

The Association of High Social Anxiety and Perceived Responsiveness with Self-Disclosure

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A Thesis Submitted to the Faculty of Graduate Studies
In Partial Fulfillment of the Requirement for the Degree of

MASTER OF ARTS

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ABSTRACT

Friendships of individuals high in social anxiety are characterized by low intimacy and closeness (Weisman et al., 2011). Past research suggests that these impairments may be due to the low levels of self-disclosure associated with high social anxiety, however the mechanism behind this behavior has not been studied (e.g. Cuming & Rapee, 2010). Cognitive models of social anxiety posit that social anxiety is developed and maintained through cognitive distortions (Clark, 2001). Low perceived responsiveness during social interactions might be a cognitive distortion leading to reduced levels of self-disclosure for individuals high in social anxiety. The present study's objective was to test the role of perceived responsiveness in the relationship between social anxiety and self-disclosure. Two hundred and twenty-two undergraduate students were recruited to fill out an on-line survey. Participants completed a measure of social anxiety. Following this, participants identified a close friend and answered questions about this close friend including perceived responsiveness and self-disclosure in this relationship. Participants completed the same procedure for an identified acquaintance. Reduced perceived responsiveness was found to mediate the relationship between high social anxiety and low self-disclosure for close friendships, but not for relationships with acquaintances. As self-disclosure contributes to intimacy in friendships, it was important to identify and test this pathway. Findings suggest the importance of perceived responsiveness in the close friendships of individuals with high social anxiety, and have implications for the treatment of social anxiety.

Keywords: social anxiety, perceived responsiveness, self-disclosure, friendship

ACKNOWLEDGEMENTS

I would like to begin by expressing my gratitude to my supervisor, Dr. John Walker. His warmth, encouragement and guidance provided me with the courage and confidence to pursue my academic and research goals. I would like to thank Dr. Marian Morry for her invaluable mentorship over the last few years. I am grateful for all of the opportunities that she provided for me, and her role in my development as a researcher. I wish to thank Dr. Patricia Furer for her feedback during the development, design, and defense of my thesis. Her insight and knowledge were especially important in the application of this research to clinical settings.

I would like to thank my mom, dad, and big brother, Sean, for their unwavering support over my academic career. I am especially indebted for the shuttling of countless home-cooked meals during the writing of my thesis. To Tristan, thank you for being my number one fan in all things, and for knowing that tea always tastes better when someone else makes it for you. A special thank you to Peeps, for keeping my lap warm during many long nights of data analysis.

In conclusion, I recognize that this research would not have been possible without the financial support of the Social Sciences and Humanities Research Council (SSHRC), and the Dr. Richard Douglas Oatway Memorial Fellowship.

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The Role of High Social Anxiety and Perceived Responsiveness on Self-Disclosure

Anna is a first year university student. She has been feeling overwhelmed. She has been trying to manage her busy schedule of classes and part-time work. Her boss at Starbucks has been scheduling her for all the early morning shifts and her car recently broke down, so she's had to bus to school straight from work. She has been struggling to keep up with her required science course, and failed the first test after spending a week studying for it. To make matters worse, Anna and her boyfriend had a big argument, and decided to take a break from their relationship. Anna meets up with her best friend Beth in hopes of finding some social support. Anna starts off by telling Beth about her endless early morning shifts. Beth responds, "Anna, your boss sounds like such a nightmare, I'm so sorry." Does Anna go on to tell Beth more about her troubles, like her failed test or relationship troubles? Or, does Anna avoid further disclosures by changing the topic to something more superficial, such as her and Beth's favorite television show? While this decision is influenced by Anna's level of social anxiety, it may also depend on how Anna interpreted Beth's level of responsiveness.

Social Anxiety

Social anxiety is characterized by intense fear and worries about being negatively evaluated by others in social situations (*DSM-5*, American Psychiatric Association, 2013). While all individuals at some point experience social anxiety, for example, worries about not being perceived as intelligent and capable when giving an oral presentation to an audience of peers, other individuals experience chronic high levels of social anxiety. For these individuals there may be one or more feared social situations that trigger high, sometimes debilitating anxiety. These feared situations are perceived as being likely to result in embarrassment, humiliation, negative appraisal, or rejection. Feared situations can range from oral presentations, parties,

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dates, or face-to-face conversations. Individuals with high social anxiety may avoid these feared situations or endure these situations with distress.

Friendship Impairments. As a consequence of this fear and difficulty enduring social situations, high levels of social anxiety have a negative impact on relationships. One type of relationship that is negatively impacted by social anxiety is friendship. Social anxiety is associated with both global and specific friendship impairment (Rodebaugh, 2009; Rodebaugh et al. 2014). Individuals with high social anxiety are more likely to report having no close friends, reduced contact with friends and experience lower friendship satisfaction and social support in friendships that are maintained (Chou, Liang, & Sareen, 2011; Bech & Angst, 1996; Falk, Dahl, & Dahl, 2010; Rodebaugh, 2009; Rodebaugh, Fernandez, & Levinson, 2012; Schneier et al., 1994, Torgrud et al., 2004; Whisman, Sheldon, & Goering, 2000). Friendships of individuals with high social anxiety are characterized by low perceived intimacy and closeness (Weisman, Aderka, Marom, Hermesh, & Gilboa-Schechtman, 2011). While psychological distress in general is associated with relational difficulties, social anxiety disorder is related to friendship impairments over and above other mental disorders (Chou, Liang, & Sareen, 2011; Rodebaugh, 2009; Rodebaugh, et al., 2012). As poor friendship quality is linked to many negative outcomes such as earlier mortality, and the mere presence of friends can make difficult life situations feel more bearable, understanding the mechanism underlying impaired friendships of individuals with high social anxiety is especially important (Giles, Glonek, Luszcz, & Andrews, 2005; Kroenke, Kubzansky, Schernhammer, Holmes, & Kawachi, 2006; Schnall, Harber, Stefanucci, & Proffitt, 2008; Steptoe, Shankar, Demakakos, & Wardle, 2013).

It has been proposed that the way that socially anxious individuals behave in social situations contributes to relational impairments (e.g., Arkin, Lake, & Baumgardner, 1986; Clark,

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2001; Rapee & Heimberg, 1997). For example, individuals with high social anxiety tend to make less eye contact and engage in more conversational silences during interpersonal interactions (Horley, Williams, Gonsalvez, & Gordon, 2003; Voncken & Bögels, 2008). There is a body of research examining the relationship between social anxiety and self-disclosure suggesting that it may play a role in friendship impairment.

Self-Disclosure

Self-disclosure is the process through which an individual reveals personal information to another individual. Through self-disclosure, individuals can move from strangers to acquaintances to close friends (Kashdan et al., 2013; Kashdan, McKnight, Fincham, & Rose, 2011). When individuals engage in reciprocal self-disclosure, they develop trust, liking, closeness, and intimacy, all necessary aspects of close friendship (Derlega, Winstead, & Greene, 2008; Laurenceau, Barrett, & Pietromonaco, 1998; Reis & Shaver, 1988; Sprecher, Felmlee, Metts, & Cupach, 2015; Sprecher, Treger, Wondra, Hilaire, & Wallpe, 2013).

Reduced Self-Disclosure. Research indicates that high social anxiety is related to low levels of self-disclosure. These studies have reported that individuals with high social anxiety tend to disclose less personal information when interacting with others, even in close relationships (e.g., Cuming & Rapee, 2010; Farmer & Kashdan, 2012; Gee, Antony, Koerner & Aiken, 2012; Sparrevohn & Rapee, 2009; Voncken, Alden, Bögels, & Roelofs, 2008).

A study by Meleshko and Alden (1993) used a sample of 84 undergraduate participants categorized as either high or low in social anxiety. Participants were paired with a confederate that they believed was another participant. The researcher instructed participants that they would be engaging in a discussion task in which they would choose a topic, and discuss it with the listening partner. Then partners would switch roles. The confederates either engaged in a high

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self-disclosure or low self-disclosure condition in which they delivered scripted discussion. Regardless of the self-disclosure level of the confederate, participants high in social anxiety disclosed at a low level and were rated as less likeable compared to participants low in social anxiety.

Reduced self-disclosure may account for some of the friendship impairments experienced by individuals with high social anxiety. Studies on self-disclosure found that conversational partners of individuals with high social anxiety viewed their interactions less positively, and were less likely to desire future interactions (Heerey & Kring, 2007; Meleshko & Alden, 1993). A study by Voncken and Dijk (2013) used unstructured and structured social interactions to study reduced likability of individuals with high social anxiety. Conversational partners rated individuals with high social anxiety as less likable compared to participants low in social anxiety. Furthermore, reduced self-disclosure was the strongest predictor for this effect. While there is a bulk of literature that states that individuals with high social anxiety tend to exhibit reduced self-disclosure, the process behind this reduced self-disclosure is less clear. Cognitive theorists have suggested that distorted cognitions may play a role in this process.

Cognitive Model of Social Anxiety

The cognitive model of social anxiety posits that distorted cognitions play a role in the development and maintenance of social anxiety (Clark & Wells, 1995). When confronted with feared situations, such as interpersonal interactions, expectations about others and self are activated. These expectations work as a sort of cognitive map that individuals use to navigate the feared social situation. For individuals with high social anxiety, these expectations include negative views of the self and expectations that others will pick up on personal flaws, leading to social rejection (Baldwin & Main, 2001; Clark, 2001; Leary, 2007; Moscovitch, 2009; Taylor &

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Alden, 2005). These expectations then bias perception of the social interaction, leading individuals with high social anxiety to pick up on confirming information, and ignore disconfirming information in the social interaction (Bogels, & Mansell, 2004; Clark, 2001). External social information that is processed by individuals high in social anxiety tends to be distorted.

Cognitive Distortions. Many studies have reported that individuals with high social anxiety are more likely to attend to negative social cues and ignore positive social cues (e.g. Huppert, Foa, Furr, Filip, & Mathews, 2003; Spokas, Rodebaugh, & Heimberg, 2008; Veljaca, & Rapee, 1998). Additionally, individuals high in social anxiety often make negative interpretations of social situations. A study by Voncken and colleagues (2003) presented social and non-social scenarios to participants. Participants could choose negative or positive interpretations of these scenarios. Individuals high in social anxiety were more likely to choose negative interpretations for social events, and this tendency was unique to social scenarios. Further research has found that individuals high in social anxiety were unable to discriminate between negative and neutral conversational partners, and interpreted positive facial expressions as less approachable (Campbell et al., 2009; Taylor & Alden, 2005). These studies suggest that individuals high in social anxiety have distorted perceptions of social situations. One particular cognitive distortion that may play a role in self-disclosure is reduced perceived responsiveness.

Perceived Responsiveness

Perceived responsiveness is the perception that one's conversational partner is caring, understanding, and validating (Reis, Clark, & Holmes, 2004). Perceived responsiveness is associated with many of the same constructs as self-disclosure, including closeness and intimacy, and is also associated with the discloser's subjective well-being and positive affect (Berg &

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Archer, 1982; Collins & Feeney, 2000; Cutrona, Shaffer, Wesner, & Gardner, 2007; Davis, 1982; Laurenceau et al., 1998; Lemay, Clark, & Feeney, 2007; Lun, Kesebir, & Oishi, 2008; Oishi, Koo, & Akimoto, 2008; Reis, et al. 2000).

