

Wilfrid Laurier University

Scholars Commons @ Laurier

---

Theses and Dissertations (Comprehensive)

---

2018

## Social Anxiety and Interpersonal Interactions: Investigating the Impact of Anxiety on Interpersonal Behaviours, Perceptions, and Processes

Kelly McDonald  
mcdo9040@mylaurier.ca

Follow this and additional works at: <https://scholars.wlu.ca/etd>



Part of the [Clinical Psychology Commons](#), [Personality and Social Contexts Commons](#), and the [Social Psychology Commons](#)

---

### Recommended Citation

McDonald, Kelly, "Social Anxiety and Interpersonal Interactions: Investigating the Impact of Anxiety on Interpersonal Behaviours, Perceptions, and Processes" (2018). *Theses and Dissertations (Comprehensive)*. 2007.  
<https://scholars.wlu.ca/etd/2007>

This Dissertation is brought to you for free and open access by Scholars Commons @ Laurier. It has been accepted for inclusion in Theses and Dissertations (Comprehensive) by an authorized administrator of Scholars Commons @ Laurier. For more information, please contact [scholarscommons@wlu.ca](mailto:scholarscommons@wlu.ca).

SOCIAL ANXIETY AND INTERPERSONAL INTERACTIONS: INVESTIGATING  
THE IMPACT OF ANXIETY ON INTERPERSONAL  
BEHAVIOURS, PERCEPTIONS, AND PROCESSES

by

Kelly McDonald

Bachelor of Arts, University of Guelph, 2011

DISSERTATION

Submitted to the Department of Psychology

in partial fulfillment of the requirement for

Doctor of Philosophy in Psychology

Wilfrid Laurier University

© Kelly McDonald 2017

## Abstract

Interpersonal theory suggests that the most important variations in people's interpersonal behaviours can be captured by just two major constructs, dominance and affiliation. Despite the admirable parsimony of interpersonal theory, in the current thesis, we argue that a key influencing variable has been absent from discussions of interpersonal behaviour and dynamics. People's levels of social anxiety during interactions has been acknowledged as an influencing factor within the interpersonal space, yet a systematic investigation of its impact on behaviours and interpersonal processes has been sparse. Thus, in the current work we consider the impact of people's social anxiety levels during an interaction on their own interpersonal behaviours, the reactions received from interaction partners, interpersonal processes (e.g., interpersonal complementarity and anxiety contagion) and relationship and task outcomes. We conducted three studies (a hypothetical scenario study ( $N = 160$ ), a confederate study ( $N = 95$ ), and a dyad study ( $N = 113$  dyads)), and the methodologies of our studies were scaffolded in such a way that allowed for stronger tests of our hypotheses with each subsequent study. Although results were somewhat disparate across our studies, several interesting results emerged. We found that increased social anxiety in participants during an interaction led to more submissive behaviour (demonstrated in Studies 2 and 3), and less affiliative behaviour (demonstrated in Study 3). We also found that there was a discrepancy between how people reported responding to partners who were higher on social anxiety and how outside observers saw partners responding. For instance, participants reported responding with more affiliation towards anxious interaction partners in Studies 1 and 2, yet were coded by observers as responding with less affiliation towards anxious partners in Study 3. Results also indicated that social anxiety moderated interpersonal processes. For example, we found that the ability for interaction partners to pass agency back and forth smoothly at a moment-to-moment level was diminished when interactants were more anxious. In

contrast, the coordination of affiliative behaviours at the moment-to-moment level was enhanced when interactants were more anxious. We also demonstrated across all three studies that anxiety in one interaction partner resulted in increased anxiety in the other interaction partner. Finally, we demonstrated the detrimental impact of social anxiety on relationship and task outcomes. For example, in Study 3, the more situational social anxiety that participants experienced, the less the dyad enjoyed the interaction and the worse they did on a task assigned to them. Overall, our work has important implications for interpersonal theory and models of social anxiety, and demonstrates that the study of social anxiety using an interpersonal theory lens provides a fertile ground for further study.

## Acknowledgements

My deepest thanks goes to my supervisors, Pam Sadler and Erik Woody. Pam, thank you for being such a wonderful role model. The integrity with which you approach research is truly admirable. You have challenged me to become a better researcher in every way and I am grateful for your guidance and patience throughout this process. Among many things, you have taught me that by paying attention to the smallest of details the bigger story will be strengthened. Erik, I appreciate all of the insight you have brought to this research. I am most thankful for the time that you have taken to teach me. Your enthusiasm for teaching is unparalleled and I am grateful for the many discussions we have had in which I walked away feeling enriched and eager to learn more. I feel privileged to have been able to learn from you.

Thank you to my committee members, Nancy Kocovski, Nicole Cain, and Judy Eaton. Your constructive feedback and insightful comments about my research encouraged me to think more deeply about the implications of my work. I also kindly thank the many people that were involved in the coding of this research. The contribution of your time and interest in these studies is invaluable to me.

I am extremely grateful for the many people that started out as colleagues in classes and turned into forever friends. I cherish all of the memories that we have made throughout graduate school and I look forward to seeing how our lives continue to flourish and intertwine.

On a personal note, my sincerest thanks go my family, whose unwavering support throughout this process has been humbling. My husband, Kyle, your love and understanding at every step has been astonishing. You have gracefully and enthusiastically embraced every task that has come your way. You are my rock, my source of love and daily laughter, and my forever-dance partner; I am truly grateful to have you as my partner in life. Finally, to my Ella – you are

a constant source of joy and pride for me. Your boundless energy, inquisitive mind, and sweet smile have inspired and motivated me. Of all the different roles I took on in graduate school, being your mom has been my favourite.

## Table of Contents

Abstract .....	ii
Acknowledgements .....	iv
Table of Contents .....	vi
List of Figures .....	viii
List of Tables .....	ix
General Introduction .....	1
Interpersonal Theory .....	1
Critiques of Interpersonal Theory .....	3
Examining Boundary Conditions .....	6
Social Anxiety and Interpersonal Behaviour .....	9
Summary and Overarching Aims of the Current Research .....	11
The Impact of People’s Social Anxiety on Their Own Interpersonal Behaviours .....	13
The Impact of a Partner’s Social Anxiety on Interpersonal Behaviours .....	14
The Impact of Social Anxiety on Patterns of Interpersonal Complementarity .....	16
The Relationship Between People’s Social Anxiety Levels .....	19
The Impact of Social Anxiety on Relationship and Task Outcome Measures .....	20
Summary of Research Questions and Hypotheses .....	21
Study 1 .....	23
Method .....	25
Results .....	31
Discussion .....	34
Study 2 .....	37
Method .....	39
Results .....	51
Discussion .....	57
Study 3 .....	60
Method .....	65
Results .....	82
Discussion .....	95
General Discussion .....	101

The Impact of People’s Social Anxiety on Their Own Interpersonal Behaviours .....	102
The Impact of a Partner’s Social Anxiety on Interpersonal Behaviours .....	105
The Impact of Social Anxiety on Patterns of Interpersonal Complementarity .....	108
The Relationship Between People’s Social Anxiety Levels .....	113
The Impact of Social Anxiety on Relationship and Task Outcome Measures .....	115
Implications .....	117
Limitations and Future Directions .....	121
Conclusions .....	124
References .....	125
Appendices .....	158



## List of Figures

Figure 1.	The interpersonal circumplex depicting the location of 16 interpersonal behaviours.....	142
Figure 2.	Results for participants' self-reported affiliation responses towards the confederate (Study 2).....	143
Figure 3.	Results for observer-coded affiliation responses towards the confederate (Study 2).....	144
Figure 4.	Model used to represent participants' situational social anxiety (Study 3).....	145
Figure 5.	Measurement model for participants' situational social anxiety (Study 3).....	146
Figure 6.	Example of a model used to relate situational social anxiety to interpersonal variables (Study 3).....	147
Figure 7.	Overall affiliation and correspondence as a function of situational social anxiety (Study 3).....	148
Figure 8.	Overall dominance and reciprocity as a function of situational social anxiety (Study 3).....	149
Figure 9.	Model for moment-to-moment correspondence and reciprocity as a function of situational social anxiety (Study 3).....	150
Figure 10.	Moment-to-moment correspondence and reciprocity as a function of situational social anxiety (Study 3).....	151
Figure 11.	Example of a model used to relate situational social anxiety and moment-to-moment indices of complementarity to preparatory interaction outcome variables (Study 3).....	152
Figure 12.	Dyadic enjoyment as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).....	153
Figure 13.	Dyadic task performance as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).....	154
Figure 14.	Example of a model used to relate situational social anxiety and moment-to-moment indices of complementarity to final presentation outcome variables (Study 3).....	155
Figure 15.	Presentation quality as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).....	156
Figure 16.	Presentation rapport as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).....	157

**List of Tables**

Table 1.	Summary of Hypotheses and Findings for Study 1.....	137
Table 2.	Summary of Hypotheses and Findings for Study 2.....	138
Table 3.	Summary Statistics for Participants' Time Series and Dyads' Overall Levels of Complementarity and Moment-to-Moment Complementarity (Study 3).....	139
Table 4.	Factor Analysis of Preparatory Interaction Outcome Measure: Principal Components Factoring with a Promax Rotation (Study 3).....	140
Table 5.	Summary of Hypotheses and Findings for Study 3.....	141

## **General Introduction**

The influential idea that important variations in interpersonal behaviours can be captured by the two main constructs of dominance and affiliation was first depicted in a “late evening sketch” by Timothy Leary in the early 1950s (Wiggins, 1996). On this sketch, the two dimensions of dominance and affiliation (also known as status and love) were represented as vertical and horizontal axes, respectively, of a Cartesian plane. This plane can be broken down into finer pie-shaped segments by drawing dimensions through the centre, and the styles or behaviours that are represented by the resulting pie-shaped segments are fuzzy sets that flow into each other to form what is now known in contemporary interpersonal theory as the interpersonal circumplex (Kiesler, 1996). This seemingly simple idea that the most important interpersonal behaviours can be represented as a blend of these two dimensions has instigated a substantial amount of research within clinical and social psychology. The parsimony and elegance of interpersonal theory are undoubted strengths, but we argue that a key influencing variable has been absent from discussions of interpersonal behaviour and dynamics. Despite the hypothesis made by Sullivan (1964) that anxiety is the primary obstacle to establishing healthy interpersonal relationships, research on the influence of anxiety within the interpersonal space has been relatively sparse. Thus, in the current work we systematically examine how anxiety during interpersonal interactions (i.e., social anxiety) effects people’s interpersonal behaviours, the reactions received from others, interpersonal processes, and relationship and task outcomes.

### **Interpersonal Theory**

Interpersonal theory offers a useful theoretical framework to study interpersonal interactions, and a major strength of this theory is its simplistic, yet exhaustive, method of defining and organizing people’s interpersonal behaviours within the interpersonal circumplex (Carson, 1969; Kiesler, 1996). The four endpoints of the two orthogonal axes comprising the

circumplex are frequently labelled dominant, submissive, friendly, and hostile, and people's interpersonal behaviours can be represented on the circumplex as a blend of these two dimensions (see *Figure 1*). The different "blends" of dominance and affiliation are organized theoretically as a circle, with the implication being that at any point on the circle, it is possible to identify a meaningful interpersonal behaviour. Behaviours that fall closer together on the circle are more positively related than behaviours that fall further apart, and behaviours that are at opposite ends of a dimension (e.g., dominant versus submissive) are negatively related.

Despite the dimensional nature of the interpersonal space, numerous researchers often use the two dimensions to categorize interpersonal behaviours into discrete groupings. For example, some researchers (e.g., Carson, 1969) discuss interpersonal behaviours as falling into one of four major quadrants: friendly-dominant, friendly-submissive, hostile-submissive, and hostile-dominant. Other researchers discuss interpersonal behaviours as falling into eight octants (Wiggins, 1982) or sixteenths (Kiesler, 1996). Regardless of how interpersonal theorists segment the circle, it is generally agreed upon that the two overarching constructs of dominance and affiliation are the most important for understanding interpersonal behaviour.

Another major strength of interpersonal theory is its explicit predictions about how people will behave in interpersonal interactions. Interpersonal theorists assert that interpersonal behaviours tend to elicit predictable reactions in others, a concept termed complementarity. Derived originally from Sullivan's (1953) "theorem of reciprocal emotion," Carson (1969) and Kiesler (1983) defined the particular directions in which complementarity should occur within the interpersonal plane. It is argued that complementary responses are similar, or "correspondent" on the affiliation dimension (i.e., friendly behaviour elicits friendly behaviour, and hostile behaviour elicits hostile behaviour) and opposite, or "reciprocal" on the dominance

dimension (i.e., dominant behaviour elicits submissive behaviour and vice versa). For example, if Person A displays a friendly-dominant behaviour (e.g., directing Person B to do something in a warm and encouraging manner), the complementary reaction by Person B would be a friendly-submissive behaviour (e.g., do the requested action in a warm and collaborative way). Patterns of complementarity have been observed across a variety of dyad types, including: unacquainted dyads (Locke & Sadler, 2007; Markey, Funder, & Ozer, 2003; Markey, Lowmaster, & Eichler, 2010; Sadler, Ethier, Gunn, Duong, & Woody, 2009; Sadler & Woody, 2003), confederate-participant dyads (Strong et al., 1988; Tiedens & Fragale, 2003), romantic couples (Cundiff, Smith, Butner, Critchfield, & Nealey-Moore, 2015; Lizdek, Woody, Sadler, & Rehman, 2016; Thomas, 2015), therapist-client dyads (Altenstein, Krieger, & Grosse Holtforth, 2013; Lichtenberg & Tracey, 2003; Thomas, Hopwood, Woody, Ethier, & Sadler, 2014; Tracey, 2004; Tracey, Sherry, & Albright, 1999), teacher-student dyads (Thijs, Koomen, Roorda, & Ten Hagen, 2011), and parent-child dyads (Nilsen, Lizdek, & Ethier, 2015).

A core tenant of interpersonal theory is that complementarity during interactions should be satisfying and beneficial for the dyad and be positively related to important outcome measures (Kiesler, 1996). Empirical research supports this prediction (Sadler, Ethier, & Woody, 2011). For example, dyads that exhibit patterns of complementarity like each other more, do better on an assigned task, view the interaction as more satisfying and positive, feel more comfortable within the dyad, and experience less interpersonal distress (Dryer & Horowitz, 1997; Locke & Sadler, 2007; Markey et al., 2010; Tiedens & Fragale, 2003; Tracey, 2004; Tracey, 2005).

### **Critiques of Interpersonal Theory**

Despite the parsimony that interpersonal theory offers for classifying interpersonal behaviours and making predictions of how people's behaviours tend to influence each other in

predictable ways within an interaction, there are some limitations of the current theory that should not be ignored. One issue is that, although the interpersonal circumplex provides a comprehensive representation of interpersonal behaviours, some important influencing variables of interpersonal behaviour are often not discussed with relation to the interpersonal space. Consider the finding that two of the Big Five personality traits can be represented on the interpersonal circumplex. More specifically, dominance and affiliation can be regarded as rotational variants of the two Big Five factors of agreeableness and extraversion, with agreeableness located approximately 30 degrees clockwise from the affiliation dimension, and extraversion located approximately 30 degrees clockwise from the dominance dimension (Pincus & Gurtman, 1995; Wiggins & Pincus, 1994). Because the interpersonal circumplex is two dimensional, and the Big Five are theorized to be orthogonal to each other, it seems that there is no room on the circumplex for the remaining Big Five traits of conscientiousness, openness, and neuroticism.

Although the theoretical structures of the Big Five Factor model and the interpersonal circumplex seem to imply that the remaining Big Five traits do not have an interpersonal role, conceptually it seems that these traits should influence individuals' interpersonal relations. Indeed, research has documented the interpersonal consequences associated with the three remaining traits. For example, an individual's openness to experience predicts outcomes such as social functioning (McCrae, 1996), autonomy taking (Pincus, Gurtman, & Ruiz, 1998), and interpersonal problems (Gurtman, 1995), and a person's level of conscientiousness predicts relationship satisfaction (Kurtz & Sherker, 2003) and peer acceptance (Jensen-Campbell & Malcolm, 2007). In addition, a person's neuroticism level is relevant to a myriad of interpersonal outcomes such as: relationship dissolution, marital success, social support, the use of coercive

manipulation tactics, relationship quality, and relationship conflict (Buss, Gomes, Higgins, & Lauterbach, 1987; Karney & Bradbury, 1995; Kelly & Conley, 1987; Ozer & Benet-Martinez, 2006; Robins, Caspi, & Moffitt, 2002). Despite the demonstrated impact of the three remaining Big Five traits on interpersonal relationships, barring a few exceptions (e.g., Ansell & Pincus, 2004; Markey & Markey, 2006; Schmidt, Wagner, & Kiesler, 1999; Trapnell & Wiggins, 1990), these three traits are often not discussed with relation to the interpersonal circumplex.

