased sensitivity to social threat fuels negative interpretations of ambiguous friendship events, such that friendship rupture or dissolution appears more likely. This view is consistent with findings that individuals with higher SA display a general tendency to appraise ambiguous or neutral social situations as more negative (Amir et al., 2005; Beard & Amir, 2010; Dryman & Heimberg, 2015). Findings of Study 2A, in which individuals with higher trait SA reported higher perceived threat in response to an ambiguous imagined friendship scenario, were consistent with the existing literature. However, because Study 2A did not include assessment of self-portrayal concerns, we were unable to test how perceptions of threat within close friendship contexts might relate to concern about revealing personal flaws to close friends. The present study addressed that shortcoming, by administering the NSPS-F to all participants,

prior to randomly assigning participants to either the threat or no-threat study condition, followed by assessment of perceived interpersonal threat.

Emotional Experiences of Social Threat

In Study 2A, we found that, among undergraduate students, perceptions of greater threat within a close friendship context were associated with higher negative affect and anxious arousal, as well as lower sense of social safeness. Social safeness has been conceptualized as a facet of positive emotionality that is uniquely predictive of better psychosocial functioning and decreased psychopathology, even when controlling for positive affect, negative affect, and perceived social support (Armstrong III et al., 2021; Gilbert 2005; Kelly et al. 2012). Given our interest in interpersonal processes within close friendships, this outcome variable was of primary interest across both undergraduate and community samples. In this study, Study 2B, to better understand how perceptions of interpersonal threat within close friendships affect emotional outcomes in a clinical sample of individuals with SAD, all measures of positive and negative affect, including social safeness, were administered to our community sample. By examining this link, we aimed to replicate past findings, with the aim of ultimately informing treatment interventions.

Social Approach versus Avoidance

In addition to investigating sensitivity to interpersonal threat and emotional outcomes, we sought to clarify how SAD and HC participants respond to perceived threat. As was reviewed in Study 2A, models of interpersonal risk regulation highlight the importance of trust in an interaction partner's positive regard for enabling people to engage in approach behaviours in the face of social threat (Murray et al., 2006). In the absence of a secure bond, threat is likely to activate self-protective (avoidance) strategies, focused on relational distancing, in an attempt to

lessen pain associated with potential relationship dissolution (Murray et al., 2006, 2008). Prior research has consistently found that socially anxious individuals generally rely on avoidance strategies for coping with anxiety-provoking social situations (Alden & Bieling, 1998; Cuming et al., 2009; McManus et al., 2008; Moscovitch et al., 2013; Piccirillo et al., 2016; Plasencia et al., 2011; Wells et al., 1995), despite the fact that avoidant coping has the unintended effect of exacerbating symptoms over time (Dabas et al., 2023; Moscovitch et al., 2013). For instance, avoidance decreases opportunities for positive emotional rewards following social interactions (Kashdan 2007) and tends to generate less, rather than more, favourable impressions of self on others (Alden & Taylor, 2004).

When applied to coping with conflict within close relations, avoidance is believed to leave personal needs unmet (Murray et al., 2006, 2008). We suggest that avoidance strategies in the context of close friendships similarly impede social connection and contribute to relationship dissatisfaction (Murray et al., 2006, 2008). Study 2A was the first to investigate the effect of SA on behavioural motivations (i.e., approach versus avoidant relational goals) in the face of interpersonal threat within an imagined close friendship context. We found that SA was associated with increased reliance on self-protective (avoidant) friendship goals regardless of study condition, as well as decreased endorsement of friendship-promoting (approach) goals, but only in the discrepancy threat condition. In the present study, that same experimental manipulation was extended to a clinical sample, and administration of the NSPS-F prior to condition assignment further allowed us to examine the potential moderating effect of self-portrayal concerns, on the relation between SA and friendship goals.

Study Aims, Research Questions, and Hypotheses

This study aimed to replicate and extend Study 2A by examining the effects of a SAD diagnosis on sensitivity to interpersonal threat as well as the effects of increased threat salience on affect and friendship goals. The following research questions and hypotheses were tested:

1. Do individuals with SAD experience greater perceived threat about a potential friendship rupture than HC participants? We hypothesized that (H1a) ratings of threat would be higher in the discrepancy threat condition compared to no threat condition, which would also serve as a manipulation check. We also expected that (H1b) collapsed across study conditions, individuals with SAD would report greater perceptions of interpersonal threat than HC participants. These hypotheses are consistent with the findings regarding discrepancy threat within our undergraduate sample. In addition, although not supported within the undergraduate sample, we expected that (H1c) SAD diagnosis would amplify the effects of the discrepancy threat condition on the appraisal of threat condition compared to no-threat condition.
2. Does diagnostic status (SAD vs. HC) interact with experimentally-manipulated discrepancy threat to predict increased emotional arousal and negative affect, as well as a decreased sense of social safeness and positive affect? We hypothesized that (H2) a diagnosis of SAD would predict significantly more negative affect and emotional arousal, as well as lower state social safeness and positive affect, when discrepancy threat is salient relative to the no threat condition.
3. What are the effects on behavioural motivation when discrepancy threat is salient and how does this motivation vary by diagnostic status? Hypotheses for this were grounded in risk regulation models (e.g., Murray et al., 2008) and results of the previous study (Study

2A), which examined this question in an undergraduate sample. It was expected that (H3) especially when primed with potential for discrepancy threat (compared with no threat), participants with SAD would be more likely to pursue self-protective goals and less likely to pursue friendship-promoting goals, in comparison to HC participants.

In addition to these three hypotheses, we conducted exploratory analyses to test how negative self-portrayal concerns relate to perceived closeness to the selected friend (assessed pre-manipulation) and level of perceived interpersonal threat (post-manipulation). Perceived friendship closeness was also tested as a moderator of the proposed relations between diagnostic status and both perceived threat and friendship goals. For additional context, exploratory analyses tested the correlation between participants' perceived threat and emotional outcomes.

Methods

Participants

The present study relied on the same sample of community adults as was recruited for Study 1B, and procedures for both were completed within the same 30-minute session. For participant characteristics, including the process of community recruitment and diagnostic assessment, please refer to Study 1B. The final sample included in analyses consisted of 46 participants meeting criteria for a DSM-5 diagnosis of SAD and 43 participants without history of significant mental health concerns (HC group).

Procedures

Participant recruitment and diagnostic assessment followed the procedures detailed in Study 1B. All participants underwent a neutral mood induction prior to completion of baseline measures and the experimental manipulation of threat salience, consistent with procedures used with the undergraduate sample in Study 2A. A series of neutral images selected from the

International Affective Picture System (Lang et al., 1997) was presented on the screen for 1 minute, accompanied by music of similarly neutral valance (Wind on Water by Fripp, 1975).

Next, participants selected a close friend to keep in mind for the remainder of the study. Due to research suggesting gender-differences in friendship processes (Hall et al., 2011; Hays, 1984, 1989; Oswald et al., 2004; Parker & de Vries, 1993) and suggesting that same-gender close friendships are more common than mixed-gender close friendships (Altmann, 2020, 2022; Baumgarte & Nelson, 2009; Reeder, 2003), we aimed to standardize this variable across participants by encouraging them to select a non-romantic same-gender close friend, if possible. If a participant was unable to bring to mind a same-gender close friend, they were asked to bring to mind any non-romantic close friend. Participants were then prompted to enter the initials of their selected friend and to provide the gender identity of the selected friend, if known. Once a close friend was selected, participants rated perceived closeness to their selected friend via the Inclusion of Other in the Self Scale (Aron et al., 1992) and their baseline sense of social safeness within that specific friendship was assessed via the Social Safeness and Pleasure Scale (Gilbert et al., 2009).

Participants were then randomly assigned, by Qualtrics randomization in the survey flow, to either the discrepancy threat or no threat (control) study condition. Procedures for the two conditions were identical to procedures used in Study 2A. In the discrepancy threat condition, participants were asked to imagine their selected friend telling them how they wish one thing about them was different than it is. To facilitate engagement with this task, participants were asked to imagine the situation as vividly as possible. Participants were then asked to type what they were imagining into a provided text box, in terms of (1) describing the one thing their friend would like to change about them, (2) how the friend sounds and appears as they are saying this,

and (3) how it makes the participant feel to think about the selected friend telling them this. In the no threat condition, participants were instead instructed to imagine their close friend describing their typical weekday morning routine to them. Participants were then asked to write about (1) the routine that their friend is describing, (2) how their friend sounds and appears as they are talking about the routine, and (3) how it makes the participant feel to think about their friend telling them this. For these tasks, participants were presented with written instructions on the screen, which were accompanied by an audio recording of those instructions. In both conditions, participants were prompted to imagine their respective situations as vividly as possible and were asked to provide an open-ended description of what they were imagining, which was used as an adherence check for inclusion in study analyses.

Next, via both written instructions and an audio recording, participants in both conditions were presented with the same ambiguous friendship scenario as used in Study 2A. Specifically, participants were instructed to imagine that, a few days ago, they spent time with their selected friend but since then had not been chatting or texting with this friend as much as they normally would. Participants were asked to imagine that this friend sent them a message asking if they are available to come over to chat that evening, because there is something they wish to discuss. Instructions specified that it was unclear what the friend had in mind and that it was hard to decipher the tone of their message.

Dependent variables of interest were assessed after the experimental manipulation. In response to the ambiguous friendship situation that was presented, all participants completed measures of state emotional arousal and affect via the Self-Assessment Manikin (Bradley & Lang, 1994) and Positive and Negative Affect Schedule – state version (Watson et al., 1988), state social safeness via the Social Safeness and Pleasure Scale – State version (Gilbert et al.,

2009), perception of interpersonal threat via the Perception of Interpersonal Threat Measure (initially created for Study 2A), and measure of relationship goals via the Relationship Goals Questionnaire: Friendship Version (Elliot et al., 2006).

Following completion of these measures, participants completed an additional adherence check, consisting of four condition-specific questions that assessed whether participants engaged with the tasks as requested (e.g., *How challenging was it to think of one thing that your selected friend would like to change about you?*). All participants were also presented with questions asking how difficult it was to select a friend for this study, their estimated number of close friends, and how representative the friendship selected for this study is of their close friendships in general. The survey concluded with a questionnaire that collected demographic variables (age, ethnicity, gender identity) and asked about self-reported attention and effort during study completion.

Measures

Social Anxiety

In addition to determination of participant diagnostic status (SAD or HC), as outlined above and within the Diagnostic Assessment section of Study 1B, participants completed self-report measures of SA symptoms and associated impairment. All participants were administered the Social Interaction Anxiety Scale (SIAS; Mattick & Clark, 1998), Social Phobia Inventory (Connor et al., 2001), and Sheehan Disability Scale (Sheehan, 1983), with excellent internal consistency for the Social Anxiety Interaction Scale – straightforward items ($\alpha = .97$) and Social Phobia Inventory ($\alpha = .96$), and good internal consistency for the Sheehan Disability Scale ($\alpha = .83$).

Negative self-portrayal concerns

To assess the extent to which participants were concerned about revealing perceived personal flaws to close friends, across the domains of physical appearance, social competence, and physical signs of anxiety, we employed the friendship version of the Negative Self Portrayal Scale (NSPS-F; Moscovitch & Huyder, 2011; Study 1A). The NSPS-F was initially introduced and validated in Study 1A, and use of this scale with the present sample is already described in Study 1B. As noted previously, the NSPS-F with our community sample demonstrated strong internal consistency, with Cronbach's alphas ranging from 0.88 to 0.96. In the present study, the scale was used in exploratory analyses, to examine the relation between self-portrayal concerns, perceived friendship closeness, and perceptions of interpersonal threat.

Positive and Negative Affect

Measures of subjective arousal and affect were administered both before and after the experimental manipulation, via the Self-Assessment Manikin (Bradley & Lang, 1994) and Positive and Negative Affect Schedule – state version (Watson et al., 1988). A detailed description of these measures is available in the procedures section of Study 2A. Internal consistency in the present study was excellent at both baseline (PANAS – positive affect $\alpha = 0.93$; PANAS – negative affect $\alpha = 0.90$) and post manipulation (PANAS – positive affect $\alpha = 0.92$; PANAS – negative affect $\alpha = 0.92$).

Social Safeness

As with Study 2A, state social safeness within the selected friendship was assessed via the Social Safeness and Pleasure Scale (Gilbert et al., 2009), adapted to be used as a friend-specific state version rather than a trait measure (i.e., asking participants to respond about how they feel “*in the friendship [they] selected, right now, at the present moment*”). For additional

information about the Social Safeness and Pleasure Scale, please refer to the procedures of Study 2A. Cronbach's alphas of 0.91 at baseline and 0.96 post-manipulation indicated excellent internal consistency at both assessment points.

Perceived Closeness with Friend

Assessment of perceived closeness to the selected friend at the time of friend selection was consistent with the assessment of this variable in Study 2A, using the *Inclusion of Other in the Self* Scale (Aron, Aron, & Smollan, 1992). The choice between seven concentric circles is conceptualized as a single item; as such, internal consistency cannot be calculated.

Threat Perception

After the experimental manipulation, perceived interpersonal threat was assessed using an author-developed 10-item Perception of Interpersonal Threat measure, as described in Study 2A. This measure of interpersonal threat served as our manipulation check, to test that the threat condition elicited higher perceptions of interpersonal threat than the control condition, as well as a dependent variable of interest, to test the hypothesis that participants with SAD experienced higher threat sensitivity than HCs. A Cronbach's alpha of 0.84 indicated good internal consistency in the present study.

Friendship Goals

As described in Study 2A, friendship goals were measured using the Relationship Goals Questionnaire: Friendship Version (Elliot et al., 2006). In the present study, internal consistency for this scale ranged from acceptable ($\alpha = 0.73$ for the Avoidance subscale) to good ($\alpha = 0.83$ for the Approach subscale).

Demographics, Characteristics of the Selected Friendship, and Attention Checks

At the end of the study, participants were presented with a demographic questionnaire which collected information including age, gender identity, and cultural/ethnic identity. The demographic variables for this community sample are presented in Study 1B (see Table 6). In the present study, all participants also provided estimates of: (a) how many close (or best) friends they have; how difficult it was to think of *any* close friend to select for this study, on a scale from 1 (not at all difficult) to 7 (extremely difficult); how difficult it was to decide *which* close friend to select for the study, on a scale from 1 (not at all difficult) to 7 (extremely difficult); and how *representative* the selected friendship was of the participant's other close friendships, on a scale from 1 (not at all representative) to 4 (perfectly representative). Responses were used to compare the friendship characteristics of SAD and HC participants, for the purpose of providing additional context for study findings.

Finally, after the demographic questionnaire, effort and attention checks asked about participants' levels of effort during study completion and how clear and understandable they found the instructions to be, and assessed whether researchers should be cautious about including their data in analyses. Measures of effort and attention were used to exclude low-quality responses from the final data included in analyses, as outlined in Study 1B.

Data Analytic Approach

Hypothesis 1

To test H1a, that ratings of threat would be higher in the discrepancy threat condition, compared to no threat (control) condition, we conducted an independent samples t-test. This also served as our manipulation check, to ensure the experimental manipulation had the intended effect on perception of interpersonal threat. For H1b, that individuals with SAD would report

greater perceptions of interpersonal threat than HC participants, we conducted an independent samples t-test comparing interpersonal threat ratings of SAD vs. HC participants. Finally, to test H1c, that the predictive utility of diagnostic status would be particularly strong in the discrepancy threat, compared to no threat, condition, we ran a 2 (diagnostic group: SAD or HC) by 2 (study condition: Discrepancy Threat or No Threat) ANOVA, predicting ratings of perceived threat on the Perception of Interpersonal Threat Scale.

Hypothesis 2

The hypothesis that diagnostic status would interact with threat salience to predict increased emotional arousal and negative affect, as well as a decreased sense of social safeness and positive affect, was tested via five 2 x 2 x 2 mixed ANOVA models. In each model, diagnostic status (SAD vs. HC) and study condition (Discrepancy Threat vs. No Threat) were entered as between-subject predictors, and Time (Baseline vs. Post-manipulation) was entered as a within-subjects predictor. Affect and social safeness over time were the outcomes of interest, assessed across the models using 1) PANAS-negative affect, (2) SAM – arousal rating, (3) SAM – valence, (4) PANAS – positive affect, and (5) state social safeness. A three-way interaction was expected in each model, such that the difference between SADs and HCs would be particularly pronounced in the Discrepancy Threat Condition.

Hypothesis 3

Two separate 2 (diagnostic status: SAD or HC) x 2 (study condition: Discrepancy Threat or No Threat) ANOVAs were employed to test the hypothesis that (H3) when participants were primed with potential for discrepancy threat, those with SAD would be more likely to pursue self-protective goals and less likely to pursue friendship-promoting goals, in comparison to HCs. The outcome in one ANOVA model was friendship-promoting goals, and the outcome in the

other ANOVA model was self-protective goals, both assessed via the Relationship Goals Questionnaire.

Exploratory Analyses

Friendship characteristics. Independent samples t-tests compared responses of SAD and HC participants on the following variables: number of close (or best) friends, how difficult it was to think of *any* close friend for the study, how difficult it was to decide *which* close friend to select for the study, how *representative* the selected friendship was of the participant's other close friendships, and perceived closeness to the selected friend via the Inclusion of Other in the Self Scale.

Perceived closeness, self-portrayal concerns, and interpersonal threat. First, we tested how negative self-portrayal concerns within friendships relate to reported closeness with the close friend selected for this study by examining bivariate correlations between the Inclusion of Other in the Self Scale and each of the NSPS-friend version domains, all of which were collected prior to the experimental manipulation. Bivariate correlations also tested for the relation between NSPS-F domains and perceptions of threat following the experimental manipulation.

Next, we conducted planned exploratory analyses on the potential effects of perceived friendship closeness on outcome variables of interest. First, hierarchical linear regression was used to examine whether the relation between diagnostic status and perception of interpersonal threat was moderated by perceived closeness to the selected friend. Due to results of Study 2A, which suggested that higher perceptions of closeness may act as a buffer against feelings of threat specifically when discrepancy threat is made salient, study condition was also included as a moderator in the regression model. In a regression analysis predicting scores on the interpersonal threat scale, study condition (0 = Control; 1 = Threat), perceived closeness

(Inclusion of Other in the Self Scale score), and diagnostic status (0 = HC; 1 = SAD) were entered as predictors in Step 1 of the model. All two-way interaction terms were entered in Step 2 and the three-way interaction was entered in Step 3 of the model predicting perceived threat.

Perceived closeness and friendship goals. Given that Study 2A exploratory analyses also suggested that perceived friendship closeness may facilitate understanding of behavioural motivation following our experimental manipulation, similar analyses were conducted in the present study. Consistent with the data analytic plan for predicting perceived threat, in two hierarchical linear regression analyses predicting friendship goals (approach goals in one model and avoidance goals in the other), we entered study condition (0 = Control; 1 = Threat), diagnostic status (0 = HC; 1 = SAD), and perceived closeness (Inclusion of Other in the Self Scale scores) as predictors in Step 1. All two-way interaction terms were entered in Step 2 of each of the two models predicting friendship goals, and the three-way interaction was entered in Step 3 of each model.

Correlates of increased threat salience. To better understand the emotional effects of increased threat salience, we examined bivariate correlations between the continuous ratings of perceived threat on the interpersonal threat scale and state affect and social safeness.

Results

Preliminary Analyses

Missing data were imputed using EM for scales for which Little's test was not significant, indicating data were missing completely at random, and no more than 2.2% of data were missing. Missing data that were not imputed were excluded pairwise from analyses, such that data were retained in analyses for which all necessary data points were available.

Examination of skewness and kurtosis suggested data were normally distributed, consistent with

Kline's (1998) recommendations of skewness below 3.0 and kurtosis below 10.0. Univariate outliers, defined as more than 3 SD above or below the mean, were winsorized to be exactly 3 SD from the mean.

Sample Characteristics

This study utilized the same community sample as Study 1B, with both study procedures completed at the same time point. A total of 89 participants were included in study analyses (HC = 43; SAD = 46). For participant demographic information, including age, gender, and ethnicity, please see Table 6, within Study 1B.

Friendship characteristics of the SAD and HC participant groups were compared, to provide additional context for study results. It was observed that HC participants ($M = 3.16$, $SD = 2.03$) and those with SAD ($M = 3.04$, $SD = 1.85$) did not differ in estimates of how many close (or best) friends they reported ($t(87) = 0.29$, $p = .773$, 95% CI [- 0.70, 0.94], $d = .06$). In addition to reporting a similar number of close friends, HC and SAD participants did not differ in ratings of how difficult it was to think of any close friend for the study ($t(87) = 0.18$, $p = .855$, 95% CI [- 0.64, 0.77], $d = .04$) or how difficult it was to decide which close friend to select ($t(87) = 1.08$, $p = .283$, 95% CI [- 0.28, 0.95], $d = .23$). HC participants did, however, rate the friendship selected for this study as significantly more representative of their friendships in general than those with SAD ($t(87) = 2.79$, $p = .006$, 95% CI [0.15, 0.89], $d = .59$) and, on the Inclusion of Other in the Self Scale, they reported feeling significantly closer to their selected friends than did participants with SAD ($t(87) = 4.73$, $p < .001$, 95% CI [0.83, 2.04], $d = 1.00$).

Threat Perception

To test the hypothesis that ratings of threat would be higher in the discrepancy threat than control condition, we conducted an independent samples t-test, comparing ratings of perceived

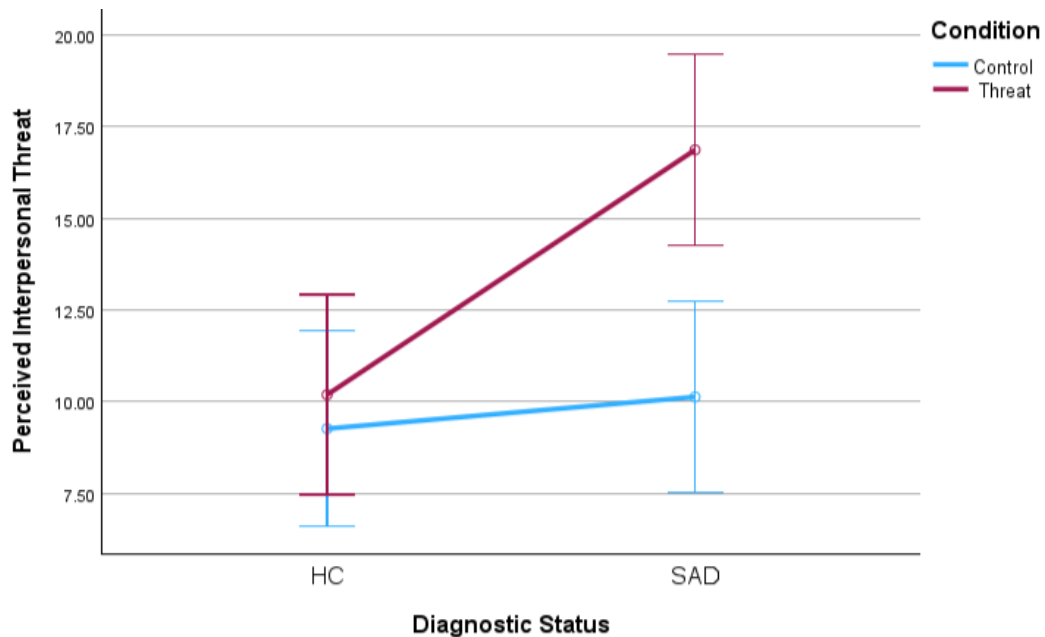
threat of participants randomly assigned to the discrepancy threat versus no threat condition. The t-test showed significantly higher perceptions of interpersonal threat among participants in the threat ($M = 13.68$, $SD = 7.80$) than no threat ($M = 9.71$, $SD = 5.31$) condition ($t(87) = 2.82$, $p = .006$, 95% CI [-6.78, -1.17], $d = .60$). Therefore, Hypothesis 1a was supported, suggesting the effectiveness of our experimental manipulation.