Interpersonal Process Model of Intimacy. Perceived responsiveness has been conceptualized as part of the same process as self-disclosure, the interpersonal process model of intimacy (Reis & Shaver, 1988). This is a transactional model that aims to explain the process through which close relationships, like friendships, develop. The model states that self-disclosure, or the choice to self-disclose, is influenced by perceived responsiveness. More specifically, Person A enters into an interaction with B with certain expectations and predictions about Person B and the social interaction. Person A discloses to Person B, and B responds. Person A then evaluates this response. If A evaluates the response as caring, understanding, and validating A may expect that B will continue to be responsive, and will continue to self-disclose. Research on perceived responsiveness has found that self-disclosing to a partner perceived as responsive led to a more enjoyable interaction for the discloser, and a greater willingness to disclose in the future (Reis et al., 2010).

Perceived responsiveness may be influenced by the cognitive distortions experienced by individuals with high social anxiety. As individuals high in social anxiety enter the social interaction expecting rejection, they may ignore cues that indicate responsiveness, instead attending to cues indicating low responsiveness. This may result in the perception that person B has been unresponsive during the interaction. Perceptions of unresponsiveness signal to person A that she should protect herself, which may result in lowered self-disclosure (Clark & Monin, 2006; Murray, Bellavia, Rose, & Griffin, 2003; Murray, Rose, Bellavia, Holmes, & Kusche, 2002).

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In fact, when individuals with high social anxiety expect a conversational partner to be accepting, they display an equal level of self-disclosure compared to individuals low in social anxiety (Alden & Bieling, 1998). When individuals with high social anxiety self-disclosed at the same level as individuals low in social anxiety, they were rated to be equally likeable compared with individuals low in social anxiety (Alden & Bieling, 1998). Thus, perceived responsiveness seems to play a mediating role in the relationship between social anxiety and self-disclosure.

The Current Study

The current literature on social anxiety and friendship has identified self-disclosure, perceived responsiveness, and the interpersonal process model of intimacy as areas requiring further research (Alden, Auyeung, & Plascencia, 2014; Heimberg, Brozovich, & Rapee, 2014). While past research has identified friendship impairments for individuals high in social anxiety, and has posited that this may be partly due to reduced self-disclosure, the mechanism behind reduced self-disclosure has not been explored. This study aimed to address this issue by testing perceived responsiveness as a mediator between high social anxiety and reduced self-disclosure in friendships. Additionally, the study examined how these variables were related to friendship intimacy as an indicator of the impact of this process on friendship quality.

University Population

The current study used a sample of university students. During this period of life, friendships are especially important, as friends surpass parents as the primary source of social support (e.g., Aisenson et al., 2007; Stice, Ragan, & Randall, 2004). The transition from high school to university can place close friendships at risk of reduced quality or dissolution (Oswald & Clark, 2003). While the structure of high school supports friendships, university often signals a divergence of close friends in terms of different schedules, new friend groups, and part-time

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jobs. High levels of social anxiety may only add to the difficulty in maintaining these important relationships. High rates of social anxiety have been reported in first year university students (Purdon, Antony, Monteiro, & Swinson, 2001; Stewart & Mandrusiak, 2007). Undergraduate students with high social anxiety have been found to engage in reduced self-disclosure (Farmer & Kashdan, 2012; Gee et al., 2012; Spokas, Luterek, & Heimberg, 2009). As reduced self-disclosure is deleterious to friendships, and the transition to university already poses a risk to friendships, this in a valuable population to examine for this study (Buote et al., 2007).

Close Friends and Acquaintances

There are different types of friendships, which vary in levels of intimacy. Close friendships are characterized by close interpersonal ties and voluntary relationships in which each seeks out the other, and is concerned with the other's well-being (Clark & Mills, 1979). Acquaintances are characterized by limited familiarity, casual encounters, and relationships that may be related to convenience (e.g., work-related acquaintances, Jehn & Shah, 1997). The interpersonal process model of intimacy states that dyads move from acquaintances to close friends through continued transactions of increasingly intimate self-disclosures. This model has been supported by past research that found that individuals were more able to openly express emotions in front of a close friend compared to an acquaintance (Lippert & Prager, 2001). As close friendships develop and are maintained through a higher level of self-disclosure than acquaintance relationships, it is possible that reduced self-disclosure may have a different impact on these two types of friendships. For example, superficial disclosures such as opinions on television shows may be sufficient to maintain an acquaintance relationship, but not to maintain a close friendship. As suggested by previous research on friendships, this research included an examination of both close friends and acquaintances to more clearly understand the friendships

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of individuals high in social anxiety (e.g., Davila & Beck, 2002; Lambert & Hopwood, 2016; Overup, Brunson, & Acitelli, 2015).

Gender

The current study also considered the association of gender differences in friendship and self-disclosure. Traditional views of gender and friendship suggest, “talk is the substance of women’s friendship” (Johnson & Aries, 1983, p. 354). Indeed, research confirms that women tend to engage in higher levels of self-disclosure in close relationships than men (Derlega et al., 2008; Fehr, 2004; Reis, Senchak, & Solomon, 1985; Shaffer & Ogden, 1986; Sparrevohn & Rapee, 2009). Men also engage in higher levels of emotional distancing compared to women (Blazina, Eddings, Burrige, & Settle, 2007). These differences in expression have been attributed to differing societal expectations for women and men. Women are socialized to be more attentive to social cues and are expected to engage in higher levels of self-disclosure than men (Collins & Miller, 1994; Langer, 2010). Perhaps as a result of higher self-disclosure, women tend to form stronger bonds with others and view their friendships as more intimate than men (Lee & Robbins, 2000). Gender may also play a role in social anxiety’s effect on self-disclosure. Cuming and Rapee (2010) used a community sample in a survey examining social anxiety and close relationships. They found that social anxiety was associated with low self-disclosure in close friendships for women, but not for men. While the research on gender differences in self-disclosure and friendships is limited, it is important to consider gender when analyzing results.

Primary Outcomes

Hypothesis 1: High social anxiety is associated with low self-disclosure.

Hypothesis 2: High social anxiety is associated with low perceived responsiveness.

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Hypothesis 3: High social anxiety is associated with low intimacy.

Hypothesis 4: Low self-disclosure is associated with low intimacy.

Hypothesis 5: Low perceived responsiveness is associated with low self-disclosure.

Hypothesis 6: Low perceived responsiveness is associated with low intimacy.

Hypothesis 7: Perceived responsiveness mediates the relationship between high social anxiety and low self-disclosure.

Secondary Outcomes

I did not include specific hypotheses about gender or differences between close friends and acquaintances, though I did explore these factors in secondary analyses. Additionally, I assessed measures not related to the primary outcomes. These measures include ability to elicit self-disclosure, satisfaction, and interconnectedness. These measures were used to further explore how social anxiety affects different aspects of friendships, and how social anxiety is related to the interpersonal process model of intimacy and self-disclosure.

Method

Participants

Sample Size. I used multiple guidelines for the determination of sample size. For multiple regression models such as the simple mediation tested for this study, the $N:q$ guideline is recommended (Jackson, 2003). This rule states that for each parameter in the study, 20 participants are necessary for sufficient power. The mediation model proposed in this research featuring perceived responsiveness as the mediator between social anxiety and self-disclosure includes three parameters. Thus a minimum recommended sample size of $n = 60$. As I proposed that gender could play a role in this model, two more parameters would be added in a moderated mediation, thus a recommended minimum sample size of $n = 100$.

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In order to obtain a second recommendation for sample size, I conducted a G*Power analysis (Faul, Erdfelder, Lang, & Buchner, 2007). Past research on social anxiety and self-disclosure found small ($r = -.18$; Cuming, Rapee, 2010) to medium ($F = 18.32, p < .001, \eta_p^2 = .153$, Sparrevohn & Rapee, 2009) effect sizes. The G*power analysis of a small effect size (Cohen's $f^2 = .01, a = .05$ and power .80) for the mediation model suggested a sample size of $n = 100$, and with a third predictor of gender, a sample size of $n = 114$.

Based on a review of median sample sizes in SEM models, I increased the minimum sample size to $n = 200$ (Kline, 2015; Fritz & MacKinnon, 2007). The sample size was increased further because I planned to exclude participants who failed the attentional measure included in the study.

Recruitment. Participants ($n = 276$) were recruited from the University of Manitoba student population through an on-line research credit system (SONA). In exchange for participation in the study, participants were awarded research credits used towards fulfillment of the introductory psychology research requirements. Recruitment enrolled even numbers of males and females.

Exclusions. Fifty-four participants who did not attain a passing score on the attentional measure were excluded from data analysis. This resulted in a sample of $n = 222$ participants.

Procedure

Once participants were recruited, they followed a link to the on-line survey, hosted through SurveyGizmo and reviewed the consent form (Appendix A). The consent form explained the study procedure, and provided contact information should participants have any questions before proceeding with the study. Participants clicked a checkbox if they consented to

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proceed, or clicked a different checkbox to leave the survey. Regardless of full completion of the survey, all participants received research credits.

Following the consent process, participants completed a series of self-report questionnaires. Participants completed a measure of social anxiety (Appendix C). Participants then completed questions that were organized in two different parts. The first part asked participants to identify their closest friend. This was qualified by instructions that this closest friend should not be a romantic partner or close family member (Appendix B). Participants were asked to type in this close friend's name or initials which was piped into subsequent questions assessing perceived responsiveness, self-disclosure, intimacy, ability to elicit self-disclosure, satisfaction, interconnectedness, and social contact with this close friend (Appendix B-J). The second part asked participants to identify an acquaintance that they felt warmly towards. This was qualified by instructions that this acquaintance should not be a romantic partner or close family member (Appendix K). Participants entered this person's name or initials which was then piped into questions assessing perceived responsiveness, self-disclosure, intimacy, ability to elicit self-disclosure, and social contact (Appendix D-G, J). After completing questions relating to the relationship with the identified acquaintance, participants completed demographic questions, followed by an attentional measure (Appendix L, M).

Upon completion of the survey, participants read an on-line debriefing form that explained the purpose of the study, and again provided contact information should they have any questions or concerns (Appendix N). As discussing friendships and anxiety may cause some psychological discomfort, the form included on-campus and other local resources for crisis and counseling. Completion of the survey took approximately 30 minutes.

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Measures

Demographics. Participants reported gender, ethnicity, and age and responded to other demographic questions (Appendix L). Gender was used as a factor in secondary analyses and other demographic questions were used to describe the sample.

Social Anxiety. Level of social anxiety was measured using the Social Interaction Performance Scale (SIPS; Carleton et al., 2009; Appendix C). This 14-item measure assessed three aspects of social anxiety: fear of overt evaluation, fear of attracting attention, and fear of social interaction. The third subscale, fear of social interaction (e.g., “I find myself worrying that I won’t know what to say in social situations”) was used to assess social anxiety for this study. Participants were asked to indicate their level of agreement with a series of statements using a 5-point Likert scale (0 = *not at all characteristic or true of me.*; 4 = *extremely characteristic or true of me*). The social interaction subscale was found to have a high level of internal consistency in past research (Cronbach’s $a = .85-.88$; Carleton et al., 2014), and in this study (Cronbach’s $a = .92$).

Perceived Responsiveness. Perceived responsiveness was measured using Maisel and Gable’s (2009) adaptation of Reis’s (2003) responsiveness measure (Appendix D). This 3-item measure asked participants to indicate their level of agreement with a series of statements. These statements and instructions were adapted to reflect perceived responsiveness of a friend (e.g., “--- understands me”). Participants responded to these questions using a 5-point Likert scale (1= *not at all true*; 5 = *completely true*). This measure of perceived responsiveness was found to have a high level of internal consistency in past research (Cronbach’s $a = .91$; Maisel & Gable, 2009), and in this study (close friend analysis, (close friend analysis, Cronbach’s $a = .83$; acquaintance analysis, Cronbach’s $a = .85$).