Not only are three of the Big Five traits often absent from discussions of interpersonal behaviours and patterns, but one of the most basic and enduring dispositions and motivations is often not discussed. Elliot and Thrash (2002) propose that personality is comprised of two fundamental dispositions: approach temperament and avoidance temperament. Approach temperament has been linked to the behavioural activation system, positive emotionality, and most importantly for our argument, extraversion. In contrast, avoidance temperament has been linked to the behavioural inhibition system, negative emotionality, and neuroticism. If we think of the interpersonal space as a comprehensive representation of interpersonal styles and behaviours, it seems puzzling that one of the most basic and enduring dispositions is central to understanding interpersonal behaviours (i.e., approach temperament, which is linked to the trait of extraversion), and the other (i.e., avoidance temperament, which is linked to the trait of neuroticism) is regarded as somewhat irrelevant. Logically it seems that both temperaments should influence interpersonal behaviour.

A second issue with interpersonal theory is that the core predictions made by the principle of interpersonal complementarity have not always held true when tested empirically. For example, some research has shown that patterns of complementarity are notably stronger and more consistent for affiliation correspondence than dominance reciprocity (e.g., Bluhm, Widiger,

& Miele, 1990; Cundiff et al., 2015). Additionally, Orford (1986) argued that patterns of complementarity are often observed on the friendly side of the circle (i.e., friendly-dominant behaviour elicits friendly-submissive behaviour, and vice versa), but less frequently on the hostile side of the circle (i.e., hostile-dominant behaviour does not necessarily elicit hostile-submissive behaviour and vice versa). Thus, the somewhat inconsistent findings for empirical tests of complementarity suggest that the ways in which people's interpersonal behaviours influence one another during an interaction cannot solely be predicted by the expected patterns of behaviour set forth by the principle. Indeed, some researchers have sought to examine possible contextual factors that can impact the degree to which complementarity occurs within an interaction. Some of these factors include: the interpersonal motivations and goals of interactants (Dryer & Horowitz, 1997), individual differences in interpersonal styles, (Bluhm et al., 1990), personality traits (Yao & Moskowitz, 2015) and the setting in which the interaction occurs (Moskowitz, Ho, & Turcotte-Tremblay, 2007).

Thus far we have identified two main criticisms of interpersonal theory. First, although the constructs of dominance and affiliation are important for understanding interpersonal behaviours and dynamics, the impact of additional constructs that seem potentially relevant in people's social interactions are often not considered. Second, the predictions made by the principle of interpersonal complementarity are perhaps too simplistic and could benefit from consideration of additional contextual variables.

### **Examining Boundary Conditions**

Given the critiques of interpersonal theory outlined above, it is interesting to consider possible next research questions that could be helpful from an interpersonal perspective in addressing these criticisms. Zanna and Fazio (1982) noted that as a field of research advances,



the nature of questions in that field goes through successive generations. First-generation questions address the simple issue of if relationships between variables exist. For example, can people's dominance behaviours during an interaction be predicted by their partner's dominance behaviours? Or, do people's dominance behaviours become negatively correlated over the course of an interaction? Interpersonal theorists have most often addressed these first-generation questions. Second-generation questions address potential boundary conditions of the relationships established in the first generation. For example, what are the conditions in which patterns of reciprocity on dominance or correspondence on affiliation are enhanced or diminished? That is, what variables serve as moderators of complementarity between people in their social interactions? Despite best attempts by some researchers to examine these second-generation questions, the call to consider a more complex model of interpersonal behaviour that addresses the boundaries of predicted relationships made by interpersonal theory (e.g., Orford, 1986) has gone relatively unanswered. Thus, in the current work we begin to answer the second-generation questions, and suggest that integrating an additional variable into the interpersonal space will help to inform our understanding of interpersonal behaviour and address some of the critiques of the theory.

Although there are a number of potential variables that may be considered as relevant to interpersonal behaviour, in the present work we explore the impact of people's anxiety levels during an interaction on their own behaviours, the behaviours of their interaction partners, interpersonal processes that occur within an interaction, and relationship and task outcomes. The importance of anxiety on interpersonal behaviour has been recognized by seminal interpersonal theorists. For example, Sullivan (1953) argued that a basic human motivation is to minimize anxiety. Furthermore, he argued that anxiety is always triggered interpersonally and it serves as

an indicator of insecurity, a signal of danger to self-respect, and is the major disruptive force in interpersonal relationships. Sullivan likened anxiety to a “blow on the head” (p. 160) – it makes people incapable of learning, impairs memory, and narrows perceptions – and he indicated that it is the primary cause of inadequate or inappropriate patterns of interpersonal relations. When a person experiences anxiety during an interaction, Sullivan asserted that *security operations* are activated, which are psychological and behavioural processes that have a primary goal of reducing anxiety. For example, one security operation is selective inattention, which involves a person shifting their awareness away from the anxiety-filled interpersonal situation. Although selective inattention allows a person to remove themselves from the anxious situation, it precludes them from learning information that could result in more effective patterns of interpersonal communication for future interactions (Evans, 1996). The importance of anxiety was echoed by Leary (1957) who, when laying out working principles for an interpersonal theory of personality, referenced the idea that all interpersonal behaviours are attempts by a person to avoid anxiety or establish self-esteem. Thus, anxiety is recognized by interpersonal theorists as a powerful driving force of interpersonal behaviour, yet its impact within the interpersonal space has often not been explicitly discussed or researched.

Apart from the acknowledgement by some interpersonal theorists that anxiety is a relevant interpersonal variable, there are additional theoretical and empirical reasons to consider incorporating anxiety into the interpersonal space. As noted previously, the trait of neuroticism is typically not represented within the interpersonal space. However, given the evidence that neuroticism is indeed an interpersonal trait (e.g., Ozer & Benet-Martinez, 2006), and the persuasive theoretical reason for integrating avoidance motivation (which is widely assumed to be an underlying factor in the personality trait of neuroticism) into the interpersonal space (i.e., if

approach temperament is relevant to interpersonal behaviour, then avoidance temperament should be too), a key facet of neuroticism, anxiety, seems like a compelling variable to integrate into our understanding of people's interpersonal behaviours. In the current research we use an interpersonal theory framework to examine how anxiety in a social situation (i.e., social anxiety) is an influencing factor on interpersonal behaviours and processes.

### **Social Anxiety and Interpersonal Behaviour**

Anxiety can be elicited or experienced in a variety of different situations. According to cognitive behavioural models of social anxiety (Clark & Wells, 1995), when a person believes they are in a situation in which they could act in a way that might be viewed negatively by others, and their behaviour could result in a loss of status or rejection, social anxiety is activated. Experiencing social anxiety is not inherently problematic for an individual or their social interactions, and, under some circumstances, anxiety is adaptive. Leary (2010) proposes that social anxiety is an "early warning system" that alerts an individual to threats against their social acceptance, and motivates an individual to engage in behaviours to thwart the threat, eliminate their anxiety, and help to manage their interpersonal relationships. Thus, social anxiety, within bounds, can be beneficial to an individual.

However, experiencing social anxiety is not always adaptive. According to cognitive models of social anxiety, once a certain level of social anxiety is activated in response to a feared situation, the anxious person will experience somatic, cognitive, and behavioural changes, as well as a shift in their focus of attention. Specifically, the anxious person will become preoccupied with the changes they are experiencing, resulting in an internal focus that interferes with the person's ability to process external social cues (Clark & Wells, 1995). The influence of

high levels of social anxiety on people's behaviours during an interaction and their ability to process social cues will undoubtedly have important interpersonal consequences.

Indeed, some research supports the direct relationship between social anxiety levels and how people behave during interactions, how people perceive others, and relationship outcomes. For example, social anxiety impacts people's verbal and nonverbal behaviours during interactions. People who have higher levels of social anxiety adopt a unique style of speaking to their interaction partners: they have low self-disclosure during interactions, have short speech duration and long conversational pauses, and fail to maintain eye contact (Alden & Taylor, 2004; Leary, Knight, & Johnson, 1987). In addition, our perceptions of other people are influenced by how much social anxiety they display. For example, those who are high on social anxiety are seen as less warm and affiliative than those who are low on social anxiety (Alden & Taylor, 2004). Finally, a person's level of social anxiety impacts important relationship outcomes. People who experience higher levels of social anxiety develop fewer social relationships, and when they do develop social relationships, these relationships are less intimate, functional, and satisfying than relationships of people with lower levels of social anxiety (Alden & Taylor, 2004). Even in brief interactions between unacquainted dyads, others are less likely to desire future interactions with individuals who have high levels of social anxiety (Meleshko & Alden, 1993). Thus, empirical evidence suggests that social anxiety is relevant to interpersonal behaviours and processes, furthering our argument that social anxiety is a pertinent variable to integrate into discussions of the interpersonal circumplex.

Although interpersonal research that incorporates social anxiety is relatively sparse overall, the majority of attempts by interpersonal theorists to connect social anxiety to interpersonal theory have been completed with participants who have clinically high levels of

social anxiety. For example, some researchers have tried to identify subtypes of interpersonal problems among those with diagnosed social anxiety, and found that people with clinical levels of social anxiety typically have friendly-submissive interpersonal problems or hostile-submissive interpersonal problems (Cain, Pincus, & Grosse Holtforth, 2010). Other work has examined the dominance and affiliation behaviours of individuals with high levels of social anxiety, and found that highly anxious people exhibit more submissive behaviour during interactions than less anxious individuals (Russell et al., 2011). Researchers have also investigated how people who are high on social anxiety evaluate the dominance and affiliation behaviours of others.

Rodebaugh and colleagues (2016) found that people with high levels of social anxiety have increased tolerance for individuals who are hostile and submissive, and the authors argue that this increased tolerance is driven by the presumed similarity between the anxious person and cold and submissive others. Finally, some research has sought to make broad connections between interpersonal processes and people with high levels of social anxiety. For example, Alden and Taylor (2004) discuss social anxiety with relation to self-perpetuating interpersonal cycles, and review literature on interpersonal variability in social phobia and the effect of social anxiety on the processing of social information.

### **Summary and Overarching Aims of the Current Research**

Anxiety has been identified as an important variable to consider in interpersonal theory, and the impact of social anxiety within the interpersonal space has been studied in some empirical work, but our work differs from this previous work in two important ways. First, our work uses non-clinical samples and we did not focus on *trait* social anxiety, but rather *situational* social anxiety. Although trait social anxiety and situational social anxiety are inextricably linked, such that a person who is high in trait social anxiety is likely to experience more situational

social anxiety, trait anxiety represents an individual's predisposition to respond with anxiety across a variety of situations, whereas situational anxiety is a more transient normative state specific to a certain situation (Spielberger, 1966). Not everyone can experience what it is like to be high on trait social anxiety, but the majority of people can recall instances in which their situational social anxiety was heightened. For example, a person who is low on trait social anxiety can still experience high situational social anxiety when they are asked to participate in a particularly anxiety-provoking task, such as giving an impromptu speech to a room of people. By focusing on situational social anxiety in our work, we hope to examine social anxiety as a general phenomenon that impacts the interpersonal behaviours and processes of the majority of people, not just of those who are high on trait social anxiety.

Our work also differs from previous work because we consider the interpersonal impact of social anxiety across a variety of areas. Rather than considering only one area of impact (e.g., the behaviour of a person who has high levels of social anxiety), we consider the impact of social anxiety in five different domains. First, we look at the impact of people's social anxiety on their own interpersonal behaviours (i.e., do people's social anxiety levels influence their dominance and affiliation behaviours during an interaction?). Second, we examine the impact of a partner's social anxiety on a person's interpersonal behaviours (i.e., does interacting with a person who has high levels of social anxiety influence people's dominance and affiliation behaviours during an interaction?). Third, we assess the impact of social anxiety on patterns of interpersonal complementarity (i.e., if one or both partners in an interaction are experiencing anxiety, are patterns of complementarity enhanced or diminished?). Fourth, we look at the relationship between people's social anxiety levels (i.e., does social anxiety in one person result in increased social anxiety in the other person?). Fifth, we examine the impact of social anxiety on

relationship and task outcome measures (i.e., does interacting with an anxious person lead to negative relationship and task outcomes?)

In the following, we discuss each of these five different domains, in turn.

### **The Impact of People's Social Anxiety on Their Own Interpersonal Behaviours**

We expected that people's social anxiety levels during an interaction would impact their dominance and affiliation behaviours. Regarding dominance levels in particular, people who are higher in social anxiety tend to act in ways that are consistent with a submissive interpersonal style: they tend to be described in interactions as behaving in a non-assertive and withdrawn manner, for example, averting eye contact and having a closed body posture (Beidel, Turner, & Dancu, 1985; Davila & Beck, 2002). Furthermore, increased social anxiety levels during interpersonal interactions is associated with submissive verbal patterns; people who are high on social anxiety tend to ask more questions, agree with their partners more, and present less objective information to their interaction partners (Leary et al., 1987). Not only are people who are high on social anxiety observed as acting more submissively, they also self-report that they are more submissive and have more submissive interpersonal problems than people with lower levels of social anxiety (Cain et al., 2010; Oakman, Gifford, & Chlebowsky, 2003). In addition, one daily diary study by Russell and colleagues (2011) found that when people reported more situational anxiety during an interpersonal interaction, they were also more likely to report increased submissive behaviour. Given the above information, we expected that increased situational social anxiety would result in more submissiveness from interactants.

A person's social anxiety level is also likely to impact their displays of affiliation during an interaction. People who are high on social anxiety tend to exhibit verbal and nonverbal cues in interactions that lack warmth and affiliation. For example, people who are high on social anxiety

often avoid eye contact during interactions, fail to self-disclose to an interaction partner, and are rated by observers as being less warm and less likeable (Alden & Bieling, 1998; Creed & Funder, 1998; Gough & Thorne, 1986; Meleshko & Alden, 1993; Papsdorf & Alden, 1998). In addition, people who have higher levels of social anxiety tend to characterize themselves as cold and less warm than people who have lower levels of social anxiety (Alden & Phillips, 1990; Oakman et al., 2003), and increased situational anxiety during an interpersonal interaction leads to people self-reporting fewer agreeable and more quarrelsome behaviours (Russell et al., 2011). Therefore, consistent with previous literature, we expected that increased situational anxiety would result in reduced affiliation from interactants.

### **The Impact of a Partner's Social Anxiety on Interpersonal Behaviours**

It is also interesting to consider the ways in which people *respond* interpersonally to those who are higher on social anxiety. As noted by Alden and Taylor (2004), people's interpersonal reactions to individuals with higher levels of social anxiety have been relatively understudied. Nonetheless, there is some empirical work from which we draw some predictions. With regard to dominant behaviours, people interacting with those who have higher levels of social anxiety have been described as trying to dominate and control the interaction, and "talking at" rather than "talking with" the highly anxious person (Creed & Funder, 1998). Additionally, we can use the principle of interpersonal complementarity to predict the amount of dominance we would expect from partners of people with higher levels of social anxiety. If we expect people with higher levels of social anxiety to display relatively more submissiveness during an interaction, then the complementary response from their interaction partner should be relatively dominant. Thus, consistent with findings from previous research, and the predictions made by



the principle of interpersonal complementarity, we expected that people would display relatively more dominance towards interaction partners who were higher on situational social anxiety.

The prediction for how much affiliation people respond with towards a person who is higher on social anxiety is less clear. Some empirical evidence suggests that people typically do not react with high levels of affiliation towards people who are higher on social anxiety. For example, interaction partners are less likely to desire future interactions with a person who is higher on social anxiety (Meleshko & Alden, 1993; Papsdorf & Alden, 1998), are rated as displaying irritability towards a person with higher levels of social anxiety, and are more likely to see highly anxious people as moody and self-pitying (Creed & Funder, 1998). Furthermore, applying predictions made from the principle of interpersonal complementarity, we would expect the typically cold behaviours of a person who is higher on social anxiety to elicit cold responses from interaction partners. However, there is also some research that suggests people respond to more socially anxious individuals (at least in unacquainted dyads) with increased empathy and support (Heerey & Kring, 2007). It is possible that some people view a person with higher levels of social anxiety as quite fragile, and respond with warmth and support towards them rather than coldness. Finally, some work suggests that people's affiliative responses are not impacted by a person's level of social anxiety. Work by Dobson (1989) found that there were no significant differences in hostile or affiliative responses towards people who were higher versus lower on social anxiety. In light of this contradictory evidence, we remained agnostic about how much warmth would be shown by interaction partners towards people with higher levels of social anxiety.