I also expected that, collapsed across study conditions, (H1b) individuals with SAD would report greater perceptions of interpersonal threat than HC participants. An independent samples t-test, comparing ratings of perceived threat for HC participants versus those with SAD, showed a significant difference in perceived threat between HC ($M = 9.71$, $SD = 5.89$) and SAD ($M = 13.50$, $SD = 7.35$) participants ($t(87) = 2.67$, $p = .009$, 95% CI [-6.60, -0.96]), $d = .57$), with a medium effect size in the expected direction. Therefore, H1b was also supported.

Hypothesis 1c, that the effect of diagnostic status on threat perception would be particularly strong in the discrepancy threat, compared to control, condition, was tested via a 2 (diagnostic group: SAD or HC) by 2 (study condition: discrepancy threat or no threat) ANOVA. As expected, in addition to the two main effects presented via the t-tests above, the ANOVA model predicting perceived interpersonal threat revealed a significant diagnostic status by condition interaction ($F(1, 85) = 4.75$, $p = .032$, $\eta_p^2 = .05$), such that participants with SAD reported greater perceived threat than HC participants in the discrepancy threat condition ($t(42) = 3.11$, $p = .003$, 95% CI [-11.01, -2.34], $d = -.94$) but not in the control condition ($t(43) = 0.54$, $p = .591$, 95% CI [-4.08, 2.35], $d = -.16$). Therefore, Hypothesis 1c was supported (see Figure 5).

Figure 5

Perceived Interpersonal Threat by Diagnostic Status and Study Condition



Note. This figure displays the relation between diagnostic status (HC = Healthy Control; SAD = Social Anxiety Disorder) and perception of interpersonal threat, with the two study conditions (Control vs. Discrepancy Threat) represented by separate lines. The Y-axis represents estimated marginal means on the author-developed Perception of Interpersonal Threat scale, with possible scores ranging from 0 to 40 and higher scores indicating greater perception of threat. Error bars represent 95% confidence intervals.

Affective Experiences

Next, five mixed ANOVA models were used to test hypothesis 2, that a diagnosis of SAD would predict significantly more negative affect and emotional arousal, as well as lower state social safeness and positive affect, when discrepancy threat is salient relative to the no threat condition.

Negative Affect

In the mixed ANOVA predicting negative affect on the PANAS, there was a significant main effect of time ($F(1, 85) = 18.40, p < .001, \eta_p^2 = .18$), qualified by a time by condition interaction ($F(1, 85) = 9.53, p = .003, \eta_p^2 = .10$), as well as a main effect of diagnostic status ($F(1, 85) = 10.86, p = .001, \eta_p^2 = .11$). Findings revealed that individuals with SAD reported more negative affect than HC participants in both conditions, and that negative affect remained stable from baseline to post-manipulation in the no threat (control) condition ($t(44) = 0.85, p = .402, 95\% \text{ CI } [-3.35, 1.37], d = 0.13$) but increased from baseline to post-manipulation in the discrepancy threat condition ($t(43) = 5.23, p < .001, 95\% \text{ CI } [-8.65, -3.83], d = 0.79$). Contrary to expectations, there were no significant two-or three-way interactions with diagnosis; instead, HC and SAD participants reported similar increases in negative affect from baseline in response to experimentally-induced interpersonal threat. Means and standard deviations for affect outcome variables, across time, study condition, and diagnostic group, are presented in Table 12.

In predicting anxious arousal on the Self-Assessment Manikin, there were main effects of time ($F(1, 84) = 20.23, p < .001, \eta_p^2 = .19$) and diagnostic status ($F(1, 84) = 9.44, p = .003, \eta_p^2 = .10$). In addition, a significant time by diagnostic status interaction was observed ($F(1, 84) = 5.90, p = .017, \eta_p^2 = .07$), such that anxious arousal increased from baseline to post-manipulation, but only for SAD participants. As such, collapsed across conditions, there were no differences between SAD and HC participants in baseline anxious arousal ($t(86) = 1.15, p = .254, 95\% \text{ CI } [-1.37, 0.37], d = 0.25$), but after the threat manipulation, SADs reported significantly more anxious arousal than HCs ($t(87) = 4.00, p < .001, 95\% \text{ CI } [-2.54, -0.86], d = 0.85$). There was no significant effect of study condition, no time by condition interaction, and no three-way interaction (all F 's < 1.71 , all p 's $> .103$).

Positive Affect

The mixed ANOVA predicting PANAS – positive affect revealed significant main effects of time ($F(1, 84) = 12.48, p < .001, \eta_p^2 = .13$) and diagnostic status ($F(1, 84) = 39.04, p < .001, \eta_p^2 = .32$), as well as a time by diagnostic status interaction ($F(1, 84) = 4.46, p = .038, \eta_p^2 = .05$). HC participants endorsed significantly more positive affect than SAD participants at both baseline ($t(87) = 6.62, p < .001, 95\% \text{ CI } [8.59, 15.96], d = 1.40$) and post-manipulation ($t(86) = 5.11, p < .001, 95\% \text{ CI } [5.60, 12.75], d = 1.09$) and, as evidenced by the effect sizes, this difference decreased after the experimental manipulation. The effect was small but significant and appeared to be driven by HC participants experiencing greater decreases in positive affect as they progressed through the study, compared to those with SAD (see Table 12), irrespective of condition. Indeed, the main effect of study condition was non-significant, as were the condition by group and three-way interaction effects (all F 's < 0.91 , all p 's $> .845$).

With the Self-Assessment Manikin measure of emotional valence as the dependent variable, there was a main effect of time ($F(1, 85) = 31.35, p < .001, \eta_p^2 = .27$), qualified by a significant time by condition interaction ($F(1, 85) = 5.66, p = .020, \eta_p^2 = .06$). Collapsed across diagnostic status, Self-Assessment Manikin scores decreased more (i.e., in the direction of indicating less positive/more negative affect) among participants in the discrepancy condition than in the control condition; however, there was no significant difference in Self-Assessment Manikin affect ratings between study conditions at either baseline ($t(87) = 1.22, p = .227, 95\% \text{ CI } [-0.97, 0.24], d = .26$) or post-manipulation ($t(87) = 1.62, p = .109, 95\% \text{ CI } [-0.15, 1.44], d = .34$). There was also a main effect of diagnostic status ($F(1, 84) = 10.23, p = .002, \eta_p^2 = .11$), which was consistent across time and study conditions, with HC participants reporting overall more positive/less negative affect than SAD participants at both baseline and post-manipulation.

The main effect of condition was non-significant, as were the condition by group and three-way interaction effects (all F 's < 0.22 , all p 's $> .645$).

Social Safeness

In the mixed ANOVA predicting state social safeness within the friendship selected for this study, there was a significant effect of time ($F(1, 85) = 24.71, p < .001, \eta_p^2 = .23$), as well as a significant time by condition two-way interaction ($F(1, 85) = 8.48, p = .005, \eta_p^2 = .09$) and a time by condition by diagnostic status three-way interaction trending toward significance ($F(1, 85) = 3.30, p = .073, \eta_p^2 = .04$). There were no significant main effects of condition ($p = .087$) or diagnostic status ($p = .159$) on social safeness ratings.

Given the relatively small size of the clinical sample, we recognized the possibility that the three-way interaction could be indicating a meaningful but underpowered effect. This was therefore probed by examining the time by diagnostic status interaction in predicting state social safeness within each condition separately. This analysis revealed no differences between HC and SAD participants over time in either the control condition ($F(1, 43) = 1.00, p = .323, \eta_p^2 = .02$) or discrepancy threat condition ($F(1, 42) = 2.30, p = .137, \eta_p^2 = .05$). The nature of the significant time by condition two-way interaction was also probed by examining the effect of time within each condition separately. The effect was such that the decrease in state social safeness, from baseline to post-manipulation, was significantly greater for the threat condition than for the control condition (see Table 12). Whereas there were no condition differences in social safeness at baseline ($t(87) = 0.41, p = .684, 95\% \text{ CI } [-2.18, 3.31], d = 0.09$), participants in the control condition reported significantly more social safeness than participants in the threat condition after the experimental manipulation, ($t(87) = 2.49, p = .015, 95\% \text{ CI } [0.98, 8.76], d = .53$).

Therefore, hypothesis 2 was not supported, given that a diagnosis of SAD was not associated with increased negative, and decreased positive, emotionality specifically in the discrepancy threat condition.

Table 12*Means of Baseline and Post-Manipulation Affect Scores*

		Baseline		Post-Manipulation	
		Control condition	Threat condition	Control condition	Threat condition
		<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>
PANAS-NA					
	HC	14.09 (5.33)	14.55 (7.10)	15.82 (6.27)	19.29 (7.83)
	SAD	18.76 (8.00)	17.52 (5.43)	19.04 (7.52)	25.13 (8.95)
SAM arousal					
	HC	3.41 (2.36)	3.55 (2.31)	3.91 (1.54)	4.05 (2.28)
	SAD	3.78 (1.91)	4.17 (1.70)	4.83 (2.04)	6.48 (1.86)
PANAS-PA					
	HC	32.89 (12.02)	32.05 (8.76)	30.05 (10.74)	26.95 (7.95)
	SAD	20.83 (7.13)	19.83 (6.91)	20.13 (8.06)	18.52 (6.61)
SAM affect					
	HC	5.73 (1.61)	6.24 (1.51)	4.91 (2.09)	4.33 (1.62)
	SAD	4.83 (0.83)	5.09 (1.35)	4.26 (2.16)	3.57 (1.50)
Social safeness					
	HC	36.86 (4.96)	36.80 (7.11)	34.50 (6.55)	32.86 (10.43)
	SAD	35.61 (5.83)	34.61 (7.82)	35.00 (8.20)	27.17 (10.68)

Note. *Ns* varied from 21 to 23 per cell. PANAS = Positive and Negative Affect Schedule – state version (Watson et al., 1988); NA = Negative Affect; PA = Positive Affect; SAM = Self-Assessment Manikin (Bradley & Lang, 1994); Social Safeness was assessed via the Social Safeness and Pleasure Scale (Gilbert et al., 2009), state version.

Behavioural Motivation

Neither diagnostic status ($F(1, 85) = 2.71, p = .103, \eta_p^2 = .03$) nor study condition ($F(1, 85) = 2.23, p = .139, \eta_p^2 = .03$) predicted friendship-promoting goals, and the diagnostic status by condition interaction was not significant ($F(1, 85) = 1.07, p = .304, \eta_p^2 = .01$). Similarly, there were no significant main effects (diagnostic status: $F(1, 85) = 2.26, p = .137, \eta_p^2 = .03$, condition: $F(1, 85) = 0.53, p = .468, \eta_p^2 = .01$) or interactions in predicting self-protective goals ($F(1, 85) = 0.99, p = .323, \eta_p^2 = .01$). Therefore, Hypothesis 3 was not supported.

Exploratory Analyses

Friendship Closeness, Self-Portrayal Concerns, Friendship Goals, and Perceived Threat

Next, exploratory analyses were conducted to examine how self-portrayal concerns related to perceptions of friendship closeness and perceptions of threat following the experimental manipulation. I found that only the social competence domain of NSPS was significantly correlated with perceived friendship closeness, such that greater closeness was related to lower levels of concern about social competence, $r(87) = -.24, p = .023$. In addition, all three NSPS subscales were found to be positively correlated with perceptions of interpersonal threat following presentation of the ambiguous friendship situation ($r_s = .26 - .42, p_s < .015$).

To further understand effects of friendship closeness on outcomes of interest, I ran exploratory hierarchical regression analyses in which study condition (control or threat), diagnostic status (HC or SAD), and ratings of friendship closeness (via the Inclusion of Other in the Self Scale) were entered as predictors of perceived interpersonal threat. The model with study condition, diagnostic status, and perceived closeness entered as simultaneous predictors significantly predicted perceived interpersonal threat ($R^2 = .21, F(3, 85) = 7.71, p < .001$). Addition of two-way interactions did not improve predictive utility of the model ($\Delta R^2 = .06$,

$\Delta F(3, 82) = 2.25, p = .088$) and neither did addition of the condition by diagnostic status by perceived closeness three-way interaction ($\Delta R^2 < .01, \Delta F(3, 81) = 0.08, p = .784$). Main effects were such that diagnostic status did not predict ratings of interpersonal threat ($p = .167, B = 2.07, 95\% \text{ CI } [-0.88, 5.02]$), whereas assignment to the Threat (vs. Control) study condition predicted significantly higher perceptions of interpersonal threat ($p = .008, B = 3.63, 95\% \text{ CI } [0.99, 6.28]$) and higher closeness to the selected friend predicted significantly lower perceptions of interpersonal threat ($p = .015, B = -1.16, 95\% \text{ CI } [-2.10, -0.23]$).

Although the omnibus interaction was not statistically significant, in an attempt to replicate the results of Study 2A, where I found that the relation between SA and interpersonal threat was moderated by perceived closeness to the selected friend, but only within the discrepancy threat condition, follow-up tests of the perceived closeness by diagnostic status interaction were conducted within each condition separately. Within the control condition, neither diagnostic status nor closeness to the selected friend predicted interpersonal threat ($R^2 = .03, F(2, 42) = 0.56, p = .574$), and addition of their interaction term did not improve the predictive utility of the model ($\Delta R^2 = .02, \Delta F(1, 41) = 1.02, p = .320$). However, within the discrepancy threat condition, the regression model with diagnostic status and Inclusion of Other in the Self Scales scores predicting perceived threat was significant ($R^2 = .28, F(2, 41) = 7.85, p = .001$). There were two main effects, such that participants with SAD endorsed higher perceptions of threat than HC participants ($p = .051, B = 4.54, 95\% \text{ CI } [-0.03, 9.10]$), and higher closeness to the selected friend was associated with decreased perceptions of threat ($p = .029, B = -1.44, 95\% \text{ CI } [-2.73, -0.15]$). Addition of the interaction term did not improve the predictive utility of the model ($\Delta R^2 = .01, \Delta F(1, 40) = 0.37, p = .544$).

Friendship Closeness and Friendship Goals

I also ran two hierarchical linear regressions predicting friendship goals (approach or avoidance). In these models, study condition, diagnostic status and ratings of perceived closeness were entered as simultaneous predictors in Step 1, two-way interaction terms were entered in Step 2, and the three-way interaction was entered in Step 3 of each of the two models. The model with study condition, diagnostic status, and perceived closeness entered as simultaneous predictors significantly predicted approach (friendship-promoting) friendship goals ($R^2 = .18$, $F(3, 85) = 6.01$, $p < .001$). Addition of two-way interactions did not improve predictive utility of the model ($\Delta R^2 = .02$, $\Delta F(3, 82) = 0.50$, $p = .680$) and neither did addition of the condition by diagnostic status by perceived closeness three-way interaction ($\Delta R^2 = .03$, $\Delta F(1, 81) = 3.14$, $p = .080$). The main effects were such that approach goals were not predicted by either study condition ($p = .195$, $B = -1.20$, 95% CI [-3.02, 0.63]) or diagnostic status ($p = .967$, $B = 0.04$, 95% CI [-1.99, 2.08]), but greater reported closeness to the selected friend was predictive of significantly greater approach-oriented goals following the experimental manipulation ($p < .001$, $B = 1.14$, 95% CI [0.49, 1.78]).

In the hierarchical linear regression with avoidance (self-protective) friendship goals as the dependent variable, the model with study condition, diagnostic status, and perceived closeness as simultaneous predictors was not significant ($R^2 = .04$, $F(3, 85) = 1.27$, $p = .289$). Addition of two-way interactions in Step 2 did, however, improve predictive utility of the model ($\Delta R^2 = .09$, $\Delta F(3, 82) = 2.73$, $p = .049$). Addition of the 3-way interaction (condition by diagnostic status by perceived closeness) in Step 3 did not further improve the model predicting avoidance goals ($\Delta R^2 < .01$, $\Delta F(1, 81) < .01$, $p = .958$). The only significant two-way interaction – diagnosis by friendship closeness – was probed by examining the effect of perceived closeness

on motivation for self-protective behaviour at each level of diagnostic status. Among HCs, higher reported closeness to the selected friend was predictive of higher avoidance goals following the experimental manipulation ($p = .018$, $B = 0.86$, 95% CI [0.15, 1.57]); in contrast, ratings of friendship closeness among participants in the SAD group did not predict post-manipulation avoidance goals ($p = .193$, $B = -0.54$, 95% CI [-1.36, 0.28]).

Affective correlates of increased threat salience. Zero-order correlations between perceptions of interpersonal threat and all measures of state affect, including social safeness, were examined and are presented in Table 13.

Table 13

Zero-order Correlations Between Perceived Threat and Post-Manipulation Emotionality

	Perceived Threat	PANAS - NA	SAM arousal	PANAS - PA	SAM affect	SSPS
Perceived Threat	1					
PANAS –NA	.45**	1				
SAM arousal	.47**	.62**	1			
PANAS – PA	-.24*	-.15	-.32**	1		
SAM affect	-.27*	-.62**	-.57**	.32**	1	
SSPS	-.42**	-.40**	-.37**	.31**	.37**	1

Note. Missing data that were not imputed because they were not MCAR were deleted pairwise; therefore, N s ranged from 88 to 89. Numbers represent Person correlation coefficients with state variables following the experimental manipulation (e.g., post-manipulation emotionality).

Perceived threat was assessed via the 10-item author developed measure; PANAS = Positive and Negative Affect Schedule – state version (Watson et al., 1988); NA = Negative Affect; PA = Positive Affect; SAM = Self-Assessment Manikin (Bradley & Lang, 1994); SSPS = Social Safeness and Pleasure Scale – state version (Gilbert et al., 2009).

* $p < .05$

** $p < .01$

Discussion

The present study sought to replicate and extend the findings of Study 2A in a sample of community adults with SAD compared with HC participants. Participants were asked to bring to mind a close friend from their own life and were then randomly assigned to either a discrepancy threat experimental condition or to a neutral (control) condition. In the threat condition, they imagined their selected close friend highlighting a personal characteristic about them (the participant) they wish they could change, while in the control condition they imagined their close friend engaging in their morning routine. Finally, all participants then imagined an ambiguous relational scenario in which they and their close friend had communicated somewhat less than usual that week and the friend contacts the participant to ask whether they could get together to discuss something with them in person. Primary research questions examined sensitivity to interpersonal threat, emotional experiences, and behavioural motivation in response to these scenarios. Exploratory (secondary) analyses also examined the effects of perceived friendship closeness and negative self-portrayal concerns on outcome variables of interest, including perceived threat, positive affect, negative affect, emotional arousal, social safeness, and behavioural motivation in terms of friendship-promoting and self-protective friendship goals.

Friendship characteristics and self-portrayal concerns

We found that, on the surface, the close friendships of people with SAD and HCs appear quite similar. For example, in the present study, both groups estimated having a similar number of close friends and provided similar ratings of how difficult it was to select a close friend to keep in mind for the study. However, despite these similarities, individuals with SAD reported significantly more concern about revealing perceived personal flaws to close friends, particularly within the domain of social competence. In addition, individuals with SAD, compared to HCs,

endorsed lower feelings of closeness with the specific friend they selected for this study. It is unclear, however, whether group differences in ratings of closeness reflect impoverished friendship quality among people with SAD that would be felt by both interaction partners, or whether individuals with SAD conceptualize “closeness” differently from how individuals without SAD might conceptualize it, which may lead to discrepant ratings. Nonetheless, the finding of lower perceptions of closeness in the close friendships of participants with SAD is consistent with a growing body of literature that suggests individuals with higher SA experience lower satisfaction, and more conflict, in their close relationships (Alden & Taylor 2004; Cuming & Rapee, 2010; Porter & Chambless, 2017; Sparrevohn & Rapee, 2009). While people with SAD are able to form and maintain close friendships, it appears that concerns about negative self-portrayal, postulated to be at the core of SA (Moscovitch, 2009), extend to friendship contexts and potentially manifest in ways that limit perceptions of closeness. To better understand the potential link between self-portrayal concerns and perceived friendship closeness, we examined the bivariate correlations between these study variables. We found that social competence was the only domain of negative self-portrayal concerns that was significantly correlated with feelings of perceived closeness to the selected friend, such that greater closeness was related to lower levels of concern about social competence when in the company of close friends. In subsequent analyses, described below, we observed that feelings of closeness may in turn meaningfully influence interpretations of ambiguous friendship interactions and that lower feelings of closeness may increase sensitivity to interpersonal threat.

Perceptions of interpersonal threat

In the present study, diagnostic status moderated the effect of condition on interpersonal stress, in the expected direction. Specifically, while no differences were observed in the level of

interpersonal threat endorsed by HC and SAD participants in the control condition, in which participants imagined their close friend describing their typical morning routine, the groups differed significantly in the threat condition, with individuals meeting diagnostic criteria for SAD endorsing more threat in response to an ambiguous friendship situation that was preceded by an imaginal exercise of their friend describing one thing they wish to change about them. This finding supports the hypothesis that core fears driving SA may lie relatively dormant in typical close friendship contexts in which they feel socially safe without threat of evaluation or failure to meet others' expectations; however, these fear may be activated even within close friendship contexts when a perceived expectations-abilities gap becomes salient and the threat of evaluation and failure to meet a close friend's expectations arises. Thus, individuals with SAD may experience a "fragile" sense of safety within their close friendships.