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Self-Disclosure. Self-disclosure was measured using the Self-Disclosure Index (SDI, Miller, Berg, & Archer, 1983; Appendix E). This 10-item measure asked participants to indicate how much they discuss different topics relating to the self with a friend (e.g., “With ---, I discuss my deepest feelings”). Participants responded to these questions using a 4-point Likert scale (1 = *discuss not at all*; 4 = *discuss fully and completely*). The SDI was found to have a high level of internal consistency in past research (Cronbach’s $a = .86 - .93$; Miller et al., 1983), and in this study (close friend analysis, Cronbach’s $a = .89$; acquaintance analysis, Cronbach’s $a = .93$).

Intimacy. Intimacy was measured using the Sternberg Intimacy Scale (SIS; Sternberg, 1988; Appendix F). This 15-item measure asked participants to indicate their level of agreement a series of statements (e.g. “I am able to count on ---. In times of need.”; “I feel close to ---”). Participants responded to these statements using a 9-point Likert scale (1 = *not at all*; 9 = *extremely*). The SIS was found to have a high level of internal consistency in past research (Cronbach’s $a = .95$; Rodebaugh et al., 2014), and in this study (close friend analysis, Cronbach’s $a = .95$; acquaintance analysis, Cronbach’s $a = .97$).

Ability to Elicit Self-Disclosure. Participants’ ability to elicit self-disclosure from others was measured using the Opener Scale (Miller et al., 1983; Appendix G). This 10-item measure asked participants to indicate their level of agreement with a series of statements (e.g., “--- frequently tell me about himself/herself”). Participants responded to these questions using a 5-point Likert scale (1 = *strongly agree*; 5 = *strongly disagree*). I reverse coded the items for ease of interpretation. The Opener Scale was found to have a high level of internal consistency in past research (Cronbach’s $a = .79$; Miller et al., 1983), and in this study (close friend analysis, Cronbach’s $a = .92$; acquaintance analysis, Cronbach’s $a = .86$).

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Satisfaction. Friendship satisfaction was measured using Hendrick's Relational Assessment Scale (RAS; Hendrick, 1988; Appendix H). This 7-item measure asked participants questions related to satisfaction (e.g. "How well does --- meet your needs?"), and participants responded using a 7-point Likert scale. The Likert scale labels are specific to each question (e.g. 1 = *not well*; 7 = *very well*). The RAS was found to have a high level of internal consistency in past research (Cronbach's $a = .86$; Hendrick, 1988), and in this study (close friend analysis, Cronbach's $a = .76$).

Interconnectedness. Friendship interconnectedness was measured using the Inclusion of Other in Self Scale (IOS; Aron, Aron, & Smollan, 1992; Appendix I). This is a single pictorial item measure that assesses the degree of interpersonal interconnectedness between the participant and the identified friend. Participants viewed a set of images of two circles that increase in degree to which they overlap, and chose which image best represents the interconnectedness in the friendship. In past research, the IOS was found to have good test-retest reliability, convergent and divergent validity (Aron et al., 1992). As this is a one-item measure, internal consistency is not computed.

Social Contact. Although not analyzed in this paper, questions pertaining to frequency and type of contact with friends were adapted from Statistics Canada General Social Survey (Appendix J). These questions assessed participant's number of friends, frequency of contact with friends, type of communication with friends, and satisfaction of contact.

Attentional Measure. An attentional measure was created for this study adapted from measures created by Dr. Jessica Cameron (personal communication, March 18, 2017, Appendix M). A National Geographic article about whales was presented to participants to read. Following this, participants were asked five true or false questions based on this reading. It was pre-

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determined that should participants fail to answer at least 3 questions correctly that their data would not be included in analyses.

Data Analysis

Data Preparation

Outlier data greater than or lower than 3 standard deviations from the mean were Winsorized. This process involved replacing the outlier scores with the most extreme non-outlier score present in the data (Wilcox, 2014). This transformation was performed on outlier data in perceived responsiveness (close friend analysis, 4 participants), self-disclosure (close friend analysis, 45 participants), intimacy (close friend analysis, 3 participants), ability to elicit self-disclosure (close friend analysis, 9 participants; acquaintance analysis, 4 participants), and satisfaction (close friend analysis, 5 participants). The other data did not contain outliers.

Cook's distance, which assesses the influence of outliers on variables used in regression analyses, was examined for the raw data variables used in the proposed mediation model (Cook, 1977). These variables included social anxiety, perceived responsiveness, and self-disclosure.

All Cook's distance indices were $D_i < .15$. As these indices were below $D_i < 1$, this indicated that any outliers in the raw data would not have a strong influence on regression analyses.

Furthermore, *PROCESS* (Darlington & Hayes, 2016), has been found not to be susceptible to outliers, even in small sample mediations (Creedon & Hayes, 2015), thus I decided that using raw data would be most appropriate for mediation analyses. Raw data was also used for moderation and moderated mediation, which used the same variables as the mediation analysis with the addition of gender. Transformed data was used for all other analyses.

Data skewness and kurtosis were assessed for the transformed data (Winsorization), as well as the raw data used in the mediation analysis. Skewness measures the symmetry of the data

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distribution, kurtosis measures the degree to which scores cluster in the tail ends of a distribution, and together these measures assess normality of data distribution (Field, 2013). Skewness and kurtosis were assessed using visual inspection of q-q plots and further inspection of indices greater or smaller than 2 (Field, 2013; Gravetter & Wallnau, 2014; Trochim & Donnelly, 2006). When data skewness or kurtosis values are +/- 2 it indicates a violation of normal distribution. The indices for all variables ranged from (.01 - 1.31), which meets the assumption of normal distribution of data.

Multicollinearity between the two predictors in the mediation model (social anxiety and perceived responsiveness) was assessed using the variance inflation factor (*VIF*). The *VIF* assess whether the predictor has a strong linear relationship with the other predictor, or in this case, the mediator (Field, 2013). Strong linear relationships between predictors may bias regression models. *VIF* values greater than 10 have been cited as indications of multicollinearity (Cohen, Cohen, West, & Aiken, 2003; Myers, 1990). The *VIF* = 1 for both the friend and acquaintance analyses, thus the assumption of no multicollinearity was not violated.

Data Analytic Approach

Bivariate associations were assessed using Pearson's correlation coefficients (*r*). Correlations were assessed through significance testing with the p-value of .05. Davis (1971) guidelines were used to interpret the magnitude of the correlations. Correlations of $r = .01 - .09$ were considered negligible, $r = .10 - .29$ were considered low associations, $r = .30 - .49$ were considered moderate associations, $r = .50 - .69$ were considered substantial associations, and $r = .70$ and higher were considered very strong associations.

Mediation analyses were assessed using *PROCESS* macro for SPSS (Darlington & Hayes, 2016). *PROCESS* (Darlington & Hayes, 2016) tests the indirect effect of the predictor on

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the outcome through the mediator. The indirect effect was tested using bootstrapping with 10,000 resamples. The bootstrapping results were reviewed using confidence intervals, and if 0 was not contained within the given confidence intervals, mediation was supported. Other statistical outcomes of mediation testing were also obtained using *PROCESS* (Darlington & Hayes, 2016) including the direct effect of the predictor on the outcome, the effect of the predictor on the mediator and the effect of the mediator on the outcome. These statistics were assessed using unstandardized betas, and significance testing using a p-value of .05. The effect size of the mediation was assessed using R^2 , and was interpreted using Cohen's guidelines (1988). $R^2 = .01$ was considered a small effect size, $R^2 = .13$ was considered a medium effect size, and $R^2 = .26$ was considered a large effect size. *PROCESS* macro (version 3, Darlington & Hayes, 2016) was also used to conduct moderation and a moderated mediation analyses. These tests also used regressions to test the models, as well as bootstrapping to analyze results.

In order to explore gender differences on friendship measures, mixed ANOVAs were performed for all variables that were used in both the close friend and acquaintance analyses. To assess gender differences in satisfaction and interconnectedness, which were only assessed for the close friend analysis, independent samples t-tests were performed. Both the F-statistic used in the mixed ANOVA and the t-statistic used in the independent samples t-tests were assessed through significance testing with the p-value of .05. The ANOVA analyses use η_p^2 for effect sizes, $\eta_p^2 = .01$ is considered a small effect, 0.06 is considered a moderate effect and .14 is considered a large effect. The independent t-tests use Cohen's d for effect sizes, $d = .20$ is considered a small effect, $d = .50$ is considered a moderate effect and $d = .80$ is considered a large effect (Cohen, 1988). Statistical Package for the Social Sciences (SPSS, version 24, IBM) was used for all of the data analyses.

Results

Demographics. Participant demographic characteristics are presented in Table 1. There was a close balance in terms of participants' identified gender ($n = 111$ males, $n = 110$ females, $n = 1$ other). Age of participants ranged from 17 to 40 with a mean age of 20 years of age ($SD = 3.46$). The majority of participants reported their ethnicity as European (49 %, $n = 109$), were born in Canada (68 %, $n = 150$), and identified English as their first language (69 %, $n = 153$). Most participants were full-time students (74 %, $n = 164$).

Table 1. Demographic Characteristics of Participants

Characteristic	Demographic	<i>n</i>	Proportion
Ethnicity	European	109	49 %
	Pacific Islands	28	13 %
	East Asian	16	7 %
	African	11	5 %
	Middle Eastern	10	5 %
	Indigenous	7	3 %
	Caribbean	4	2 %
	Hispanic-American	3	1 %
	African-American	2	1 %
	Latin	1	0.5 %
	Other/missing	31	14 %
Country of birth	Canada	150	68 %
	Other	72	32 %
First Language	English	153	69 %
	Other	69	31 %
Student Status	Full-time	164	74 %
	Part-time	58	26 %
Employment	Full-time	14	6 %
	Part-time	86	39 %

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Descriptive Statistics

Descriptive statistics, including mean, standard deviation, minimum and maximum values for all variables were assessed and are presented in Table 2. Internal consistencies are also reported in this table.

Table 2. Descriptive Statistics

Variable	Friend Type	Mean	SD	Min	Max	<i>a</i>
Social Anxiety		2.27	1.04	1	5	.92
Perceived Responsiveness	Close Friend	4.47	.63	1.67	5	.83
	Acquaintance	3.31	.93	1	5	.85
Self-Disclosure	Close Friend	3.46	.56	1.3	4	.89
	Acquaintance	2.09	.75	1	4	.93
Intimacy	Close Friend	8.05	1.00	4.73	9	.95
	Acquaintance	5.16	1.87	1	9	.97
Ability to Elicit Self-Disclosure	Close Friend	4.21	.76	1	5	.92
	Acquaintance	3.55	.64	1	5	.86
Satisfaction	Close Friend	6.22	.72	3	7	.76
Interconnectedness	Close Friend	5.07	1.32	1	7	-

n = 222

Primary Analyses

Results for hypotheses 1-6 can be seen in Tables 3 and 4. The mediation analyses for hypothesis 7 can be seen in Figures 1 and 2.

Hypothesis 1. Social anxiety was not significantly associated with self-disclosure in the close friend or acquaintance analyses (close friend, $r(212) = -.10, p = .14$; acquaintance $r(212) = -.04, p = .57$).

Hypothesis 2. Social anxiety was negatively associated with perceived responsiveness in the close friend analysis ($r(214) = -.18, p = .009$). Higher social anxiety was associated with lower perceived responsiveness in close friendships, however this was a low magnitude association. The acquaintance analysis did not reach significance ($r(212) = .07, p = .31$).

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Hypothesis 3. Social anxiety was negatively associated with intimacy in the close friend analysis ($r(208) = -.19, p = .007$). Higher social anxiety was associated with lower intimacy in close friendships, however this was a low magnitude association. The acquaintance analysis did not reach significance ($r(211) = .02, p = .77$).