## **The Impact of Social Anxiety on Patterns of Interpersonal Complementarity**

As noted earlier, a strength of interpersonal theory is that it allows for the prediction of how people will behave and respond to others during social interactions. Each person's behaviour tends to elicit or constrain subsequent behaviour from a partner during an interaction, a process termed interpersonal complementarity. Given that we expect a person's social anxiety level to impact their own behaviours and the behaviours of interaction partners, it is also reasonable to expect that a person's level of social anxiety will impact processes, such as interpersonal complementarity, that often take place during interactions. To our knowledge, our work is the first to examine the potential influence of social anxiety on patterns of complementarity.

Until recently, interpersonal theory has not been specific about the time scale at which patterns of complementarity occur. However, there are at least two distinct approaches used to study patterns of complementarity during interactions, and these two approaches use different time scales. One approach, which we call *complementarity of overall levels*, examines how people adjust their *overall* levels of dominance and affiliation to complement the dominance and affiliation levels of their partners (e.g., Dryer & Horowitz, 1997; Locke & Sadler, 2007; Sadler & Woody, 2003). To assess this type of complementarity, traditionally participants (or observers) make overall ratings of how dominant or affiliative the target was during an interaction, and researchers use these overall ratings to examine how correspondent (i.e., similar on levels of affiliation) and reciprocal (i.e., opposite on levels of dominance) the behaviour of the dyad members were. Although useful and interesting information may be captured by looking at complementarity of overall levels, important information about the continuous behavioural exchange that occurs between two partners is lost.

Another approach to studying patterns of complementarity, which we call *moment-to-moment complementarity*, addresses this issue by applying a more fine-grained approach to capturing the continuous flow of each person's dominance and affiliation behaviours as they unfold over an interaction. Specifically, using a computer joystick and a joystick monitoring program (Sadler et al., 2009), observers focus on one person in a video-recorded dyadic interaction and use the joystick to code moment-to-moment levels of that person's dominance and affiliation behaviours. The resulting data is two time series, one for the target person's dominance behaviours and one for the target person's affiliation behaviours. The observer typically then watches the video again and codes the other person in the dyad, resulting in time series for the interaction partner's dominance and affiliation behaviours. Because the dyad members' time series are coordinated in time, they can be correlated to quantify the degree of moment-to-moment affiliation correspondence (i.e., similarity on affiliation) and dominance reciprocity (i.e., oppositeness on dominance) that occurs within each dyad. Importantly, moment-to-moment complementarity is entirely distinguishable from complementarity of overall levels (Sadler et al., 2009).

To broaden the understanding of how social anxiety impacts interpersonal processes, the current research investigates the impact of social anxiety on patterns of complementarity at both the overall level (Studies 1 – 3) and the moment-to-moment level (Study 3).

We expected that increased social anxiety would dampen overall levels of correspondence but be unrelated to overall levels of reciprocity. As discussed previously, people who are higher on social anxiety tend to be seen as more hostile-submissive during interpersonal interactions. Thus, the complementary response from an interaction partner should be hostile-dominance. However, as noted by Orford (1986), a fairly common response to hostile-

submissive behaviour is friendly-dominant behaviour. Reacting in a friendly-dominant way towards a person who is higher on social anxiety is not completely inconsistent with previous work that has observed partners of more socially anxious people reacting with empathy and support, that is, acting more affiliatively (Heerey & Kring, 2007), yet also with direction and control, that is, acting more dominantly (Creed & Funder, 1998). Given that the affiliation levels of people who are higher on social anxiety and their interaction partners might be mismatched at the overall level (i.e., more anxious people ought to be relatively more hostile and their partners ought to be relatively more friendly), complementarity of overall levels of correspondence in these dyads should be dampened. In contrast, given that the dominance levels of people who are higher on social anxiety and their interaction partners follow predicted patterns of reciprocity, (i.e., more anxious people are likely to be relatively more submissive and their partners are likely to be relatively more dominant), complementarity of overall levels of reciprocity should be unaffected by social anxiety.

We also expected that the presence of social anxiety in an interaction would dampen patterns of moment-to-moment correspondence and reciprocity. As stated previously, cognitive behavioural models of social anxiety posit that increased anxiety during an interaction increases self-focused attention, which, in turn, leads to decreased external cue processing and less concentration on the interaction (Clark & Wells, 1995). Decreased external cue processing could result in individuals who are higher on social anxiety overlooking or missing their partner's affiliative and dominance cues during interactions. For example, if Partner A smiles at Partner B, the complementary affiliative response from Partner B would be a matching affiliative behaviour, such as a smile in return. If, however, Partner B is experiencing higher levels of social anxiety and does not process the external cue (i.e., the smile) from Partner A, Partner B is

unlikely to respond with a corresponding affiliative behaviour, decreasing the moment-to-moment coordination of affiliation within the dyad. If Partner B continues to not respond with complementary behaviours to Partner A, the overall moment-to-moment complementarity of the dyad will be dampened.

Consistent with this prediction, Heerey and Kring (2007) found that participants with higher levels of social anxiety were less likely than people with lower levels of social anxiety to match the smile type (i.e., a polite smile versus a pleasant smile) of their interaction partners. They reasoned that the increased self-focused attention of people who are higher on social anxiety precluded them from responding with the appropriate matching smile to their interaction partner. Additionally, they found that when a highly anxious person was paired with a less anxious partner, both dyad members found the interaction to be less smooth and coordinated than when two people who were lower on social anxiety were paired together. It is conceivable that the lack of smoothness and coordination that participants reported was an indication of dampened patterns of moment-to-moment correspondence and reciprocity within the dyad. Additional support for our hypothesis comes from the finding that perceptions of higher levels of anxiety in an interaction partner results in worse tracking of the partner's interest in maintaining a relationship (West, Dovidio, & Pearson, 2013). Therefore, people who perceive their partner to be more socially anxious during an interaction may be worse at tracking the partner's cues, leading to lower levels of moment-to-moment complementarity between interaction partners.

### **The Relationship Between People's Social Anxiety Levels**

Another interpersonal effect of social anxiety that is explored in the current work is whether the social anxiety levels of people become related during an interaction. Just like people's affiliation levels tend to become more similar (i.e., correspondent), and people's

dominance levels tend to become more opposite (i.e., reciprocal), people's social anxiety levels might become related in a meaningful way in an interpersonal context. We predicted that increased situational social anxiety in one person would result in increased situational social anxiety in another person (i.e., anxiety levels would be correspondent). This hypothesis is based on previous literature that suggests there may be a "contagious" component to anxiety. For example, researchers have found that when a person who was higher in social anxiety was paired with a person who was lower in social anxiety, both partners fidgeted more, in comparison to when both partners were lower in social anxiety (Heerey & Kring, 2007). Additionally, people who interact with more anxious people report feeling more distressed (Gurtman, Martin, & Hintzman, 1990), and a strong positive relationship has been found between dyad members' self-reported anxiety levels (Gump & Kulik, 1997). Park and colleagues (2009) recently noted that findings surrounding anxiety contagion are intriguing, but preliminary. Therefore, our work helps to shed light on this area of research and aids in making more conclusive statements about how the social anxiety levels of people become related in interpersonal contexts.

### **The Impact of Social Anxiety on Relationship and Task Outcome Measures**

The final area that is explored in the current work is the impact of social anxiety on relationship and dyadic task outcome measures. Existing research suggests that generally, interacting with a person who has higher levels of social anxiety leads to negative relationship and task outcomes. For example, with regards to relationship outcomes, people are less likely to want to engage in future interactions with people who have high levels of social anxiety during an initial encounter (Meleshko & Alden, 1993). Similarly, the quality of an interaction is rated to be higher when two people who are low on social anxiety initially interact compared to when at least one member of the dyad has higher levels of social anxiety (Heerey & Kring, 2004). Given

these established findings, we predicted that when participants were reading about (Study 1) or interacting with (Studies 2 and 3) a person who had higher levels of social anxiety, they would be less likely to desire a future relationship with that person. Additionally, in Study 3 we predicted that the more social anxiety unacquainted dyads were experiencing during an interaction, the less the dyad as a whole would enjoy the interaction and the less rapport they would display while completing an assigned task.

The relationship between levels of social anxiety and dyadic task outcomes (i.e., how well a dyad does on an assigned task) is arguably less clear. At an individual level, previous research has demonstrated that the higher a person's social anxiety level, the worse their performance on a variety of tasks, including a speech performance task (Losiak, Blaut, Klosowska, & Slowik, 2016), and an interpersonal perception task (Schroeder & Ketrow, 1997). However, to our knowledge, the impact of social anxiety levels on the task performance of a *dyad* has yet to be examined. Drawing from the literature documenting the adverse effects of an individual's social anxiety on task performance, we hypothesized that higher levels of social anxiety in a dyadic interaction would be a detriment to a dyad's performance on an assigned task. We tested this hypothesis in Study 3.

### **Summary of Research Questions and Hypotheses**

To summarize, we examine the impact of social anxiety on interpersonal behaviours and dynamics by answering five major research questions. We examine these five research questions across three studies. In the first study, participants responded to a target person in imagined scenarios. In the second study, participants interacted with a trained confederate. And in the third study, two participants interacted with each other. A summary of our research questions and our hypotheses can be found below.

**Research Question 1:** How does social anxiety impact a person's dominance and affiliation behaviours? We hypothesized that when a person experiences more social anxiety, they would display more submissive and less affiliative behaviour during an interaction.

**Research Question 2:** How does an interaction partner's social anxiety impact a person's dominance and affiliation behaviours? We hypothesized that interacting with a person who is higher on social anxiety would result in more dominant behaviour from an interaction partner. Given the discrepant previous findings with regard to how much affiliation people respond with towards people who have higher levels of social anxiety, we did not have an explicit prediction for how a person's level of social anxiety would impact a partner's affiliation behaviour.

**Research Question 3A:** How does the social anxiety of one or both members in an interaction impact overall levels of complementarity? We predicted that higher levels of social anxiety would dampen overall levels of correspondence, but be unrelated to overall levels of reciprocity.

**Research Question 3B (tested in Study 3 only):** How does the social anxiety of one or both members in an interaction impact moment-to-moment complementarity? We expected that higher levels of social anxiety would dampen patterns of moment-to-moment correspondence and reciprocity.

**Research Question 4:** To what degree is there a relationship between people's social anxiety levels? We predicted that increased social anxiety in one person would result in increased situational social anxiety in another person.

**Research Question 5A:** How does social anxiety during an interaction impact relationship outcomes? We hypothesized that when a person was interacting with an individual who was higher on social anxiety, they would express less of a desire to form a future relationship with



that anxious individual (tested in Studies 1 – 3). Further, we expected that increased social anxiety during a dyadic interaction would result in observers seeing both dyad members as enjoying the interaction less and as having less rapport while completing an assigned task (tested in Study 3).

**Research Question 5B (tested in Study 3 only):** How does social anxiety during an interaction impact task performance outcomes? We expected that increased social anxiety during a dyadic interaction would result in a poorer performance on a task assigned to a dyad.

### Study 1

In Study 1, participants read a vignette in which the social anxiety and agreeableness of the described target person they were to imagine interacting with was manipulated. Participants then reported how they would respond to such a target and how much anxiety they would experience in the described social interaction. We chose to begin our investigation into the impact of social anxiety on interpersonal behaviours and processes using vignettes because it allowed us to directly manipulate the variables of interest (i.e., the social anxiety and agreeableness levels of the target) and keep the social interaction that participants were imagining themselves in well controlled across participants.

The target in the scenario that participants were reading about was described as having higher or lower levels of social anxiety and displaying either agreeable or disagreeable behaviours. By manipulating these two variables of interest, we were able to begin a preliminary investigation into how social anxiety impacts interpersonal behaviours, responses, and processes. More specifically, by manipulating the target's social anxiety level we could assess whether participants' self-reported anxiety, and dominance and affiliation responses towards the target differed depending on whether they were reading about having an interaction with a person who had a higher versus lower level of social anxiety. Further, by manipulating the agreeableness

level of the target we were able to assess the impact of social anxiety on overall levels of complementarity. Recall that the Big Five factor of agreeableness can be regarded as a rotational variant of the two circumplex factors, dominance and affiliation, with agreeable interpersonal behaviours being located in the friendly-submissive quadrant of the circumplex, and disagreeable interpersonal behaviours being located in the hostile-dominant quadrant of the circumplex.

According to the predictions made by the principle of interpersonal complementarity, agreeable (i.e., friendly-submissive) behaviours should elicit more affiliative and dominant responses from interaction partners, whereas disagreeable (i.e., hostile-dominant) behaviours should elicit fewer affiliative and dominant responses from interaction partners. By examining the interaction between the social anxiety manipulation and the agreeableness manipulation, we can assess whether the target's level of social anxiety moderated typical patterns of complementarity between the fictitious target in the scenario and our participants.<sup>1</sup>

For the current study (and similar to the hypotheses noted in the General Introduction), we hypothesized that:

---

<sup>1</sup> Because the Big Five factor of extraversion is also a rotational variant of dominance and affiliation, we could have manipulated the target's extraversion level to assess how social anxiety moderates typical patterns of complementarity towards people who are high on extraversion (falling in the friendly-dominant quadrant) and low on extraversion (falling in the hostile-submissive quadrant). We chose to manipulate the agreeableness level of the target, rather than the extraversion level, because people with high levels of social anxiety are more likely to differ on levels of agreeableness than on levels of extraversion. For example, people who have high levels of social anxiety have been observed as displaying agreeable behaviours during social interactions (e.g., smiling, nodding; Pilkonis, 1977) and disagreeable behaviours (e.g., being critical and angry; Alden & Taylor, 2004). In contrast, although people with high levels of social anxiety have been observed as displaying introverted behaviours during an interaction (e.g., acting submissively; Russell et al., 2011), the notion that people with high levels of social anxiety consistently display extraverted behaviours during an interaction seems unlikely. Thus, to increase the ecological validity of our manipulation, we opted to manipulate the agreeableness level of the target rather than the extraversion level.

1. Participants' self-reported social anxiety would impact their dominant and affiliative responses towards the target in the scenario. In particular, we expected that participants who reported they would have more anxiety in the interaction would also report that they would display more submissive and hostile responses towards the target in the scenario (Research Question 1).
2. The target's level of social anxiety would impact participants' interpersonal responses. We hypothesized that participants who read about the high social anxiety target (versus the low social anxiety target) would indicate having more dominant responses towards the target; however, we were agnostic with regards to our predictions for how participants' affiliative responses would differ towards the high versus low social anxiety target (Research Question 2).
3. Participants would report less overall correspondence on affiliation with the high social anxiety target (versus the low social anxiety target), but patterns of overall reciprocity on dominance would not be impacted by the target's level of social anxiety (Research Question 3A).
4. Participants who imagined interacting with a high social anxiety target would report higher levels of social anxiety compared to participants who imagined interacting with a low social anxiety target (Research Question 4).
5. Participants would indicate less of a desire to form a future relationship with the high social anxiety target compared to the low social anxiety target (Research Question 5A).

## **Method**

**Participants.** Over the course of three school terms, 219 undergraduate students participated in this study. All of the participants were enrolled in introductory psychology

courses and received partial credit for their participation. Participants were recruited through the Psychology Research Experience Program (PREP) at Wilfrid Laurier University.

A total of 59 individuals were excluded from the analyses. The majority of these individuals were removed because of failure to answer an attention check question. Embedded in the questionnaire was an item reading, “If you are reading this question, please check off moderately inaccurate.” Of the 59 individuals excluded, 53 participants did not answer this question correctly. The remaining six individuals were removed from the analyses for failing to answer a substantial portion of the survey. After removing these individuals from the data set, the sample size used for analyses totaled 160 (110 females, 49 males, 1 other). The mean age for participants was 19.50 ( $SD = 2.27$ ).