From these findings, it is reasonable to conclude that increased sensitivity to interpersonal threat within close friendships may have important implications for the daily lives of socially anxious individuals, in terms of their cognitive, behavioural and emotional outcomes and experiences within close friendship contexts. Indeed, perceptions of threat were related to greater negative affect and anxious arousal, as well as lower positive affect and social safeness within the selected friendship, supporting the notion that interpersonal threat affects various domains of emotional experiences. Although not assessed in the present study, sensitivity to threat may also contribute to avoidance of emotional expressivity and self-disclosure in relationships due to fears of embarrassment, conflict, or rejection (Kashdan et al., 2007; Leary & Jongman-Sereno, 2014). Research involving participant interaction with study confederates has shown socially anxious individuals to consistently self-disclose at a moderate level, rather than adapting level of self-disclosure to match their interaction partner (Meleshko & Alden, 1993).

This was viewed as a self-protective strategy, aimed to minimize negative evaluation, but was associated with decreased liking and more discomfort on the part of their partners (Meleshko & Alden, 1993). The extent to which this effect, of low variability in level of self-disclosure, translates to close friendships currently remains unclear and increased insight is required into variables that might moderate this effect. For example, with a sample of adults not selected based on level of SA, Forgas (2011) found that positive mood was associated with more intimate, varied, and abstract disclosure of personal information, compared to disclosures of individuals who reported a more negative mood. In another study of individual across the SA spectrum, Dupasquier and colleagues (2020) showed that exercises aimed at cultivating self-compassion promoted longer and deeper disclosures of events that individuals perceived as having threatened their self-esteem, compared to control conditions, further highlighting the importance of contextual variables in interpersonal processes. While self-protective avoidance of self-disclosure provides short-term perceptions of interpersonal safety, it has the potential to impede close friendship quality over time, via decreased access to social support and emotional intimacy (Kashdan et al., 2007; Sparrevohn & Rapee, 2009).

Evidence supporting the behavioural consequences of sensitivity to interpersonal threat in the present study was equivocal; specifically, neither study condition nor diagnostic status of participants predicted friendship goals when confronted with an imaged ambiguous friendship situation. However, greater approach-oriented goals following the experimental manipulation were predicted by greater closeness to the selected friend. In contrast, higher avoidance-oriented goals were predicted by greater closeness only among HC participants, but not among participants with SAD. It is possible that the cross-sectional and self-report nature of this study limited insight into the effect of reliance on self-protective strategies over time. Future studies

could address this shortcoming via incorporation of friend and/or observer-report ratings of variables of interest, as well as assessment of self-protective strategy use (e.g., avoidance) and friendship variables (e.g., satisfaction of the interaction partners), over time. For example, participants and their friends could be prompted to answer study questions daily for a couple of weeks or could be invited to participate in laboratory interactions several times over the course of a few weeks, thereby providing insight into behavioural patterns within friendships and effects of this on both members of the friendship dyad.

Due to the potential for increased sensitivity to interpersonal threat to meaningfully influence thoughts, feelings, and behaviours within friendships, this may be an important treatment target for socially anxious individuals. Mindfulness techniques could be used to facilitate awareness of one's thoughts and feelings (Shapiro, 2009), such that escalating perceptions of threat may be noticed at less extreme, and more manageable, levels. This process of slowing down emotional reactivity may also provide an opportunity for individuals to check the accuracy of their internal alarm system, with the possibility of reappraising inaccurate or unhelpful thoughts (Clark, 2013; Hayes-Skelton & Lee, 2020). Together, increased internal awareness and cognitive restructuring are expected to provide individuals with greater control about how to act in uncomfortable friendship situations, with the potential to purposefully engage in behaviours that build closeness, foster feelings of satisfaction and interpersonal closeness. Furthermore, given that cognitive-behavioural conceptualizations of SA place negative and persisting beliefs about the self as central to symptom maintenance (Clark & Wells, 1995; Ginat-Frolich et al., 2024; Hofmann, 2007; Moscovitch, 2009), updating of self-schema is thought to be critical for effective treatment (Moscovitch & Huppert, in press). The recommendations outlined by Moscovitch and Huppert (in press) emphasize the importance of

utilizing both schema-congruent and schema-incongruent learning to facilitate symptom change, with specific treatment techniques depending on the clinician's psychotherapeutic orientation. The authors proposed that specific self-updating interventions may include cognitive reappraisal (e.g., Greenberger & Padesky, 2016), video feedback (e.g., Harvey et al., 2000), behavioural exposures and experiments (Bennet-Levy, 2003), and imagery rescripting (Wild & Clark, 2011). Future research could investigate how each of these approaches could be applied to interventions aimed at updating beliefs about the self specifically in relation to close friends.

Within the context of the present study, I also wondered whether the observed sensitivity to threat may be related to negative self-portrayal concerns about self as socially incompetent, physically unattractive, and/or visible anxious (Moscovitch & Huyder, 2011). Follow-up analyses showed that all three negative self-portrayal domains assessed were positively correlated with perceptions of threat following presentation of the ambiguous friendship situation. As such, therapeutic interventions aimed at decreasing negative-self portrayal concerns within the context of close friendships may help reduce experiences of interpersonal threat and, consequently, the associated emotional and behavioural effects of increased threat perceptions. Indeed, clinicians working with socially anxious clients must help them update negative self-relevant beliefs that may be activated even within close friendships through cognitive restructuring and behavioural experiments as well as other well-established methods for testing the veracity of negative beliefs and automatic assumptions that arise within friendship contexts (Clément et al., 2019; Moscovitch & Huppert, in press; Schreiber et al., 2015).

Additional exploratory analyses sought to examine whether friendship closeness served to protect against feelings of interpersonal threat, as was observed in Study 2A. As reported within the primary analyses, we found that participants assigned to the threat condition

experienced more threat than those assigned to the control condition and that socially anxious individuals experienced higher levels of threat than HC participants. In addition, exploratory analyses showed that higher perceptions of closeness to the selected friend were associated with decreased feelings of threat for all participants, regardless of diagnostic status or study condition. This partially replicated findings from Study 2A, in which I found that high perceived closeness to the selected friend buffered the link between SA symptoms and greater perceptions of threat, specifically in the threat condition. Although the present study did not replicate this finding, the two studies together offer support for the suggestion that interpersonal closeness acts as a protective factor against feelings of threat when faced with a potentially stressful friendship event, such as a perceived interpersonal rupture. Given the potential protective effect of perceived friendship closeness and the observation that, at baseline, participants with SAD in the present study reported lower friendship closeness than HCs, we recommend that future research explore ways in which treatments for SAD could incorporate strategies for increasing perceptions of closeness within existing relationships through, for example, increased self-disclosure and other forms of effective communication and relational skill implementation that have been shown to enhance emotional intimacy (e.g., Lambert & Fincham, 2011; Murray et al., 2006). Interventions that assist individuals with SAD to behave in ways that make them feel closer to their friends would likely have a variety of meaningful emotional and behavioural benefits.

Affect and social safeness

Beyond understanding factors that affect perceptions of interpersonal threat within close friendships, the present study sought to clarify effects of increased threat on emotions and behavioural motivation. I found that, for both SAD and HC participants, negative affect

remained stable from baseline to post-manipulation in the control condition and increased in the threat condition, thereby supporting the effectiveness of the experimental manipulation in eliciting emotions as intended. In addition, participants with SAD consistently reported higher levels of PANAS negative affect than HCs. Whereas previous research has linked SAD with a propensity to experience negative affect within anxiety-provoking social situations (Blanco & Joormann, 2017; Jazaieri et al., 2015; Sewart et al., 2019), the novel contribution of the present findings is that negative emotions of individuals with SAD permeate their lives, which may have negative impacts even within close friendship contexts.

Furthermore, in both study conditions, SADs endorsed significantly *less* positive affect on the PANAS than HCs at both baseline and post-manipulation assessment points, a finding that is consistent with literature on positivity deficits among socially anxious individuals (Blanco & Joormann, 2017; Kashdan, 2007; Kashdan et al., 2011). Factors postulated to contribute to positivity deficits among socially anxious individuals in anxiety-provoking situations in general are impaired attention to positive stimuli (Farmer et al., 2014) and poorer memory for positive social events (Romano et al., 2020). Results of the current study show that such deficits for people with SAD are similarly observable within close friendships, suggesting the potential importance of clinical interventions for socially anxious clients that are designed to increase positive affect and reward enhancement within their close friendships. Such interventions could draw on emerging clinical data suggesting that treatments specifically targeting positive affect, rather than focused on decreasing negative affect, improve reward sensitivity and reduce symptoms of anxiety and depression (Craske et al., 2023). Increased positive affect and decreased anxiety and depressive symptom endorsement were also demonstrated with a new transdiagnostic Positive Activity Intervention protocol, proposed by Taylor and colleagues

(2017). Tasks such as gratitude reflections, cultivation of optimism, and acts of kindness could be strategically and consistently applied to the context of close friendships, with the expectation that this may help individuals with SAD boost positive affect within close friendships, during times of social threat and more generally (Taylor et al., 2017). Moreover, there is already content within the Positive Activity Intervention protocol dedicated to increasing prosocial behaviour and strengthening connections, such that an emphasis on friendships may be easily integrated into the existing empirically-supported intervention (Taylor et al., 2017).

Social safeness, characterized by feelings of warmth and connectedness (Kelly et al., 2012), was observed to decrease from baseline to post-manipulation in both conditions, but especially in the threat condition. I was surprised to find that the observed effect of study condition on feelings of social safeness within the friendship did not depend on the participant's diagnostic status. Gilbert (2005) theorized that social safeness emerges from the soothing-affiliation system, with a sense of safeness arising in response to cues of affiliation from caregivers, romantic partners, friends, acquaintances, and strangers (Liotti & Gilbert, 2011), and safeness serving to downregulate the threat system by promoting social connection. Given that we found increased sensitivity to the interpersonal threat induction among participants with SAD compared to HC participants, and interpersonal threat is believed to be inversely related to social safeness (Armstrong III et al., 2021; Gilbert 2005, 2009; Kelly et al. 2012), it was surprising that participants with SAD did not also experience significantly greater reductions in social safeness following the experimental manipulation. Moreover, lower social safeness is typically associated with decreased trust within a relationship and correlates positively with withdrawal behaviour, which would over time be expected to thwart feelings of connectedness (Gilbert, 2024) and therefore might have provided a potential explanatory mechanism for the finding of lower

friendship closeness among our clinical, compared to control, participants. The absence of group differences suggests that an ambiguous friendship situation has important implications for adults with and without SAD, and that the critical aspect that varies by diagnostic status may be management of fluctuations in perceptions of emotional safety with close friends. For example, it is possible that HC participants would be able to more effectively cope with diminished social safeness and to act in ways that more efficiently return their sense of social safeness back to baseline levels, compared to individuals with SAD. Although this idea was not assessed in the present study, and may be a fruitful venture for future research, friendship goals in response to the experimental manipulation were assessed and are discussed below.

Goals in response to perceived threat

Finally, we were interested in potential differences in the approach and avoidance goals of participants with SAD and HCs following exposure to the Threat (vs. Control) condition. Results of the present study did not support the hypothesis that, when primed with potential for discrepancy threat (compared with no threat), participants with SAD would be more likely to pursue self-protective (avoidance) goals and less likely to pursue friendship-promoting (approach) goals, than HC participants. Surprisingly, neither diagnostic status nor study condition predicted either friendship-promoting goals or self-protective goals. Results of the present study. Therefore, differed from those of Study 2A, where approach motivation decreased among undergraduates with higher SA randomly assigned to the threat condition (while avoidance increased among higher SAs in both study conditions). These divergent findings may be because the present study analyses were comprised of a smaller sample ($N = 89$) than the undergraduate sample ($N = 472$). Although, as expected, the threat condition activated feelings of interpersonal threat and emotional distress, the present study may not have been sufficiently

powered to detect differences in behavioural motivation within close friendships. Given that self-reported behavioural motivation does not necessarily reflect actual behaviour (Ajzen, 1991; Fishbein & Ajzen, 2010), we recommend that future research assess friendship goals in response to social threat via both questionnaire data and in-lab observations of behaviour with an individual's close friend.

Exploratory analyses also demonstrated that whereas perceived closeness did not predict endorsement of either friendship-promoting (approach) or self-protective (avoidance) goals within the control condition, it did significantly predict higher approach motivation following exposure to the discrepancy threat manipulation. Interestingly, this effect was not moderated by diagnostic status, such that higher feelings of closeness promoted approach among both SAD and HC participants. These results suggest that perceptions of closeness predict friendship-promoting behavioural motivation for everyone, irrespective of SA symptoms, especially when there is a risk of relationship rupture, a conclusion that aligns with risk regulation models that emphasize the importance of trust within relationships as necessary for undertaking the risk of approach behaviour (Murray et al., 2008). Though intriguing, these findings are highly tentative and must be interpreted with caution because they represent simple effects that were probed within the context of a non-significant omnibus test.

Limitations and future directions

While the present study addressed several shortcomings of Study 2A, notable limitations related to both study design and sample generalizability remain. First, the methods of assessment relied exclusively on self-report questionnaires, the accuracy of which is limited by participant insight into their internal experiences (Paulhus & Vazire, 2007). This limitation may be particularly important in the assessment of behavioural motivation. Although motivation is a

robust predictor of action, it does not perfectly correlate with behavioural outcomes and studies have repeatedly emphasized the importance of contextual factors (Ajzen, 1991; Deci & Ryan, 2000; Fishbein & Ajzen, 2010). It is also unclear to what extent participants would feel confident and skillful to employ the friendship strategies endorsed in this study within real-life friendship situations. For example, although SAD and HC participants may similarly aspire to engage in approach-oriented behaviours in response to friendship rupture, either lack of skill in how to execute the desired behaviour and/or the possibility of rejection could make SAD participants less likely to follow through with their intentions. In addition, our experimental manipulation relied on imagined friendship interactions, which we then used to make inferences about the likely real-life interactions of participants with their close friends. We recommend that future research manipulate discrepancy threat within the context of lab-based dyad interactions, with downstream emotional and behavioural effects assessed via both self-report measures and observer ratings.

Moreover, asking participants to select a single friend and extrapolating from that one relationship to their broader friendship patterns is not ideal. To increase confidence in between-subject differences, future research paradigms would benefit from assessing each participant's feelings, thoughts, and behaviours in relation to several different friends, perhaps by asking participants to bring multiple friends to the lab or through the assessment of naturalistic friendship contexts via a daily diary or ecological momentary assessment approach. Another drawback of our study design is that measures of affect were administered only after both parts of the experimental manipulation were presented, rather than after the component of the experimental manipulation that varied between conditions, and then again after the ambiguous situation was presented. This design limited our ability to disentangle the unique effects of the

portion of the experimental manipulation that varied between conditions from the effects of the ambiguous friendship situation that was presented to participants in both conditions and may have been inherently anxiety-provoking in itself. Future iterations of this study could remedy this situation by administering a brief measure of affect (e.g., the SAM) after the initial imaginal exercise and then again after the ambiguous friendship situation is presented.

There are also limitations associated with characteristics of the sample used in this study. Although the sample size of the present study was based on a power analysis conducted for the primary research questions, replication with a larger sample would permit a broader range of statistical analyses (e.g., testing of three-way interactions within exploratory analyses). There were also differences in gender composition between the diagnostic groups, with the HC group being primarily composed of cisgender men and the SAD group primarily composed of cisgender women. To increase generalizability of the study findings, replication is required with diagnostic groups matched for gender composition and with greater representation of individuals identifying as transgender and non-binary. In terms of cultural composition, the majority of participants identified as White/European in both diagnostic groups. As such, it is unclear to what extent findings translate to individuals with other racial, ethnic, and cultural identities, and it remains possible that manifestation of SAD with close friendships varies across cultures. Moreover, increased ethnic diversity within each diagnostic group would allow for tests of how interpersonal threat and downstream emotional and behavioural responses within friendships may be uniquely expressed across cultures. For example, direct communication of disapproval or dissatisfaction may be more normative in more individualistic cultures than in more collectivistic cultures (Tan & Goh, 2006). Furthermore, our community sample was relatively young, with both HC and SAD participants reporting to be, on average, in their mid-to-late twenties.

Although it was desirable that age not systematically vary by diagnostic group, such that it is not a confounding variable in analyses, this does temper confidence in the generalizability of results to older adults. It is advisable that future research recruit adults across the lifespan and test for age as a moderating variable in analyses.

Conclusions

The present study represented a clinical replication and extension of Study 2A, demonstrating the effectiveness of our novel experimental manipulation for eliciting interpersonal threat among a sample of community adults with and without SAD. Results suggest that, although friendships of individuals with and without SAD may outwardly appear similar, they are characterized by differences in sensitivity to interpersonal threat, felt closeness, and emotional experiences. This study provides suggestions for clinical interventions that may help treatment-seeking individuals with SAD better access high quality close friendships.

General Discussion

My dissertation consisted of four studies in which I sought to provide insight into reasons why socially anxious individuals tend to be less satisfied within their close friendships, compared to individuals with lower levels of anxiety. Studies 1A and 1B were correlational studies of undergraduates and community participants that aimed to clarify the extent to which beliefs about negative self-portrayal within close friendship (i.e., concerns about close friends noticing their perceived negative self-attributes) and beliefs about friendship expectations (i.e., how participants believed their friends ought to behave) varied across levels of SA symptoms. Studies 2A and 2B were experimental studies of undergraduates and community participants that investigated the cognitive, emotional, and motivational effects of induced interpersonal threat in which the possibility of failing to meet a close friend's needs or expectations – i.e., “the discrepancy gap” – was made salient. Insights from these studies can help to elucidate the reasons for decreased friendship satisfaction in people who struggle with social anxiety and help to inform interventions for improving the friendship quality of socially anxious individuals.

Friendship Expectations

Given the hypothesized role of expectation fulfillment in friendship satisfaction (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002), I developed and administered the Friendship Expectations Scale in Studies 1A and 1B to facilitate the standardized assessment of adult friendship expectations. In Study 1A, an exploratory factor analysis suggested a 2-factor solution, such that the four friendship expectation dimensions proposed in the literature (Hall, 2010) were collapsed into two friendship domains based on the data: (1) Symmetrical Reciprocity and Communion, representing expectations related to trust, loyalty, commitment, genuineness, intimacy, self-disclosure, and empathy); and (2) Solidarity and Agency,

representing expectations related to inclusion, mutual activities, companionship, resources, and status). In line with the Ideal Standards Model (Fletcher et al., 1999) and research suggesting that dissatisfaction stems from present circumstances falling short of internal expectations (Argyle & Henderson, 1984; Dunbar, 2018; Holmes, 2002), I had hypothesized that individuals with higher levels of trait SA (or SAD) would endorse higher expectations on the newly developed Friendship Expectations Scale.

In Study 1A, which was conducted on the undergraduate student sample, levels of trait SA did not predict friendship expectations on either of the two subscales. This result was unexpected and suggests that individuals across the SA symptom spectrum tend to hold similar kinds of expectations of their friends, suggesting they hold similar internal models of how friends ought to behave. Thus, it seems unlikely that differences in friendship satisfaction in individuals with high versus low SA are related to a tendency to hold different or unrealistically high expectations of their friends.

In Study 1B, which was conducted on the community sample, results indicated no group (SAD vs. HC) difference in perceived friendship expectations on the symmetrical reciprocity and communion dimension, supporting the findings of Study 1A for that particular dimension of friendship expectations. However, community adults with SAD endorsed significantly *lower* expectations on the solidarity and agency dimension than did HC participants, which – again – represented an unexpected finding that did not support my hypothesis (which was anchored in the Ideal Standards Model of relationship satisfaction) that those with SAD would hold higher expectations of their friends.

Given that internalized prototypes of friendships are formed and maintained through personal experience (Fehr, 2004), the finding of lower expectations for solidarity and agency

friendship expectations in clinical participants with SAD (but not in high SA undergraduates) may reflect differences in life experiences for individuals who have normative or subclinical levels of SA versus those with clinical levels of SA symptoms. For instance, individuals with less impairing levels of SA may have more normative social experience and/or more experiences of acceptance and inclusion on which to draw when forming expectations about solidarity and agency within close friendships, compared to experiences of people with SAD. While specific patterns of early interpersonal experiences of individuals with and without SAD require increased research attention, this possibility aligns with the assertion that relational difficulties in SAD are rooted in social developmental experiences, with early patterns maintained in adult relationships (Alden et al., 2014). Further support for the importance of early life experiences in expression of SA in adulthood is found in the association between childhood bullying and adult SA (Boulton, 2013), as well as findings suggesting that individuals with SAD demonstrate negatively biased social learning about the self (e.g., Koban et al., 2023; Moscovitch et al., 2023). On the Friendship Expectations Scale, the items assessing solidarity and agency measure companionship, inclusion, and mutual activities (e.g., celebrating special events and prioritizing spending time together), as well as provision of resources, status, and rewards (e.g., helping a friend move or introducing the friend to new people). Thus, differences between clinical and nonclinical participants in their experiences of being accepted and included within friendship and other relational contexts may be reflected in lower ratings of friendship expectations for solidarity and agency among participants with a clinical diagnosis of SAD, as observed in Study 1B. These divergent results in my student versus clinical samples underscore the importance of clinical replication in research that is intended to inform interventions for psychological disorders.

Another factor that may account for lower expectations for solidarity and agency of close friends among participants with SAD may be that they have a higher tolerance for and are generally more accepting of interaction partners who have less desirable personality traits perhaps, in part, because they tend to view themselves as less worthy of high-quality partners (Alden et al., 2001; Bielak & Moscovitch, 2012; Wilson & Rapee, 2006). Research that has used hypothetical vignettes of fictional characters to examine the relational preferences of people with higher levels of SA has shown that everyone prefers to interact with fictional characters perceived to be more similar to themselves, and that people with higher SA are therefore more tolerant of characters who are more submissive and lower in interpersonal warmth (Rodebaugh et al., 2016). Similar results were found with a laboratory-based study of online dating preferences, with individuals with SAD demonstrating greater desire to meet partners who were less attractive and more submissive, compared to individuals without SAD (Strulov et al., 2025). It is also possible that people with SAD may remain in unrewarding friendships characterized by frequent undesirable behaviours (e.g., criticism or social exclusion), which may in turn lower their expectations of their friends' solidarity and agency. It would be interesting for future research to examine how perceptions of friendship expectations evolve in a specific friendship, for example following repeated experiences of either disappointing or satisfying interactions with a given individual over time.