Hypothesis 4. Self-disclosure was positively associated with intimacy for both the close friend and acquaintance analyses (close friend, $r(209) = .62, p < .001$; acquaintance $r(210) = .68, p < .001$). Lower self-disclosure was associated with lowered intimacy in relationships with close friends and acquaintances, and these were both substantial associations.

Hypothesis 5. Perceived responsiveness was positively associated with self-disclosure for both the close friend and acquaintance analyses (close friend, $r(213) = .54, p < .001$; acquaintance $r(212) = .59, p < .001$). Higher perceived responsiveness was associated with higher levels of self-disclosure in both close friendships and acquaintances, and these were both substantial associations.

Hypothesis 6. Perceived responsiveness was positively associated with intimacy for both the close friend and acquaintance analyses, (close friend, $r(210) = .69, p < .001$; acquaintance $r(211) = .75, p < .001$). Higher perceived responsiveness was associated with higher levels of intimacy in both close friends and acquaintances. The close friend analysis was a very strong association, and the acquaintance analysis was a substantial association.

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Table 3. Correlations Among Measures – Close Friend Analyses

	S.A.	P.R.	S.D.	Int.	Ab.	Sat.	Inter.
Social Anxiety	-						
Perceived Responsiveness	-.18**	-					
Self-Disclosure	-.10	.54**	-				
Intimacy	-.19*	.69**	.62**	-			
Ability to Elicit Self-Disclosure	-.14*	.43**	.45**	.60**	-		
Satisfaction	-.17*	.47**	.39**	.70**	.52**	-	
Interconnectedness	-.03	.28**	.40**	.49**	.36**	.40**	-

* $p < .05$; ** $p < .01$

Table 4. Correlations Among Measures – Acquaintance Analyses

	S.A.	P.R.	S.D.	Int.	Ab.
Social Anxiety	-				
Perceived Responsiveness	.07	-			
Self-Disclosure	-.04	.59**	-		
Intimacy	.02	.75**	.68**	-	
Ability to Elicit Self-Disclosure	-.03	.57**	.44**	.62**	-

* $p < .05$; ** $p < .01$

Hypothesis 7

Close Friend Analysis. Results for the mediation analysis are presented in Figure 1. When testing the mediation model for the close friend analysis, social anxiety was not significantly associated with self-disclosure ($b = -.01, p = .79$), and this was consistent with the close friend correlational results from hypothesis 1. Social anxiety was negatively associated with the mediator, perceived responsiveness, with high social anxiety predicting low perceived responsiveness. ($b = -.09, p = .03$), and this was consistent with the close friend correlational results from hypothesis 2. Perceived responsiveness was positively associated with self-disclosure, with high levels of perceived responsiveness predicting high levels of self-disclosure

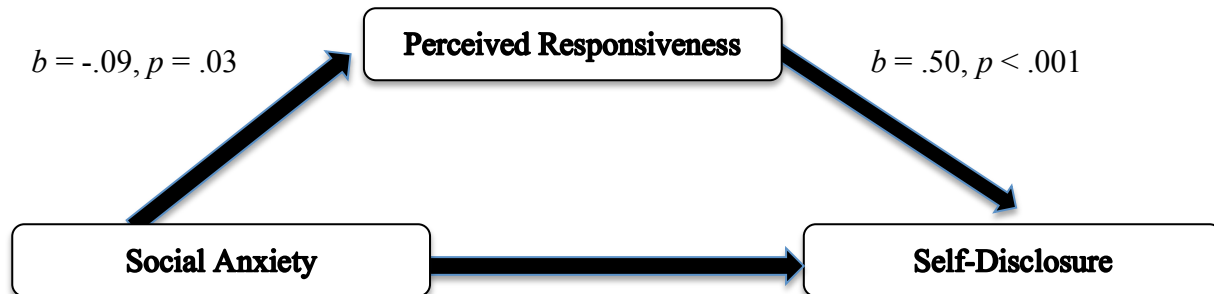
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($b = .50, p < .001$), and this was consistent with the close friend correlational results from hypothesis 5. There was a significant indirect effect of social anxiety on self-disclosure through perceived responsiveness ($b = -.05, 95\% \text{ CI } [-.093, -.008]$). High social anxiety predicted lower perceived responsiveness, which in turn, predicted reduced self-disclosure in close friendships. This significant indirect effect confirms mediation, however this was a relatively small effect ($R^2 = .01$).

Acquaintance Analysis. Results for the mediation analysis are presented in Figure 2. When testing the mediation model for the acquaintance analyses, social anxiety was negatively associated with self-disclosure, with high social anxiety predicting low self-disclosure ($b = -.10, p = .03$). This association was not found in the correlational testing for hypothesis 1, or for the mediation testing for the close friends analysis. Social anxiety was not associated with the mediator, perceived responsiveness ($b = -.01, p = .94$), and this was consistent with the acquaintance correlational results for hypothesis 2. Perceived responsiveness was positively associated with self-disclosure, with high levels of perceived responsiveness predicting high levels of self-disclosure ($b = .35, p < .001$), and this was consistent with the acquaintance correlational results from hypothesis 5. The indirect effect of social anxiety on self-disclosure through perceived responsiveness was not significant ($b = -.003, 95\% \text{ CI } [-.052, .044]$), and this finding differed from the close friend mediation testing which did reach significance for the indirect effect. This finding indicates that mediation did not occur for the acquaintance analysis.

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Figure 1. Indirect Effect of Social Anxiety on Self-disclosure Through Perceived Responsiveness – Close Friend Analyses

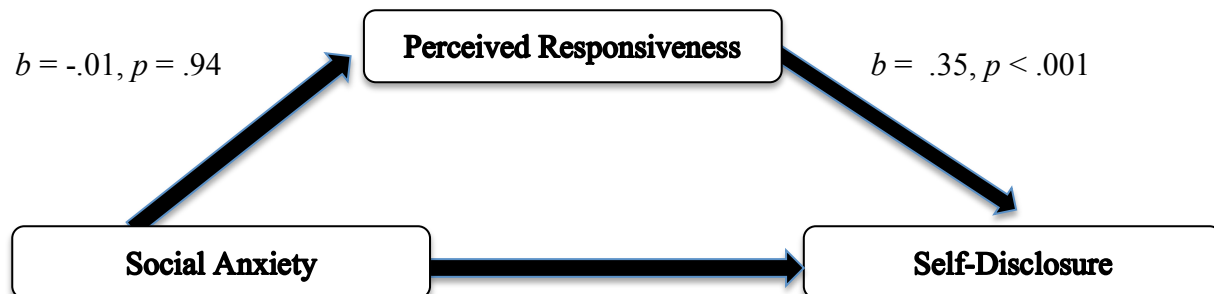


Direct effect, $b = -.01, p = .79$

Indirect effect, $b = -.05, 95\% \text{ CI } [-.093, -.008]$

Note. Unstandardized (b) displayed

Figure 2. Indirect Effect of Social Anxiety on Self-disclosure Through Perceived Responsiveness – Acquaintance Analyses



Direct effect, $b = -.10, p = .03$

Indirect effect, $b = -.003, 95\% \text{ CI } [-.052, .044]$

Note. Unstandardized (b) displayed

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Secondary Analyses

Ability to Elicit Self-Disclosure. Ability to elicit self-disclosure was positively associated with perceived responsiveness (close friend, $r(212) = .43, p < .001$; acquaintance $r(211) = .57, p < .001$), self-disclosure (close friend, $r(212) = .45, p < .001$; acquaintance $r(211) = .44, p < .001$), and intimacy (close friend, $r(209) = .60, p < .001$; acquaintance $r(209) = .62, p < .001$) for both the close friend and acquaintance analyses and these ranged from moderate to substantial associations. Additionally, satisfaction and interconnectedness were tested for the close friend analyses. Ability to elicit self-disclosure was positively associated with both variables and yielded substantial and moderate associations (satisfaction, $r(204) = .52, p < .001$; interconnectedness, $r(208) = .36, p < .001$). In close friendships and relationships with acquaintances the ability to elicit self-disclosure was associated with high perceived responsiveness, self-disclosure, and intimacy as well as high levels of satisfaction and interconnectedness for the close friendships. Ability to elicit self-disclosure was not associated with social anxiety for the close friend or acquaintance analyses (close friend, $r(211) = -.14, p = .05$; acquaintance, $r(211) = -.03, p = .64$).

Satisfaction. Satisfaction was only tested for the close friend analyses. Satisfaction was negatively associated with social anxiety ($r(206) = -.17, p = .01$) and positively associated with perceived responsiveness ($r(206) = .47, p < .001$), self-disclosure ($r(204) = .39, p < .001$), intimacy ($r(202) = .70, p < .001$) and interconnectedness ($r(201) = .40, p < .001$), and these ranged from low to very strong associations. In close friendships, low satisfaction was associated with high social anxiety, low perceived responsiveness, self-disclosure, intimacy, and interconnectedness.

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Interconnectedness. Interconnectedness was only tested for the close friend analyses. Interconnectedness was not significantly associated with social anxiety ($r(210) = -.03, p = .69$). Interconnectedness was positively associated with perceived responsiveness ($r(210) = .28, p < .001$), self-disclosure ($r(209) = .40, p < .001$) and intimacy ($r(205) = .49, p < .001$), and these ranged from low to moderate associations. In close friendships, low interconnectedness was associated with high social anxiety, and low perceived responsiveness, self-disclosure, and intimacy.

Gender Analyses

Results of ANOVA and Independent samples t-tests can be seen in Tables 5 and 6.

Perceived Responsiveness. There was a significant main effect of friend type ($F(1, 212) = 231.93, p < .001, \eta_p^2 = .52$), and this was a large effect size. Contrasts revealed that participants reported significantly higher perceived responsiveness in close friendships compared to relationships with acquaintances ($M_{cf} = 4.49, M_{aq} = 3.33$). There was no main effect of gender ($M_{male} = 3.87, M_{female} = 3.94, F(1, 212) = .79, p = .38, \eta_p^2 = .004$). There was a significant interaction effect between friend type and gender ($F(1, 212) = 4.51, p = .04, \eta_p^2 = .02$), and this was a small to moderate effect size. Pairwise comparisons revealed a significant difference between male and female scores in the relationships with close friends ($M_{male} = 4.38, M_{female} = 4.60, F(1, 212) = 7.78, p = .006, \eta_p^2 = .04$; see Figure 3), and this was a small to moderate effect size. In the close friendships, females reported higher perceived responsiveness than males.

Self-Disclosure. There was a significant main effect of friend type ($F(1, 213) = 780.58, p < .001, \eta_p^2 = .79$), and this was a large effect size. Contrasts revealed that participants reported significantly higher self-disclosure in close friendships compared to self-disclosure in relationships with acquaintances ($M_{cf} = 3.54, M_{aq} = 2.09$). There was no main effect of gender

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($M_{\text{male}} = 2.77$, $M_{\text{female}} = 2.86$, $F(1, 213) = 1.74$, $p = .19$, $\eta_p^2 = .008$). There was a significant interaction effect between friend type and gender ($F(1, 213) = 6.34$, $p = .01$, $\eta_p^2 = .03$), and this was a small to moderate effect size. Pairwise comparisons revealed a significant difference between male and female scores in the relationships with close friends ($M_{\text{male}} = 3.43$, $M_{\text{female}} = 3.64$, $F(1, 213) = 16.20$, $p < .000$, $\eta_p^2 = .07$; see Figure 4), and this was a moderate to large effect size. In the close friendships, females reported higher self-disclosure compared to males.