**Procedure.** This study was completed by participants entirely online. After participants signed up to participate in this study via the PREP system, a webpage link was provided. This link routed participants to a secure website that hosted the survey. The first page that participants were routed to was the informed consent. In the informed consent, participants were told that the study investigated individuals’ responses to social situations and that they would be asked to read a scenario about a target individual and answer some questions about how they think they would respond if they were in the described scenario. After informed consent was obtained, participants were able to begin the study.

Participants were randomly assigned to read one of 16 possible scenarios (described below). The scenarios were one-paragraph in length and described a target individual in a social situation. After reading the scenario, participants were asked a variety of questions that assessed how they think they would respond to the target individual in the scenario. After completing the study, participants were routed to a debriefing screen.

**Materials and measures.** The materials and measures for the current study are described in more detail below.<sup>2</sup>

*Manipulation scenario.* All participants read a one-paragraph scenario, which served as the experimental manipulation. The scenarios differed on two main variables: 1) the social anxiety level of the target person described in the scenario (high social anxiety versus low social anxiety) and 2) the agreeableness level of the target person described in the scenario (agreeable versus disagreeable). These manipulations were fully crossed to produce the following four main conditions: 1) high social anxiety/agreeable target, 2) low social anxiety/agreeable target, 3) high social anxiety/disagreeable target, and 4) low social anxiety/disagreeable target. The personality descriptions and behaviours of the target in each scenario were based on personality, interpersonal theory, and social anxiety literature (e.g., Alden & Taylor, 2004; Kiesler, 1996; Widiger, 2009). For example, for the social anxiety manipulation, the target who was high in social anxiety was described as being nervous and uneasy. In contrast, the target who was low in social anxiety was described as being relaxed and comfortable. These descriptions correspond to characterizations in the social anxiety literature of individuals with higher and lower levels of social anxiety, respectively. For the agreeableness manipulation, the agreeable target was described as unguarded, trusting, and a bit of an “open book”, whereas the disagreeable target was described as guarded, untrusting, and a bit standoffish. These descriptions correspond to characterizations in the personality literature (e.g., Graziano & Tobin, 2009) and Kiesler’s (1996) characterizations of individuals whose behaviours fall in the friendly-submissive quadrant of the circumplex (i.e., where agreeable interpersonal behaviours are located) and the hostile-dominant quadrant of the circumplex (i.e., where disagreeable interpersonal behaviours are located).

---

<sup>2</sup> For a list of additional measures administered to participants that are not of interest in the current work, please see Appendix A.

The scenarios differed on two additional variables: 1) gender of the target (Adam versus Andrea) and 2) social situation of the target (giving a class presentation versus going into a yearly evaluation work meeting). These two additional variables were fully crossed with the previously mentioned ones, producing 16 scenarios in total. It was expected that these two variables would not impact participants' responses and were incorporated into the current study so that generalizations could be made across different genders and social situations. The 16 manipulation scenarios can be found in Appendix B.

***Manipulation check.*** Immediately after reading the scenario, using a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*extremely*), participants made ratings about the target's levels of anxiety and warmth. Specifically, to assess the effectiveness of the social anxiety manipulation, participants rated how anxious they thought the target individual was about the social situation that was being described. We expected that participants who were reading about the high social anxiety target would rate the target as more anxious than those who were reading about the low social anxiety target. To assess the effectiveness of the agreeableness manipulation, participants rated how warm they thought the target in the scenario was. Higher levels of warmth are characteristic of individuals who are high on agreeableness (Graziano & Tobin, 2009), and thus we expected that participants who were reading about the agreeable target would rate the target as warmer than those participants who were reading about the disagreeable target.

***Self-reported anxiety.*** Participants completed three items that assessed the extent to which they would experience anxiety if they were engaging in the interaction described in the scenario. Consistent with other items used in previous research to assess state anxiety (e.g., Russell et al., 2011; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; West et al., 2013), participants rated how anxious they would be, how comfortable they would be (reverse scored),

and how at ease they would be (reverse scored) in the scenario. Ratings took place on a 1 (*not at all*) to 5 (*extremely*) scale and a copy of the items administered to participants for the different contexts (giving a class presentation versus going into an important work meeting) can be found in Appendix C. Cronbach's alpha for this measure was .71.

***Affiliative responses to target.*** Participants completed 16 items that assessed the extent to which they would respond with affiliation or hostility towards the target described in the scenario. A total of nine items assessed participants' affiliative responses towards the target and seven items assessed participants' hostile responses towards the target. The majority of content used in the construction of items for this subscale came from well-established scales. In particular, ten items were adapted from the agreeableness and quarrelsome subscales of the Social Behavior Inventory (SBI; Moskowitz, 1994) and six items were adapted from the friendliness and hostile subscales of the Checklist of Interpersonal transactions (CLOIT; Kiesler, 1984).

Examples of affiliative responses towards the target are, "I want to smile at Adam" and "I would tell Adam that he did a great job on his presentation." Examples of hostile responses towards the target are, "I would give Adam verbal or nonverbal cues that I am annoyed with him" and "I would try to make Adam feel badly about his presentation." Responses took place on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*). We calculated a dimension score for each participant by subtracting the mean of participants' scores on the hostile items from the mean of participants' scores on the affiliation items. Thus, higher scores on this measure indicate a relatively more affiliative response towards the target and lower scores on this scale indicate a relatively more hostile response towards the target. For the current sample, Cronbach's alpha of this measure was .87. A copy of this measure can be found in Appendix D.

***Dominant responses to target.*** Participants completed eight items that assessed the extent to which they would respond with dominance or submissiveness towards the target in the scenario. Four items assessed participants' dominant responses towards the target and four items assessed participants' submissive responses towards the target. The majority of items were selected and adapted for the current study from the dominance and submissiveness subscales of the Social Behavior Inventory (Moskowitz, 1994). Examples of dominant responses towards the target are, "I would express an opinion to Adam about his presentation" and "I would make clear and firm suggestions to Adam about his presentation." Examples of submissive responses toward the target are, "I would not directly say what I really wanted to say to Adam" and "I would not talk to Adam about what was truly on my mind." We calculated a dimension score on this measure by subtracting the mean of participants' scores on the submissive items from the mean of participants' scores on the dominance items. Thus, higher scores on this measure indicate a relatively more dominant response towards the target and lower scores on this measure indicate a relatively more submissive response towards the target. Cronbach's alpha for this measure was .56 and a copy of this measure can be found in Appendix E.

***Desire for future relationship scale.*** Participants' willingness to engage in a future interaction with the target described in the scenario was also assessed. This subscale was comprised of seven items. Four of the items asked participants to rate how willing they would be to engage in various types of interactions with the target individual (e.g., work on a project with them, have coffee with them, etc.). The remaining three items asked participants about their general feelings towards the target in the scenario (e.g., how much they like the target, how much they would want to get to know the target better, etc.). Ratings were made on a 5-point Likert



scale, ranging from 1 (*not at all*) to 5 (*extremely*). A copy of this scale can be found in Appendix F. Cronbach's alpha for this scale was .94.

## Results

**Manipulation check.** Consistent with expectations, participants rated the high social anxiety target ( $M = 3.98$ ,  $SD = .94$ ) as more anxious than the low social anxiety target ( $M = 2.49$ ,  $SD = 1.24$ ),  $t(158) = 8.59$ ,  $p < .001$ ,  $d = 1.35$ . Participants also rated the agreeable target as warmer ( $M = 3.80$ ,  $SD = .70$ ) than the disagreeable target ( $M = 1.95$ ,  $SD = .84$ ),  $t(158) = 14.97$ ,  $p < .001$ ,  $d = 2.39$ .

### **The impact of social anxiety on participants' dominance and affiliation behaviours.**

To address the first research question of how people's own social anxiety impacts their interpersonal behaviours, participants' self-reported social anxiety was correlated with their self-reported affiliative and dominant responses towards the target. In order to remove the impact of the group level variables (i.e., the social anxiety and agreeableness manipulations) and filter out the impact of any potentially distorting group-level effects on our correlations, we calculated pooled-within-group correlations.

Results revealed a significant relationship between self-reported social anxiety and self-reported affiliation behaviours: the more anxiety a participant predicted that they would experience in the interaction, the more affiliative behaviours they said they would display in the interaction,  $r(158) = .20$ ,  $p = .012$ . There was no relationship found between participants' self-reported social anxiety and their predictions of how dominant they would be during the interaction,  $r(158) = -.02$ ,  $p = .802$ .

**The impact of target social anxiety on participants' dominance and affiliation behaviours and patterns of interpersonal complementarity.** To address the second and third

research questions regarding how social anxiety impacts a partner's interpersonal responses and patterns of complementarity, a series of between-subject ANOVAs were conducted. As anticipated, the gender of the target (Adam versus Andrea) and the situation of the target (giving a class presentation versus having a yearly review) did not interact with the main manipulations and thus results are collapsed across these variables.

***Affiliative responses to target.*** We first examined whether a target's social anxiety level impacted participants' affiliative responses, and further whether the social anxiety level of the target moderated typical patterns of interpersonal correspondence. To do this we conducted a Target Social Anxiety (high social anxiety versus low social anxiety) X Target Agreeableness (agreeable versus disagreeable) between-subjects ANOVA with participants' affiliation responses towards the target as the dependent variable. Results revealed a significant main effect of Target Social Anxiety,  $F(1, 156) = 10.91, p = .001, \eta^2_p = .07$ . Participants who were asked to imagine themselves interacting with the high social anxiety target reported that they would display more affiliative behaviours ( $M = 2.08, SD = .11$ ) than those who were asked to imagine themselves interacting with the low social anxiety target ( $M = 1.57, SD = .11$ ). There was also a significant main effect of Target Agreeableness,  $F(1, 156) = 10.86, p = .001, \eta^2_p = .07$ , which was consistent with the principle of interpersonal correspondence; participants reported that they would respond with more affiliation towards the agreeable target ( $M = 2.08, SD = .11$ ) than the disagreeable target ( $M = 1.57, SD = .11$ ). This pattern of correspondence was not moderated by the social anxiety level of the target (i.e., the interaction between Target Social Anxiety and Target Agreeableness was not significant),  $F(1, 156) = 1.09, p = .298, \eta^2_p = .01$ .

***Dominant responses to target.*** Next, we tested whether a target's social anxiety level impacted participants' dominance responses, and whether the social anxiety level of the target

moderated typical patterns of interpersonal reciprocity. To do this we conducted a Target Social Anxiety (high social anxiety versus low social anxiety) X Target Agreeableness (agreeable versus disagreeable) between-subjects ANOVA with participants' dominance responses towards the target as the dependent variable. There was no main effect of Target Social Anxiety,  $F(1, 156) = .17, p = .684, \eta^2_p = .001$ , indicating that participants responded with similar levels of dominance towards the high social anxiety target ( $M = .62, SD = .10$ ) and the low social anxiety target ( $M = .56, SD = .10$ ). There was a significant main effect of Target Agreeableness,  $F(1, 156) = 40.82, p < .001, \eta^2_p = .21$ , which was consistent with the principle of interpersonal reciprocity. Recall that agreeable behaviours fall in the friendly-submissive quadrant of the circumplex and disagreeable behaviours fall in the hostile-dominant quadrant of the circumplex. Thus, the reciprocal response to agreeable behaviours from the target is one of dominance, whereas the reciprocal response to disagreeable behaviours from the target is one of submissiveness. Consistent with this pattern, participants responded with more dominance towards the agreeable target ( $M = 1.06, SD = .11$ ) than the disagreeable target ( $M = .12, SD = .10$ ). Patterns of reciprocity were not moderated by the social anxiety level of the target,  $F(1, 156) = 1.36, p = .246, \eta^2_p = .01$ .

**The relationship between participant social anxiety and target social anxiety.** To address our fourth research question regarding the relationship between people's social anxiety levels, we tested whether people who imagined interacting with the high social anxiety target reported that they would experience more social anxiety than those who imagined interacting with the low social anxiety target. We conducted an independent samples *t*-test with Target Social Anxiety (high social anxiety versus low social anxiety) as the between-subjects variable and participants' self-reported anxiety as the dependent variable. Consistent with our predictions,

participants who imagined interacting with the high social anxiety target ( $M = 3.47$ ,  $SD = .83$ ) reported they would experience significantly more anxiety during the interaction than those who imagined interacting with the low social anxiety target, ( $M = 2.85$ ,  $SD = .97$ ),  $t(158) = 4.30$ ,  $p < .001$ ,  $d = .68$ .

**The impact of social anxiety on relationship outcomes.** To address our fifth research question about the impact of social anxiety on relationship outcomes, we tested if participants' desire to form a future relationship with the target depended on whether they read about the target with high social anxiety or the target with low social anxiety. Previous research has demonstrated that one's desire to form a future relationship with a person is impacted by that person's agreeableness level (e.g., Cuperman & Ickes, 2009). Thus, we included the agreeableness manipulation in our analysis as a covariate. We conducted an ANOVA with Target Social Anxiety (high social anxiety versus low social anxiety) as the between-subjects variable, Target Agreeableness (agreeable versus disagreeable) as a covariate, and participants' responses on the desire for future relationship subscale as the dependent variable. There was a marginal main effect of Target Social Anxiety on our dependent variable,  $F(1, 157) = 3.51$ ,  $p = .063$ ,  $\eta^2_p = .02$ , with participants reporting that they would rather form a future relationship with the low social anxiety target ( $M = 3.00$ ,  $SD = .92$ ) than the high social anxiety target ( $M = 2.79$ ,  $SD = .80$ ).

## **Discussion**

The purpose of Study 1 was to begin to examine the influence that social anxiety has on interpersonal behaviours and processes. This study had three notable findings that were consistent with our hypotheses (see Table 1 for a summary of all of our findings). First, we found that the target's social anxiety level impacted participants' affiliative responses (Research

Question 2). We did not have a directional hypothesis for how the target's social anxiety level would impact participants' affiliative responses, but our results showed that when participants were imagining themselves interacting with a target who was higher on social anxiety (versus a target who was lower on social anxiety), they would respond with more affiliation towards the target. This result is consistent with some previous work that suggests that people respond with empathy and support towards people who have high levels of social anxiety (Heerey & Kring, 2007).

Second, consistent with our hypothesis for Research Question 4, we found that participants who imagined interacting with the high social anxiety target reported that they would be more anxious than those who imagined interacting with the low social anxiety target. These findings are consistent with previous literature on anxiety contagion (e.g., Park et al., 2009).

Finally, we found that participants who read about the target who was higher on social anxiety tended to express less of a desire to form a future relationship with the target than those participants who read about a target who was lower on social anxiety (Research Question 5). Although this finding was marginal ( $p = .063$ ), it is consistent with our hypothesis and previous literature (e.g., Meleshko & Alden, 1993). Interestingly, despite participants reporting that they would react with more affiliation towards the target with higher levels of social anxiety, it seems that this affiliation was temporary, as participants report a reduced desire to interact with the high social anxiety target in the future.

Inconsistent with our hypothesis for Research Question 1, we found that the more anxiety participants thought they would experience during the imaginary interaction, the more affiliative behaviours they thought they would display. This finding was in contrast to our prediction that

increased social anxiety in participants would result in decreased affiliative behaviours. We also did not find any evidence that participants' predicted anxiety levels during the interaction, or the social anxiety level of the target they were reading about, impacted participants' dominance responses during the interaction (Research Questions 1 and 2). Furthermore, although we found evidence for patterns of correspondence and reciprocity, inconsistent with our predictions, we did not find moderation by target social anxiety on patterns of correspondence (Research Question 3).

There are two major methodological issues that could account for these unsupported hypotheses. First, the scale designed to assess participants' dominance responses towards the target had a relatively low alpha value (i.e., .56). Thus, the items we gave participants did not do a sufficient job of assessing how dominant participants thought they would be in the fictitious interaction. We address this issue in the next study by improving the scale that is used to assess participants' dominant responses in an interpersonal context.

The second major issue is the type of methodology used in this study. The connection between what people *say* they will do after reading a hypothetical scenario about an interpersonal interaction and what they would *actually* do if they were engaging in that interaction is conceivably quite tenuous. Previous research has found discrepancies between what people self-report their behaviour would be and what their actual behaviour is (e.g., Epley & Dunning, 2000). As pointed out in an article by Baumeister and colleagues (2007):

People have not always done what they say they have done, will not always do what they say they will do, and often do not even know the real causes of the things they do. These discrepancies mean that self-reports of past behaviors, hypothetical future behaviors, or causes of behavior are not necessarily accurate (pp. 397).

Thus, as an attempt to reduce potential errors in prediction by participants for how they *think* they would act during an interpersonal interaction, in the next two studies, participants actually participated in an interpersonal interaction, rather than just reading about one.