Could lower friendship expectations account for decreased satisfaction in close friendships, which has been reported in previous studies of friendships in people with SAD, as noted above? It is possible that holding lower solidarity and agency expectations of one's friends would lead to decreased satisfaction in such friendships due to the perception that one's needs are not being met within those relationships. An important drawback of my studies is that I did

not assess friendship satisfaction alongside friendship expectations, so I am unable to speak directly to how these two factors may be related. It is recommended that future research designs incorporate both of these elements and test the suggested processes outlined here. It is also possible that factors beyond friendship expectations likely account for decreased satisfaction at higher levels of SA. For example, attentional biases away from positive social stimuli (Li et al., 2008; Pishyar et al., 2000; Taylor et al., 2010), paired with more salient memories of negative versus positive social events (Cody & Teachman, 2010; Krans et al., 2014; Moscovitch et al., 2018; Romano et al., 2020) may contribute to lower friendship satisfaction.

Moreover, it is possible that the types of cognitions that are most relevant for understanding socially anxious individuals' experience of close friendships relate to perceptions of what friends expect of them, rather than what they expect from their friends. These perceptions are not assessed by the Friendship Expectations Scale but cognitive models of SA posit that distress in anticipation and during social events is driven, at least in part, by the belief that others hold unreachable expectations and that failure to meet those expectations would have catastrophic social consequences (e.g., rejection; Clark & Wells, 1995; Hofmann, 2007; Rapee & Heimberg, 1997). Perceptions that one is unable to meet the expectations of others may be fueled by beliefs of self as fundamentally flawed and/or inadequate (Moscovitch, 2009). Socially anxious individuals who perceive themselves as unable to meet their friend's needs or expectations may be more likely to interpret neutral or ambiguous relational cues within their friendships negatively and in ways that strengthen their existing beliefs about their own inadequacy, fueling feelings of dissatisfaction within the friendship. This conceptualization was explored in Studies 2A and 2B, which are discussed below.

As stipulated by cognitive-behavioural and interpersonal models of SAD, individuals are likely to act in ways consistent with their expectations. For example, friendship situations that are perceived as interpersonally risky (i.e., potential for rejection) might be avoided due to fear of revealing a perceived inability to fulfill their friend's expectations. Thus, negative beliefs of socially anxious individuals may prompt them to behave in ways that elicit the expected reactions from others, thus creating self-fulfilling prophecies that maintain familiar interpersonal patterns over time (Alden & Taylor, 2004). That is, individuals with SAD might engage in friendship behaviours that fuel unsatisfying social interactions and serve to reinforce beliefs about self as inadequate and one's close friendships as relatively unsatisfying. For example, intentionally avoiding an emotionally difficult topic may decrease perceived closeness and elicit feelings of disappointment in the friend, which would in turn reinforce the socially anxious individual's beliefs that they are unable to meet the social expectations of others. As such, socially anxious individuals may find that the quality of their close friendships falls short of their desired close friendship quality, leading to a discrepancy gap that is associated with perceptions of lower friendship satisfaction, as would be postulated by the ideal standards model.

Finally, it is possible that the self-report assessment method utilized in our correlational studies may have been inadequate for accurately capturing the construct of friendship expectations. Indeed, an implicit measure of expectations may have more effectively enabled participants to access their internal working models of friendship than a scale that required endorsement of explicitly articulated friendship expectations. Therefore, prior to ruling out differences in one's friendship expectations as an explanatory factor for the relation between SA and satisfaction, it is recommended that researchers administer both explicit and implicit measures of friendship expectations. Moreover, presenting participants with either imaginal or

in-vivo friendship scenarios (e.g., study tasks that present unfinished narratives, videos, or in-lab interactions, and ask participants to provide predictions about what happens next) might activate personal memories and conceptualizations of friendship and elicit ecologically valid responses that align with participants' implicit friendship expectations.

Negative Self-Portrayal Concerns

In the two correlational studies, I also adapted the Negative Self-Portrayal Scale (NSPS; Moscovitch & Huyder, 2011) to assess self-portrayal concerns that people may hold within the context of their close friendships. Using the close friendship version of the NSPS, I demonstrated across both studies that the negative self-portrayal concerns which have been theorized to fuel and maintain symptoms of SA at both subclinical and clinical levels (Moscovitch & Huyder, 2011; Moscovitch et al., 2013; Moscovitch et al., 2015) also permeate the close friendships of those with higher levels of SA and SAD. The positive association between trait SA (or SAD) and concerns about revealing perceived personal flaws to close friends emerged across studies, with moderate to large effects. Within both samples, this effect was strongest for the domain of concerns related to appearing socially incompetent, followed by concern about appearing physically unattractive in the company of close friends. Support for the notion that SA fuels concerns about appearing visibly anxious in the company of close friends was mixed, with the relation observed among undergraduate students but not within the community sample.

Results of the close friendship version of the NSPS can be situated within the broader literature on negative self-portrayal and SA. Benchmarking NSPS mean scores from historical data, I observed that the negative self-portrayal concerns of people with SAD are reduced within close friendship contexts compared to anxiety-provoking social situations with unfamiliar others. However, although people with high SA and SAD experience some reprieve within close

friendship contexts from the concerns they tend to have about being socially undesirable when interacting with evaluative others, these concerns do not disappear entirely within close friendships. Thus, results of the current studies underscore the pervasive nature of such concerns for people with high SA and SAD that extend even to their close friendships, suggesting that individuals with high SA perceive a deep-rooted need to hide aspects of self, presumably because such aspects are perceived as unlikely to be accepted even by relatively close others (Levinson et al., 2017; Moscovitch, 2009; Rodebaugh, 2009).

According to Rodebaugh (2009) and later expanded by Levinson et al. (2017), individuals with SAD are fundamentally concerned that showing their true selves would result in rejection and ostracism. The authors refer to this constellation of beliefs about oneself as fundamentally unacceptable and unlovable as being a “core extrusion schema” because it leads to a core fear about the possibility of being extruded from one’s social group, thereby promoting a perceived need to hide one’s true self from others (Levinson et al., 2017). These authors noted that a core extrusion schema may be consistent with evolutionary theories of SA (e.g., Gilbert, 2001), which conceptualize SA as an evolutionary mechanism that serves to protect against loss of status and/or rejection from one’s tribe, as such social inclusion would have been particularly important for survival in early environments (Levinson et al., 2017). The pervasiveness of negative self-portrayal concerns observed in my studies, which may be linked to a core extrusion schema, fuels fear about negative judgement and rejection in socially anxious individuals, even within close friendships. This may leave socially anxious individuals few opportunities to challenge their deep-rooted beliefs about the self as fundamentally flawed (Moscovitch, 2009), which has important implications for therapeutic approaches in which patients are encouraged to

gather evidence to disconfirm and update negative beliefs about the self – an issue we will return to later in our discussion.

One critical consequence of the finding that self-portrayal concerns are heightened in individuals with greater SA symptoms pertains to the expected behavioural impact of such concerns within close friendships. It is well-established within the SA research and treatment literatures that perceived risk of revealing perceived personal flaws to others fuels the use of safety behaviours that are employed to conceal these flaws (Moscovitch et al., 2013), such as limiting self-disclosure, asking questions to keep attention away from oneself, or avoiding situations in which one has limited control over self-presentation. Reliance on safety behaviours prevents individuals from learning that the consequences of revealing perceived flaws to others are often not as catastrophic as they seem (Kyron et al., 2023), in that disclosure of flaws may not necessarily lead to rejection. On the contrary, demonstration of vulnerability and personal foibles typically fosters emotional intimacy and builds trust in relationships (Murray et al., 2006). By using safety behaviours, socially anxious individuals may fail to learn that some of their perceived flaws are exaggerated or that the consequences of friends gaining insight into such flaws are not as detrimental as they fear (e.g., that they can be loved despite their flaws). Therefore, presence of strong negative self-portrayal concerns in both anxiety-provoking and relatively safe social contexts may help, at least in part, explain the persistence and chronicity of SA. Clinically, it may therefore be important for practitioners to uncover how clients' concerns about negative self-portrayal manifest within their close friendships and serve to maintain their symptoms of anxiety, with subsequent incorporation of exercises such as exposure and behavioural experiments to test alternative ways of behaving in friendships, with the aim of updating maladaptive beliefs about self and others within close friendship, which would move

the focus of treatment beyond the typical fears of evaluation by strangers, which often tends to be the focus of exposure therapy for SAD.

Finally, exploratory analyses in Study 2B demonstrated that all three domains of negative self-portrayal concerns (measured pre-manipulation) were positively correlated with perceptions of threat (measured post-manipulation) when participants encountered an ambiguous friendship situation. Therefore, therapeutic interventions for SAD aimed at decreasing negative self-portrayal concerns within the context of close friendships may help reduce the perception of interpersonal threat and its associated emotional and behavioural consequences, as described in more detail below.

Interpersonal Threat

Following the first pair of studies, which were correlational and focused on testing the newly developed scales, the second two studies incorporated an experimental design in which discrepancy threat salience was manipulated between individuals. I sought to elicit threat of friendship rupture by elevating concerns about the ability of participants in the Threat condition to meet their close friend's needs or expectations, in comparison to a No-threat Control condition, in which this threat was not made salient. Subsequently, all participants were presented with an ambiguous friendship scenario. Although the experimental manipulation was based on an interpersonal threat paradigm that has been used in relational research previously (Afram & Kashdan, 2015; Murray et al., 2002), it was adapted from its initial format and purpose (i.e., to investigate the effects of SA on romantic partners within the context of an in-lab study) for an online study on SA and close friendships. Therefore, the experimental manipulation used in my dissertation was novel, designed to increase salience of the discrepancy gap (i.e.,

discrepancy between perceived personal abilities and perceived demands of the friend) for participants assigned to the discrepancy threat condition.

Results provided evidence of the effectiveness of the experimental manipulation, within both the undergraduate and clinical samples; however, the effect size of the manipulation was greater among clinical participants than undergraduate students. The larger effect size is consistent with literature demonstrating that emotional and interpersonal responses of individuals with SAD differ markedly from HCs when they are under social threat (e.g., Moscovitch et al., 2010). Moreover, it is reasonable to assume that manipulation of interpersonal threat in participants with SAD would be even more effective within the context of real-life interactions, compared to the imagined scenarios that were used here due to restrictions on in-person research during the COVID-19 pandemic. As such, it would be useful to test in future research whether day-to-day friendship interactions that present the possibility of even a small-scale rupture (e.g., slight disagreements or ambiguous remarks) would be perceived as threatening for socially anxious individuals and elicit concern and insecurity that friendship dissolution may be imminent. This relatively low threshold for perception of interpersonal threat within friendships would be expected to have implications for emotional and behavioural outcomes. It was precisely this link between interpersonal threat perception and emotional and behavioural outcomes within close friendships that I aimed to assess in studies 2A and 2B, using virtual manipulation of threat salience to amplify the perceived threat of friendship rupture.

Emotional and Behavioural Outcomes

In terms of the emotional experiences of participants in the two experimental studies, it was observed that across samples and across assessment instruments, SA was positively related to negative emotionality. It was intriguing that this effect of SA on negative emotionality was not

contained to the discrepancy threat condition. That differences in negative affect by level of SA were evident prior to experimental manipulation suggests that socially anxious individuals' general propensity toward negative thoughts and feelings (e.g., Blanco & Joormann, 2017; Jazaieri et al., 2015; Sewart et al., 2019) permeates the close friendship context. But why might negative affect persist within the warm and supportive interactions (Hall, 2011; Oswald et al., 2004) that typically characterize close friendships? Negative affect may be present within close friendships even in the absence of interpersonal threat salience due to beliefs about the self as fundamentally flawed (Moscovitch, 2009), as noted above. Although close friendships typically provide evidence that is contrary to the negative core beliefs of socially anxious individuals (e.g., by providing evidence that one is loved and accepted), it may be difficult for socially anxious individuals to accept this positive social feedback as being true because it is schema-incongruent, which can elicit cognitive immunization and prevent updating of negative self-perception (Kube et al., 2019; Moscovitch et al., 2023). Consequently, this schema-incongruent information is not integrated into one's sense of self and negative beliefs and accompanying negative emotions are maintained across time and contexts.

Relatedly, friendship interactions that suggest one is accepted and valued may also fuel negative emotions by providing social information that is at odds with internal working models of self as fundamentally flawed and socially undesirable, and this could create a sense of internal tension as socially anxious individuals grapple with conflicting views of self (Stopa et al., 2010). Research on self-concept clarity, which is a learned system of feelings, beliefs, and values about oneself, has been established as an important indicator of mental health (e.g., Campbell et al., 1996; Glezakis et al., 2024; Owens & Samblanet, 2013). Low self-concept clarity has been linked to poor psychological adjustment and functioning, including higher trait SA and SAD

(Gregory & Peters, 2017; Orr & Moscovitch, 2015; Stopa et al., 2010; Wilson & Rapee, 2006), whereas high self-concept clarity in previous studies has been linked to adaptive psychological adjustment and functioning (Cicero, 2018). Individuals with low self-concept clarity may be especially likely to develop SAD because, due to lack of internal consistency and confidence in self-concept, external events are more likely to have an impact on their self-concepts (Cicero, 2018). Therefore, friendship contexts may provide information about one's sense of self that is incompatible with one's existing beliefs about self, which increases internal doubt and anxiety via heightened discrepancy in self-image, fueling the negative emotions that were observed in my studies even prior to interpersonal threat induction.

It was interesting to observe that individuals with varying levels of SA (including participants with SAD as well as HCs) reported similar increases in negative affect following the interpersonal threat induction, suggesting that a potential rupture within close friendships is perceived as distressing for high and low SA individuals alike. This insight was possible due to assessment of negative affect at two time-points within my studies; the significant difference in post-manipulation negative affect, without the context of baseline differences in negative affect, would have provided a misleading picture about the effect the experimental manipulation.

Although the threat condition was associated with similar increases in negative affect for all participants, it was observed that the absolute level of emotional distress after being confronted with the potential friendship rupture scenario was higher at higher levels of SA, suggesting that for individuals with high SA or SAD, negative affect lingers for longer than it would for individuals with lower levels of SA (or HCs). This may also have implications for the ability of socially anxious individuals to implement strategies for relationship rupture repair, as emotional distress has been shown to impair brain areas critical for problem solving, reasoning,

and impulse control, all of which are necessary for effectively navigating interpersonal conflict (Bechara et al., 2000; Schwabe & Wolf, 2013; Starcke & Brand, 2012). Although I attempted to gain insight into processes of rupture repair via assessment of behavioural motivation, the online nature of my studies severely limited the insights I was able to glean from the data. In order to adequately assess the role of emotional distress on processes of friendship rupture repair, behavioural study tasks and assessment of participant action would be required, to capture both motivation for action as well as participants' skills and abilities to engage in behaviours in line with their stated goals. Limitations associated with use of self-reported behavioural motivation as a proxy for behavioural outcomes are discussed below.

Although not assessed in the present set of studies, it would be interesting to consider how trait shame, as well as level of shame elicited in response to activation of discrepancy threat within a close friendship, may interact with SA to predict behavioural outcomes. In the available literature, shame has been referred to as a self-conscious emotion due to its role in processes of self-evaluation and self-reflection (Fergus et al., 2010). Similar to SA, shame is linked to negative self-evaluation (e.g., about the self as fundamentally flawed) and action tendencies such as social avoidance and submissive behaviour (Swee et al., 2021). The relation between shame and SA may be conceptualized in the context of social rank theory (Trower & Gilbert, 1989; Gilbert, 2000) and may be fruitful to explore in the context of friendship rupture and repair, given the relevance of these constructs to navigating threat to interpersonal bonds (for a review of the relation between shame and SA, see Swee et al., 2021). In contrast to the largely consistent results relating to negative affect, findings related to positive affect and social safeness were not consistent across the two samples and highlight the importance of assessing positive and negative affect as distinct facets of human experience (Larsen et al., 2017). It may be that

positivity deficits extend to the close friendship context only at clinically significant levels of SA, as may be suggested by my findings, thereby emphasizing the severity of impairment associated with psychiatric diagnoses.

Findings regarding behavioural motivation, in response to potential friendship rupture, were also inconsistent across samples. Given that literature on interpersonal risk regulation within romantic relationships suggests decreased approach and increased avoidance is characteristic of individuals with more insecure attachment styles and lower self-esteem, and is predictive of worse relational outcomes (Cavallo et al., 2009; Murray et al. 2006), I wondered whether similar processes might impair friendships of socially anxious individuals. Although decreased approach motivation and increased avoidance motivation were only observed within the undergraduate sample and not within the clinical sample, this finding was based on self-report questionnaire data and does not rule out the possibility that diagnostic status would predict behavioural differences in how individuals cope with perceived or potential friendship ruptures. This represents a potentially fruitful and important area for future study.

Strengths and Limitations

The four studies presented here offer new insights, with several notable methodological strengths, including large undergraduate samples, replication attempts in moderately-sized clinical and community samples, and both correlational and experimental research design features. However, results must also be interpreted within the context of study limitations, as discussed in detail within each specific study. For example, due to physical distancing measures during the COVID-19 pandemic the set of online studies reported here represents a departure from our initially conceived studies that were planned to be laboratory-based in-person paradigms, which we acknowledge would have provided a more appropriate context for

investigating interpersonal processes in ways that would have maximized external validity. It is possible that the online study context was more comfortable or acceptable for individuals with greater SA symptoms, such that outcome variables of interest do not accurately reflect real-life reactions to friendship scenarios occurring outside an imaginal context. It would have, therefore, been preferable for threat of friendship rupture to be elicited via in-person manipulation rather than relying on imagined friendship scenarios. Moreover, unique circumstances of the pandemic might have affected intensity and expression of SA among study participants, in ways that meaningfully influenced study findings. It is possible that young adults in the context of the pandemic missed key developmental experiences, such as normative friendship disagreements and ambiguous situations, which would routinely provide practice with processes of friendship rupture and repair. If this was the case, tasks of my experimental studies may have been experienced as more or less threatening than they would have been outside of a pandemic context, and replication outside the context of a global pandemic is warranted.

Another limitation of the two experimental studies is that all participants within our experimental studies were presented with the same hypothetical ambiguous friendship scenario, which was useful for maximizing internal validity, but may have limited external validity as the situation presented in this study (describing the friend sending a text message of ambiguous meaning) may not have been equally relevant or believable for all participants. Moreover, the studies presented here focused specifically on the context of close friendships, which were hypothesized to represent a relative reprieve from anxiety-provoking social interactions more generally. It is expected that the level of interpersonal threat elicited, as well as associated emotional reactions and behavioural motivation, would differ based on whether an individual is interacting with their acquaintance, casual friend, or close friend. It is recommended that future

research explore how the processes outlined in this dissertation vary across the different types of friendships of socially anxious individuals, with procedures that have a within-subject component of “friendship type” built into the design to enable these comparisons directly within the same participants.

In addition, although self-report measures provide important advantages for psychological research (e.g., insight into internal thought processes and practicality; Paulhus & Vazire, 2007), the utility of self-report measures is also limited by disadvantages such as susceptibility to socially desirable response styles and the limited ability of individuals to accurately report on certain aspects of their experience (e.g., due to interpretation biases or lack of awareness about one’s effect on others; Chan, 2010; Paulhus & Vazire, 2007). Ideally, outcomes of interest would have been assessed by self-report measures that were supplemented with measures of physiological markers of emotional arousal, such as salivary or plasma cortisol levels (Grace et al., 2022; Petrowski et al., 2021), skin conductance (Moscovitch et al., 2010), or heart rate (Moscovitch et al., 2010), as well as assessment of behavioural outcomes via observable action rather than self-reported behavioural motivation alone. Indeed, there are numerous methodological, contextual, and motivational factors that could lead to low correlations between self-reported outcomes and actual in-vivo ones (Ajzen, 1991; Fishbein & Ajzen, 2010; Deci & Ryan, 2000).

Moreover, our study samples were comprised predominantly of young and white study participants, with undergraduate participants also identifying primarily as women. The relative narrow range in variability of demographic characteristics among our study samples tempers confidence in the generalizability of our results to broader and more diverse populations.

Another notable limitation is that neither of the two experimental studies captured experiences of socially anxious individuals who did not have a close friend to bring to mind. It is possible that individuals without a close friend self-selected out of the studies by declining participation, as the recruitment materials stated participation would involve imaginal exercises with a close friend from one's own life. It is unknown what proportion of individuals with elevated trait SA or SAD experience close relationship impairment to the extent that they would have had no close friends to imagine in the present study, limiting insight into generalizability of our study findings. Moreover, it would be useful to investigate factors that predict presence versus absence of close friendships in the lives of socially anxious individuals, with the potential to uncover symptom profiles that are most associated with increased risk for having no close friendships. Such information could help identify individuals most at risk of the adverse effects of lack of social support, including increased depressive symptoms, suicidality, and decreased physical health (e.g., Barth et al., 2010; Marver et al., 2017; Vidal et al., 2024) and facilitate early intervention. It would also be interesting to investigate how emotional experiences and wellbeing of SA individuals without any close friends compare to the experience of high SA individuals who find themselves in unsatisfying close friendships.

Last, future research would benefit from incorporating a wider variety of potential moderating variables to provide a more nuanced understanding of heterogeneity in the social experiences of socially anxious individuals. For example, proneness to interpersonal threat and behavioural motivation for rupture repair versus self-protection may be related to attachment styles (Shaver & Mikulincer, 2009), which we did not assess in the current studies. As previously noted, literature on adult attachment is based on early research on child-parent relations (Bowlby, 1969), which was later extended to facilitate understanding of adults' views of

themselves and others in close relationships (Hazan & Shaver, 1987). It has been shown that insecure attachment in childhood is associated with SA in adulthood (Eng et al., 2001; Manning et al., 2017; Read et al., 2018). Given that attachment style plays an important role in shaping how individuals engage in close relationships (Shaver & Mikulincer, 2009), understanding a socially anxious adult's attachment style could provide insight into their internal working models of close friendships and improve prediction of relational patterns for risk regulation. For example, an individual with high SA and an anxious (preoccupied) attachment style may be more likely to worry excessively about their own sense of worth and friendship stability (Manning et al., 2017), fuelling distress and behaviours such as frequent reassurance-seeking. Within the context of rupture repair, this may manifest as appeasement of the other individual and frequent verbal checking that the friendship is in good standing. In comparison, an adult with high SA and an avoidant (dismissive) attachment style might isolate themselves or avoid situations where emotional closeness is needed (Read et al., 2018). Within the context of a real or perceived rupture, this is more likely to be associated with self-protective strategies such as devaluing one's friend, as well as emotionally and/or physically withdrawing from that relationship (Murray et al., 2006). In disorganized attachment, elements of both anxiety (e.g., reassurance-seeking) and avoidance (e.g., withdrawal) styles may be present (Shaver & Mikulincer, 2009), with such conflicting tendencies potentially causing internal tension for the individual, as well as possible frustration for their friend who is exposed to the behavioural manifestation of conflicting goals for closeness. Given evidence that adults exhibit different attachment styles within different close relationships, rather than a stable attachment style with all significant others (Baldwin et al., 1996; Cook, 2000; Cozzarelli et al., 2000; Overall et al., 2003), I would have ideally assessed both general attachment tendencies of study participants

and attachment towards the close friend selected for the study. Thus, inclusion of these variables is recommended for future research.