Intimacy. There was a significant main effect of friend type ($F(1, 208) = 525.35$, $p < .001$, $\eta_p^2 = .72$), and this was a large effect size. Contrasts revealed that participants reported significantly higher intimacy in relationships with close friends compared to relationships with acquaintances ($M_{\text{cf}} = 8.06$, $M_{\text{aq}} = 5.10$). There was no main effect of gender ($M_{\text{male}} = 6.47$, $M_{\text{female}} = 6.67$, $F(1, 208) = 1.70$, $p = .19$, $\eta_p^2 = .008$). There was a significant interaction effect between friend type and gender ($F(1, 208) = 11.05$, $p = .01$, $\eta_p^2 = .03$; see Figure 5), and this was a small to moderate effect size. Pairwise comparisons revealed a significant difference between male and female scores in the relationships with close friends ($M_{\text{male}} = 7.78$, $M_{\text{female}} = 8.31$, $F(1, 208) = 15.54$, $p < .000$, $\eta_p^2 = .07$; see Figure 5), and this was a moderate effect size. In the close friendships, females reported higher intimacy compared to males.

Ability to Elicit Self-Disclosure. There was a significant main effect of friend type ($F(1, 210) = 212.18$, $p < .001$, $\eta_p^2 = .50$), and this was a large effect size. Contrasts revealed that participants reported significantly greater ability to elicit self-disclosure in close friendships compared to relationships with acquaintances ($M_{\text{cf}} = 4.30$, $M_{\text{aq}} = 3.56$). There was a significant main effect of gender ($F(1, 210) = 10.42$, $p = .001$, $\eta_p^2 = .05$), and this was a small to moderate effect size. Contrasts revealed that females reported a significantly higher ability to elicit self-disclosure compared to males ($M_{\text{male}} = 3.83$, $M_{\text{female}} = 4.03$). There was a significant interaction

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effect between friend type and gender ($F(1, 210) = 5.63, p = .02, \eta_p^2 = .03$), and this was a small to moderate effect size. Pairwise comparisons revealed a significant difference between male and female scores in the relationships with close friends ($M_{male} = 4.14, M_{female} = 4.46, F(1,210) = 19.06, p < .001, \eta_p^2 = .08$; see Figure 6), and this was a moderate to large effect size. In the close friendships, females reported higher ability to elicit self-disclosure compared to males.

Social Anxiety, Satisfaction and Interconnectedness. Self-reported social anxiety did not differ significantly between males and females ($M_{male} = 2.19, SD = 1.03; M_{female} = 2.34, SD = 1.04, t(209) = -1.11, p = .27, d = -.15$). Satisfaction in close friendships was significantly higher for females ($M_{female} = 6.36, SD = .62$) compared to males ($M_{male} = 6.10, SD = .74, t(209) = -2.77, p = .006, d = -.32$) and this represents a small to moderate effect size. Interconnectedness in close friendships was significantly higher for females ($M_{female} = 5.42, SD = 1.31$) compared to males ($M_{male} = 4.74, SD = 1.26, t(212) = -3.92, p < .000, d = -.60$), and this represents a moderate effect size.

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Table 5. ANOVA for Gender and Friend Type

Variable		Mean	<i>F</i>	<i>p</i>	η_p^2
Perceived Responsiveness	Friend Type		231.93	<.001	.52
	Close Friend	4.49			
	Acquaintance	3.33			
	Gender		.79	.38	.004
	Male	3.87			
	Female	3.94			
	Friend Type *Gender		4.51	.04	.02
Self-Disclosure	Friend Type		780.584	<.001	.79
	Close Friend	3.54			
	Acquaintance	2.09			
	Gender		1.74	.19	.008
	Male	2.77			
	Female	2.86			
	Friend Type*Gender		6.34	.01	.03
Intimacy	Friend Type		525.35	<.001	.72
	Close Friend	8.06			
	Acquaintance	5.10			
	Gender		1.70	.19	.008
	Male	6.47			
	Female	6.67			
	Friend Type*Gender		11.05	.01	.03
Ability to Elicit Self-Disclosure	Friend Type		212.18	<.001	.50
	Close Friend	4.30			
	Acquaintance	3.56			
	Gender		10.42	.001	.05
	Male	3.83			
	Female	4.03			
	Friend Type *Gender		5.63	.02	.03

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Figure 3. Interaction of Friend Type by Gender for Perceived Responsiveness

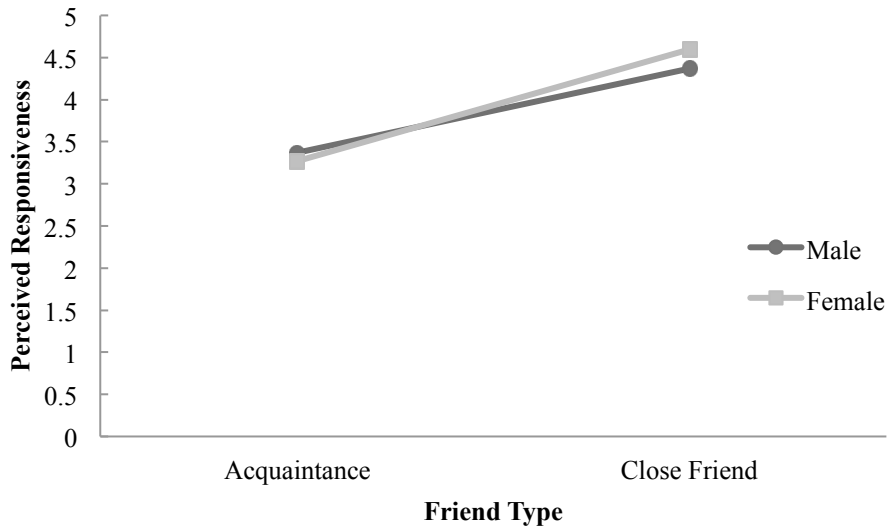


Figure 4. Interaction of Friend Type by Gender for Self-Disclosure

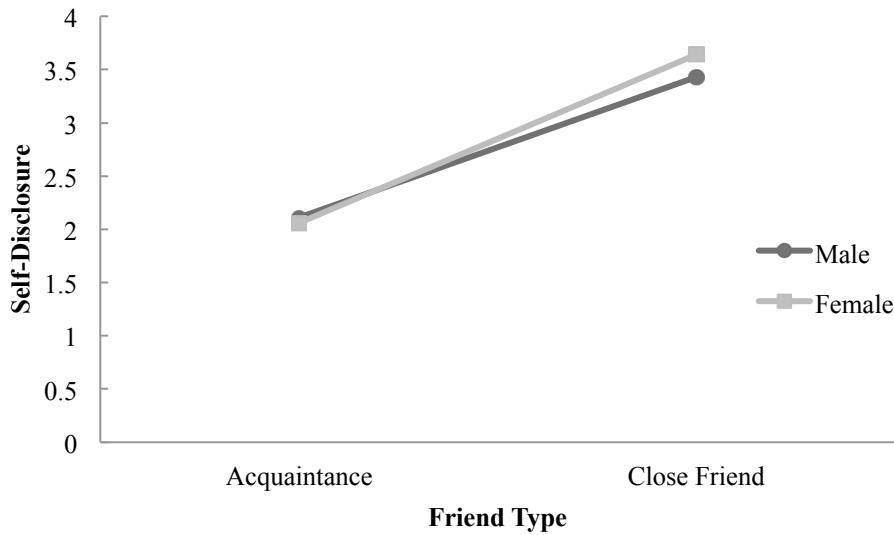


Figure 5. Interaction of Friend Type by Gender for Intimacy

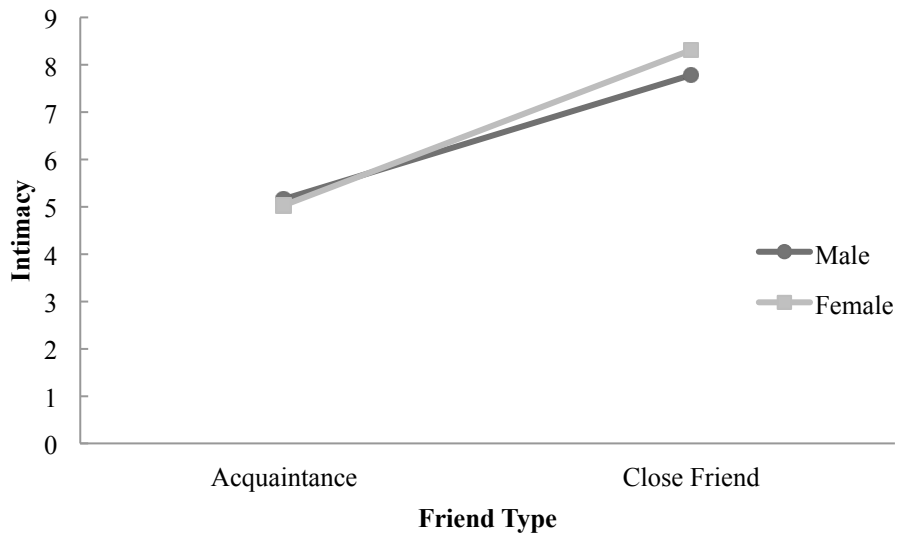


Figure 6. Interaction of Friend Type by Gender for Ability to Elicit Self-Disclosure

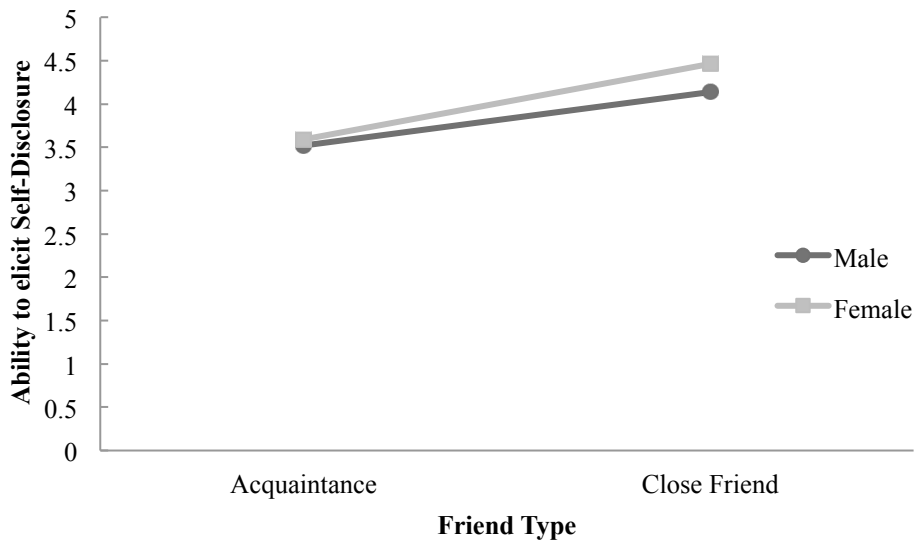


Table 6. Independent T-Tests for Gender

Variable	Gender	Mean	SD	<i>t</i>	<i>p</i>	<i>d</i>
Social Anxiety				-1.11	.27	-.15
	Male	2.19	1.03			
	Female	2.34	1.04			
Satisfaction				-2.77	.006	-.32
	Male	6.10	.74			
	Female	6.36	.62			
Interconnectedness				-3.92	<.001	-.60
	Male	4.74	1.26			
	Female	5.42	1.31			

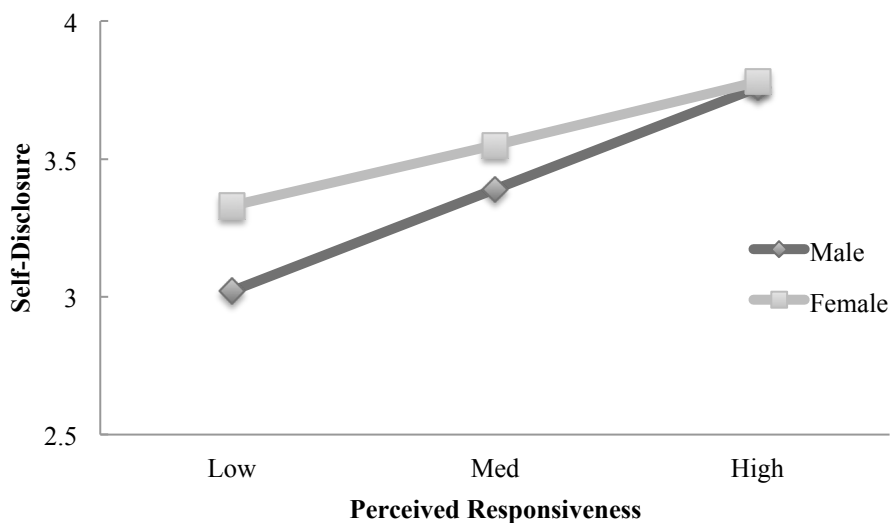
Gender as Moderator. Based on findings by Cuming and Rapee (2010) in which social anxiety was associated with self-disclosure for females close friendships, but not males close relationships in correlational research, I decided to perform a moderation analysis on the relationship between social anxiety and self-disclosure with gender as a moderator. The interaction between predictors social anxiety and gender was not significant for the close friend analyses ($b = .05, p = .49$) or for the acquaintance analyses ($b = -.03, p = .87$).