## **Study 2**

In Study 2, participants engaged in an interaction with a confederate whose social anxiety and agreeableness levels were manipulated. Throughout the interaction, the confederate appeared either high or low on social anxiety (social anxiety manipulation) and displayed either agreeable or disagreeable behaviours (agreeableness manipulation). Using a research design involving a confederate allowed us to make the interpersonal interaction tangible for participants, while still allowing us to have enough experimental control to draw conclusions about the impact of the confederate's manipulated behaviour on participants' interpersonal behaviours and responses. By manipulating the social anxiety displayed by the confederate, we were able to directly examine how interacting with a person who is high versus low on social anxiety influences participants' own social anxiety, their affiliation and dominance behaviours (both self-reported and observer rated), and their desire to form a future relationship with the confederate.

In addition, by manipulating the agreeableness shown by the confederate we were able to assess the impact of the confederate's social anxiety on overall levels of complementarity. Recall that agreeable and disagreeable interpersonal behaviours fall in the friendly-submissive and hostile-dominant quadrants, respectively, of the interpersonal circumplex. Thus, in accordance with the principle of interpersonal complementarity, agreeable behaviours should elicit greater affiliative and dominant responses from interaction partners, whereas disagreeable behaviours should elicit fewer affiliative and dominant responses from interaction partners. In the current study, we were able to test if participants' complementary responses towards the agreeable and

disagreeable behaviours of the confederate were moderated by the confederate's level of social anxiety (thus allowing us to answer Research Question 3, detailed below).

Our hypotheses for the current study, which are in-line with the hypotheses described in the General Introduction, are as follows:

1. Participants' self-reported social anxiety would impact their dominant and affiliative responses towards the confederate. We expected that participants who reported that they had more anxiety during the interaction would respond with more submissiveness and less affiliation towards the confederate (Research Question 1).
2. The confederate's level of social anxiety would impact participants' interpersonal responses. We expected that participants who interacted with a confederate displaying high (versus low) levels of social anxiety would respond with more dominance towards the confederate. We also hypothesized that the confederate's social anxiety level would impact participants' affiliative responses, but given the conflicting literature surrounding affiliative responses towards people who have higher levels of social anxiety, we did not have a directional hypothesis for this effect (Research Question 2).
3. We hypothesized that overall patterns of interpersonal correspondence would be dampened when participants were interacting with the confederate displaying high (versus low) levels of social anxiety; however, overall patterns of reciprocity on dominance would not be impacted by the confederate's level of social anxiety (Research Question 3).
4. We expected that participants would report experiencing more social anxiety when they interacted with a confederate displaying high (versus low) levels of social anxiety (Research Question 4)



5. We expected that participants would express less of a desire to form a future relationship with the confederate displaying high (versus low) levels of social anxiety (Research Question 5).

## Method

**Participants.** Over the course of two school terms, 100 undergraduate students participated in this study. Participants were recruited through a variety of methods: a paid participant pool ( $n = 20$ ), the Psychology Research Experience Program (PREP) ( $n = 61$ ), and on-campus advertisements ( $n = 19$ ). As anticipated, the method of recruitment did not significantly impact any of our variables of interest. Participants were either compensated with course credit or \$11 for their time.

As anticipated, the gender of the confederate and the speech topic of the confederate did not interact with our main manipulations and thus results are collapsed across these variables.

A total of five individuals were excluded from the analyses because they were suspicious of the true purpose of the experiment and the role of the confederate. After removing these individuals from the data set, the sample size used for analyses totaled 95 (32 males, 63 females). The mean age for participants was 20.60 ( $SD = 5.9$ ).

**Procedure.** Prior to coming into the lab, participants were informed that the purpose of the study was to investigate effective communication and that they would be asked to engage in an interaction task with another undergraduate student. On the day of the research session, the experimenter met the participant and their interaction partner in a research waiting area. Unbeknownst to participants, their interaction partner was a confederate. The entire research session was audio and video recorded.

After signing the informed consent, the participant and the confederate were informed that there were two roles in the experiment: the speaker and the audience member. Assignment of roles was seemingly random; however, the experiment was fixed so that the confederate would always be assigned the role of the speaker and the participant would always be assigned the role of the audience member. The illusion of random assignment was maintained by having the participant and the confederate pick one of two pieces of paper out of a bowl. The participant was led to believe that one piece of paper said speaker and the other piece of paper said audience member. In truth, both papers had audience member written on them and when the participant and confederate were asked to read their roles out loud, the confederate was instructed to say that his/her paper had speaker written on it. The participant and confederate were then given more detailed information about their roles.

The confederate, whose role was that of the speaker, was informed that he/she would have five minutes in another room to prepare a two-minute speech on the topic of cell phone use in the classroom. The participant, whose role was that of the audience member, was informed that they would be required to watch the speaker's presentation. Participants were also told that while the speaker prepared his/her speech, they would be given a document to read that outlined what was expected of them as an audience member. The experimenter then asked both the participant and confederate to confirm that they understood their roles in the experiment. The confederate's response to the experimenter was scripted and began the experimental manipulation (described in full below). The confederate was then taken into another room so that both participants could ostensibly complete their tasks in private.

After exactly five minutes, the confederate was brought back into the room with the participant. The participant and confederate sat at a table facing one another so that the video

camera could capture both individuals. Once the confederate and participant were seated, the experimenter informed the confederate that they could begin their speech. The confederate then proceeded to give an approximately 90-second speech and after the confederate was finished their speech, the experimenter asked the confederate to contemplate counter-arguments to the speech topic assigned (the confederate's response to the question was part of the experimental manipulation). The experimenter then left the participant and the confederate alone in the room for 45 seconds, during which the confederate delivered a scripted line. After the experimenter returned, the confederate and participant were separated and the participant completed a series of self-report measures.

Finally, after completing the self-report measures, participants were funnel debriefed and asked if they had any questions. Any questions were addressed.

**Materials for confederate.** The way in which the confederate acted throughout the research session served as the experimental manipulation. The confederate's behaviour was manipulated in two ways: 1) the social anxiety level of the confederate (high social anxiety versus low social anxiety) and 2) the agreeableness level of the confederate (agreeable versus disagreeable). These manipulations were evident through the confederate's scripted lines and behaviours. In total, the confederate enacted four conditions: 1) high social anxiety/agreeable 2) low social anxiety/agreeable 3) high social anxiety/disagreeable and 4) low social anxiety/disagreeable. The behaviours displayed by the confederate and the scripted lines spoken by the confederate in each of the four conditions were consistent with personality, interpersonal theory, and social anxiety literature (e.g., Alden & Taylor, 2004; Kiesler, 1996; Widiger, 2009).

**Training procedure for confederates.** Two confederates were involved in this study (one male and one female). Before beginning the study, confederates underwent 10 hours of

individualized training. To begin, confederates were familiarized with the design of the study and the four conditions they would be enacting. They were given information on the verbal and nonverbal behaviours and scripted lines they would be delivering in each of the four conditions. After receiving and studying this information, the confederates practiced their performance in each of the four conditions several times and received targeted feedback from the experimenter. After both confederates had completed their individualized training, they underwent an additional 6 hours of training together. The two confederates practiced the four conditions repeatedly with one another and the experimenter. This proved to be beneficial in calibrating the confederates to be as similar as possible across the four conditions.

*Confederate speeches.* Because the confederate was ostensibly assigned the role of the speaker, they were required to give a speech on an assigned topic. The topic that the confederate gave a speech on concerned cell phone use, and was either supporting cell phone use in the classroom or opposing cell phone use in the classroom (for a copy of the speeches, see Appendix G). The two speeches were pilot tested prior to the beginning of the study to ensure that the arguments used in the speeches did not differ in strength or quality. Individuals who completed the pilot study ( $n = 18$ ) were randomly assigned to read one of the speeches and rate the arguments on how reasonable, persuasive, and clear they were. As expected, there were no differences in participants' ratings of how reasonable,  $t(16) = .68, p = .506$ , persuasive,  $t(16) = .14, p = .893$ , or clear,  $t(16) = .49, p = .627$ , the arguments were in the two speeches.

*Confederate manipulations.* The two main manipulations of the confederate's behaviour (i.e., the social anxiety level of the confederate and the agreeableness level of the confederate) were evidenced in four places throughout each research session: 1) after role assignment took place, 2) while delivering the speech, (3) in response to the experimenter's question after the

confederate delivered their speech, and 4) while the confederate was left alone in the room with the participant. Examples of the experimental manipulation for each of these four parts of the research session are detailed below and a description of the entire experimental manipulation for each condition can be found in Appendix H. Outside of these instances, the confederate was instructed to remain relatively neutral with respect to their behaviour.

*After role assignment.* After the participant and confederate had ostensibly been randomly assigned to their roles of audience member and speaker, respectively, the experimenter described each role to them. After describing the two roles, the experimenter asked the participant and the confederate if their role in the upcoming research session was clear. The confederate's response to the experimenter's question regarding role clarity differed depending on which condition the confederate was enacting. If the confederate was enacting the high social anxiety/agreeable condition, he/she responded to the experimenter with "I wish I was the audience member. Presentations make me really nervous. I hope it goes okay though." In contrast, if the confederate was enacting the low social anxiety/agreeable condition, he/she responded to the experimenter by saying "I am glad I am the speaker. I like giving presentations. I hope it goes okay." If the confederate was enacting the high social anxiety/disagreeable condition, he/she would respond by saying "I wish I was the audience member. Presentations made me really nervous, especially when it's a bad topic." Finally, in the low social anxiety/disagreeable condition the confederate would respond by saying, "I am glad I am the speaker. I like giving presentations, but usually only when it's a good topic."

*Delivery of the speech.* The way in which the speech was delivered by the confederate was also part of the experimental manipulation. More specifically, the first and last lines of the speech, the confederate's response to making a mistake while giving his/her speech, and the

mannerisms displayed by the confederate throughout the speech differed depending on which condition the confederate was enacting. For example, when enacting the high social anxiety conditions, the confederate would start his/her speech by saying “I’m really nervous” and would appear quite anxious throughout the speech, as evidenced by slight trembling, pauses in speech, and a general appearance of being uncomfortable. In contrast, when enacting the low social anxiety condition, the confederate would start his/her speech by saying “Okay, I’ll get started” and would appear calm and relaxed while delivering the presentation. For the agreeableness manipulation, if the confederate was assigned to enact the agreeable condition, he/she would start the speech (after delivering the first line of the speech relevant to the social anxiety manipulation) by saying “I hope this is kind of what you are looking for”, and would end his/her speech by asking “Was that okay?” The confederate would smile and attempt to make eye contact while delivering his/her speech, and would apologize to the participant after making a mistake partway through the speech. In contrast, if the confederate was assigned to enact the disagreeable condition, he/she would start the speech (after delivering the first line of the speech relevant to the social anxiety manipulation) with “I can’t believe this is useful for your research” and would end his/her speech by saying “I’m done.” While presenting, the confederate would appear disengaged (e.g., no eye contact, speak in a monotone voice) and react with hostility after making a mistake during the speech.

*Response to experimenter’s question after the speech.* After the confederate was finished delivering the speech, the experimenter asked if he/she could think of an argument that would counter their speech topic (i.e., if the confederate was delivering a speech opposing cell phone use in the class, they were asked to think of an argument supporting cell phone use in the class and vice versa). Responses to this question by the confederate depended on which condition

he/she was enacting. If the confederate was enacting the agreeable condition, he/she would reply with “That’s a good question. I am sure there are other arguments, I just cannot think of any right now. Sorry.” In contrast, if the confederate was enacting the disagreeable condition, he/she would reply with “No you didn’t ask me to think of any other arguments. I just did what you asked me to do.” If the confederate was enacting the high social anxiety condition, he/she would deliver the scripted line sheepishly, whereas if the confederate was enacting the low social anxiety condition, he/she would deliver the scripted line confidently.

*Left alone with participant.* The participant and confederate were left alone in the room for 45-seconds after the confederate had finished his/her speech. During this 45-second period, the confederate immediately spoke to the participant in a manner that was consistent with the condition they were enacting. More specifically, the confederate delivered two sentences, the first was consistent with the social anxiety condition they were enacting and the second sentence was consistent with the agreeableness condition they were enacting. If the confederate was enacting the high social anxiety condition, he/she would say “I was really nervous”, and if they were enacting the low social anxiety condition, he/she would say “I think that went well.” For the agreeableness manipulation, if the confederate was enacting the agreeable condition, he/she would then say “I hope that was okay”, whereas in the disagreeable condition, he/she would say “That was so dumb.”

*Pilot test of manipulations.* To ensure that the manipulations would be salient to participants we videotaped both confederates separately enacting each of the four conditions. We then showed 16 graduate students one of eight possible videotapes (2 confederates X 4 possible conditions). To assess the anxiety manipulation, we asked the graduate students to rate how anxious and tense the target in the videotape was on a scale from 1 (*Extremely Anxious/Tense*) to

6 (*Extremely Relaxed/At Ease*). To assess the agreeableness manipulation, we asked the graduate students to rate how warm and kind the target in the videotape was (both of which are adjectives typically used to describe people who are high on agreeableness; Graziano & Tobin, 2009), using a scale from 1 (*Extremely Warm/Kind*) to 6 (*Extremely Cold/Unkind*). Because students' ratings of how anxious and tense the confederate was were highly correlated ( $r(14) = .93, p < .001$ ) we averaged these two ratings together to create a single rating for how anxious the confederate in the video appeared to be. Next, we subtracted the students' ratings from seven so that higher numbers indicate seeing the confederate as more anxious. Similarly, because students' ratings of how warm and kind the confederate was were highly correlated ( $r(14) = .89, p < .001$ ) we averaged these two ratings together to create a single rating for how agreeable the confederate in the video appeared to be. Next, we subtracted the ratings from seven so that higher numbers indicate seeing the confederate as more agreeable. As anticipated, the confederates were seen as being more anxious when they were enacting the high social anxiety condition ( $M = 5.06, SD = .68$ ) versus the low social anxiety condition ( $M = 1.56, SD = .56$ ),  $t(14) = 11.23, p < .001$ . Furthermore, the confederates were seen as being more agreeable when they were enacting the agreeable condition ( $M = 4.65, SD = .85$ ) versus the disagreeable condition ( $M = 1.67, SD = .26$ ),  $t(14) = 8.25, p < .001$ .

We also wanted to ensure that there were no striking differences in how believable and convincing the two confederates were. As such, we also asked the 16 graduate students to rate how believable and natural the confederate's performance was in the videotape that they watched. Ratings took place on a 1 (*not at all*) to 5 (*extremely*) scale, and on average the graduate students found the confederates to be moderately to very natural ( $M = 3.94, SD = .85$ ) and believable ( $M = 3.81, SD = .75$ ) in their roles. The two confederates did not differ in how natural



they appeared,  $t(14) = .28, p = .781$ , nor in how believable they were in their roles,  $t(14) = .32, p = .751$ . Further, ratings of how natural the confederates were did not differ across the four conditions,  $F(3, 12) = 1.15, p = .370$ , nor did ratings of how believable the confederates were,  $F(3, 12) = .77, p = .535$ .

**Measures for participants.** The self-report measures completed by participants are described in more detail below.<sup>3</sup>

**Manipulation check.** Participants completed a similar manipulation check to the one administered in Study 1. In particular, participants were asked to rate how anxious they thought their interaction partner (i.e., the confederate) was and how warm they thought their interaction partner was. We expected that the confederate would be rated as displaying more anxiety when they were enacting the high social anxiety condition versus the low social anxiety condition. Further, we expected that the confederate would be rated as warmer when they were enacting the agreeable condition versus the disagreeable condition.

**Self-reported anxiety.** Participants completed similar items to those administered in Study 1 to assess their anxiety during the interaction. Participants rated how anxious they felt, how at ease they felt (reverse scored), and how comfortable they felt (reversed scored). Ratings took place on a 5-point scale, ranging from 1 (*not at all*) to 5 (*extremely*). Cronbach's alpha for this measure was .82.

**Affiliative responses to confederate.** Participants completed 16 items that assessed the extent to which they responded with affiliation or hostility towards the confederate. These 16 items were very similar to the ones administered in Study 1, but were adapted for the context of Study 2. An example of an affiliative response towards the confederate is "I nodded at the

---

<sup>3</sup> For a list of additional measures administered to participants that are not of interest in the current work, please see Appendix A.

speaker.” An example of a hostile response towards the confederate is “I tried to make the speaker feel badly about their presentation.” Responses took place on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*). We calculated a dimension score for each participant by subtracting the mean of participants’ scores on the hostile items from the mean of participants’ scores on the affiliation items. Thus, higher scores indicate greater affiliative responses towards the confederate and lower scores indicate greater hostile responses towards the confederate. Cronbach’s alpha for this measure was .78. A copy of the items administered can be found in Appendix I.