Treatment Implications and Future Directions

Results of the studies presented here have potentially important implications for cognitive-behavioural therapy (CBT) interventions with socially anxious individuals (e.g., Heimberg, 2002; Hofmann & Otto, 2008; Leichsenring et al., 2014). One prominent finding of clinical interest is the pervasiveness of negative self-portrayal concerns among socially anxious individuals. Given evidence that such concerns about oneself decrease but remain active and prominent even within close friendship contexts, they may warrant increased attention in therapeutic interventions. First, individuals may not be aware of the extent to which such fears persist even with relatively close others, with exploration of core beliefs about the self specifically in the context of close friendships as a fruitful therapeutic venture. Next, therapeutic interventions may benefit from examination of idiosyncratic manifestation of such beliefs. People may be minimally aware of ways in which their negative self-portrayal concerns manifest in close relations (e.g., subtle avoidance strategies), in ways that may not only serve to maintain symptoms of SA (Moscovitch et al., 2013) but also have the potential to impede friendship closeness. Increased awareness of behavioural tendencies and underlying beliefs driving behaviour lay the foundation for strategic behaviour change, in line with one's goals and values (e.g., decreased avoidance for increased emotional closeness) as well as for cognitive restructuring where clients are guided to evaluate the validity of internal assumptions regarding self and others, with the goal of therapeutically updating such beliefs (Moscovitch & Huppert, in press). Such a clinical approach is consistent with current models of CBT for SAD (Ginat-

Frolich et al., 2024; Heimberg, 2002; Hofmann & Otto, 2008; Leichsenring et al., 2014; McEvoy et al., 2022), with an added emphasis on the context of close friendships.

Mental representations of the self are believed to be captured in self-schemas, which reflect core beliefs that inform interpretations of events, emotional reactions, and behavioural motivation (Moscovitch et al., 2023). Accumulating evidence suggests that updating of self-schemas is critical for effective treatment of SAD across psychotherapeutic approaches (Moscovitch & Huppert, in press), via both schema-congruent and schema-incongruent learning (Moscovitch et al., 2023). Emerging support for the effectiveness of memory-based interventions for reconstructing key autobiographical memories that inform deeply held beliefs about the self and serve to maintain symptoms of anxiety (Moscovitch et al., 2023; Moscovitch et al., 2024; Reimer & Moscovitch, 2015; Sheldon et al., 2024) may be highly applicable to friendship contexts, which would be expected to offer socially anxious individual with positive experiences that can be accessed via positive memory retrieval protocols. Retrieval of positive social autobiographical memories has been linked to positive emotional outcomes specifically when they are focused on deep processing via emphasis on self-meaning of the memory, in comparison to superficial processing that focuses on perceptual features of the memory (Moscovitch et al., 2024). Interestingly, recent work in our lab has shown that such intentional retrieval and self-processing of such memories can help individuals with high social anxiety recover their self-esteem in the aftermath of exclusion, which in turn leads them to experience increased social approach motivation and reward anticipation for subsequent social engagement with strangers (Kudryk et al., submitted).

Since individuals with SA tend to have more difficulty effectively coping with experiences of social exclusion compared to their non-anxious counterparts (Hudd &

Moscovitch, 2023), it would be important to examine whether such effects also extend to feelings of rejection or exclusion when there is a sense of rupture within their close friendships and whether recalling and deeply processing positive social autobiographical memories about their friendship can help them recover from such ruptures. Therefore, approaches focused on increasing positive affect via meaningful engagement with positive autobiographical memories may be a fruitful avenue for future investigation on how to help socially anxious individuals repair relationship ruptures in their close friendships. It may also be worthwhile for future research to examine how childhood social trauma history, such as degree or quality of bullying, may affect one's internal working models of friendship, which may in turn assist the development of interventions aimed at alleviating symptoms of SA.

Moreover, findings of higher negative affect at higher levels of SA, even within close friendship and in the absence of interpersonal threat salience, suggests that the role of mood congruent thinking warrants clinical attention in friendship interventions. Specifically, negative affect has the potential to bias interpretations of friendship events in a negative direction (e.g., towards more negative interpretations of ambiguous events) and decrease motivation to engage in relationship-building behaviours that could effectively resolve interpersonal distress (Moscovitch et al., 2013). Given that the developmental stage that coincides with undergraduate studies for most people represents an important time for friendship formation, this is an area that may warrant increased attention on university campuses, where developing and maintaining close friendships can help to buffer against psychological distress; indeed, a broad-based focused on strengthening social supports is one way that university campuses may promote improved mental health of its students.

In light of the potential protective effect of perceived friendship closeness, and the observation that participants with SAD in our study reported lower closeness to their selected friends than HCs, I recommend that future research explore ways in which treatments for SAD can incorporate strategies for increasing perceptions of closeness within existing relationships. Rather than viewing closeness as the end product of satisfying friendships, it may be fruitful to think about friendship closeness as having a bidirectional relationship with other aspects of friendship functioning. For example, helping individuals with SAD feel closer to their friends would be expected to generate a multitude of emotional and behavioural benefits. Thus, therapeutic attention to increasing socially anxious individuals' confidence in their own worth and the value they bring to relationships may be a critical focus of treatment, which could draw upon compassion-based approaches that have been useful for improving self-esteem (Niveau et al., 2021), as improved self-esteem is linked to positive interpersonal outcomes (Lewis, 2009). It might also be advisable for cognitive-behavioural interventions to emphasize the acquisition of friendship skills, such as effective communication skills, which could facilitate assertive communication that helps clients meet their emotional needs and navigate disagreements within their close relationships, thereby fostering greater emotional closeness with their friends (Alberti & Emmons, 2017; Kelly, 2008).

Future research could also address the study limitations detailed above by recruiting demographically diverse samples, exploring friendship dyads of various gender compositions, and integrating multi-method approaches to measurement including self-report questionnaires, naturalistic observation, behavioural ratings by coders, and ratings provided by participants' friends. Given the interpersonal nature of research questions addressed within this dissertation, results of these four online studies also warrant replication using laboratory-based in-person

paradigms. Incorporation of qualitative data analysis also has the potential to further enrich our understanding of friendship processes at different levels of SA. For example, when not constrained to the response options offered within a questionnaire, participants could provide more nuanced explanations of how they interpreted an ambiguous friendship event and their thought process for determining how to behave in response to the event. The qualitative data could then be coded, either by software that is appropriate for this purpose or by trained research assistants, to extract themes and then examine variability across participants in relation to individual difference variables such as trait SA.

Finally, it is worthwhile to reiterate my earlier position regarding the importance of attachment styles in examination of close friendship processes. Attachment was not the focus of this dissertation, given my interest in ultimately informing cognitive-behavioural treatment interventions for SAD; however, the present line of work may help inform literature that ultimately contributes to more attachment-based psychological interventions for individuals with insecure attachment styles and associated impairment in close friendships. For example, future research may examine links between the Friendship Expectations Scale and different attachment styles, which may then inform treatment targets for attachment-oriented psychotherapies. There is also potential for future research to explore the interaction of adult attachment and variables assessed here, to help elucidate the personal historical roots of negative self-portrayal concerns and sensitivity to interpersonal threat within individual participants' relationships and lives.

General Conclusion

Given increasing trends of loneliness and impoverished interpersonal connections (Nie & Hillygus, 2002; Nowland et al., 2018; Stepanikova et al., 2010), along with data suggesting poor social connections increase risk for both mental and physical ailments (Dunbar, 2018; Holt-

Lunstad et al., 2007; Pezirkianidis et al., 2023; Umberson & Karas Montez, 2010), I sought to pursue a line of research that may ultimately help address this global problem. Due to the prominence of low friendship satisfaction among socially anxious individuals in particular (Rodebaugh, 2009; Rodebaugh et al., 2012), with reasons for this observation being poorly understood, I conducted four studies aimed at clarifying the link between SA and quality of close friendships. My results broadly supported the relevance of negative self-portrayal concerns within close friendships, though did not support the idea that lower friendship satisfaction at higher levels of SA stems from unreasonably high friendship expectations. In addition, individuals with both subclinical and clinical levels of SA tended to perceive more interpersonal threat in response to an imagined ambiguous friendship interaction, which was observed to have potentially important implications for emotional outcomes and behavioural motivation (e.g., in terms of friendship-promoting and self-protective goals for potential rupture repair). This line of work has the potential to ultimately improve treatment interventions for individuals with social anxiety disorder, to help them access satisfying close friendships, along with the many mental and physical health associated with such social bonds.

References

- Aderka, I. M., Weisman, O., Shahar, G., & Gilboa-Schechtman, E. (2009). The roles of the social rank and attachment systems in social anxiety. *Personality and Individual Differences*, 47(4), 284-288. <https://doi.org/10.1016/j.paid.2009.03.014>
- Afram, A., & Kashdan, T. B. (2015). Coping with rejection concerns in romantic relationships: An experimental investigation of social anxiety and risk regulation. *Journal of Contextual Behavioral Science*, 4(3), 151-156. <https://doi.org/10.1016/j.jcbs.2015.04.003>
- Ainsworth, M. D. S. (1978). The Bowlby-Ainsworth attachment theory. *Behavioral and Brain Sciences*, 1(3), 436-438. DOI: 10.1017/S0140525X00075828
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211. DOI: 10.1016/0749-5978(91)90020
- Alberti, R., & Emmons, M. (2017). *Your perfect right: Assertiveness and equality in your life and relationships*. New Harbinger Publications.
- Alden, L. E., & Bieling, P. (1998). Interpersonal consequences of the pursuit of safety. *Behaviour Research and Therapy*, 36(1), 53-64. [https://doi.org/10.1016/S0005-7967\(97\)00072-7](https://doi.org/10.1016/S0005-7967(97)00072-7)
- Alden, L. E., Bieling, P. J., & Wallace, S. T. (1994). Perfectionism in an interpersonal context: A self-regulation analysis of dysphoria and social anxiety. *Cognitive Therapy and Research*, 18(4), 297-316. DOI: 10.1007/BF02357507
- Alden, L. E., Mellings, T. M. B., & Ryder, A. G. (2001). Social anxiety, social phobia, and the self. In S. G. Hofmann & P. M. DiBartolo (Eds.), *From social anxiety to social phobia: Multiple perspectives* (pp. 304–320). Boston, USA: Allyn & Bacon.

- Alden, L. E., & Taylor, C. T. (2004). Interpersonal processes in social phobia. *Clinical Psychology Review*, 24, 857-882. <https://doi.org/10.1016/j.cpr.2004.07.006>
- Alden, L. E., & Wallace, S. T. (1991). Social standards and social withdrawal. *Cognitive Therapy and Research*, 15(1), 85-100. DOI: 10.1007/BF01172944
- 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)
- Alden, L. E., Regambal, M. J., & Plasencia, L. (2014). Relational processes in social anxiety disorder. In J. W. Weeks (Ed.), *The Wiley Blackwell handbook of social anxiety disorder* (pp. 159-178). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9781118653920.ch8>
- Alavi, K. (2021). The role of social safeness and self-compassion in mental health problems: A model based on Gilbert theory of emotion regulation systems. *Practice in Clinical Psychology*, 9(3), 237-246. <https://doi.org/10.32598/jpcp.9.3.768.1>
- Altmann, T., & Roth, M. (2020). Individual differences in the preference for cross-sex friendship (heterosociality) in relation to personality. *Personality and Individual Differences*, 157, 109838. DOI:10.1016/j.paid.2020.109838
- Altmann, T. (2022). Sex differences partially moderate the relationships between personal values and the preference for cross-sex friendships (heterosociality). *Journal of Individual Differences*, 2151-2299. DOI:10.1027/1614-0001/a000367
- American Psychiatric Association. (2013). Anxiety Disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association.
- Amir, N., Beard, C., & Bower, E. (2005). Interpretation bias and social anxiety. *Cognitive Therapy and Research*, 29, 433-443. DOI: 10.1007/s10608-005-2834-5

- Antony, M. M., Rowa, K., Liss, A., Swallow, S. R., & Swinson, R. P. (2005). Social comparison processes in social phobia. *Behavior Therapy*, 36(1), 65-75.
[https://doi.org/10.1016/S0005-7894\(05\)80055-3](https://doi.org/10.1016/S0005-7894(05)80055-3)
- Argyle, M., & Henderson, M. (1984). The rules of friendship. *Journal of Social and Personal Relationships*, 1(2), 211-237. <https://doi.org/10.1177/0265407584012005>
- Armstrong III, B. F., Nitschke, J. P., Bilash, U., & Zuroff, D. C. (2021). An affect in its own right: Investigating the relationship of social safeness with positive and negative affect. *Personality and Individual Differences*, 168, 109670.
<https://doi.org/10.1016/j.paid.2019.109670>
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, 63(4), 596-612.
<https://doi.org/10.1037/0022-3514.63.4.596>
- Ashbaugh, A. R., Antony, M. M., McCabe, R. E., Schmidt, L. A., & Swinson, R. P. (2005). Self-evaluative biases in social anxiety. *Cognitive Therapy and Research*, 29, 387-398. DOI 10.1007/s10608-005-2413-9
- Azios, J. H., Strong, K. A., Archer, B., Douglas, N. F., Simmons-Mackie, N., & Worrall, L. (2022). Friendship matters: A research agenda for aphasia. *Aphasiology*, 36(3), 317-336. DOI: 10.1080/02687038.2021.1873908
- Bakan, D. (1966). *The duality of human existence*. Boston, USA: Beacon.
- Baldwin, M. W., Keelan, J. P. R., Fehr, B., Enns, V., & Koh-Rangarajoo, E. (1996). Social-cognitive conceptualization of attachment working models: Availability and accessibility effects. *Journal of Personality and Social Psychology*, 71(1), 94-109.
<https://doi.org/10.1037/0022-3514.71.1.94>

- Barber, K. C., & Moscovitch, D. A. (2023). Positive emotional reactivity to pleasant social and nonsocial stimuli in social anxiety disorder. *Emotion*, 23(5), 1306–1316.
<https://doi.org/10.1037/emo0001143>
- Barth, J., Schneider, S., & Von Känel, R. (2010). Lack of social support in the etiology and the prognosis of coronary heart disease: a systematic review and meta-analysis.
Psychosomatic medicine, 72(3), 229-238. DOI: 10.1097/PSY.0b013e3181d01611
- Baumeister, R. F. (2012). Need-to-belong theory. In P.A.M. Van Lange, A.W., Kruglanski, & E.T. Higgins (Eds.), *Handbook of theories of social psychology*, (2nd ed, pp. 121-140). Sage Publications.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529.
doi:10.1037/0033-2909.117.3.497
- Baumeister, R. F., Tice, D. M., & Hutton, D. G. (1989). Self-presentational motivations and personality differences in self-esteem. *Journal of Personality*, 57(3), 547-579.
<https://doi.org/10.1111/j.1467-6494.1989.tb02384.x>
- Baumgarte, R., & Nelson, D. W. (2009). Preference for same-versus cross-sex friendships. *Journal of Applied Social Psychology*, 39(4), 901-917.
<https://doi.org/10.1111/j.1559-1816.2009.00465.x>
- Beard, C., & Amir, N. (2010). Negative interpretation bias mediates the effect of social anxiety on state anxiety. *Cognitive Therapy and Research*, 34, 292-296. DOI 10.1007/s10608-009-9258-6

- Benenson, J. F., & Christakos, A. (2003). The greater fragility of females' versus males' closest same-sex friendships. *Child Development*, 74(4), 1123-1129.
<https://doi.org/10.1111/1467-8624.00596>
- Bennett-Levy, J. (2003). Mechanisms of change in cognitive therapy: The case of automatic thought records and behavioural experiments. *Behavioural and Cognitive Psychotherapy*, 31(3), 261-277. <https://doi.org/10.1017/S1352465803003035>
- Bechara, A., Damasio, H., & Damasio, A. R. (2000). Emotion, decision making and the orbitofrontal cortex. *Cerebral Cortex*, 10(3), 295-307.
<https://doi.org/10.1093/cercor/10.3.295>
- Blanco, I., & Joormann, J. (2017). Examining facets of depression and social anxiety: The relation among lack of positive affect, negative cognitions, and emotion dysregulation. *The Spanish Journal of Psychology*, 20, E51. DOI:10.1017/sjp.2017.43
- Bielak, T., & Moscovitch, D. A. (2012). Friend or foe? Memory and expectancy biases for faces in social anxiety. *Journal of Experimental Psychopathology*, 3(1), 42-61.
<https://doi.org/10.5127/jep.019711>
- Bielak, T., & Moscovitch, D. A. (2013). How do I measure up? The impact of observable signs of anxiety and confidence on interpersonal evaluations in social anxiety. *Cognitive Therapy and Research*, 37, 266-276. <https://doi.org/10.1007/s10608-012-9473-4>
- Bigelow, B. J. (1977). Children's friendship expectations: A cognitive-developmental study. *Child Development*, 48, 246-253. <https://doi.org/10.2307/1128905>
- Bigelow, B. J., & La Gaipa, J. J. (1975). Children's written descriptions of friendship: A multidimensional analysis. *Developmental Psychology*, 11(6), 857–858.
<https://doi.org/10.1037/0012-1649.11.6.857>

- Biggs, B. K., Vernberg, E. M., & Wu, Y. P. (2012). Social anxiety and adolescents' friendships: The role of social withdrawal. *The Journal of Early Adolescence*, 32(6), 802-823.
<https://doi.org/10.1177/0272431611426145>
- Blatt, S. J., & Zuroff, D. C. (1992). Interpersonal relatedness and self-definition: Two prototypes for depression. *Clinical Psychology Review*, 12(5), 527-562. DOI: 10.1016/0272-7358(92)90070-O
- Blay, Y., Keshet, H., Friedman, L., & Gilboa-Schechtman, E. (2021). Interpersonal motivations in social anxiety: Weakened approach and intensified avoidance motivations for affiliation and social-rank. *Personality and Individual Differences*, 170, 110449.
<https://doi.org/10.1016/j.paid.2020.110449>
- Blieszner, R. (2014). The worth of friendship: Can friends keep us happy and healthy?. *Generations*, 38(1), 24-30. doi: <https://www.jstor.org/stable/10.2307/26556021>
- Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*, 25(1), 49-59. [https://doi.org/10.1016/0005-7916\(94\)90063-9](https://doi.org/10.1016/0005-7916(94)90063-9)
- Brannan, D., Biswas-Diener, R., Mohr, C. D., Mortazavi, S., & Stein, N. (2013). Friends and family: A cross-cultural investigation of social support and subjective well-being among college students. *The Journal of Positive Psychology*, 8(1), 65-75.
<https://doi.org/10.1080/17439760.2012.743573>
- Brown, T. A., & Barlow, D. H. (2014). *Anxiety and related disorders interview schedule for DSM-5 (ADIS-5L): Client interview schedule*. Oxford University Press.
- Boelen, P. A., & Reijntjes, A. (2009). Intolerance of uncertainty and social anxiety. *Journal of Anxiety Disorders*, 23(1), 130-135. <https://doi.org/10.1016/j.janxdis.2008.04.007>

- Bowlby, J. (1969). Attachment and loss. *Attachment* (Vol. 1). London: Hogarth Press.
- Brannan, D., Biswas-Diener, R., Mohr, C. D., Mortazavi, S., & Stein, N. (2013). Friends and family: A cross-cultural investigation of social support and subjective well-being among college students. *The Journal of Positive Psychology*, 8(1), 65-75.
<https://doi.org/10.1080/17439760.2012.743573>
- Cacioppo, J. T., Gardner, W. L., & Berntson, G. G. (1999). The affect system has parallel and integrative processing components: Form follows function. *Journal of Personality and Social Psychology*, 76, 839 – 855. DOI:10.1037/0022-3514.76.5.839
- Cacioppo, J. T., Fowler, J. H., & Christakis, N. A. (2009). Alone in the crowd: The structure and spread of loneliness in a large social network. *Journal of Personality and Social Psychology*, 97(6), 977–991. <https://doi.org/10.1037/a0016076>
- Candiotto, L. (2022). Extended loneliness. When hyperconnectivity makes us feel alone. *Ethics and Information Technology*, 24(4), 47. DOI: <https://doi.org/10.1007/s10676-022-09669-4>
- Carleton, R. N. (2012). The intolerance of uncertainty construct in the context of anxiety disorders: Theoretical and practical perspectives. *Expert review of Neurotherapeutics*, 12(8), 937-947. <https://doi.org/10.1586/ern.12.82>
- Carleton, R. N., Collimore, K. C., & Asmundson, G. J. (2010). “It's not just the judgements—It's that I don't know”: Intolerance of uncertainty as a predictor of social anxiety. *Journal of Anxiety Disorders*, 24(2), 189-195. DOI: 10.1016/j.janxdis.2009.10.007
- Carmichael, C. L., Reis, H. T., & Duberstein, P. R. (2015). In your 20s it's quantity, in your 30s it's quality: The prognostic value of social activity across 30 years of adulthood. *Psychology and Aging*, 30(1), 95–105. <https://doi.org/10.1037/pag0000014>

- Campbell, J. D., Trapnell, P. D., Heine, S. J., Katz, I. M., Lavalley, L. F., & Lehman, D. R. (1996). Self-concept clarity: Measurement, personality correlates, and cultural boundaries. *Journal of Personality and Social Psychology*, 70(1), 141–156.
<https://doi.org/10.1037/0022-3514.70.1.141>
- Campbell, L., Simpson, J. A., Kashy, D. A., & Fletcher, G. J. (2001). Ideal standards, the self, and flexibility of ideals in close relationships. *Personality and Social Psychology Bulletin*, 27(4), 447-462. <https://doi.org/10.1177/0146167201274006>
- Carpenter, A., & Greene, K. (2015). Social penetration theory. *The International Encyclopedia of Interpersonal Communication*, 1-4. DOI:10.1002/9781118540190.wbeic0160
- Casbon, T. S., Burns, A. B., Bradbury, T. N., & Joiner Jr, T. E. (2005). Receipt of negative feedback is related to increased negative feedback seeking among individuals with depressive symptoms. *Behaviour Research and Therapy*, 43(4), 485-504. DOI <https://doi.org/10.1016/j.brat.2004.03.009>
- Cavallo, J. V., Fitzsimons, G. M., & Holmes, J. G. (2009). Taking chances in the face of threat: Romantic risk regulation and approach motivation. *Personality and Social Psychology Bulletin*, 35(6), 737-751. <https://doi.org/10.1177/0146167209332742>
- Cavallo, J. V., Murray, S. L., & Holmes, J. G. (2013). Regulating interpersonal risk. In J. A. Simpson & L. Campbell (Eds.), *Oxford handbook of close relationships* (pp. 116-136). New York, NY: Oxford University Press.
- Chen, J., Short, M., & Kemps, E. (2020). Interpretation bias in social anxiety: A systematic review and meta-analysis. *Journal of Affective Disorders*, 276, 1119-1130.
<https://doi.org/10.1016/j.jad.2020.07.121>