In testing the other predictor in the mediation, perceived responsiveness, with the outcome variable, self-disclosure, there was a significant moderation effect for the close friend analyses ($b = -.23, p = .02$, see Figure 7). For males, there was a significant positive relationship between perceived responsiveness of close friend and own self-disclosure ($b = .58, 95\% \text{ CI } [0.455, .721]$). For females, there was also a significant positive relationship between perceived responsiveness of close friend and own self-disclosure, however this relationship was less powerful than the male analysis ($b = .36, 95\% \text{ CI } [0.213, .505]$). When examining the simple slopes in Figure 7, it is evident that this effect is mainly due to difference in self-disclosure in males and females at the low end of perceived responsiveness. When males and females perceive low responsiveness from their close friends, males tend to engage in less disclosure compared to

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females. This interaction represents a relatively small effect size ($R^2_{change} = .02$). This moderation effect did not reach significance in the acquaintance analyses ($b = -.10, p = .26$).

Figure 7. Moderation of the relationship Between Perceived Responsiveness and Self-Disclosure by Gender



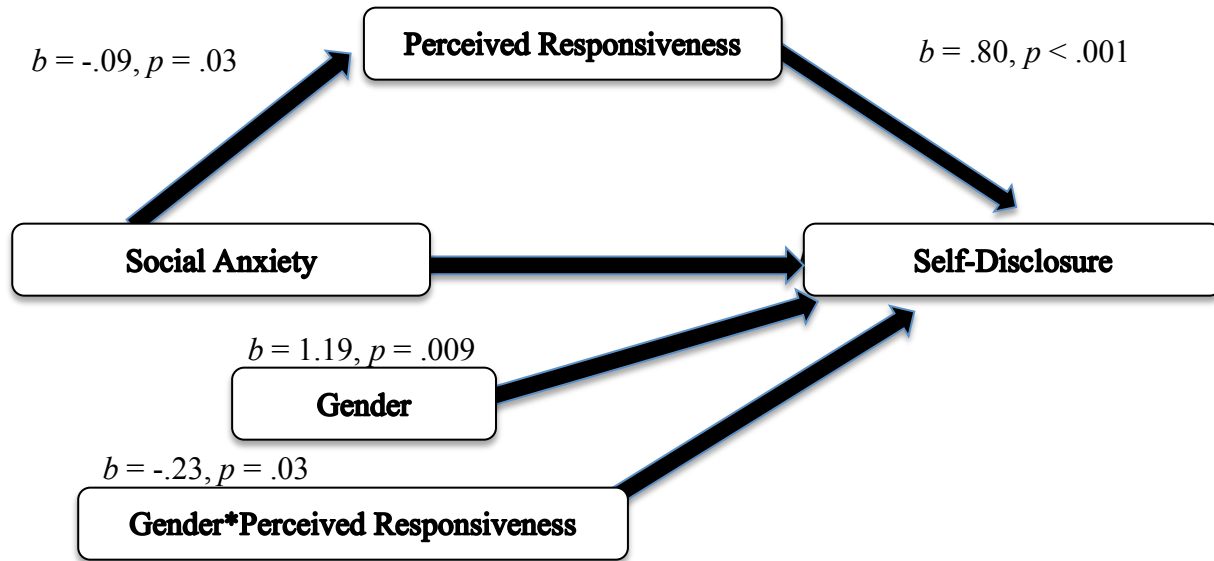
Moderated Mediation. As there was a moderation effect in the relationship of perceived responsiveness and self-disclosure, I decided to test a moderated mediation effect that would include this moderation in the mediation model (see Figure 8). In the mediation model for social anxiety, perceived responsiveness and self-disclosure, moderated by gender, social anxiety was negatively associated with perceived responsiveness ($b = -.09, p = .03$), but was not significantly associated with self-disclosure ($b = -.02, p = .60$). The proposed mediator, perceived responsiveness was positively associated with self-disclosure ($b = .80, p < .001$). These findings replicates the findings from the mediation analyses performed in the primary analysis for close friends (hypothesis 7). With the addition of the moderator, gender, there are some new findings. Gender was positively associated with self-disclosure ($b = 1.19, p = .009$), indicating a higher level of self-disclosure from females compared to males with close friends. This replicates

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findings from the gender analyses. The interaction of gender by perceived responsiveness (moderation) was negatively associated with self-disclosure ($b = -.23, p = .03$), and this replicates findings from the moderation analysis. Due to the addition of the moderator, there are now two indirect effects. One indirect effect is associated with the male analysis, and the other is associated with the female analysis. Essentially, this can be conceptualized as two “mini” mediations, one for each gender. The indirect effect for males indicated the presence of mediation ($b = -.05, 95\% \text{ CI } [-.0106, -.010]$), as did the indirect effect for females ($b = -.03, 95\% \text{ CI } [-.080, -.005]$). Additionally, the index of moderated mediation indicates that a moderated mediation did occur ($b = .02, 95\% \text{ CI } [.0022, .0574]$). In examining the coefficients, it can be interpreted that the indirect effect for males was stronger than the indirect effect for females. The pathway from social anxiety to self-disclosure is better explained by the indirect route through perceived responsiveness. Furthermore, when males and females high in social anxiety perceive less responsiveness from their close friends, males have a greater reduction of self-disclosure compared to females.

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Figure 8. Indirect Effect of Social Anxiety on Self-disclosure Through Perceived Responsiveness Moderated by Gender – Close Friend Analysis



Direct effect, $b = -.02, p = .60$

Indirect effect (Males), $b = -.05, 95\% \text{ CI } [-.0106, -.010]$

Indirect effect (Females), $b = -.03, 95\% \text{ CI } [-.080, -.005]$

Index of moderated mediation: $b = .02, \text{ CI } [.0022, .0574]$

Discussion

This study's findings supported the interpersonal process model of intimacy developed by Reis and Shaver (Shaver, 1988). Low perceived responsiveness was associated with low self-disclosure, and both low perceived responsiveness and self-disclosure were associated with low intimacy. On the other side of the interpersonal transaction, ability to elicit self-disclosure from others was related to high perceived responsiveness, own self-disclosure and intimacy.

Additionally, perceived responsiveness, self-disclosure, ability to elicit self-disclosure and intimacy were found to be significantly higher in close friendships than relationships with acquaintances. These findings reinforce research findings on friendship impairments associated with reduced self-disclosure including reduced intimacy in relationships with acquaintances and friends, and reduced satisfaction and interconnectedness in close friends (Derlega et al., 2008; Laurenceau et al., 1998; Reis & Shaver, 1988; Sprecher et al., 2015; Sprecher et al., 2013).

Gender differences in self-disclosure reported by other research were supported by this research however, gender differences were only found in relationships with close friends, not acquaintance relationships (Blazina et al., 2007; Lee & Robbins, 2000). In close friendships, females disclosed at a higher level than males. However, findings from the gender moderation suggest a more complicated process than women simply disclosing at a higher level than men. In close friendships, when perceived responsiveness was low, males reported lower self-disclosure compared to females, whereas when perceived responsiveness was high, males and females disclosed at the same level to their close friends. Traditional narratives have stated that women disclose at a higher level than men (Collins & Miller, 1994). These societal messages may lead to males feeling that intimate self-disclosures are women's domain. This idea may lead to higher feelings of risk associated with intimate self-disclosures for men, thus requiring a greater "safety

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net” in order to engage in this behavior. Higher levels of perceived responsiveness may provide this “safety net” for men. While this moderation represented a small effect size, it is an area of research that should be explored in future studies to better understand gender differences in friendship and self-disclosure.

Social anxiety was not associated with self-disclosure in close friendships or in relationships with acquaintances. This was unexpected, as past findings have reported this association (Cuming & Rapee, 2010; Farmer & Kashdan, 2012; Gee, et al., 2012; Sparrevohn & Rapee, 2009). High social anxiety was associated with reduced perceived responsiveness, intimacy, satisfaction and ability to elicit self-disclosure for close friendships but not for relationships with acquaintances. Close friends differ from acquaintances, as they require a greater involvement in the interpersonal process model of intimacy in order to develop and be maintained. This engagement may be especially difficult for individuals with high social anxiety due to expectations of social rejection during interactions. Relationships with acquaintances may not be impaired, as maintenance of these relationships requires more superficial engagement in the process, which may be more manageable for individuals high in social anxiety

Prior to this study, perceived responsiveness and social anxiety had not yet been studied in the context of friendships. Low perceived responsiveness was associated with high social anxiety and low self-disclosure in close friendships, and was found to mediate the association between social anxiety and self-disclosure in close friendships. This was important, as past research has reported associations between high social anxiety and low self-disclosure; it had not examined potential mechanisms behind this association. While results from the mediation support a pathway through perceived responsiveness to reduced self-disclosure for individuals high in social anxiety during interactions with close friends, this study was non-experimental. In

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order to better determine causation, future research should employ an experimental design to test this pathway.

The cognitive model conceptualizes social anxiety as being maintained through distorted cognitions (Clark & Wells, 1995). Findings from this study identify perceived responsiveness as a potentially distorted cognition. Individuals high in social anxiety expect social rejection, and overly attend to negative cues, while ignoring positive cues (Clark, 2001; Huppert, Foa, Furr, Filip, & Mathews, 2003). During social interactions, individuals high in social anxiety may ignore signals of responsiveness, and overly attend to possible signals of low responsiveness. This low perceived responsiveness then signals to individuals high in social anxiety that they need to protect themselves, resulting in the adoption of a safety strategy of reduced self-disclosure (Clark & Monin, 2006). While there is evidence that perceived responsiveness may represent a cognitive distortion, this study did not test this hypothesis. Future research should test perceived responsive as a distorted cognition.

Perceived responsiveness as a distorted cognition has implications for the treatment of social anxiety disorder. Past research shows that when individuals high in social anxiety expect a conversational partner to be responsive, they are able to engage in the same level of self-disclosure as individuals low in social anxiety (Alden & Bieling, 1998). Cognitive behavioral therapists may work on cognitive restructuring of perceived responsiveness in order to reduce distortions. Clients may also engage in behavioral tasks such as exposure to self-disclosure through tasks requiring increasing intimacy of disclosure.