***Dominant responses to confederate.*** Participants completed 12 items that assessed the extent to which they responded with dominance or submissiveness towards the confederate. Five of the original eight items were retained from the scale used in Study 1 to assess participants’ dominant responses, and an additional seven items were added. The additional seven items that were added were items adapted from the Dominant (two items), Assured (one item), Submissive (two items), and Unassured (one item) subscales of the Check List of Interpersonal Transactions (Kiesler, 1984). The added items reflect possible dominant and submissive behaviours that participants could have engaged in towards the confederate. An example of a dominant response towards the confederate is “When with the speaker, I seized opportunities to explain things or give them advice.” An example of a submissive response towards the confederate was “When with the speaker, I was quick to agree with their opinions.” Responses took place on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*). Participants did not display any variability on two of the items that were meant to assess participants’ dominance responses towards the confederate (“I gave the speaker advice on how they could have improved on their next presentation” and “When with the speaker, I commented on my own accomplishments,

awards, or successes), and thus these two items were removed from the scale. With the remaining 10 items, we calculated a dimension score for each participant by subtracting the mean of participants' scores on the submissive items from the mean of participants' scores on the dominance items. Thus, higher scores indicate a more dominant response towards the confederate and lower scores indicate a more submissive response towards the confederate. Cronbach's alpha for this measure was .62. A copy of the items administered can be found in Appendix J.

***Desire for future relationship scale.*** Participants' willingness to engage in future interactions with the confederate was also assessed. This scale was comprised of eight items. Five of the items asked participants to rate how willing they would be to engage in various types of interactions with the confederate (e.g., participate in another study with the confederate, go for coffee, etc.). The remaining three items were identical to the items administered in Study 1 and asked participants about their general feelings towards the confederate (e.g., how much they liked the confederate). Ratings were made on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*). Cronbach's alpha for this subscale was .94. A copy of this scale can be found in Appendix K.

**Measures for observational ratings.** Three independent observers received 8 hours of training for coding situational interpersonal behaviours using the Social Behavior Inventory (SBI; Moskowitz, 1994). Coders were asked to use a modified version of the SBI to make assessments of participants' behaviour during the 45-second portion of the research session when the participant and confederate were left alone together. The SBI was originally designed as a measure of trait interpersonal style, but has been used in previous research by observers to rate participants' interpersonal behaviour during an interaction (e.g. Sadler & Woody, 2003). To

reflect the context of the current study, four items from the original 46 were deleted because they seemed particularly unlikely to occur during the 45-second period of the research session that was being coded. These four items are: “This person took the lead in planning/organizing a project or activity”, “This person asked for a volunteer”, “This person assigned someone to a task”, and “This person let others plan or make decisions.”

Therefore, observers rated participants’ affiliative, hostile, dominant, and submissive behaviours towards the confederate using a total of 42 SBI items (see Appendix L). For each of the items, observers indicated how often each of the behaviours occurred by selecting a value from 1 (*Never*) to 5 (*Extreme Amount*). Examples of items assessing affiliative responses towards the confederate are “This person complimented or praised the confederate” and “This person smiled and laughed with the confederate”; examples of items assessing hostile responses towards the confederate are “This person did not respond to the confederate’s questions or comments” and “This person criticized the confederate”; examples of items assessing dominant responses towards the confederate include “This person expressed an opinion to the confederate” and “This person spoke in a clear firm voice to the confederate”; and submissive behaviours were assessed using items such as “This person spoke only when spoken to by the confederate” and “This person avoided taking the lead in the conversation with the confederate.”

To calculate observer agreement, we computed each observer’s means on the affiliation, hostile, dominance, and submissive subscales, and subsequently conducted four reliability analyses (one for each subscale) using each observer’s mean on the relevant subscale as one item in a three-item test (this procedure is equivalent to calculating the reliability through the intraclass correlation). The alpha coefficients indicated high observer agreement about participants’ affiliative ( $\alpha = .90$ ), hostile ( $\alpha = .82$ ), dominant ( $\alpha = .93$ ), and submissive ( $\alpha = .92$ )

behaviours towards the confederate. There was no variability on four of the items completed by observers and thus these items were removed from future analyses. The four items that displayed no variability are identified in Appendix L by asterisks.

Given the high interrater agreement regarding participants' behaviours, we averaged across the three raters on the remaining 38 items to create four scores for each participant: one score for participants' observed affiliative responses, one score for participants' observed hostile responses, one score for participants' observed dominance responses, and one score for participants' observed submissive responses. Next, an affiliation dimension score was obtained for each participant by subtracting participants' observed hostile responses from their observed affiliation responses. Similarly, a dominance dimension score was obtained for each participant by subtracting participants' observed submissive responses from their observed dominant responses. Internal consistency reliabilities for the affiliation and dominance dimensions were .89 and .90, respectively.

## **Results**

**Manipulation check.** Consistent with expectations, participants rated the confederate as being significantly more anxious ( $M = 4.7$ ,  $SD = 1.34$ ) when the confederate was enacting the high social anxiety condition compared to when the confederate was enacting the low social anxiety condition ( $M = 2.17$ ,  $SD = .92$ ),  $t(93) = 8.45$ ,  $p < .001$ ,  $d = 1.74$ . Also consistent with expectations, participants rated the confederate as significantly warmer when the confederate was enacting the agreeable condition ( $M = 3.44$ ,  $SD = .80$ ) compared to when the confederate was enacting the disagreeable condition ( $M = 2.13$ ,  $SD = .88$ ),  $t(93) = 7.63$ ,  $p < .001$ ,  $d = 1.56$ .

### **The impact of social anxiety on participants' dominance and affiliation behaviours.**

To address the first research question regarding how people's own social anxiety during an

interaction impacts their interpersonal behaviours, participants' self-reported anxiety was correlated with their self-reported affiliative and dominant responses towards the confederate. To filter out the impact of any potentially distorting group-level effects on our correlations, we calculated pooled-within-group correlations.

There was no significant relationship between participants' self-reported social anxiety and self-reported affiliation behaviours,  $r(93) = .08, p = .441$ . However, there was a significant relationship between participants' self-reported social anxiety and their self-reported dominance behaviours,  $r(93) = -.26, p = .011$ . As expected, the more anxiety participants reported having during the interaction, the less dominance they reported displaying.

**The impact of the confederate's social anxiety on participants' dominance and affiliation behaviours and patterns of interpersonal complementarity.** To assess how social anxiety impacts a partner's interpersonal responses and overall patterns of complementarity (i.e., Research Questions 2 and 3), a series of between-subjects ANOVAs were conducted. As anticipated, the gender of the confederate and the speech topic of the confederate did not interact with our main manipulations and thus results are collapsed across these variables.

All of the ANOVAs were conducted using Confederate Social Anxiety (high social anxiety versus low social anxiety) and Confederate Agreeableness (agreeable versus disagreeable) as between-subject variables. The results for our four dependent variables of interest are described separately below.

***Self-Reported affiliative responses.*** First, we tested if the confederate's social anxiety level impacted participants' self-reported affiliative responses, and further, if the social anxiety level of the confederate moderated typical patterns of interpersonal correspondence. The dependent variable for this ANOVA was participants' self-reported affiliation responses towards

the confederate. There was a significant main effect of Confederate Social Anxiety,  $F(1, 91) = 57.56, p < .001, \eta^2_p = .39$ . Participants who interacted with the high social anxiety confederate ( $M = 2.47, SD = .10$ ) reported that they displayed more affiliation towards the confederate than participants who interacted with the low social anxiety confederate ( $M = 1.41, SD = .10$ ). There was also a significant main effect of Confederate Agreeableness,  $F(1, 91) = 12.65, p = .001, \eta^2_p = .12$ , which was consistent with the principle of interpersonal correspondence; participants reported that they responded with more affiliation when the confederate was agreeable ( $M = 2.19, SD = .10$ ) versus when the confederate was disagreeable ( $M = 1.70, SD = .10$ ). There was also a significant interaction between Confederate Social Anxiety and Confederate Agreeableness,  $F(1, 91) = 7.79, p = .006, \eta^2_p = .08$ , indicating that the degree of correspondence between the confederate and the participant differed depending on whether the confederate was high or low on social anxiety (see *Figure 2*). Post-hoc analyses using Fisher's LSD revealed that participants who interacted with the low social anxiety confederate responded in ways consistent with the principle of interpersonal correspondence; they responded with more affiliation when the confederate was agreeable ( $M = 1.85, SD = .62$ ) versus disagreeable ( $M = .96, SD = .89$ ),  $p < .001$ . In contrast, when participants were interacting with the high social anxiety confederate, patterns of interpersonal correspondence were dampened; participants reported responding with similar levels of affiliation regardless of whether the confederate was agreeable ( $M = 2.53, SD = .63$ ) or disagreeable ( $M = 2.42, SD = .56$ ),  $p = .587$ .

***Observer-coded affiliative responses.*** Recall that observers made ratings of how affiliative participants were towards the confederate during the 45-second period when the confederate and participant were left alone in the research room. We performed a similar analysis to the one above; however, for this analysis we used observers' ratings of participants'

affiliative responses as the dependent variable. The main effect of Confederate Social Anxiety was not significant,  $F(1, 83) = .80, p = .373, \eta^2_p = .01$ , indicating that participants were seen as responding with similar levels of affiliation towards the confederate regardless of whether the confederate was high ( $M = 1.06, SD = .75$ ) or low on social anxiety ( $M = .94, SD = .95$ ). The main effect of Confederate Agreeableness was significant,  $F(1, 83) = 34.09, p < .001, \eta^2_p = .29$ , which was consistent with the principle of interpersonal correspondence; participants were observed as responding with more affiliation towards the agreeable target ( $M = 1.43, SD = .78$ ) than the disagreeable target ( $M = .54, SD = .67$ ). The Confederate Social Anxiety X Confederate Agreeableness interaction was significant,  $F(1, 83) = 6.71, p = .011, \eta^2_p = .08$  (see *Figure 3*). Post-hoc analyses using Fisher's LSD revealed that when participants were interacting with the low social anxiety confederate, they were coded as responding with more affiliation when the confederate was agreeable ( $M = 1.56, SD = .71$ ) versus disagreeable ( $M = .28, SD = .70$ ),  $p < .001$ . Although participants were also coded as responding with more affiliation when the high social anxiety confederate was agreeable ( $M = 1.30, SD = .84$ ) versus disagreeable ( $M = .81, SD = .54$ ),  $p = .025$ , the difference in affiliative responses when interacting with the high social anxiety confederate ( $M_{DIFF} = .49$ ) was not as large as the difference in affiliative responses when interacting with the low social anxiety confederate ( $M_{DIFF} = 1.28$ ). These results suggest that participants' patterns of correspondence were dampened when they were interacting with the high social anxiety confederate.

***Self-reported dominant responses.*** Next, we tested if the confederate's social anxiety level impacted participants' self-reported dominant responses, and further whether the social anxiety level of the confederate moderated typical patterns of interpersonal reciprocity. The dependent variable for this ANOVA was participants' self-reported dominant responses towards



the confederate. The main effect of Confederate Social Anxiety was not significant,  $F(1, 91) = .05, p = .818, \eta^2_p = .001$ , indicating that participants did not report responding with different levels of dominance when the confederate was high on social anxiety ( $M = .85, SD = 1.12$ ) versus when the confederate was low on social anxiety ( $M = .91, SD = 1.15$ ). The main effect of Confederate Agreeableness was significant,  $F(1, 91) = 18.22, p < .001, \eta^2_p = .17$ , and was consistent with the principle of reciprocity. Recall that agreeable behaviours fall in the friendly-submissive quadrant of the circumplex and disagreeable behaviours fall in the hostile-dominant quadrant of the circumplex. Thus, the reciprocal response to agreeable behaviours from the confederate is one of dominance, whereas the reciprocal response to disagreeable behaviours from the confederate is one of submissiveness. Consistent with this pattern, participants reported responding with more dominance when the confederate was agreeable ( $M = 1.34, SD = .95$ ) versus disagreeable ( $M = .42, SD = 1.11$ ). The Confederate Social Anxiety X Confederate Agreeableness interaction was not significant,  $F(1, 91) = .44, p = .511, \eta^2_p = .01$ , indicating that patterns of reciprocity between the confederate and participant were not moderated by the confederate's social anxiety level.

***Observer-coded dominant responses.*** We also tested whether the confederate's social anxiety level impacted participants' observed dominance behaviours during the period of the experiment when the confederate and participant were left alone. Further, we tested whether the social anxiety level of the confederate moderated patterns of interpersonal reciprocity between the confederate and participants. The dependent variable for this ANOVA was observers' ratings of participants' dominant responses towards the confederate. The main effect of Confederate Social Anxiety was significant,  $F(1, 83) = 10.70, p = .002, \eta^2_p = .11$ . Participants were observed as being more dominant when they were interacting with the high social anxiety confederate

( $M = -.90$ ,  $SD = .96$ ) versus when they were interacting with the low social anxiety confederate ( $M = -1.56$ ,  $SD = .97$ ). There was a marginally significant main effect of Confederate Agreeableness,  $F(1, 83) = 3.56$ ,  $p = .063$ ,  $\eta^2_p = .04$ . Consistent with the principle of interpersonal reciprocity, participants were seen as being more dominant when interacting with the agreeable confederate ( $M = -1.05$ ,  $SD = 1.03$ ) versus the disagreeable confederate ( $M = -1.43$ ,  $SD = .96$ ). The Confederate Social Anxiety X Confederate Agreeableness interaction was not significant,  $F(1, 83) = 1.20$ ,  $p = .276$ ,  $\eta^2_p = .01$ , indicating that observers' perceptions of reciprocity between the confederate and the participant were not moderated by the confederate's social anxiety level.

**The relationship between participant social anxiety and confederate social anxiety.**

To address our fourth research question regarding the relationship between people's social anxiety levels during an interaction, we tested whether people who interacted with the high social anxiety confederate reported that they experienced more anxiety compared to those participants who interacted with the low social anxiety confederate. We conducted an independent samples  $t$ -test with Confederate Social Anxiety (high social anxiety versus low social anxiety) as the between-subjects variable and participants' self-reported anxiety as the dependent variable. Consistent with our predictions, participants who interacted with the high social anxiety confederate ( $M = 3.81$ ,  $SD = .90$ ) reported they experienced more anxiety compared to those who interacted with the low social anxiety confederate ( $M = 2.71$ ,  $SD = 1.02$ ),  $t(93) = 5.59$ ,  $p < .001$ .

**The impact of social anxiety on relationship outcomes.** To address our fifth research question about the impact of social anxiety on relationship outcomes, we tested if participants' desire to form a future relationship with the target depended on whether they interacted with the high social anxiety confederate or the low social anxiety confederate. We included the

confederate's agreeableness level as a covariate because of its established impact on people's desire to form future relationships with others (e.g., Cuperman & Ickes, 2009). We conducted an ANOVA with Confederate Social Anxiety (high social anxiety versus low social anxiety) as the between-subjects variable, Confederate Agreeableness (agreeable versus disagreeable) as a covariate, and participants' responses on the desire for future relationship subscale as the dependent variable. Contrary to expectations, participants' desire to form a future relationship with the confederate did not significantly differ depending on whether the confederate was high in social anxiety ( $M = 2.29$ ,  $SD = .94$ ) or low in social anxiety ( $M = 2.45$ ,  $SD = .94$ ),  $F(1, 92) = .75$ ,  $p = .388$ ,  $\eta^2_p = .01$ .

## **Discussion**

This study evaluated several hypotheses about the influence of social anxiety on interpersonal behaviours and processes. Several notable findings emerged and support for many of our hypotheses was found (see Table 2 for a summary).

With regards to our first research question, as we predicted, participants' anxiety during the interaction influenced their levels of dominance during the interaction. We found a negative and significant correlation between participants' self-reported anxiety during the interaction and their self-reported dominance responses; participants who reported that they experienced more anxiety during the interaction with the confederate also reported that they acted with less dominance throughout the interaction.