- Chan, D. (2010). So why ask me? Are self-report data really that bad?. In C. E. Lance & R. J. Vandenberg (Eds.), *Statistical and methodological myths and urban legends: Doctrine, verity and fable in organizational and social sciences* (pp. 329-356). Routledge.
- Cicero, D.C. (2018). Self-Concept Clarity and Psychopathology. In J. Lodi-Smith & K. DeMarree (Eds.), *Self-Concept Clarity* (pp. 219-242). Springer, Cham.
https://doi.org/10.1007/978-3-319-71547-6_12
- Clark, D. M. (2001). 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). John Wiley.
- Clark, D.A. (2013). Cognitive Restructuring. In S.G. Hofmann (Ed.), *The Wiley Handbook of Cognitive Behavioral Therapy*. Wiley. <https://doi.org/10.1002/9781118528563.wbcbt02>
- Clark, D. M., & McManus, F. (2002). Information processing in social phobia. *Biological Psychiatry*, 51(1), 92-100. [https://doi.org/10.1016/S0006-3223\(01\)01296-3](https://doi.org/10.1016/S0006-3223(01)01296-3)
- Clark, M. S., & Reis, H. T. (1988). Interpersonal processes in close relationships. *Annual Review of Psychology*, 39(1), 609-672. <https://doi.org/10.1146/annurev.ps.39.020188.003141>
- 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). The Guilford Press.
- Clément, C., Lin, J., & Stangier, U. (2019). Efficacy of behavioral experiments in cognitive therapy for social anxiety disorder: Study protocol for a randomized controlled trial. *Trials*, 20, 1-11. <https://doi.org/10.1186/s13063-019-3905-3>

- Cody, M. W., & Teachman, B. A. (2010). Post-event processing and memory bias for performance feedback in social anxiety. *Journal of Anxiety Disorders*, 24(5), 468-479. DOI: <https://doi.org/10.1016/j.janxdis.2010.03.003>
- Cohen, S. (2004). Social relationships and health. *American Psychologist*, 59(8), 676-684. <https://doi.org/10.1037/0003-066X.59.8.676>
- Connor, K. M., Davidson, J. R. T., Churchill, L. E., Sherwood, A., Weisler, R. H., & Foa, E. (2000). Psychometric properties of the Social Phobia Inventory (SPIN): New self-rating scale. *The British Journal of Psychiatry*, 176(4), 379-386. DOI: <https://doi.org/10.1192/bjp.176.4.379>
- Cook, W. L. (2000). Understanding attachment security in family context. *Journal of Personality and Social Psychology*, 78(2), 285-294. <https://doi.org/10.1037/0022-3514.78.2.285>
- Coyne, J. C. (1976). Toward an interactional description of depression. *Psychiatry*, 39(1), 28-40. DOI: 10.1080/00332747.1976.11023874
- Cozzarelli, C., Hoekstra, S. J., & Bylsma, W. H. (2000). General versus specific mental models of attachment: Are they associated with different outcomes?. *Personality and Social Psychology Bulletin*, 26(5), 605-618. <https://doi.org/10.1177/0146167200267008>
- Craske, M. G., Meuret, A. E., Echiverri-Cohen, A., Rosenfield, D., & Ritz, T. (2023). Positive affect treatment targets reward sensitivity: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 91(6), 350-366. <https://doi.org/10.1037/ccp0000805>
- Crawford, A. M., & Manassis, K. (2011). Anxiety, social skills, friendship quality, and peer victimization: An integrated model. *Journal of Anxiety Disorders*, 25(7), 924-931. <https://doi.org/10.1016/j.janxdis.2011.05.005>

- Cuming, S., & Rapee, R. M. (2010). Social anxiety and self-protective communication style in close relationships. *Behaviour Research and Therapy*, 48(2), 87-96.
<https://doi.org/10.1016/j.brat.2009.09.010>
- Cuming, S., Rapee, R. M., Kemp, N., Abbott, M. J., Peters, L., & Gaston, J. E. (2009). A self-report measure of subtle avoidance and safety behaviors relevant to social anxiety: Development and psychometric properties. *Journal of Anxiety Disorders*, 23(7), 879-883.
<https://doi.org/10.1016/j.janxdis.2009.05.002>
- Curtis, R. C., & Miller, K. (1986). Believing another likes or dislikes you: Behaviors making the beliefs come true. *Journal of Personality and Social Psychology*, 51(2), 284-290.
<https://doi.org/10.1037/0022-3514.51.2.284>
- Davila, J., & Beck, J. G. (2002). Is social anxiety associated with impairment in close relationships? A preliminary investigation. *Behavior Therapy*, 33(3), 427-446.
[https://doi.org/10.1016/S0005-7894\(02\)80037-5](https://doi.org/10.1016/S0005-7894(02)80037-5)
- Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological inquiry*, 11(4), 227-268.
https://doi.org/10.1207/S15327965PLI1104_01
- De Jong, P. J., Sportel, B. E., De Hullu, E., & Nauta, M. H. (2012). Co-occurrence of social anxiety and depression symptoms in adolescence: differential links with implicit and explicit self-esteem?. *Psychological Medicine*, 42(3), 475-484. DOI:
<https://doi.org/10.1017/S0033291711001358>
- Demir, M., & Özdemir, M. (2010). Friendship, need satisfaction and happiness. *Journal of Happiness Studies*, 11(2), 243-259. DOI 10.1007/s10902-009-9138-5

- Demir, M., & Weitekamp, L. A. (2007). I am so happy' cause today I found my friend: Friendship and personality as predictors of happiness. *Journal of happiness Studies*, 8, 181-211. DOI 10.1007/s10902-006-9012-7
- Dunbar, R. I. M. (2018). The anatomy of friendship. *Trends in Cognitive Sciences*, 22, 32-51. <https://doi.org/10.1016/j.tics.2017.10.004>
- Dabas, G., Rowa, K., Milosevic, I., Moscovitch, D. A., & McCabe, R. E. (2023). The impact of particular safety behaviours on perceived likeability and authenticity during interpersonal interactions in social anxiety disorder. *Behavioural and Cognitive Psychotherapy*, 51(1), 46-60. <https://doi.org/10.1017/S1352465822000492>
- Dryman, M. T., Gardner, S., Weeks, J. W., & Heimberg, R. G. (2016). Social anxiety disorder and quality of life: How fears of negative and positive evaluation relate to specific domains of life satisfaction. *Journal of Anxiety Disorders*, 38, 1-8. <https://doi.org/10.1016/j.janxdis.2015.12.003>
- Dryman, M. T., & Heimberg, R. G. (2015). Examining the relationships among social anxiety, fears of evaluation, and interpretation bias. *Cognitive Therapy and Research*, 39, 646-657. DOI 10.1007/s10608-015-9694-4
- Dupasquier, J. R., Kelly, A. C., Moscovitch, D. A., & Vidovic, V. (2020). Cultivating self-compassion promotes disclosure of experiences that threaten self-esteem. *Cognitive Therapy and Research*, 44, 108-119. <https://doi.org/10.1007/s10608-019-10050-x>
- Edelmann, R. J., & Baker, S. R. (2002). Self-reported and actual physiological responses in social phobia. *British Journal of Clinical Psychology*, 41(1), 1-14. <https://doi.org/10.1348/014466502163732>

- Elliot, A. J., Gable, S. L., & Mapes, R. R. (2006). Approach and avoidance motivation in the social domain. *Personality and Social Psychology Bulletin*, 32(3), 378-391.
- 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. *Journal of Anxiety Disorders*, 19(2), 143-156.
- 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(4), 365–380.
<https://doi.org/10.1037/1528-3542.1.4.365>
- Farmer, A. S., Kashdan, T. B., & Weeks, J. W. (2014). Positivity deficits in social anxiety: Emotions, events, and cognitions. In P.M. DiBartolo & S.G. Hofmann (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3rd ed., pp. 551-578). Academic Press. <https://doi.org/10.1016/B978-0-12-394427-6.00019-4>
- Fehr, B. (1996). *Friendship processes*. Thousand Oaks, CA: Sage.
- Fehr, B. (2004). Intimacy expectations in same-sex friendships: A prototype interaction-pattern model. *Journal of Personality and Social Psychology*, 86(2), 265–284.
<https://doi.org/10.1037/0022-3514.86.2.265>
- Fehr, B., & Harasymchuk, C. (2017). The role of friendships in wellbeing. In J. E. Maddux (Ed.), *Subjective wellbeing and life satisfaction* (pp. 103–128). Routledge. doi: 10.4324/9781351231879-5
- Fergus, T. A., Valentiner, D. P., McGrath, P. B., & Jencius, S. (2010). Shame-and guilt-proneness: Relationships with anxiety disorder symptoms in a clinical sample. *Journal of Anxiety Disorders*, 24(8), 811-815. <https://doi.org/10.1016/j.janxdis.2010.06.002>

- Fernandez, K. C., & Rodebaugh, T. L. (2011). Social anxiety and discomfort with friendly giving. *Journal of Anxiety Disorders*, 25(3), 326-334.
<https://doi.org/10.1016/j.janxdis.2010.10.005>
- Fishbein, M., & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. Psychology Press. <https://doi.org/10.4324/9780203838020>
- Fletcher, G. J., Simpson, J. A., Thomas, G., & Giles, L. (1999). Ideals in intimate relationships. *Journal of Personality and Social Psychology*, 76(1), 72–89.
<https://doi.org/10.1037/0022-3514.76.1.72>.
- Forgas, J. P. (2011). Affective influences on self-disclosure: Mood effects on the intimacy and reciprocity of disclosing personal information. *Journal of Personality and Social Psychology*, 100(3), 449–461. <https://doi.org/10.1037/a0021129>
- Fripp, R. (1975). Wind on Water. The Essential Fripp & Eno [CD]. New York: Virgin Records. Track 3.
- Gable, S. L., & Gosnell, C. L. (2013). Approach and avoidance behavior in interpersonal relationships. *Emotion Review*, 5(3), 269-274. DOI: 10.1177/1754073913477513
- 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(6), e0129478. <https://doi.org/10.1371/journal.pone.0129478>
- Gillespie, B. J., Lever, J., Frederick, D., & Royce, T. (2015). Close adult friendships, gender, and the life cycle. *Journal of Social and Personal Relationships*, 32(6), 709-736.
<https://doi.org/10.1177/0265407514546977>
- Gilbert, P. (2000). The relationship of shame, social anxiety and depression: The role of the evaluation of social rank. *Clinical Psychology & Psychotherapy: An International*

- Journal of Theory & Practice*, 7(3), 174-189. [https://doi.org/10.1002/1099-0879\(200007\)7:3<174::AID-CPP236>3.0.CO;2-U](https://doi.org/10.1002/1099-0879(200007)7:3<174::AID-CPP236>3.0.CO;2-U)
- Gilbert, P. (2001). Evolution and social anxiety: The role of attraction, social competition, and social hierarchies. *Psychiatric Clinics of North America*, 24, 723-751. DOI: 10.1016/s0193-953x(05)70260-4
- Gilbert, P. (2005). Compassion and cruelty: A biopsychosocial approach. In P. Gilbert (Ed.), *Compassion: Conceptualisations, research, and use in psychotherapy* (pp. 1–74). London: Routledge
- Gilbert, P. (2024). Threat, safety, safeness and social safeness 30 years on: Fundamental dimensions and distinctions for mental health and well-being. *British Journal of Clinical Psychology*, 453-471. DOI: 10.1111/bjc.12466
- Gilbert, P., McEwan, K., Mitra, R., Richter, A., Franks, L., Mills, A., Bellew, R., & Gale, C. (2009). An exploration of different types of positive affect in students and patients with a bipolar disorder. *Clinical Neuropsychiatry*, 6(4), 135-143.
- Gilbert, P., & Simos, G. (2022). The evolved functions of caring connections as a basis for compassion. In P. Gilbert (Ed), *Compassion focused therapy* (pp. 90-121). Routledge.
- Gilbert, P., Allan, S., Brough, S., Melley, S., & Miles, J. N. V. (2002). Relationship of anhedonia and anxiety to social rank, defeat and entrapment. *Journal of Affective Disorders*, 71(1-3), 141-151. DOI: 10.1016/S0165-0327(01)00392-5
- Gilbert, P., & Trower, P. (2001). Evolution and process in social anxiety. In W. R. Crozier & L. E. Alden (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness* (pp. 259–279). John Wiley & Sons Ltd.

- Gilboa-Schechtman, E., Keshet, H., Livne, T., Berger, U., Zabag, R., Hermesh, H., & Marom, S. (2017). Explicit and implicit self-evaluations in social anxiety disorder. *Journal of Abnormal Psychology, 126*(3), 285. <http://dx.doi.org/10.1037/abn0000261>
- Gilboa-Schechtman, E., Keshet, H., Peschard, V., & Azoulay, R. (2020). Self and identity in social anxiety disorder. *Journal of Personality, 88*(1), 106-121. <https://doi.org/10.1111/jopy.12455>
- Ginat-Frolich, R., Gilboa-Schechtman, E., Huppert, J. D., Aderka, I. M., Alden, L. E., Bar-Haim, Y., Becker, E. S., Bernstein, A., Geva, R., Heimberg, R. G., Hofmann, S. G., Kashdan, T. B., Koster, E. H. W., Lipsitz, J., Maner, J. K., Moscovitch, D. A., Philippot, P., Rapee, R. M., Roelofs, K., Rodebaugh, T. L., ... Wieser, M. J. (2024). Vulnerabilities in social anxiety: Integrating intra- and interpersonal perspectives. *Clinical Psychology Review, 109*, 102415. <https://doi.org/10.1016/j.cpr.2024.102415>
- Glezakis, K., Burton, A. L., Abbott, M. J., & Norton, A. R. (2024). Self-concept clarity in social anxiety: psychometric properties and factor structure of the Self-Concept Clarity Scale in a social anxiety disorder sample. *Clinical Psychologist, 28*(2) 111-121. <https://doi.org/10.1080/13284207.2024.2311104>
- Gomillion, S., & Murray, S. L. (2014). Shifting dependence: The influence of partner instrumentality and self-esteem on responses to interpersonal risk. *Personality and Social Psychology Bulletin, 40*(1), 57-69. DOI: 10.1177/0146167213503885
- Gough, H. G., & Thorne, A. (1986). Positive, negative, and balanced shyness: Self-definitions and the reactions of others. In W. H. Jones, J. M. Cheek, & S. R. Briggs (Eds), *Shyness: Perspectives on research and treatment* (pp. 205-225). Springer. https://doi.org/10.1007/978-1-4899-0525-3_16

- Grace, C., Heinrichs, M., Koval, P., Gorelik, A., von Dawans, B., Terrett, G., ... & Labuschagne, I. (2022). Concordance in salivary cortisol and subjective anxiety to the trier social stress test in social anxiety disorder. *Biological Psychology*, 175, 108444. <https://doi.org/10.1016/j.biopsycho.2022.108444>
- Gray, E., Beierl, E. T., & Clark, D. M. (2019). Sub-types of safety behaviours and their effects on social anxiety disorder. *Plos One*, 14(10), e0223165. DOI: <https://doi.org/10.1371/journal.Pone.0223165>
- Greco, L. A., & Morris, T. L. (2005). Factors influencing the link between social anxiety and peer acceptance: Contributions of social skills and close friendships during middle childhood. *Behavior Therapy*, 36(2), 197-205. [https://doi.org/10.1016/S0005-7894\(05\)80068-1](https://doi.org/10.1016/S0005-7894(05)80068-1)
- Gregory, B., & Peters, L. (2017). Changes in the self during cognitive behavioural therapy for social anxiety disorder: A systematic review. *Clinical Psychology Review*, 52, 1-18. DOI: <https://doi.org/10.1016/j.cpr.2016.11.008>
- Greenberger, D., & Padesky, C. A. (2016). *Mind over mood: Change how you feel by changing the way you think*. The Guilford Press.
- Grunebaum, M. F., Galfalvy, H. C., Mortenson, L. Y., Burke, A. K., Oquendo, M. A., & Mann, J. J. (2010). Attachment and social adjustment: Relationships to suicide attempt and major depressive episode in a prospective study. *Journal of Affective Disorders*, 123(1-3), 123-130. <https://doi.org/10.1016/j.jad.2009.09.010>
- Hall, J. A. (2011). Sex differences in friendship expectations: A meta-analysis. *Journal of Social and Personal Relationships*, 28(6), 723-747. <https://doi.org/10.1177/0265407510386192>

- Hall, J. A., Larson, K. A., & Watts, A. (2011). Satisfying friendship maintenance expectations: The role of friendship standards and biological sex. *Human Communication Research*, 37(4), 529-552. <https://doi.org/10.1111/j.1468-2958.2011.01411.x>
- Harris, K., & Vazire, S. (2016). On friendship development and the Big Five personality traits. *Social and Personality Psychology Compass*, 10(11), 647-667. <https://doi.org/10.1111/spc3.12287>
- Hartup, W. W., & Stevens, N. (1997). Friendships and adaptation in the life course. *Psychological Bulletin*, 121(3), 355 – 370. <https://doi.org/10.1037/0033-2909.121.3.355>.
- Harvey, A. G., Clark, D. M., Ehlers, A., & Rapee, R. M. (2000). Social anxiety and self-impression: Cognitive preparation enhances the beneficial effects of video feedback following a stressful social task. *Behaviour Research and Therapy*, 38(12), 1183–1192. DOI: 10.1016/S0005-7967(99)00148-5
- Hassebrauck, M., & Aron, A. (2001). Prototype matching in close relationships. *Personality and Social Psychology Bulletin*, 27(9), 1111-1122. <https://doi.org/10.1177/0146167201279004>
- Hayes-Skelton, S. A., & Lee, C. S. (2020). Decentering in mindfulness and cognitive restructuring for social anxiety: An experimental study of a potential common mechanism. *Behavior Modification*, 44(6), 817-840. <https://doi.org/10.1177/0145445519850744>
- Hays, R. B. (1984). The development and maintenance of friendship. *Journal of Social and Personal Relationships*, 1, 75-98. <https://doi.org/10.1177/0265407584011005>

- Hays, R. B. (1989). The day-to-day functioning of close versus casual friendships. *Journal of Social and Personal Relationships*, 6, 21-37.
<https://doi.org/10.1177/026540758900600102>
- Hazan, C., & Shaver, P. (1987). Romantic love conceptualized as an attachment process. *Journal of Personality and Social Psychology*, 52(3), 511-524. DOI 10.1037/0022-3514.52.3.511
- Heerey, E. A., & Kring, A. M. (2007). Interpersonal consequences of social anxiety. *Journal of Abnormal Psychology*, 116(1), 125 - 134. DOI: 10.1037/0021-843X.116.1.125
- Heimpel, S. A., Elliot, A. J., & Wood, J. V. (2006). Basic personality dispositions, self-esteem, and personal goals: An approach-avoidance analysis. *Journal of Personality*, 74, 1293–1320. <https://doi.org/10.1111/j.1467-6494.2006.00410.x>
- Heimberg, R. G. (2002). Cognitive-behavioral therapy for social anxiety disorder: Current status and future directions. *Biological Psychiatry*, 51(1), 101-108. DOI:10.1016/S0006-3223(01)01183-0
- Heimberg, R. G., Brozovich, F. A., & Rapee, R. M. (2010). A cognitive behavioral model of social anxiety disorder: Update and extension. In P.M. DiBartolo & S.G. Hofmann (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (2nd ed, pp. 395-422). Academic Press. DOI: <https://doi.org/10.1016/B978-0-12-375096-9.00015-8>
- Heinrichs, N., & Hofmann, S. G. (2001). Information processing in social phobia: A critical review. *Clinical Psychology Review*, 21(5), 751-770. [https://doi.org/10.1016/S0272-7358\(00\)00067-2](https://doi.org/10.1016/S0272-7358(00)00067-2)
- Hirsch, C. R., & Clark, D. M. (2004). Information-processing bias in social phobia. *Clinical Psychology Review*, 24(7), 799-825. <https://doi.org/10.1016/j.cpr.2004.07.005>

- Ho, J. T., & Moscovitch, D. A. (2022). The moderating effects of reported pre-pandemic social anxiety, symptom impairment, and current stressors on mental health and affiliative adjustment during the first wave of the COVID-19 pandemic. *Anxiety, Stress, & Coping*, 35(1), 86-100. <https://doi.org/10.1080/10615806.2021.1946518>
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94(3), 319 – 340. <https://doi.org/10.1037/0033-295X.94.3.319>.
- Higgins, E. T., Klein, R., & Strauman, T. (1985). Self-concept discrepancy theory: A psychological model for distinguishing among different aspects of depression and anxiety. *Social Cognition*, 3(1), 51-76. <https://doi.org/10.1521/soco.1985.3.1.51>
- Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive Behaviour Therapy*, 36(4), 193-209. DOI: 10.1080/16506070701421313
- Hofmann, S. G., & Otto, M. W. (2008). *Cognitive behavioral therapy for social anxiety disorder: Evidence-based and disorder-specific treatment techniques*. Routledge.
- Holmes, J. G. (2002). Interpersonal expectations as the building blocks of social cognition: An interdependence theory perspective. *Personal Relationships*, 9(1), 1-26. <https://doi.org/10.1111/1475-6811.00001>
- Holt-Lunstad, J., Robles, T. F., & Sbarra, D. A. (2017). Advancing social connection as a public health priority in the United States. *American Psychologist*, 72(6), 517-530. doi:10.1037/amp0000103
- Holt-Lunstad, J., Uchino, B. N., Smith, T. W., & Hicks, A. (2007). On the importance of relationship quality: The impact of ambivalence in friendships on cardiovascular