Limitations of the Study

This study used a sample of university students enrolled in a first year psychology class as participants. Many researchers have suggested that university students do not represent the

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greater population, and results obtained from this sample should not be generalized to other populations (Benz & Meier, 2006; Kam et al., 2007; Sears, 1986). University undergraduates generally fall within a limited age range and have an over-representation of the persons with a higher socioeconomic status. Additionally, certain ethnic groups are under-represented (Benz & Meier, 2006; Kam et al., 2007; Sears, 1986). Low socioeconomic status has been linked to reduced social quality and higher levels of social anxiety (Bohnke, 2008; Hidalgo et al., 2000; Levitas, 2008). Clinical populations reflect a higher concentration of individuals with severe social anxiety. The undergraduate sample may have reported a lower level of social anxiety than what would be required to analyze greater effect sizes. For example, multiple studies have reported the association of high social anxiety and low self-disclosure, but in this study, that association failed to reach significance (e.g. Cuming & Rapee, 2010). Future studies should examine both community and clinical samples in order to increase external validity, and the ability to make inferences about the population at large.

Another limitation was the self-report nature of the research. Participants may engage in certain response styles when answering self-report questionnaires such as acquiescence (tendency to respond to all questions with positive statements) or extreme responding (tendency to respond using the extreme points of a Likert scale; e.g. Naemi, Beal, & Payne, 2009). During data cleaning, I did examine data for outliers greater than two standard deviations from the mean, and performed Winsorization where needed, which may have reduced the high and low scores resulting from extreme responders.

While other studies have evidence to support the idea that social anxiety is associated with friendship impairments over and above other mental distress such as depression, this study was not able to confirm this finding as it did not include a measure of depression (Rodebaugh,

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2009; Rodebaugh, et al., 2012). Future research could include measures of depression, or generalized anxiety in order to determine if social anxiety is uniquely associated with impairments surrounding perceived responsiveness and self-disclosure.

Conclusion

This is the first study to examine perceived responsiveness in the context of friendships of individuals high in social anxiety. This research is also the first study to include perceived responsiveness in relation to self-disclosure, and the interpersonal process model of intimacy pertaining to friendship. An indirect pathway was identified for close friendships in which high social anxiety predicted low perceived responsiveness, which predicted reduced self-disclosure. As self-disclosure is integral in the development and maintenance of close friendships, it was important to identify and test this pathway. Social anxiety involves cognitive distortions relating to interpersonal functioning and this study has identified perceived responsiveness as a specific cognitive distortion worthy of continued research. Furthermore, the impact of perceived responsiveness for the close friendships of individuals high in social anxiety has implications for the treatment of social anxiety. Future research should examine how clinicians can target distortions of low perceived responsiveness to improve the close relationships of individuals high in social anxiety.

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Appendix A

Study Name: Friendship Study
Researchers: Sarah Petty, pettys@myumanitoba.ca
Dr. John Walker, john.walker@umanitoba.ca
Dr. M. Morry, morrym@cc.umanitoba.ca
Department of Psychology, P508 Duff Roblin, 204-474-7840

INFORMED CONSENT

This consent form, a copy of which can be printed at the end of the study, is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, you should feel free to ask before beginning the survey by contacting Sarah Petty at pettys@myumanitoba.ca. Please take the time to read this carefully and to understand any accompanying information.

You will be asked a series of questions related to friendships, including questions about social contact and friendship satisfaction. In addition, you will be asked to complete a number of questionnaires about your self, including socio-demographic questions such as age, gender, ethnicity, and questions about mental health, such as social anxiety. Some individuals may experience distress from answering these questions, therefore counseling information will be provided at the end of the study session.

Although your email address and student number will initially be linked to your data, once all data has been collected and your participation credits awarded, your email address, and student number will be removed from the data file. Only researchers associated with this project will have access to this data. Identifying information from this data will be destroyed once data collection is complete, in Spring 2017. Anonymous data in the questionnaire will then be kept indefinitely. It will take approximately 50 minutes to complete this survey and you will receive 2 experimental credits toward your research participation requirement. Participation in this study is voluntary and you can refuse to answer any question or withdraw your consent at any time without penalty or loss of your experimental credit. At the end of the session today, you will be provided with feedback about our specific hypotheses. In addition, if you provided your email address below, you will be emailed the results of the study in Summer, 2017. The findings of this study will be presented at a national psychology conference and will be published in a psychology journal.

Your consent on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a subject. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time by closing your browser, and /or refrain from answering any questions you prefer to omit, without prejudice or consequence.

The University of Manitoba Research Ethics Board(s) and a representative(s) of the University of Manitoba Research Quality Management / Assurance office may also require access to your research records for safety and quality assurance purposes.

This research has been approved by the Psychology/Sociology Research Ethics Board at the University of Manitoba. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Coordinator (HEC) at 204-474-

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7122. A copy of this consent form will be given to you at the end of the study today and you are strongly encouraged to print it off and keep for your records and reference.

To receive the results of this study please include your email address here:

I have read the above information and hereby (click on the appropriate box below):

PROVIDE my consent (enters questionnaire)

DO NOT PROVIDE my consent (exits program)

SOCIAL ANXIETY AND PERCEIVED RESPONSIVENESS

Appendix B

The questions in this survey will concern your friendship with your closest friend.

Please think of your closest friend. We would like you to consider your closest friend who is not your romantic partner, or a close family member (e.g., parent, brother, or sister).

Please type in the first name or initials of your closest friend in the box below. This name or initials will be used to help clarify later questions in the survey. His or her name or initials will be confidential, and only used for the purposes of clarifying the questions.

*Research note: From here on in, I will write **friendinitials** to show where the piped initials or name of the closest friend will appear.*

Is **friendinitials** your romantic partner?

Yes/No

Is **friendinitials** a family member?

Yes/No

If YES to: *Is **friendinitials** a family member?*

Please choose the below answer to describe how you and **friendinitials** are related:

- a) Parent
- b) Step-parent
- c) Sibling
- d) Step-sibling
- e) Aunt/Uncle
- f) Cousin
- g) Grandparent
- h) Other

If Other: Please explain:

What is the gender of **friendinitials** : Female _____ Male _____ Unspecified _____

What is **friendinitials** age: _____

How long have you and **friendinitials** been friends? _____

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Appendix C

Social Interaction Phobia Anxiety Scale (SIPS) – Fear of social interaction subscale

Carleton et al., 2009

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true of you.

The rating scale is as follows:

0 = Not at all characteristic or true of me.

1 = Slightly characteristic or true of me.

2 = Moderately characteristic or true of me.

3 = Very characteristic or true of me.

4 = Extremely characteristic or true of me.

1. When mixing socially, I am uncomfortable.
2. I have difficulty talking with other people.
3. I find myself worrying that I won't know what to say in social situations.
4. I am nervous mixing with people I don't know well.
5. I am tense mixing in a group.

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Appendix D

Perceived Responsiveness

Adapted from Maisel and Gable, 2009

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true of your friendship with **friendinitials**.

The rating scale is as follows:

- 1 = not at all true
- 2 = somewhat true
- 3 = true
- 4 = very true
- 5 = completely true

When I am talking to **friendinitials** ...

1. **friendinitials** understands me.
2. **friendinitials** made me feel like he/she values my abilities and opinions.
3. **friendinitials** makes me feel cared for.

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Appendix E

Self-Disclosure Index (SDI)
Miller, Berg, & Archer; 1983

Instructions: Thinking about your relationship with **friendinitials** please rate the extent to which you discuss each of the following with him/her.

1) With friendinitials , I discuss my personal habits.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
2) With friendinitials , I discuss things I have done which I feel guilty about.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
3) With friendinitials , I discuss things I wouldn't do in public.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
4) With friendinitials , I discuss my deepest feelings.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
5) With friendinitials , I discuss what I like and dislike about myself.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
6) With friendinitials , I discuss what is important to me in life.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
7) With friendinitials , I discuss what makes me the person I am.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
8) With friendinitials , I discuss my worst fears.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
9) With friendinitials , I discuss things I have done which I am proud of.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely
10) With friendinitials , I discuss my close relationships with other people.	1 Discuss Not at All	2	3	4 Discuss Fully and Completely

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Appendix F

Sternberg Intimacy Scale (SIS)

Sternberg, 1988

Rate your agreement with each statement according to the following scale, and enter the appropriate number between 1 and 9.

1. I am actively supportive of **friendinitials**'s well-being.
2. I am able to count on **friendinitials** in times of need.
3. I have a warm relationship with **friendinitials**.
4. **friendinitials** is able to count on me in times of need.
5. I receive considerable emotional support from **friendinitials**.
6. I give considerable emotional support to **friendinitials**.
7. I feel close to **friendinitials**.
8. I share deeply personal information about myself with **friendinitials**.
9. I value **friendinitials** greatly in my life.
10. I feel that **friendinitials** really understands me.
11. I have a comfortable relationship with **friendinitials**.
12. I feel that I can really trust **friendinitials**.
13. I feel that I really understand **friendinitials**.
14. I am willing to share myself and my possessions with **friendinitials**.
15. I communicate well with **friendinitials**.

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Appendix G

Opener Scale

Miller, Berg, & Archer; 1983

Instructions: Please read the following items and rate your level of agreement.

The rating scale is as follows:

1 = strongly disagree

2 = disagree

3 = neither agree or disagree

4 = agree

5 = strongly agree

1. **friendinitials** frequently tell me about themselves
2. **friendinitials** has told me that I'm a good listener
3. I'm very accepting of **friendinitials**.
4. **friendinitials** trust me with their secrets
5. I easily get **friendinitials** to "open up"
6. **friendinitials** feels relaxed around me
7. I enjoy listening to **friendinitials**
8. I'm sympathetic to **friendinitials**'s problems
9. I encourage **friendinitials** to tell me how they are feeling
10. I can keep **friendinitials** talking about himself/herself

SOCIAL ANXIETY AND PERCEIVED RESPONSIVENESS

Appendix H

Relational Assessment Scale

Hendrick, 1988

Thinking about the relationship you have with this **friendinitials** answer the following questions by circling the number between 1 and 7 that best describes your feelings and impressions.

1. How well does friendinitials meet your needs?	1 2 3 4 5 6 7 Not well Very well
2. In general, how satisfied are you with your friendship with friendinitials ?	1 2 3 4 5 6 7 Not satisfied satisfied Very
3. How good is your friendship with friendinitials compared to most?	1 2 3 4 5 6 7 Not good good Very
4. How often do you wish you hadn't gotten into this friendship with friendinitials ?	1 2 3 4 5 6 7 Not often often Very
5. To what extent has your friendship with friendinitials met your original expectations?	1 2 3 4 5 6 7 Not met Very met
6. How much do you like friendinitials ?	1 2 3 4 5 6 7 Not much much Very
7. How many problems are there in your friendship with friendinitials ?	1 2 3 4 5 6 7 Not many many Very

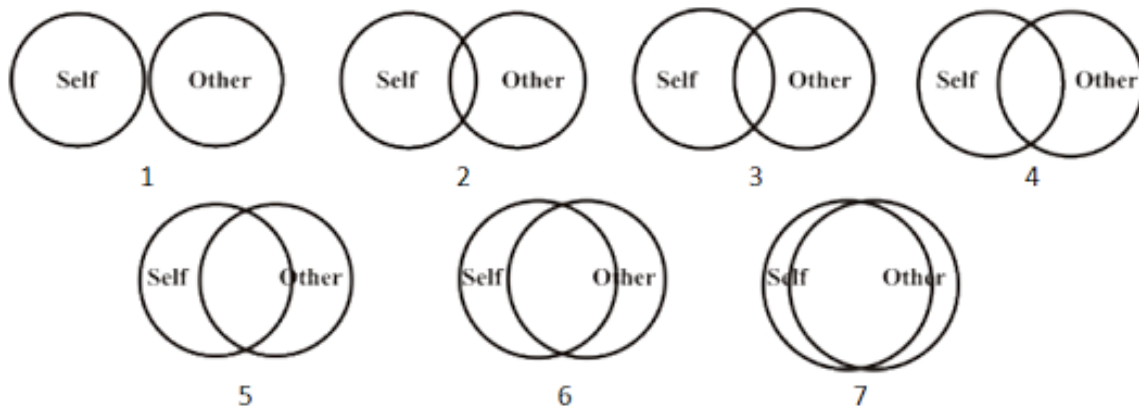
SOCIAL ANXIETY AND PERCEIVED RESPONSIVENESS

Appendix I

IOS – Inclusion of Other in Self Scale

Aron, Aron, & Smollan 1992

Instructions : Please choose the image that best describes your friendship with **friendinitials**.