Pertaining to our second research question, we found that the confederate's level of social anxiety influenced participants' self-reported and observer-coded interpersonal behaviours. Consistent with Study 1, we found that when participants were interacting with the high social anxiety confederate, they reported responding with more affiliation towards the confederate

throughout the research session. However, when observers rated participants' behaviour during the period of the research session when the participant was left alone with the confederate, observers did not see a difference in how affiliative participants were towards the high social anxiety confederate and the low social anxiety confederate. Concerning dominant responses towards the confederate, overall, participants did not report responding with differing levels of dominance towards the high and low social anxiety confederate; however, observers coded participants as responding with more dominance towards the high social anxiety confederate compared to the low social anxiety confederate. One possible explanation for the discrepancies between self-reported and observer-coded responses is that the ratings were made in reference to different time periods in the research session. The self-report ratings consisted of participants' perceptions of their behaviours across the *entire* research session, whereas the observer-coded ratings were about participants' behaviours during a select 45-second period of the research session. It is possible that participants' behaviour (as seen by observers) during the period of the interaction when the participant and confederate were left alone was distinct from participants' behaviour across the entire research session. Another explanation for the discrepant results between self-reported responses and observer-coded responses is that there is a true discrepancy between participants' overt (i.e., observer-coded behaviours) and their self-perceived responses. We return to this issue in the General Discussion.

Consistent with our hypotheses set forth for Research Question 3, we found that overall patterns of interpersonal correspondence between the confederate and the participant were dampened when the participant was interacting with the high social anxiety confederate versus the low social anxiety confederate. Although participants responded with more affiliation when the confederate was agreeable (versus disagreeable), this expected pattern of correspondence was

stronger when participants were interacting with the low social anxiety confederate. Participants' affiliative responses towards the confederate were significantly less correspondent when participants were interacting with the high social anxiety confederate. This pattern of results held for participants' self-reported affiliative responses and observer-coded affiliative responses.

In addition, we found that participants responded in a reciprocal manner towards the confederate. More specifically, participants self-reported and were coded as responding with more dominance towards the agreeable confederate versus the disagreeable confederate. As expected, overall levels of reciprocity were not moderated by the confederate's level of anxiety.

Finally, we found support for our hypothesis regarding how people's anxiety levels are related during an interaction (Research Question 4). Consistent with the idea of anxiety contagion, participants who interacted with the high social anxiety confederate reported experiencing more anxiety during the interaction than those who interacted with the low social anxiety confederate.

Although we found support for many of our hypotheses, we did not find support for our hypothesis that participants' own social anxiety during the interaction would impact their affiliation behaviours throughout the interaction. One possible explanation for this null finding is that the primary catalyst for participants' affiliative behaviours was the social anxiety of the confederate rather than their own anxiety. It is possible that participants were using the social anxiety level of the confederate (rather than their own) to determine their degree of affiliative responses towards the confederate.

We also did not find support for the hypothesis that the confederate's level of social anxiety would impact participants' desire to form a future relationship with the confederate. Perhaps the lack of support for this hypothesis (and the unsupported hypothesis mentioned

earlier) comes as a result of the methodology employed in this study. Although the confederate design of Study 2 allowed us to have experimental control over the behaviour of one person during the interaction (i.e., the confederate), it also restricted the natural give-and-take that occurs in an interaction. Because there was not ample opportunity for the confederate and participant to freely interact, perhaps participants' assessments of whether they wanted to form a future relationship with the confederate were affected. It seems plausible that the lack of generalizability to real social interactions between two freely participating individuals might account for the absence of support for some of our hypotheses.

In the next study we implement a change in methodology that made the interpersonal interaction even more realistic for participants and allowed us to test our hypotheses in a more naturalistic interaction between dyads.

### **Study 3**

Results from Study 2 indicate that a person's own level of social anxiety during an interaction, as well as the social anxiety level of an interaction partner, are important variables to consider when investigating interpersonal behaviours and processes. In Study 3 we sought to extend our findings from Study 2 by testing our hypotheses using a more naturalistic interaction. More specifically, in Study 3 we had two unacquainted females engage in an interaction that was designed to elicit anxiety. In the previous two studies, participants responded to an experimental target/confederate's scripted behaviour, and thus the influence of one interaction partner's behaviour on the other was unidirectional. That is, the target's behaviour in Study 1 and the confederate's behaviour in Study 2 could influence the participant's behaviour, but the participant's behaviour could not influence the behaviour of the target in Study 1 or the confederate in Study 2. By employing a dyadic design in which both interactants were

participants in Study 3, we are able to investigate the mutual influence of both interactants' behaviour on each other.

The same five research questions that were addressed in Studies 1 and 2 were also addressed in Study 3. However, two novel hypotheses (previously mentioned in the General Introduction) were also explored. The first novel hypothesis addressed how situational social anxiety is related to patterns of complementarity at the moment-to-moment level. In the previous two studies, we examined the influence of social anxiety on complementarity of *overall levels*, which involved looking at how people adjusted their overall levels of dominance and affiliation to complement the overall dominance and affiliation levels of their interaction partners. The mutual-influence dyadic design of Study 3 permitted us to examine the unexplored influence of social anxiety on patterns of *moment-to-moment* complementarity as behaviours of both partners unfold over time. Recall that examining patterns of moment-to-moment complementarity allows us to draw conclusions about how dyad members coordinate their affiliation and dominance behaviours over time during an interaction. We can examine the *direction* and the *magnitude* of such coordination by looking at cross-correlations of their time series. A positive cross-correlation for dyads' moment-to-moment affiliation behaviours is consistent with the hypothesis of sameness on affiliation (i.e., correspondence), whereas a negative cross-correlation for dyads' moment-to-moment dominance behaviours is consistent with the hypothesis of oppositeness on dominance (i.e., reciprocity). Cross-correlations can also quantify the *degree* of coordination between dyad members. For instance, consider an example where Dyad A has an affiliation cross-correlation of .30 and a dominance cross-correlation of -.70, and Dyad B has an affiliation cross-correlation of .70 and a dominance cross-correlation of -.30. In this example, although the direction of the cross-correlations are all consistent with the hypothesis of complementarity, the

magnitudes of the cross-correlations indicate that Dyad A is better at coordinating their dominance behaviours than Dyad B, however Dyad B does a better job of coordinating their affiliative behaviours than Dyad A.

It is important to note that the moment-to-moment complementarity of a dyad is distinct from the dyad's overall level of complementarity (Sadler et al., 2009). For example, a dyad could show complementarity at the overall level (i.e., at a mean level both partners are similar on affiliation and opposite on dominance), but have low levels of moment-to-moment complementarity (i.e., the dyad does not do a good job of coordinating their affiliative behaviours and passing agency back and forth over time).

In the current study we examined complementarity at the overall level and the moment-to-moment level. Recall that in Studies 1 and 2, we hypothesized that higher levels of social anxiety would be negatively related to overall levels of correspondence, but be unrelated to overall levels of reciprocity; we tested this same hypothesis in Study 3. However, because complementarity at the overall level represents a separate interpersonal phenomenon from complementarity at the moment-to-moment level, we had a different hypothesis for how social anxiety would influence patterns of moment-to-moment reciprocity and correspondence. As previously mentioned in the General Introduction, we hypothesized that increased social anxiety during an interaction would result in dampened patterns of moment-to-moment correspondence and reciprocity. Because social anxiety is thought to result in decreased processing of external cues (Clark & Wells, 1995), we reasoned that people who experience more social anxiety during an interaction would overlook or miss their partner's affiliative and dominance cues, and in doing so, are less able to respond accordingly to those cues, thereby dampening patterns of moment-to-moment correspondence and reciprocity. Consistent with this reasoning, previous



work has found that people with high levels of social anxiety fail to reciprocate the appropriate matching smile to their interaction partners, and interactions with more socially anxious individuals are rated as less smooth and coordinated when compared to interactions with two nonanxious people (Heerey & Kring, 2007). Using the Continuous Assessment of Interpersonal Dynamics (CAID; Sadler et al., 2009) approach (described in detail below), we can gather information about dyads' moment-to-moment exchanges of dominance and affiliation behaviours, allowing us to test our hypothesis that increased social anxiety in participants results in dampened patterns of moment-to-moment correspondence and reciprocity.

The second novel hypothesis in this study concerned relating moment-to-moment indices of complementarity to our dyadic outcome measures. A core tenant of interpersonal theory is that complementary interactions are the most satisfying and should be related to a host of positive outcome measures (Kiesler, 1996). Empirical work supports this prediction (for a review see Sadler et al., 2011); however, most of this previous work has looked at how patterns of complementarity at the *overall level* relate to outcome measures. Because the technique used to capture patterns of moment-to-moment complementarity (i.e., the CAID approach) is still relatively novel, little research has been done relating indices of *moment-to-moment complementarity* to outcome measures. To our knowledge, only one study has looked at moment-to-moment complementarity and outcome measures in unacquainted dyads. This study, by Markey and colleagues (2010), found that unacquainted dyads who had higher moment-to-moment correspondence during an interaction tended to like each other more and performed tasks quicker and with more accuracy than dyads who were not as high on moment-to-moment correspondence. The present work expands on this finding by Markey et al. (2010) by having dyads complete a different type of task and by using different dyadic outcome measures

(described below). Consistent with predictions made by interpersonal theory, we hypothesized that stronger patterns of moment-to-moment correspondence and reciprocity would be positively related to our dyadic outcome measures.

The hypotheses for the current study (which are in-line with the hypotheses outlined in the General Introduction and include our two novel hypotheses for this study) were as follows:

1. The more social anxiety a participant experienced during the interaction (as measured by participant's self-reported anxiety, partner's perception of participant's anxiety, and observers' ratings of participant's anxiety), the less overall dominance and affiliation they would display during the interaction (Research Question 1).
2. The more social anxiety a participant experienced during the interaction, the more dominance their partner would respond with towards them. Similar to the previous two studies, we hypothesized that a person's social anxiety would influence their partner's affiliative responses, but we do not have a directional hypothesis for this effect (Research Question 2).
3. For overall levels of complementarity, we expected that higher levels of social anxiety in participants would be negatively related to overall levels of correspondence, but be unrelated to overall levels of reciprocity (Research Question 3A). Concerning patterns of moment-to-moment complementarity, we hypothesized that increased social anxiety in participants would result in decreased moment-to-moment correspondence and moment-to-moment reciprocity (Research Question 3B).
4. Participants' social anxiety levels would be positively related, such that increased social anxiety in one dyad member would result in increased social anxiety in the other dyad member (Research Question 4).

5. The more social anxiety participants experienced in the interaction, the worse they would do on relationship and task performance outcome variables (Research Question 5A). We also predicted that increased moment-to-moment correspondence and reciprocity would result in better relationship and task outcomes for dyads (Research Question 5B).

## Method

**Participants.** Over the course of three school terms, 133 pairs of students participated in this study, with each pair consisting of two females who did not know each other. Consistent with reasoning by other interpersonal researchers (e.g., Locke & Sadler, 2007), we used same-sex dyads to reduce any unwanted variance that may be elicited by opposite-gendered dyads. Participants were recruited through the Psychology Research Experience program (PREP) ( $n = 89$  dyads) and the Paid Research Pool ( $n = 24$  dyads) at Wilfrid Laurier University. As anticipated, the method of recruitment did not significantly impact any of our variables of interest.

A total of 12 dyads were excluded from analysis because one or both dyad members failed to answer a substantial portion of the questionnaire package or answered the questions administered in the lab in a suspicious manner (e.g., answering a “3” for all questions). An additional two dyads were excluded because they had a prior relationship before coming into the lab. One dyad was excluded because of a language barrier, making it difficult for the interaction partners to communicate. Finally, an additional five dyads were excluded due to technical issues with the videotape of their research session (e.g., the videos had poor audio quality or one dyad member was off screen for an extended period of time). Thus, the total sample size used for analyses was 113 dyads. The mean age for participants was 19.66 ( $SD = 3.85$ ).

**Procedure.** We recruited participants using a stratified sampling technique. All participants completed a measure of trait neuroticism and trait agreeableness prior to coming into the lab and potential participants were invited to participate based on their scores on these two measures. The purpose of using a stratified sampling technique was that we wanted to make sure that our sample consisted of participants who would express a range of anxiety levels (as assessed broadly with a neuroticism measure) and a range of agreeableness levels (as assessed with an agreeableness measure), and that there would be different pairings of participants based on these levels. To do this, participants were categorized as having “high” trait neuroticism or “low” trait neuroticism and “high” trait agreeableness or “low” trait agreeableness by using median splits. The study design consisted of fully crossing the two categorizations of neuroticism (high versus low) and the two categorizations of agreeableness (high versus low), in turn producing 10 unique types of dyads.<sup>4</sup>

After being introduced to each other, the pair of students were told that the purpose of the study was to examine characteristics of an effective communicator, and they would be given ten minutes to prepare a five-minute presentation on an assigned topic. The topic assigned was either supporting or opposing cell-phone use in the classroom. To make the task more anxiety provoking, participants were told that their presentation would be video-recorded, and it would

---

<sup>4</sup> Unexpectedly, participants’ scores on the trait neuroticism measure were a weak predictor of participants’ situational anxiety during the dyadic interaction (i.e., trait neuroticism scores predicted little variability (between 3-5%) in our situational measures of anxiety), and scores on the trait agreeableness measure were a weak predictor of participants’ affiliation levels during the interaction (i.e., participants’ trait agreeableness scores predicted 1% of the variability in participants’ situational affiliation). Given this finding, along with the focus of the current thesis on *situational anxiety*, we opted not to use participants’ scores on the trait neuroticism and agreeableness measures as predictors of participants’ situational behaviour during the interaction that took place in Study 3. Thus, these measures are not discussed in our results.

be evaluated based on: (a) the quality and effectiveness of the arguments used in their presentation, and (b) the dyads' cooperation, collaboration, and ability to deliver a clear and coherent presentation. The experimenter then left the room, and indicated that she would return in approximately 10 minutes. On average, participants were left alone for 12 minutes during the presentation-preparation period (henceforth referred to as the preparatory interaction). The entire preparatory interaction (and the subsequent presentation) was video-recorded. The video camera was located behind a one-way mirror in order to minimize the distraction of videotaping the research session.

After the preparatory interaction, the experimenter returned and the dyad delivered their presentation to her. Following this, dyad members were separated and asked to complete a series of self-report questionnaires. After completing the questionnaires, participants were fully debriefed, given the opportunity to ask questions, and were compensated with either course credit or \$11.

**Measures.** Participants completed the following measures after delivering their presentation.<sup>5</sup>

***Trait neuroticism.*** Participants' trait neuroticism levels were assessed prior to coming into the lab using a 20-item measure from the International Personality Item Pool (Goldberg, 1999). This measure is designed to assess people's general tendency to experience negative affect and higher scores indicate a higher neuroticism level. Examples of items include, "I get stressed out easily" and "I worry about things." The internal consistency reliability of this measure in the current sample was .90. A copy of this measure can be found in Appendix M.

---

<sup>5</sup> Only relevant measures are described below. For a complete list of measures administered to participants in the study, see Appendix A.

***Trait agreeableness.*** Participants' trait agreeableness levels were assessed prior to coming into the lab using a 20-item measure from the International Personality Item Pool (Goldberg, 1999). Higher scores on this measure indicate higher levels of agreeableness. Examples of items include, "I am concerned about others" and "I trust what others say." The internal consistency reliability of this measure in the current sample was .84. A copy of this measure can be found in Appendix M.

***Self-reported anxiety.*** To assess participants' self-reported anxiety we asked participants to rate how at ease they felt during the interaction and how comfortable they felt during the interaction. Ratings took place on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). These items were reverse coded so that higher numbers reflected more anxiety during the interaction. The internal consistency reliability of this measure was .71.

***Perception of partner's anxiety.*** Participants assessed the extent to which they thought their partners were anxious. Using an 8-point scale ranging from 1 (*extremely inaccurate*) to 8 (*extremely accurate*) participants were asked to rate how accurately nine adjectives described their interaction partners. These nine adjectives were taken from the neuroticism subscale of the Interpersonal Adjective Scale Revised – Big Five version (Trapnell & Wiggins, 1990). Higher scores on this measure indicated that participants saw their interaction partners as being more anxious. The internal consistency reliability of this measure was .88. A copy of this measure can be found in Appendix N.