- functioning. *Annals of Behavioral Medicine*, 33(3), 278-290.
<https://doi.org/10.1007/BF02879910>
- Hudd, T., & Moscovitch, D. A. (2022). Reconnecting in the face of exclusion: Individuals with high social anxiety may feel the push of social pain, but not the pull of social rewards. *Cognitive Therapy and Research*, 46(2), 420-435. <https://doi.org/10.1007/s10608-021-10263-z>
- Hudd, T., & Moscovitch, D. A. (2023). Social anxiety inhibits needs repair following exclusion in both relational and non-relational reward contexts: The mediating role of positive affect. *Behaviour Research and Therapy*, 162, 104270.
<https://doi.org/10.1016/j.brat.2023.104270>
- Huppert, J. D., Foa, E. B., Furr, J. M., Filip, J. C., & Mathews, A. (2003). Interpretation bias in social anxiety: A dimensional perspective. *Cognitive Therapy and Research*, 27, 569-577.
<https://doi.org/10.1023/A:1026359105456>
- Hur, J., DeYoung, K. A., Islam, S., Anderson, A. S., Barstead, M. G., & Shackman, A. J. (2020). Social context and the real-world consequences of social anxiety. *Psychological Medicine*, 50(12), 1989-2000. <https://doi.org/10.1017/S0033291719002022>
- Iancu, I., Bodner, E., & Ben-Zion, I. Z. (2015). Self esteem, dependency, self-efficacy and self-criticism in social anxiety disorder. *Comprehensive Psychiatry*, 58, 165-171.
<https://doi.org/10.1016/j.comppsy.2014.11.018>
- Jackson, J. S., Torres, M., Caldwell, C. H., Neighbors, H. W., Nesse, R. M., Taylor, R. J., ... & Williams, D. R. (2004). The National Survey of American Life: A study of racial, ethnic and cultural influences on mental disorders and mental health. *International journal of methods in psychiatric research*, 13(4), 196-207. <https://doi.org/10.1002/mpr.177>

- Jazaieri, H., Morrison, A. S., Goldin, P. R., & Gross, J. J. (2015). The role of emotion and emotion regulation in social anxiety disorder. *Current Psychiatry Reports*, 17, 1-9.
<https://doi.org/10.1007/s11920-014-0531-3>
- Jones, W. H., & Briggs, S. R. (1984). The self-other discrepancy in social shyness. *Advances in Psychology*, 21, 93-107. [https://doi.org/10.1016/S0166-4115\(08\)62117-2](https://doi.org/10.1016/S0166-4115(08)62117-2)
- Kashdan, T. B. (2007). Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. *Clinical Psychology Review*, 27(3), 348-365.
<https://doi.org/10.1016/j.cpr.2006.12.003>
- Kashdan, T. B., Volkmann, J. R., Breen, W. E., & Han, S. (2007). Social anxiety and romantic relationships: The costs and benefits of negative emotion expression are context-dependent. *Journal of Anxiety Disorders*, 21(4), 475-492.
<https://doi.org/10.1016/j.janxdis.2006.08.007>
- Kashdan, T. B., & Herbert, J. D. (2001). Social anxiety disorder in childhood and adolescence: Current status and future directions. *Clinical Child and Family Psychology Review*, 4, 37-61. <https://doi.org/10.1023/A:1009576610507>
- Kashdan, T. B., Barrios, V., Forsyth, J. P., & Steger, M. F. (2006). Experiential avoidance as a generalized psychological vulnerability: Comparisons with coping and emotion regulation strategies. *Behaviour Research and Therapy*, 44(9), 1301-1320.
<https://doi.org/10.1016/j.brat.2005.10.003>
- Kashdan, T. B., Weeks, J. W., & Savostyanova, A. A. (2011). Whether, how, and when social anxiety shapes positive experiences and events: A self-regulatory framework and treatment implications. *Clinical Psychology Review*, 31(5), 786-799.
<https://doi.org/10.1016/j.cpr.2011.03.012>

- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593-602. doi:10.1001/archpsyc.62.6.593
- Kelly, A. (2018). *Social skills: Developing effective interpersonal communication*. Routledge.
- Kelly, A. C., Zuroff, D. C., Leybman, M. J., & Gilbert, P. (2012). Social safeness, received social support, and maladjustment: Testing a tripartite model of affect regulation. *Cognitive Therapy and Research*, 36, 815-826. DOI 10.1007/s10608-011-9432-5
- Kessler, R. C., Berglund, P., Chiu, W. T., Demler, O., Heeringa, S., Hiripi, E., ... & Zheng, H. (2004). The US national comorbidity survey replication (NCS-R): design and field procedures. *International Journal of Methods in Psychiatric Research*, 13(2), 69-92. <https://doi.org/10.1002/mpr.167>
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, 62(6), 593-602. doi:10.1001/archpsyc.62.6.593
- Kessler, R. C., & Merikangas, K. R. (2004). The national comorbidity survey replication (NCS-R): background and aims. *International Journal of Methods in Psychiatric Research*, 13(2), 60-68. <https://doi.org/10.1002/mpr.166>
- Kiesler, D. J. (1983). The 1982 Interpersonal Circle: A taxonomy for complementarity in human transactions. *Psychological Review*, 90(3), 185-214. <https://doi.org/10.1037/0033-295X.90.3.185>

- Kingsbury, M., & Coplan, R. J. (2016). RU mad@ me? Social anxiety and interpretation of ambiguous text messages. *Computers in Human Behavior*, 54, 368-379.
<https://doi.org/10.1016/j.chb.2015.08.032>
- Kline, R. B. (1998). *Principles and practice of structural equation modeling*. The Guilford Press.
- Koban, L., Andrews-Hanna, J. R., Ives, L., Wager, T. D., & Arch, J. J. (2023). Brain mediators of biased social learning of self-perception in social anxiety disorder. *Translational Psychiatry*, 13(1), 292. <https://doi.org/10.1038/s41398-023-02587-z>
- Kocovski, N. L., & Endler, N. S. (2000). Social anxiety, self-regulation, and fear of negative evaluation. *European Journal of Personality*, 14(4), 347-358. DOI: 10.1002/1099-0984(200007/08)14:4<347::AID-PER381>3.0.CO;2-7
- Krans, J., de Bree, J., & Bryant, R. A. (2014). Autobiographical memory bias in social anxiety. *Memory*, 22(8), 890-897. DOI: <https://doi.org/10.1080/09658211.2013.844261>
- Kube, T., Rief, W., Gollwitzer, M., Gärtner, T., & Glombiewski, J. A. (2019). Why dysfunctional expectations in depression persist - Results from two experimental studies investigating cognitive immunization. *Psychological Medicine*, 49(9), 1532–1544.
<https://doi.org/10.1017/S0033291718002106>
- Kudryk, S., Richter Powell, A., Ho, J.T.K., & Moscovitch, D.A. (Submitted). Positive social autobiographical memory recall enhances positive affect, self-esteem, and social reward seeking after exclusion in individuals with high social anxiety. *Journal of Applied Research in Memory and Cognition*.
- Kuru, E., Safak, Y., Özdemir, İ., Tulacı, R. G., Özdel, K., Özkula, N. G., & Örsel, S. (2018). Cognitive distortions in patients with social anxiety disorder: Comparison of a clinical

- group and healthy controls. *The European Journal of Psychiatry*, 32(2), 97-104.
<https://doi.org/10.1016/j.ejpsy.2017.08.004>
- Kyron, M. J., Johnson, A., Hyett, M., Moscovitch, D., Wong, Q., Bank, S. R., ... & McEvoy, P. M. (2023). Concurrent and prospective associations between negative social-evaluative beliefs, safety behaviours, and symptoms during and following cognitive behavioural group therapy for social anxiety disorder. *Behaviour Research and Therapy*, 161, 104253. <https://doi.org/10.1016/j.brat.2023.104253>
- La Gaipa, J. J. (1987). Friendship expectations. In Burnett, R, McGhee, P, & Clarke, D. (Eds.), *Accounting for relationships: Explanation, representation and knowledge* (pp. 134 – 157). Methuen.
- La Greca, A. M., & Harrison, H. M. (2005). Adolescent peer relations, friendships, and romantic relationships: Do they predict social anxiety and depression?. *Journal of Clinical Child and Adolescent Psychology*, 34(1), 49-61. https://doi.org/10.1207/s15374424jccp3401_5
- Lambert, N. M., & Fincham, F. D. (2011). Expressing gratitude to a partner leads to more relationship maintenance behavior. *Emotion*, 11(1), 52-60. DOI: 10.1037/a0021557
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). International affective picture system (IAPS): Technical manual and affective ratings. *NIMH Center for the Study of Emotion and Attention*, 1, 39-58.
- Larsen, J. T., Hershfield, H., Stastny, B. J., & Hester, N. (2017). On the relationship between positive and negative affect: Their correlation and their co-occurrence. *Emotion*, 17(2), 323 – 336. <https://doi.org/10.1037/emo0000231>
- Leary, M. R. (2001). Shyness and the self: Attentional, motivational, and cognitive self-processes in social anxiety and inhibition. In Crozier, W. R. & Alden, L. E.

- (Eds.), *International handbook of social anxiety: Concepts, research and interventions relating to the self and shyness* (pp. 217–234). John Wiley & Sons Ltd.
- Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In Zanna, M. P. (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 2–51). Academic Press.
- Leary, M. R., & Jongman-Sereno, K. P. (2014). Social anxiety as an early warning system: A refinement and extension of the self-presentation theory of social anxiety. In P.M. DiBartolo & S.G. Hofmann (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (3rd ed., pp. 579-597). Academic Press. <https://doi.org/10.1016/B978-0-12-394427-6.00020-0>
- Leary, M. R., & Kowalski, R. M. (1995). *Social anxiety*. The Guilford Press.
- Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, 68, 518–530. DOI: 10.1037/0022-3514.68.3.518
- Leichsenring, F., Salzer, S., Beutel, M. E., Herpertz, S., Hiller, W., Hoyer, J., ... & Leibing, E. (2014). Long-term outcome of psychodynamic therapy and cognitive-behavioral therapy in social anxiety disorder. *American Journal of Psychiatry*, 171(10), 1074-1082. <https://doi.org/10.1176/appi.ajp.2014.13111514>
- Levinger, G., & Snoek, J. D. (1972). *Attraction in relationship: A new look at interpersonal attraction*. General Learning Press.
- Levinson, C. A., Rodebaugh, T. L., Lim, M. H., & Fernandez, K. C. (2017). The core extrusion schema—revised: Hiding oneself predicts severity of social interaction anxiety. *Assessment*, 24(1), 83-94. <https://doi.org/10.1177/1073191115596568>

- Lewis, D. (2009). Personality, self-esteem, interpersonal relationships and friendships. *XULaneXUS*, 7(1), 3-11.
- Lewis, D. M., Al-Shawaf, L., Russell, E. M., & Buss, D. M. (2015). Friends and happiness: An evolutionary perspective on friendship. In Demir, M. (Ed.), *Friendship and happiness: Across the life-span and cultures* (pp. 37-57). Springer Dordrecht.
https://doi.org/10.1007/978-94-017-9603-3_3
- Li, S., Tan, J., Qian, M., & Liu, X. (2008). Continual training of attentional bias in social anxiety. *Behaviour Research and Therapy*, 46(8), 905-912. DOI:
<https://doi.org/10.1016/j.brat.2008.04.005>
- Liotti, G., & Gilbert, P. (2011). Mentalizing, motivation, and social mentalities: Theoretical considerations and implications for psychotherapy. *Psychology and Psychotherapy: Theory, Research and Practice*, 84, 9–25. <https://doi.org/10.1348/147608310X520094>
- Little, R. J. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American statistical Association*, 83(404), 1198-1202.
<https://doi.org/10.1080/01621459.1988.10478722>
- MacDonald, G., & Leary, M. R. (2005). Why does social exclusion hurt? The relationship between social and physical pain. *Psychological Bulletin*, 131, 202–223. DOI:
10.1037/0033-2909.131.2.202
- Manning, R. P., Dickson, J. M., Palmier-Claus, J., Cunliffe, A., & Taylor, P. J. (2017). A systematic review of adult attachment and social anxiety. *Journal of Affective Disorders*, 211, 44-59. <https://doi.org/10.1016/j.jad.2016.12.020>

- Mansell, W., & Clark, D. M. (1999). How do I appear to others? Social anxiety and processing of the observable self. *Behaviour research and therapy*, 37(5), 419-434.
[https://doi.org/10.1016/S0005-7967\(98\)00148-X](https://doi.org/10.1016/S0005-7967(98)00148-X)
- 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(4), 455-470. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- Marver, J. E., Galfalvy, H. C., Burke, A. K., Sublette, M. E., Oquendo, M. A., Mann, J. J., & Grunebaum, M. F. (2017). Friendship, depression, and suicide attempts in adults: Exploratory analysis of a longitudinal follow-up study. *Suicide and Life-Threatening Behavior*, 47(6), 660-671. <https://doi.org/10.1111/sltb.12329>
- Mauss, I., Wilhelm, F., & Gross, J. (2004). Is there less to social anxiety than meets the eye? Emotion experience, expression, and bodily responding. *Cognition and Emotion*, 18(5), 631-642. <https://doi.org/10.1080/02699930341000112>
- McEvoy, P.M., Hyett, M.P., Bank, S.R., Erceg-Hurn, D.M., Johnson, A.R., Kyron, M.J., Saulsman, L.M., Moulds, M.L., Grisham, J.R., Holmes, E.A., Moscovitch, D.A., Lipp, O.V. Campbell, B.N.C., & Rapee, R.M. (2022). Imagery-enhanced versus verbally-based group cognitive behavior therapy for social anxiety disorder: A randomized clinical trial. *Psychological Medicine*, 52, 1277-1286. doi:10.1017/S0033291720003001
- McManus, F., Sacadura, C., & Clark, D. M. (2008). Why social anxiety persists: An experimental investigation of the role of safety behaviours as a maintaining factor. *Journal of Behavior Therapy and Experimental Psychiatry*, 39(2), 147-161.
<https://doi.org/10.1016/j.jbtep.2006.12.002>

- Mehta, C. M., & Smith, K. R. (2019). “As you grow up the divide still tends to happen”: A qualitative investigation of gender segregation in adulthood. *Gender Issues*, 36, 176-200. DOI:10.1007/s12147-018-9221-5
- Meleshko, K., & Alden, L. E. (1993). Anxiety and self-disclosure: Toward a motivational goal. *Journal of Personality and Social Psychology*, 64(6), 1000-1009. <https://doi.org/10.1037/0022-3514.64.6.1000>
- Mellings, T. M., & Alden, L. E. (2000). Cognitive processes in social anxiety: The effects of self-focus, rumination and anticipatory processing. *Behaviour Research and Therapy*, 38(3), 243-257. [https://doi.org/10.1016/S0005-7967\(99\)00040-6](https://doi.org/10.1016/S0005-7967(99)00040-6)
- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice*, 9, 85–90. <https://doi.org/10.1093/clipsy.9.1.85>
- Miething, A., Almquist, Y. B., Östberg, V., Rostila, M., Edling, C., & Rydgren, J. (2016). Friendship networks and psychological well-being from late adolescence to young adulthood: a gender-specific structural equation modeling approach. *BMC Psychology*, 4, 1-11. <https://doi.org/10.1186/s40359-016-0143-2>
- Mobini, S., Reynolds, S., & Mackintosh, B. (2013). Clinical implications of cognitive bias modification for interpretative biases in social anxiety: An integrative literature review. *Cognitive Therapy and Research*, 37, 173-182. DOI 10.1007/s10608-012-9445-8
- Morrison, A. S., & Heimberg, R. G. (2013). Social anxiety and social anxiety disorder. *Annual Review of Clinical Psychology*, 9, 249-274. <https://doi.org/10.1146/annurev-clinpsy-050212-185631>

- Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive and Behavioral Practice, 16*(2), 123-134. <https://doi.org/10.1016/j.cbpra.2008.04.002>
- Moscovitch, D. A., & Hofmann, S. G. (2007). When ambiguity hurts: Social standards moderate self-appraisals in generalized social phobia. *Behaviour Research and Therapy, 45*(5), 1039-1052. <https://doi.org/10.1016/j.brat.2006.07.008>
- Moscovitch, D. A., & Huyder, V. (2011). The negative self-portrayal scale: development, validation, and application to social anxiety. *Behavior Therapy, 42*(2), 183-196. <https://doi.org/10.1016/j.beth.2010.04.007>
- Moscovitch, D.A., & Huppert, J.D. (in press). Updating the self: A roadmap for effective treatment of adults with social anxiety disorder. In P.M. DiBartolo & S.G. Hofmann (Eds.), *Social anxiety: Clinical, developmental, and social perspectives* (4th ed). Elsevier.
- Moscovitch, D.A., Moscovitch, M., & Sheldon, S. (2023). Neurocognitive model of schema-congruent and incongruent learning in clinical disorders: Application to social anxiety and beyond. *Perspectives on Psychological Science, 18*(6), 1412-1435. <https://doi.org/10.1177/17456916221141351>
- Moscovitch, D. A., Rowa, K., Paulitzki, J. R., Antony, M. M., & McCabe, R. E. (2015). What if I appear boring, anxious, or unattractive? Validation and treatment sensitivity of the Negative Self Portrayal Scale in clinical samples. *Cognitive Therapy and Research, 39*(2), 178-192. DOI 10.1007/s10608-014-9645-5
- Moscovitch, D. A., Rowa, K., Paulitzki, J. R., Ierullo, M. D., Chiang, B., Antony, M. M., & McCabe, R. E. (2013). Self-portrayal concerns and their relation to safety behaviors and

- negative affect in social anxiety disorder. *Behaviour Research and Therapy*, 51(8), 476-486. <https://doi.org/10.1016/j.brat.2013.05.002>
- Moscovitch, D. A., Suvak, M. K., & Hofmann, S. G. (2010). Emotional response patterns during social threat in individuals with generalized social anxiety disorder and non-anxious controls. *Journal of Anxiety Disorders*, 24(7), 785-791. <https://doi.org/10.1016/j.janxdis.2010.05.013>
- Moscovitch, D. A., Vidovic, V., Lenton-Brym, A. P., Dupasquier, J. R., Barber, K. C., Hudd, T., ... & Romano, M. (2018). Autobiographical memory retrieval and appraisal in social anxiety disorder. *Behaviour Research and Therapy*, 107, 106-116. <https://doi.org/10.1016/j.brat.2018.06.008>
- Moscovitch, D.A., White, K., Hudd, T. (2024). Hooking the self onto the past: How positive autobiographical memory retrieval benefits people with social anxiety. *Clinical Psychological Science*, 12(5), 882-902. <https://doi.org/10.1177/21677026231195792>
- Murad, O. S. (2020). Social anxiety in relation to self-esteem among university students in Jordan. *International Education Studies*, 13(2), 96-103. <https://doi.org/10.5539/ies.v13n2p96>
- Murray, S. L., Holmes, J. G., & Collins, N. L. (2006). Optimizing assurance: The risk regulation system in relationships. *Psychological Bulletin*, 132(5), 641–666. <https://doi.org/10.1037/0033-2909.132.5.641>
- Murray, S. L., Derrick, J. L., Leder, S., & Holmes, J. G. (2008). Balancing connectedness and self-protection goals in close relationships: A levels-of-processing perspective on risk regulation. *Journal of Personality and Social Psychology*, 94(3), 429-459. <https://doi.org/10.1037/0022-3514.94.3.429>

- Murray, S. L., Holmes, J. G., & Collins, N. L. (2006). Optimizing assurance: The risk regulation system in relationships. *Psychological Bulletin*, 132(5), 641-666.
<https://doi.org/10.1037/0033-2909.132.5.641>
- Murray, S. L., Rose, P., Bellavia, G. M., Holmes, J. G., & Kusche, A. G. (2002). When rejection stings: how self-esteem constrains relationship-enhancement processes. *Journal of Personality And Social Psychology*, 83(3), 556-573. <https://doi.org/10.1037/0022-3514.83.3.556>
- Murray, S. L., Bellavia, G., Rose, P., & Griffin, D. (2003). Once hurt, twice hurtful: How perceived regard regulates daily marital interaction. *Journal of Personality and Social Psychology*, 84, 126 –147. DOI: 10.1037/0022-3514.84.1.126
- Nie, N. H., & Hillygus, D. S. (2002). The impact of Internet use on sociability: Time-diary findings. *It & Society*, 1(1), 1-20.
- Niveau, N., New, B., & Beaudoin, M. (2021). Self-esteem interventions in adults—a systematic review and meta-analysis. *Journal of Research in Personality*, 94, 104131.
<https://doi.org/10.1016/j.jrp.2021.104131>
- Nowland, R., Necka, E. A., & Cacioppo, J. T. (2018). Loneliness and social internet use: Pathways to reconnection in a digital world?. *Perspectives on Psychological Science*, 13(1), 70-87. <https://doi.org/10.1177/1745691617713052>
- Nurmi, J. E., Toivonen, S., Salmela-Aro, K., & Eronen, S. (1996). Optimistic, approach-oriented, and avoidance strategies in social situations: three studies on loneliness and peer relationships. *European Journal of Personality*, 10(3), 201-219.
[https://doi.org/10.1002/\(SICI\)1099-0984\(199609\)10:3<201::AID-PER257>3.0.CO;2-%23](https://doi.org/10.1002/(SICI)1099-0984(199609)10:3<201::AID-PER257>3.0.CO;2-%23)

- Olatunji, B. O., Cisler, J. M., & Tolin, D. F. (2007). Quality of life in the anxiety disorders: A meta-analytic review. *Clinical Psychology Review*, 27(5), 572-581.
<https://doi.org/10.1016/j.cpr.2007.01.015>
- Ogolsky, B. G., & Bowers, J. R. (2013). A meta-analytic review of relationship maintenance and its correlates. *Journal of Social and Personal Relationships*, 30(3), 343-367.
<https://doi.org/10.1177/0265407512463338>
- Orr, E. M., & Moscovitch, D. A. (2015). Blending in at the cost of losing oneself: dishonest self-disclosure erodes self-concept clarity in social anxiety. *Journal of Experimental Psychopathology*, 6(3), 278-296. DOI:10.5127/jep.044914
- Oswald, D. L., Clark, E. M., & Kelly, C. M. (2004). Friendship maintenance: An analysis of individual and dyad behaviors. *Journal of Social and Clinical Psychology*, 23, 413-441.
<https://doi.org/10.1521/jscp.23.3.413.35460>
- Overall, N. C., Fletcher, G. J., & Friesen, M. D. (2003). Mapping the intimate relationship mind: Comparisons between three models of attachment representations. *Personality and Social Psychology Bulletin*, 29(12), 1479-1493. <https://doi.org/10.1177/0146167203251519>
- Owens, T. J., & Samblanet, S. (2013). Self and self-concept. In J. DeLamater, & A. Ward (Eds), *Handbook of social psychology* (pp. 225-249). Springer, Dordrecht.
https://doi.org/10.1007/978-94-007-6772-0_8
- Parker, S., & de Vries, B. (1993). Patterns of friendship for women and men in same and cross-sex relationships. *Journal of Social and Personal Relationships*, 10(4), 617-626.
<https://doi.org/10.1177/0265407593104010>
- Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R.W. Robins, R.C. Fraley, and R. F. Krueger (Eds), *Handbook of research methods in personality psychology* (pp. 224-