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Appendix J

Statistics Canada Social Contact with Friends Questionnaire

Adapted questions about closest friend

1. Does **friendinitials** live in the same city or local community as you?

Yes

No

If No to: *Does **friendinitials** live in the same city or local community as you?*
Does **friendinitials** live in:

Manitoba

Canada

Other Country

2. In the past month, how often did you see **friendinitials**.

Every day

A few times a week

Once a week

2 or 3 times a month

Once a month

Not in the past month

Don't know

Refusal

3. In the past month, how often did you talk with **friendinitials** by telephone? *exclude text messages

Every day

A few times a week

Once a week

2 or 3 times a month

Once a month

Not in the past month

Don't know

Refusal

4. In the past month, how often did you communicate with **friendinitials** by text message?
*Include BBM (Blackberry) instant messages

Every day

A few times a week

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Once a week
2 or 3 times a month
Once a month
Not in the past month
Don't know
Refusal

5. In the past month, how often did you communicate with **friendinitials** by email or internet?
* Include all forms of Internet communication including Facebook, Twitter, instant message and Skype.

Every day
A few times a week
Once a week
2 or 3 times a month
Once a month
Not in the past month
Did not use email in the past month
Don't know
Refusal

6. Overall, how satisfied are you with how often you communicate with **friendinitials**? Are you...

Very satisfied
Satisfied
Neither satisfied nor dissatisfied
Dissatisfied
Very dissatisfied
Don't know
Refusal

*If chooses Dissatisfied or Very Dissatisfied to: *Overall, how satisfied are you with how often you communicate with **friendinitials**? Are you...*

7. Are you dissatisfied because you communicate with **friendinitials** too often or not enough?

Too often
Not often enough
Don't know
Refusal

8. How many close friends do you have, (that is, people who are not your relatives, but who you feel at ease with, can talk to about what is on your mind, or call on for help)?

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9. Of your close friends, how many live in the same city or local community as you?

10. Not counting your close friends or relatives, how many other friends do you have?

11. Of your other friends, how many live in the same city or local community as you?

12. Thinking of [any of your close friends/other friends], in the past month:

How often did you see [any of your close friends/other friends]?

Every day

A few times a week

Once a week

2 or 3 times a month

Once a month

Not in the past month

Don't know

Refusal

13. Thinking of [any of your close friends/other friends], in the past month:

How often did you talk with [any of your close friends/other friends] by telephone?

* Exclude text messages.

Every day

A few times a week

Once a week

2 or 3 times a month

Once a month

Not in the past month

Don't know

Refusal

14. Thinking of [any of your close friends/other friends], in the past month:

How often did you communicate with [any of your close friends/other friends] by text message?

* Include BBM (Blackberry) instant messages.

Every day

A few times a week

Once a week

2 or 3 times a month

Once a month

Not in the past month

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Don't know
Refusal

15. Thinking of [any of your close friends/other friends], in the past month:

How often did you communicate with [any of your close friends/other friends] by email or by Internet?

* Include all forms of Internet communication including Facebook, Twitter, instant message and Skype.

Every day
A few times a week
Once a week
2 or 3 times a month
Once a month
Not in the past month
Did not use email in the past month
Don't know
Refusal

16. Overall, how satisfied are you with how often you communicate with your [close friends/other friends]? Are you ...?

Very satisfied
Satisfied
Neither satisfied nor dissatisfied
Dissatisfied
Very dissatisfied
Don't know
Refusal

17. Are you dissatisfied because you communicate with them too often or not often enough?

Too often
Not often enough
Don't know
Refusal

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Appendix K

The questions in this survey will concern your friendship with a well-liked acquaintance.

This acquaintance should be someone who you have known for at least a few months, but are not close friends with. We would like you to consider an acquaintance, who is not your romantic partner, or a close family member (e.g. parent, brother, or sister).

Please type in the first name or initials of your acquaintance in the box below. This name or initials will be used to help clarify later questions in the survey. His or her name or initials will be confidential, and only used for the purposes of clarifying the questions.

*Research note: From here on in, I will write **acquaintanceinitials** to show where the piped initials or name of the acquaintance will appear. The acquaintance initials will also appear in the other measures where the friend initials were piped.*

Is **acquaintanceinitials** your romantic partner?

Yes/No

Is **acquaintanceinitials** a family member?

Yes/No

If YES to: *Is **acquaintanceinitials** a family member?*

Please choose the below answer to describe how you and **acquaintanceinitials** are related:

- a) Parent
- b) Step-parent
- c) Sibling
- d) Step-sibling
- e) Aunt/Uncle
- f) Cousin
- g) Grandparent
- h) Other

If Other: Please explain:

What is the gender of **acquaintanceinitials** : Female _____ Male _____ Unspecified _____

What is **acquaintanceinitials** age: _____

How long have you and **acquaintanceinitials** known each other? _____

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Appendix L

What is your gender?

- Male
- Female
- Prefer not to respond

What is your age?

How many years of education have you completed in the following areas?

University program –
College/Technical/Business/Vocational/Nursing (non-university) --

Please select which of the following best describes your employment status (select all that apply)

- Student full-time
- Student part-time
- Employed full-time
- Employed part-time

What is your current faculty?

- University 1
- Faculty of Arts
- Faculty of Science
- Asper School of Business
- Engineering
- Kinesiology and Recreation
- Nursing
- Architecture
- Other :

Country you were born in: _____

How many years have you lived in Canada (please enter number of years)? If less than 1 year, enter 0.

Is English your first language? Yes _____ No _____
How long have you spoken English? _____

How many years of your education were primarily in English?

What language do you commonly speak at home with your family? _____

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Please indicate your ethnic origin by choosing one of the categories listed below. Ethnic origin refers to the ethnic or cultural group(s) to which your recent ancestors belonged. Ethnic origin pertains to ancestral identity or background and should not be confused with citizenship or nationality. If you have multiple ethnic origins, then please select the one you most strongly identify with. If this is not possible, then leave this question blank.

- European (including British Isles)
- East Asian (e.g., China, Hong Kong, Korea, Japan)
- Middle Eastern
- African
- African-American
- Latin, Central, and South American
- Hispanic-American
- Pacific Islands (e.g., Philippines, Hawaii)
- Caribbean
- Aboriginal
- Other -- please specify: _____

Current relationship status (Check one)

- Never have been in a romantic relationship
- Not currently dating or involved with anyone (but have been in the past)
- Casually Dating
- Seriously or Exclusively Involved
- Engaged
- Cohabiting (living together) with romantic partner
- Married
- Other (please specify): _____

If you are currently dating or romantically involved with someone, please write down how long (in months) you have been involved with that person: _____ (months)

How many other psychology experiments have you completed this term? _____

Please list the titles of these experiments or a short description (continue on back if you need space).

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Appendix M

Attentional Measure

Mysterious Whale Swarms Perplexing Scientists

By Sarah Gibbens, originally published in National Geographic

In a new study, scientists report spotting as many as 200 humpbacks at a time gathering off South Africa. That's bizarre for a species previously believed to be loners. It's "unlike anything I have seen in working with humpback whales across the Southern Hemisphere," says study leader Ken Findlay, a marine biologist at Cape Peninsula University of Technology in Cape Town, South Africa. "These are animals that normally are in groups of up to maybe three or four. To see 200 together in an area the size of a football field is remarkable." Though the team doesn't know why the animals are congregating off South Africa, they have some theories. One theory: The species is booming, and scientists are noticing normal behavior that wasn't previously seen due to low numbers. It's possible the "behavior was always there, but its only being seen as the population makes remarkable recovery from the pressure of whaling last century," Findlay says. Commercial whaling in the 19th and early 20th centuries reduced humpback whale populations by nearly 90 percent.

Instructions: Please answer true or false

This article mentions that scientists report spotting gatherings of nearly 200 humpback whales.

True
False

These sightings are bizarre, because generally humpback whales only gather in groups of 10-20.

True
False

One theory that may help explain the large number of whales is that the waters off of South Africa provide a safe gathering space for the whales.

True
False

The population of Humpback whales has been declining over the last century, and is at an all-time low.

True
False

Ken Findlay is a marine biologist at University of Victoria, in British Columbia.

True
False

Appendix N

Feedback: Friendship Study

At this time there are a few additional things we would like to explain to you. In this study, we asked you about friendship, specifically, we asked you questions about your closest friend, such as friendship satisfaction. In addition, we asked you questions about mental health, such as social anxiety.

The current study aims to examine how individuals with higher levels of social anxiety experience friendship. Mainly, we would like to better understand why some people with higher levels of social anxiety experience impairments in friendship. One aspect of friendship that we are currently exploring is the communication patterns in friendship, and whether these patterns differ for individuals with high levels of social anxiety. In exploring this, we asked you questions about social anxiety, your perception of your closest friendship's intimacy, your level of comfort with disclosing personal information to your closest friend, and whether you perceive your friend as responsive during communication of personal information. We also asked you other questions about friendship, such as friendship satisfaction, and how much contact you have with your social circle.

Research on friendship and social anxiety indicates that social anxiety is associated with friendship impairments (Rodebaugh, 2009). Individuals with high levels of social anxiety tend to have friendships that are characterized by low perceived intimacy and closeness (Weisman, Aderka, Marom, Hermesh, & Gilboa-Schechtman, 2011). It has been proposed that the way that individuals with high levels of social anxiety behave in interpersonal situations may explain the associated friendship impairments. Specifically, individuals with high levels of social anxiety tend to engage in low levels of self-disclosure (Cuming & Rapee, 2010). Self-disclosure is an important aspect of friendships, as it is associated with the development of intimacy in relationships, thus reduced self-disclosure has a negative impact on friendships (Reis & Shaver, 1988). While reduced self-disclosure may account for reduced friendship intimacy for individuals with high levels of social anxiety, the mechanism behind this reduced self-disclosure remains unclear. Perceived responsiveness, or the perception that one is cared, validated, and understood by a friend following a self-disclosure may help clarify this mechanism. Individuals with high levels of social anxiety tend to assume that others are critical, and likely to reject (Taylor & Alden, 2005). This assumption may lead to a bias when perceiving a friend's response to a self-disclosure. This low perceived responsiveness might in turn predict reduced self-disclosure in future interactions.

Please do not discuss this experiment with other students who might yet participate on-line. If you supplied your email address on the consent form at the beginning of the survey, the aggregate results of the study will be sent to you in Summer 2017. If you did not supply your email address earlier but would now like to find out the aggregate results, please email Sarah Petty at pettys@myumanitoba.ca. Questions about this study can be directed to Sarah Petty at pettys@myumanitoba.ca. Complaints regarding a procedure may be reported to the Human Ethics Secretariat at 204-474-7122 or margaret_bowman@umanitoba.ca.

Thank-you for participating in this study. You may now print-off this feedback sheet and the attached informed consent for your records. **If you experience any emotional distress from**

SOCIAL ANXIETY AND PERCEIVED RESPONSIVENESS

writing about anxiety and/or friendship experiences, please contact one of the following sources:

Student Counseling and Career Centre: 474-8592

Klinik Community Health Centre 784-4090