- 239). perceived friendship intimacy, constructive problem solving, and depression from early to late adolescence. *Journal of Abnormal Child Psychology*, 37, 251-264.
<https://doi.org/10.1007/s10802-008-9273-1>
- Sewart, A. R., Niles, A. N., Burklund, L. J., Saxbe, D. E., Lieberman, M. D., & Craske, M. G. (2019). Examining positive and negative affect as outcomes and moderators of cognitive-behavioral therapy and acceptance and commitment therapy for social anxiety disorder. *Behavior Therapy*, 50(6), 1112-1124. <https://doi.org/10.1016/j.beth.2019.07.001>
- Shapiro, S. L. (2009). The integration of mindfulness and psychology. *Journal of Clinical Psychology*, 65(6), 555-560. <https://doi.org/10.1002/jclp.20602>
- Shaver, P. R., & Mikulincer, M. (2009). An overview of adult attachment theory. In J.H. Obegi & E. Berant (Eds), *Attachment theory and research in clinical work with adults* (pp.17-45). The Guilford Press.
- Petrowski, K., Schmalbach, I., Strunk, A., Hoyer, J., Kirschbaum, C., & Joraschky, P. (2021). Cortisol reactivity in social anxiety disorder: A highly standardized and controlled study. *Psychoneuroendocrinology*, 123, 104913.
<https://doi.org/10.1016/j.psyneuen.2020.104913>
- Pezirkianidis, C., Galanaki, E., Raftopoulou, G., Moraitou, D., & Stalikas, A. (2023). Adult friendship and wellbeing: A systematic review with practical implications. *Frontiers in Psychology*, 14, 1059057. <https://doi.org/10.3389/fpsyg.2023.1059057>
- Piccirillo, M. L., Dryman, M. T., & Heimberg, R. G. (2016). Safety behaviors in adults with social anxiety: Review and future directions. *Behavior Therapy*, 47(5), 675-687.
<https://doi.org/10.1016/j.beth.2015.11.005>

- Piccirillo, M. L., Lim, M. H., Fernandez, K. A., Pasch, L. A., & Rodebaugh, T. L. (2021). Social Anxiety Disorder and Social Support Behavior in Friendships. *Behavior Therapy*, 52(3), 720-733. <https://doi.org/10.1016/j.beth.2020.09.003>
- Pietromonaco, P. R., & Collins, N. L. (2017). Interpersonal mechanisms linking close relationships to health. *American Psychologist*, 72(6), 531-542. <https://doi.org/10.1037/amp0000129>
- Pinninti, N. R., Madison, H., Musser, E., & Rissmiller, D. (2003). MINI International Neuropsychiatric Schedule: clinical utility and patient acceptance. *European Psychiatry*, 18(7), 361-364. doi:10.1016/j.eurpsy.2003.03.004
- 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>
- Pishyar, R., Harris, L. M., & Menzies, R. G. (2004). Attentional bias for words and faces in social anxiety. *Anxiety, Stress & Coping*, 17(1), 23-36. <https://doi.org/10.1080/10615800310001601458>
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioral model of anxiety in social phobia. *Behaviour Research and Therapy*, 35(8), 741-756. [https://doi.org/10.1016/S0005-7967\(97\)00022-3](https://doi.org/10.1016/S0005-7967(97)00022-3)
- Rasmussen, M. K., & Pidgeon, A. M. (2011). The direct and indirect benefits of dispositional mindfulness on self-esteem and social anxiety. *Anxiety, Stress, & Coping*, 24, 227-233. <https://doi.org/10.1080/10615806.2010.515681>
- Rawlins, W. K. (2009). *The compass of friendship*. Thousand Oaks, CA: Sage.

- Read, D. L., Clark, G. I., Rock, A. J., & Coventry, W. L. (2018). Adult attachment and social anxiety: The mediating role of emotion regulation strategies. *PloS One*, 13(12), e0207514. <https://doi.org/10.1371/journal.pone.0207514>
- Reeder, H. M. (2003). The effect of gender role orientation on same-and cross-sex friendship formation. *Sex Roles*, 49, 143-152. DOI 10.1023/A:1024408913880
- Reimer, S.G., & Moscovitch, D.A. (2015). The impact of imagery rescripting on memory appraisals and core beliefs in social anxiety disorder. *Behaviour Research and Therapy*, 75, 48-59. <https://doi.org/10.1016/j.brat.2015.10.007>
- Reis, H. T., Clark, M. S., & Holmes, J. G. (2004). Perceived partner responsiveness as an organizing construct in the study of intimacy and closeness. In D. Mashek & A. P. Aron (Eds.), *Handbook of closeness and intimacy* (pp. 201–225). Erlbaum.
- Rodebaugh, T. L. (2009). Hiding the self and social anxiety: The core extrusion schema measure. *Cognitive Therapy and Research*, 33, 90-109. <https://doi.org/10.1007/s10608-007-9143-0>
- Rodebaugh, T. L. (2009). Social phobia and perceived friendship quality. *Journal of Anxiety Disorders*, 23(7), 872-878. <https://doi.org/10.1016/j.janxdis.2009.05.001>
- Rodebaugh, T. L., Bielak, T., Vidovic, V., & Moscovitch, D. A. (2016). The effects of social anxiety on interpersonal evaluations of warmth and dominance. *Journal of Anxiety Disorders*, 38, 68-78. <https://doi.org/10.1016/j.janxdis.2016.01.002>
- Rodebaugh, T. L., Fernandez, K. C., & Levinson, C. A. (2012). Testing the effects of social anxiety disorder on friendship quality across gender and ethnicity. *Cognitive Behaviour Therapy*, 41(2), 130-139. doi:10.1080/16506073.2012.661451
- 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(5), 623-630.
<https://doi.org/10.1016/j.janxdis.2011.02.002>
- Rodebaugh, T. L., Lim, M. H., Fernandez, K. C., Langer, J. K., Weisman, J. S., Tonge, N., ... & Shumaker, E. A. (2014). Self and friend's differing views of social anxiety disorder's effects on friendships. *Journal of Abnormal Psychology*, 123, 715.
<https://doi.org/10.1037/abn0000015>
- Rodebaugh, T. L., Lim, M. H., Shumaker, E. A., Levinson, C. A., & Thompson, T. (2015). Social anxiety and friendship quality over time. *Cognitive Behaviour Therapy*, 44(6), 502-511. <https://doi.org/10.1080/16506073.2015.1062043>
- 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(2), 192-206. <https://doi.org/10.1016/j.beth.2006.08.001>
- Romano, M., Tran, E., & Moscovitch, D. A. (2020). Social anxiety is associated with impaired memory for imagined social events with positive outcomes. *Cognition and Emotion*, 34(4), 700-712. <https://doi.org/10.1080/02699931.2019.1675596>
- Porter, E., & Chambless, D. L. (2017). Social anxiety and social support in romantic relationships. *Behavior Therapy*, 48(3), 335-348.
<https://doi.org/10.1016/j.beth.2016.12.002>
- Rowa, K., Gavric, D., Stead, V., LeMoult, J., & McCabe, R. E. (2016). The pernicious effects of post-event processing in social anxiety disorder. *Journal of Experimental Psychopathology*, 7(4), 577-587. DOI:10.5127/jep.056916
- Rubin, K.H. & Burgess, K. (2001). Social withdrawal. In M.W. Vasey & M.R. Dadds (Eds.). *The developmental psychopathology of anxiety* (pp. 407-434). Oxford University Press.

- 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 USA: results from the National Comorbidity Survey Replication. *Psychological Medicine*, 38(1), 15-28. doi:10.1017/S0033291707001699
- Schlenker, B. R., & Leary, M. R. (1985). Social anxiety and communication about the self. *Journal of Language and Social Psychology*, 4(3-4), 171-192.
<https://doi.org/10.1177/0261927X8543002>
- Schreiber, F., Heimlich, C., Schweitzer, C., & Stangier, U. (2015). Cognitive therapy for social anxiety disorder: the impact of the “self-focused attention and safety behaviours experiment” on the course of treatment. *Behavioural and Cognitive Psychotherapy*, 43(2), 158-166. DOI: <https://doi.org/10.1017/S1352465813000672>
- Schwabe, L., & Wolf, O. T. (2013). Stress and multiple memory systems: from ‘thinking’ to ‘doing’. *Trends in Cognitive Sciences*, 17(2), 60-68.
<http://dx.doi.org/10.1016/j.tics.2012.12.001>
- Scott, W. D., & Cervone, D. (2002). The impact of negative affect on performance standards: Evidence for an affect-as-information mechanism. *Cognitive Therapy and Research*, 26, 19-37. doi.org/10.1023/A:1013837520031
- Selfhout, M. H. W., Branje, S. J. T., & Meeus, W. H. J. (2009). Developmental trajectories of perceived friendship intimacy, constructive problem solving, and depression from early to late adolescence. *Journal of Abnormal Child Psychology*, 37, 251-264.
<https://doi.org/10.1007/s10802-008-9273-1>
- Sewart, A. R., Niles, A. N., Burklund, L. J., Saxbe, D. E., Lieberman, M. D., & Craske, M. G. (2019). Examining positive and negative affect as outcomes and moderators of cognitive-

- behavioral therapy and acceptance and commitment therapy for social anxiety disorder. *Behavior Therapy*, 50(6), 1112-1124. <https://doi.org/10.1016/j.beth.2019.07.001>
- Shapiro, S. L. (2009). The integration of mindfulness and psychology. *Journal of Clinical Psychology*, 65(6), 555-560. <https://doi.org/10.1002/jclp.20602>
- Shaver, P. R., & Mikulincer, M. (2009). An overview of adult attachment theory. In J.H. Obegi & E. Berant (Eds), *Attachment theory and research in clinical work with adults* (pp.17-45). The Guilford Press.
- Sheldon, S., Atack, L., Ngo, N., Moscovitch, M., & Moscovitch, D.A. (2024). Targeting schema change in social anxiety via autobiographical memory reconstruction. *Cognition and Emotion*, 1-9. 080/02699931.2024.243351631.2024.2433516
- Sheehan DV (2014) The Mini-International Neuropsychiatric Interview, Version 7.0 for DSM-5 (M.I.N.I 7.0). *Medical Outcomes Systems* (pp. 2095-2105).
- Sheehan, D. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., Hergueta, E., Baker, T., & Dunbar, G. C. (1998). The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *The Journal of Clinical Psychiatry*, 59 (Suppl 20), 22–33.
- Sheehan, D. V. (1983). *The anxiety disease*. Charles Scribner and Sons.
- Sloman, L., Price, J., Gilbert, P., & Gardner, R. (1994). Adaptive function of depression: Psychotherapeutic implications. *American Journal of Psychotherapy*, 48(3), 401-416. DOI 10.1176/appi.psychotherapy.1994.48.3.401
- Sparrevoorn, 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(12), 1074-1078. <https://doi.org/10.1016/j.brat.2009.07.016>

- Starcke, K., & Brand, M. (2012). Decision making under stress: A selective review. *Neuroscience & Biobehavioral Reviews*, 36(4), 1228-1248.
<https://doi.org/10.1016/j.neubiorev.2012.02.003>
- Starr, L. R., & Davila, J. (2008). Differentiating interpersonal correlates of depressive symptoms and social anxiety in adolescence: Implications for models of comorbidity. *Journal of Clinical Child & Adolescent Psychology*, 37(2), 337-349.
<https://doi.org/10.1080/15374410801955854>
- Stein, D. J., Lim, C. C., Roest, A. M., De Jonge, P., Aguilar-Gaxiola, S., Al-Hamzawi, A., ... & Scott, K. M. (2017). The cross-national epidemiology of social anxiety disorder: Data from the World Mental Health Survey Initiative. *BMC Medicine*, 15(1), 1-21.
<https://doi.org/10.1186/s12916-017-0889-2>
- Stepanikova, I., Nie, N. H., & He, X. (2010). Time on the Internet at home, loneliness, and life satisfaction: Evidence from panel time-diary data. *Computers in Human Behavior*, 26(3), 329-338. <https://doi.org/10.1016/j.chb.2009.11.002>
- Stopa, L., Brown, M. A., Luke, M. A., & Hirsch, C. R. (2010). Constructing a self: The role of self-structure and self-certainty in social anxiety. *Behaviour Research and Therapy*, 48(10), 955-965. <https://doi.org/10.1016/j.brat.2010.05.028>
- Stopa, L., & Clark, D. M. (2000). Social phobia and interpretation of social events. *Behaviour Research and Therapy*, 38, 273-283. [https://doi.org/10.1016/S0005-7967\(99\)00043-1](https://doi.org/10.1016/S0005-7967(99)00043-1)
- Strauman, T. J. (1989). Self-discrepancies in clinical depression and social phobia: Cognitive structures that underlie emotional disorders?. *Journal of Abnormal Psychology*, 98(1), 14.
<https://doi.org/10.1037/0021-843X.98.1.14>

- Strauman, T. J., & Higgins, E. T. (1988). Self-discrepancies as predictors of vulnerability to distinct syndromes of chronic emotional distress. *Journal of Personality*, 56(4), 685-707. DOI: 10.1111/j.1467-6494.1988.tb00472.x
- Strulov, T. S., Gilboa-Schechtman, E., & Aderka, I. M. (2025). Out of my league: Dating preferences of individuals with social anxiety disorder. *Cognitive Therapy and Research*, 49(2), 338-349. DOI: 10.1007/s10608-024-10518-5
- Swee, M. B., Hudson, C. C., & Heimberg, R. G. (2021). Examining the relationship between shame and social anxiety disorder: A systematic review. *Clinical Psychology Review*, 90, 102088. <https://doi.org/10.1016/j.cpr.2021.102088>
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston, MA: Allyn & Bacon.
- Tan, J. K., & Goh, J. W. (2006). Why Do They Not Talk? Towards an Understanding of Students' Cross-Cultural Encounters from an Individualism/Collectivism Perspective. *International Education Journal*, 7(5), 651-667.
- Taylor, C. T., & Alden, L. E. (2011). To see ourselves as others see us: an experimental integration of the intra and interpersonal consequences of self-protection in social anxiety disorder. *Journal of Abnormal Psychology*, 120(1), 129-141. <https://doi.org/10.1037/a0022127>
- Taylor, C. T., Bomyea, J., & Amir, N. (2010). Attentional bias away from positive social information mediates the link between social anxiety and anxiety vulnerability to a social stressor. *Journal of Anxiety Disorders*, 24, 403-408. doi: 10.1016/j.janxdis.2010.02.004

- Taylor, C. T., Lyubomirsky, S., & Stein, M. B. (2017). Upregulating the positive affect system in anxiety and depression: Outcomes of a positive activity intervention. *Depression and Anxiety*, 34(3), 267–280. <https://doi.org/10.1002/da.22593>
- Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? What next?. *Journal of Health and Social Behavior*, 53-79. <https://doi.org/10.2307/2626957>
- Torgrud, L. J., Walker, J. R., Murray, L., Cox, B. J., Chartier, M., & Kjernisted, K. D. (2004). Deficits in perceived social support associated with generalized social phobia. *Cognitive Behaviour Therapy*, 33(2), 87-96. <https://doi.org/10.1080/16506070410029577>
- Trower, P., & Gilbert, P. (1989). New theoretical conceptions of social anxiety and social phobia. *Clinical Psychology Review*, 9(1), 19-35. DOI 10.1016/0272-7358(89)90044-5
- Uchino, B. N. (2004). *Social support and physical health: Understanding the health consequences of relationships*. Yale University Press.
- Uchino, B. N. (2006). Social support and health: A review of physiological processes potentially underlying links to disease outcomes. *Journal of Behavioral Medicine*, 29, 377-387. DOI: 10.1007/s10865-006-9056-5
- Umberson, D., Crosnoe, R., & Reczek, C. (2010). Social relationships and health behavior across the life course. *Annual Review of Sociology*, 36(1), 139-157. doi: 10.1146/annurev-soc-070308-120011
- Umberson, D., & Karas Montez, J. (2010). Social relationships and health: A flashpoint for health policy. *Journal of Health and Social Behavior*, 51(1_suppl), S54-S66. <https://doi.org/10.1177/0022146510383501>
- Veale, D. (2008). Behavioural activation for depression. *Advances in Psychiatric Treatment*, 14(1), 29-36. doi: 10.1192/apt.bp.107.004051

- Vernberg, E. M., Abwender, D. A., Ewell, K. K., & Beery, S. H. (1992). Social anxiety and peer relationships in early adolescence: A prospective analysis. *Journal of Clinical Child Psychology, 21*(2), 189-196. https://doi.org/10.1207/s15374424jccp2102_11
- Vidal, C., Reinert, M., Nguyen, T., & Jun, H. J. (2024). Chronic stress and lack of social support: role in adolescent depression and suicide-related behaviors in the context of the COVID-19 pandemic. *Journal of Affective Disorders, 365*, 437-442. <https://doi.org/10.1016/j.jad.2024.08.090>
- Vigil, J. M. (2007). Asymmetries in the friendship preferences and social styles of men and women. *Human Nature, 18*, 143-161. DOI 10.1007/s12110-007-9003-3
- Wade, T. D., & Kendler, K. S. (2000). The relationship between social support and major depression: cross-sectional, longitudinal, and genetic perspectives. *The Journal of Nervous and Mental Disease, 188*(5), 251-258.
- Watson, J., & Nesdale, D. (2012). Rejection sensitivity, social withdrawal, and loneliness in young adults. *Journal of Applied Social Psychology, 42*(8), 1984-2005. <https://doi.org/10.1111/j.1559-1816.2012.00927.x>
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology, 54*(6), 1063-1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Wild, J., & Clark, D. M. (2011). Imagery rescripting of early traumatic memories in social phobia. *Cognitive and Behavioral Practice, 18*(4), 433-443. DOI: 10.1016/j.cbpra.2011.03.002
- Wilson, J. K., & Rapee, R. M. (2006). Self-concept certainty in social phobia. *Behaviour Research and Therapy, 44*(1), 113-136. <https://doi.org/10.1016/j.brat.2005.01.006>

- Wilson, R. E., Harris, K., & Vazire, S. (2015). Personality and friendship satisfaction in daily life: Do everyday social interactions account for individual differences in friendship satisfaction?. *European Journal of Personality*, 29(2), 173-186.
<https://doi.org/10.1002/per.1996>
- Weilage, M., & Hope, D. A. (1999). Self-discrepancy in social phobia and dysthymia. *Cognitive Therapy and Research*, 23(6), 637-650. DOI:10.1023/A:1018788925223
- Weisman, O., Aderka, I. M., Marom, S., Hermesh, H., & Gilboa-Schechtman, E. (2011). Social rank and affiliation in social anxiety disorder. *Behaviour Research and Therapy*, 49(6-7), 399-405. DOI: 10.1016/j.brat.2011.03.010
- Wells, A., Clark, D. M., Salkovskis, P., Ludgate, J., Hackmann, A., & Gelder, M. (1995). Social phobia: The role of in-situation safety behaviors in maintaining anxiety and negative beliefs. *Behavior Therapy*, 26(1), 153-161. DOI: 10.1016/S0005-7894(05)80088-7
- Wenzel, A., Graff-Dolezal, J., Macho, M., & Brendle, J. R. (2005). Communication and social skills in socially anxious and nonanxious individuals in the context of romantic relationships. *Behaviour Research and Therapy*, 43(4), 505-519.
<https://doi.org/10.1016/j.brat.2004.03.010>
- Wittchen, H. U., Fuetsch, M., Sonntag, H., Müller, N., & Liebowitz, M. (2000). Disability and quality of life in pure and comorbid social phobia. Findings from a controlled study. *European Psychiatry*, 15, 46-58. [https://doi.org/10.1016/S0924-9338\(00\)00211-X](https://doi.org/10.1016/S0924-9338(00)00211-X)
- Wrzus, C., Zimmermann, J., Mund, M., & Neyer, F. J. (2017). Friendships in young and middle adulthood: Normative patterns and personality differences. In M. Hojat & A. Moyer (Eds.), *Psychology of friendship* (pp. 21-38). Oxford University Press. doi: 10.1093/acprof:oso/9780190222024.003.0002

- Zarbatany, L., Conley, R., & Pepper, S. (2004). Personality and gender differences in friendship needs and experiences in preadolescence and young adulthood. *International Journal of Behavioral Development*, 28, 299-310. <https://doi.org/10.1080/01650250344000514>
- Zhang, X., Yu, H. W., & Barrett, L. F. (2014). How does this make you feel? A comparison of four affect induction procedures. *Frontiers in Psychology*, 5:689. doi: 10.3389/fpsyg.2014.00689

Appendix: Experimental Manipulation

Discrepancy Threat Condition

The following instructions were presented to participants via text on the screen, accompanied by an audio recording of those instructions.

Please use the next several seconds to bring to mind and envision the close friend you selected at the start of this study. Now, imagine your close friend would like to change *any one thing about you*. Picture what that one thing about you would be and imagine your friend telling you how they wish this one thing was different than it is. Imagine how your friend would look and sound as they tell you this. Hold this image in mind as vividly as possible.

Once you have identified the thing your friend would like to change about you, please consider why they would want to change that about you and how that makes you feel. In the space below, please write about: (a) the thing your friend is describing they would want to change about you, (b) how your friend sounds and appears as they are telling you this, and (c) how it makes you feel to think about them telling you this. Please write in as much detail as possible, using a minimum of 200 characters.

--- Page break for participants ---

Now, please *imagine that you hung out with your friend a few days ago but since that time you and your friend haven't been chatting or texting as much as you normally would. You wonder whether your friend may be upset about something. When you look at your phone today, you see that your friend has sent you a message asking if you are available to come over to chat this evening. (It is hard to decipher the tone of their message.)*

No-threat Condition

Same as for the Threat condition, the following instructions were presented to participants via text on the screen, accompanied by an audio recording of those instructions.

Please use the next several seconds to bring to mind and envision the close friend you selected at the start of this study. Now, imagine your friend *describing their typical weekday morning routine to you*. Picture your friend telling you about each step in their morning routine, and try to imagine this as vividly as possible.

Once you have brought to mind the scene of your friend telling you about their morning routine, please consider the manner in which they are describing this to you and how it makes you feel as you envision the scenario. In the space below, please write about: (a) the routine that your friend is describing, (b) how your friend sounds and appears as they are telling you this, and (c) how it makes you feel to think about your friend telling you this. Please write in as much detail as possible, using a minimum of 200 characters.

--- Page break for participants ---

Now, please *imagine that you hung out with your friend a few days ago but since that time you and your friend haven't been chatting or texting as much as you normally would. You wonder whether your friend may be upset about something. When you look at your phone today, you see that your friend has sent you a message asking if you are available to come over to chat this evening. (It is hard to decipher the tone of their message.)*