***Desire for future relationship.*** Participants' willingness to engage in a future relationship with their interaction partner was also assessed. This scale was comprised of eight items that were very similar to the items administered in the previous study (they were slightly modified to reflect the context of the current study). Five of the items asked participants to rate how willing

they would be to engage in various types of interactions with their partners (e.g., go for coffee, go for dinner, etc.). The remaining three items assessed participants' general feelings about their interaction partner (e.g., how much they liked their interaction partner). Ratings were made on a 5-point Likert scale, ranging from 1 (*not at all*) to 5 (*extremely*). Cronbach's alpha for this scale was .95. A copy of this measure could be found in Appendix O.

**Coding of interactions.** The videotaped research sessions were coded using four different coding schemes. Three of the coding schemes were applied to the preparatory interaction (i.e., the portion of the research session in which participants were preparing their presentation). For the preparatory interaction, observers coded: (1) the dominance and affiliation behaviours of participants using the Continuous Assessment of Interpersonal Dynamics (CAID) approach, (2) the degree of social anxiety that participants displayed throughout the interaction, and (3) dyadic outcome variables, including how much the dyads seemed to enjoy the interaction, as well as how well they did at completing their assigned task. The fourth coding scheme was applied to the final presentation, and had coders assess the quality of the dyads' presentations and how much rapport they displayed while delivering their presentations.

**Ratings of the preparatory interaction.** The three coding schemes applied to the preparatory interaction are described below.

*1. Continuous Assessment of Interpersonal Dynamics (CAID) approach.* Using an innovative joystick-based assessment technique (i.e., the CAID approach; Sadler et al., 2009) observers captured the continuous flow of participants' dominance and affiliation behaviours during the first 10 minutes of their interaction. In addition to providing us with information about participants' mean levels of dominance and affiliation during the preparatory interaction, this approach also allowed us to index the degree of moment-to-moment complementarity between

dyad members. This technique has been applied successfully in a variety of research studies (e.g., Lizdek et al., 2016; Markey et al., 2010; Sadler et al., 2009) and its intricacies are described below.

*The joystick apparatus.* The joystick apparatus consists of a Microsoft Sidewinder Force Feedback 2 joystick that is connected to a computer. A software program designed for use with the joystick apparatus was used by observers to capture the moment-to-moment assessment of a target person's behaviour. This program opens in the lower right corner of the computer screen and displays a Cartesian plane that is 6.6 cm wide by 6.6 cm tall. The *x*-axis of the Cartesian plane represents the affiliation dimension of the interpersonal circumplex, with the left and right endpoints of the axis labelled as *unfriendly* and *friendly*, respectively. The *y*-axis on the Cartesian plane represents the dominance dimension of the interpersonal circumplex, with the top and bottom endpoints of the axis labelled as *dominant* and *submissive*, respectively. The scale on both axes ranges from -1000 to 1000, with 1000 on the *x*-axis representing high levels of friendliness, and 1000 on the *y*-axis representing high levels of dominance. A small dot within the Cartesian plane denotes the current position (i.e., the *x* and *y* coordinates) of the joystick. Movements along the *x*-axis represent shifts in affiliation behaviours whereas movements along the *y*-axis signify shifts in dominance behaviours. The program records the position of the small dot on the Cartesian plane twice per second. The resulting data produces two time series, one continuous stream of ratings for affiliation and one continuous stream of ratings for dominance.

To rate a person's behaviour during an interaction using the CAID approach, the observer simultaneously watched the videotape of the dyad's interaction while continuously moving the joystick to make assessments of the target person's dominance and affiliation levels. As the observer moves the joystick and makes their continual assessments, the small dot moves in



accordance on the Cartesian plane. Thus, observers are able to capture a target person's moment-to-moment behavioural changes in dominance and affiliation as they are unfolding continuously throughout the interaction. For example, if a person smiled at their interaction partner, the observer would move the joystick further to the right (denoting an increase in friendliness). In contrast, if a person made a rude comment to their interaction partner, the observer would move the joystick further to the left (denoting a decrease in friendliness). In addition to the visual feedback of the dot location on the Cartesian plane, observers were also given feedback about the location of the joystick via the joystick's force-feedback feature. The further the joystick is away from the centre of the Cartesian plane, the greater the force that is applied to the observer's hand.

*Training of observers.* Four independent observers (three graduate students and one upper-year undergraduate student) used the joystick apparatus to rate all participants' dominance and affiliation behaviours during the preparatory interaction.

Prior to rating the videotaped interactions, observers underwent approximately 10 hours of individual training. To begin the training, each observer learned about the joystick apparatus and the affiliation and dominance dimensions represented on the displayed Cartesian plane. To test the observer's understanding of the full interpersonal circumplex space, 16 personality descriptors (e.g., sly, outgoing, sympathetic) were presented one at a time, and the observer was asked to move the joystick to the most appropriate octant in the Cartesian plane. For example, if the adjective "cold" was presented, the expected response was to move the joystick towards the left hand side of the displayed Cartesian plane. Corrective feedback was given until accurate placement of all 16 words within the Cartesian plane was achieved.

Next, the trainee used the joystick apparatus to code six 10-minute training videos of dyadic interactions. Each video was presented twice, each time for coding a different target

interactant (resulting in a total of 12 assessments). The trainer watched the observer's performance while coding each video and, following each assessment, gave detailed feedback about any issues with coding and answered any questions that the observer had about the process. Throughout the training, the trainer emphasized the importance of basing the CAID joystick assessments on behavioural changes in the target person.

The six training videos were different from the videos that observers subsequently coded for the current study in two important ways. First, the training videos consisted of male-female dyads, whereas the videos for this study consisted of female-female dyads. Second, the task that interactants completed in the training videos was different from the task that interactants completed in the videos for this study (i.e., in the former case, interactants were coming to an agreement about the personality of a third person based on her thematic apperception test (Murray 1943) answers, whereas in the latter case interactants were putting together a presentation). Because of these differences, as a next step in their training, observers coded an additional three videos that were recorded for the purpose of the current study but were not included in the final set of videos that observers coded.<sup>6</sup> Observers watched each video twice, each time coding a different female (resulting in a total of 6 assessments). The purpose of including three additional training videos was to familiarize observers with the types of interactions they would be coding in the current data set. Similar to the other training videos, observers were given targeted feedback after each assessment and were encouraged to ask the trainer questions.

---

<sup>6</sup> The additional three dyads that observers coded for training purposes were randomly selected from the 12 dyads that were excluded from the data set for providing questionable self-report data (detailed in the participants section).

*Procedure for obtaining observer ratings.* Observers began coding the interpersonal behaviour of the target person by pressing the start button on the joystick apparatus as soon as the researcher left the dyad alone in the room to begin their preparatory interaction. Observers moved the joystick continuously for the next 10 minutes and 10 seconds, producing a continuous rating of moment-to-moment levels of dominance and affiliation for each target person.

Each observer assessed the moment-to-moment interpersonal behaviour of each participant in the 113 dyads used for this study. Thus, in total, every observer made 226 assessments of behaviour. To avoid assessing participants from the same dyad consecutively, observers rated the behaviour of one participant from each dyad before moving on to another video clip. The order in which participants were rated was also varied across the four observers.

*Handling of the time series data.* A “boxcar” effect (Warner, 1998) may occur at the start of a time series when an observer quickly moves the joystick from its initial resting position (at the center of the Cartesian plane) to a position on the Cartesian plane that denotes the first true assessment of behaviour. To circumvent this issue, the first ten seconds (i.e., 20 data points) were removed from every time series. Thus, each time series had a duration of 600 seconds (610 seconds – 10 seconds), or 1200 data points (600 seconds\*2 samples/second).

*Inter-rater reliabilities of the time series data.* Consistent with the approach in Sadler et al. (2009), two types of inter-rater reliabilities were computed for the time series. The first type of inter-rater reliability was the reliability of the means of the time series, and the second type of inter-rater reliability was the reliability of the moment-to-moment time series data.

First, we assessed how well the four observers agreed about the overall mean levels of affiliation and dominance displayed by participants throughout the interaction. Using each observer’s ratings separately, means were computed from each participant’s dominance time

series and each participant's affiliation time series. Subsequently, these means were used to conduct a reliability analysis of a four-item test (where each observer served as an "item"; this procedure is equivalent to calculating the reliability through the intraclass correlation). Cronbach alphas were .88 for affiliation and .93 for dominance. Thus, observers were in high agreement about the overall mean levels of affiliation and dominance displayed by participants during the preparatory interaction.

In line with previous research (e.g., Sadler et al., 2009), we also assessed the degree to which the four observers agreed about the moment-to-moment changes in participants' behaviours. To do this, we conducted a four-item reliability analysis for each participant's dominance and affiliation time series using each observer's time series as an "item" in the reliability analysis. For example, to compute the inter-rater reliability for the moment-to-moment affiliation time series for Female 1 in Dyad 1, a reliability analysis was conducted using Observer 1's affiliation ratings of Female 1 in Dyad 1, Observer 2's affiliation ratings of Female 1 in Dyad 1, Observer 3's affiliation ratings of Female 1 in Dyad 1, and Observer 4's affiliation ratings of Female 1 in Dyad 1; the same type of four-item reliability analysis was performed for each participant's dominance and affiliation time series. The average inter-rater reliability for the affiliation and dominance time series were .72 and .89, respectively. Thus, observers showed good to excellent agreement about the changes in affiliation and dominance that participants displayed throughout the interaction.

*Averaging across raters.* Because observers displayed good to excellent inter-rater reliability, the moment-to-moment ratings of the four observers were aggregated by computing the average of observers' ratings at each time point. The resulting data for each participant

consisted of two-time series: one for the participant's level of affiliation over time, and another for the participant's levels of dominance over time.

*Calculating overall levels of complementarity.* Using data obtained from the CAID coding, we derived indices to quantify the overall degree of correspondence and reciprocity displayed by each dyad. The formulae to calculate these indices for each dyad are:

$$\text{Correspondence} = 1500 - | \text{Mean Female 1's Affiliation} - \text{Mean Female 2's Affiliation} |$$

$$\text{Reciprocity} = | \text{Mean Female 1's Dominance} - \text{Mean Female 2's Dominance} |$$

In these equations, *Mean Female 1's Affiliation* and *Mean Female 2's Affiliation* represent the mean of Female 1's and Female 2's affiliation time series, and *Mean Female 1's Dominance* and *Mean Female 2's Dominance* represent the mean of Female 1's and Female 2's dominance time series. For ease of interpretation, we subtract the absolute difference in participants' affiliation means from 1500 so that higher scores on this index indicate greater matching on affiliation for a dyad (subtracting from 1500 ensured that all of our calculated values were positive). Similarly, higher scores on the reciprocity measure indicated greater oppositeness on dominance for a dyad. This approach to computing overall levels of complementarity is consistent with approaches used by other interpersonal circumplex researchers (e.g., Lizdek, 2016; O'Conner & Dyce, 1997)

*Calculating moment-to-moment complementarity.* We also computed the degree of moment-to-moment correspondence and reciprocity displayed by dyads using data obtained from the CAID approach. To calculate these indices, a series of steps were completed. First, consistent with similar published work (e.g., Lizdek et al., 2016; Sadler et al., 2009) using a regression analysis we removed the overall linear trends from each participant's dominance and affiliation time series. Removing these linear trends allowed us to separate out and eliminate the covariation between dyad members' slopes (e.g., the similarity or degree to which the females

became increasingly more friendly across the interaction) from the phenomenon of moment-to-moment patterns of variation between dyad members' behaviours. By removing these linear trends, we get a more accurate assessment of the degree to which dyad members were coordinating their affiliative and dominance behaviours at a moment-to-moment level.

After removing these linear trends, two cross-correlations were computed for each dyad: one between dyad members' detrended affiliation time series and one between dyad members' detrended dominance time series. The affiliation cross-correlation provides an estimate of moment-to-moment correspondence, and reflects the extent to which interaction partners were coordinating their affiliative behaviour in the interaction. Affiliation cross-correlations closer to +1 indicate more moment-to-moment correspondence between dyad members (i.e., dyad members' affiliation levels were increasing and decreasing at similar times throughout the interaction). The average affiliation cross-correlation across the 113 dyads was .46 ( $SD = .23$ ), indicating that, in general, dyads were displaying moderate amounts of moment-to-moment correspondence.

The dominance cross-correlation provides an estimate of moment-to-moment reciprocity, and reflects the extent to which interaction partners were passing agency back and forth smoothly throughout the interaction. Dominance cross-correlations closer to -1 indicate more moment-to-moment reciprocity between dyad members (e.g., dyad members dominance levels were increasing and decreasing at opposite times throughout the interaction). The average dominance cross-correlation across the 113 dyads was -.56 ( $SD = .25$ ) indicating that, in general, dyads were displaying moderate amounts of moment-to-moment reciprocity. For ease of interpretation in the analyses presented in the results section, we multiplied each dyad's

dominance cross-correlation by -1 so that higher numbers in the positive direction indicate more moment-to-moment reciprocity.

For descriptive statistics of participants' overall time series, and dyads' overall levels of complementarity and moment-to-moment complementarity, see Table 3.

**2. *Situational anxiety of participants during the preparatory interaction.*** Three observers (two graduate students and one upper-year undergraduate student), who were mostly different from the CAID coders (one coder overlapped), coded participants' anxiety behaviours during the preparatory interaction using an eight-item scale (see Appendix P). Six of the eight items were taken from a scale used by Taylor and Alden (2011), in which observers rated participants' anxiety behaviours during an interaction. Two additional items were added to the scale ("avoided eye contact" and "had a closed body posture"), because these behaviours have also been found to be indicators of social anxiety (e.g., Fydrich, Chambless, Perry, Buergener, & Beazley, 1998). Using a 7-point scale, ranging from 1 (*not at all*) to 7 (*very much*) observers rated the degree to which each participant engaged in the eight behaviours presented on the scale. All observers rated the anxiety behaviours for all participants in the study after receiving 5 hours of training.

To assess the inter-rater reliability for observers' anxiety assessments, each observer's mean across the eight items was computed and entered into a reliability analysis (this procedure is equivalent to calculating the reliability through the intraclass correlation). Inter-rater reliability was .76, suggesting that observers were good at rating participants' overall levels of anxiety throughout the interaction. Because observers were reliable in their ratings, we averaged across the three observers to create one score for each participant, representing the degree to which they

displayed anxious behaviours throughout the preparatory interaction. The internal consistency reliability of these ratings was very good, at .84.

**3. Dyadic outcomes of the preparatory interaction.** The same four observers who completed the CAID assessments also completed a 14-item measure (see Appendix Q) designed to evaluate how each dyad fared during the preparatory interaction. For example, observers rated the extent to which the dyad worked well together, had rapport, and seemed to enjoy the interaction. Ratings took place on a 5-point scale ranging from 1 (*not at all*) to 5 (*all the time*), and each observer rated all of the dyads.

To assess inter-rater reliability for the dyadic outcome measure, a reliability analysis was conducted for each item, with each observer's rating for the item treated as one item in a four-item test. For example, to compute the inter-rater reliability for the first item on the measure, Observer 1's rating of the first item, Observer 2's rating of the first item, Observer 3's rating of the first item, and Observer 4's rating of the first item, were entered into a reliability analysis. The resulting alpha coefficient was .81. The same analysis was performed for the remaining 13 items on the questionnaire. Alphas for the 14 items ranged from .68 to .87, with an average alpha across all 14 items of .80. Because observers displayed good to very good reliability, ratings by the four observers for each item were averaged together.

**Factor Analysis.** A principal components factor analysis with a promax rotation was conducted to determine how many factors were present in the dyadic outcome measure. Two factors had eigenvalues greater than one, and the factors were moderately correlated at .67. The factor loadings for the two factors can be found in Table 4. Only those items that loaded uniquely onto one factor, with a factor loading greater than  $|.40|$  (and less than  $|.40|$  on the other factor) are shown.



The first factor consisted of nine items, all of which loaded positively. Examples of the items include, “To what extent does the dyad seem to enjoy the interaction?” and “To what extent does the dyad seem to hit it off?” It is proposed that this factor taps a dyad’s overall level of enjoyment with the interaction. We computed a score for each dyad on this factor by averaging across the nine items, with a higher score indicating more enjoyment throughout the interaction. A dyad’s score on this factor will subsequently be referred to as their “dyadic enjoyment” score. The internal consistency reliability of the scale based on the nine items that comprised this factor was .97.

The second factor consisted of two items, both of which loaded positively. The two items were: “To what extent does the dyad seem to accomplish the task at hand?” and “To what extent does the dyad manage the task effectively?” It is proposed that this factor taps a dyad’s overall task performance. A score was computed for each dyad by averaging across these two items. The higher a dyad’s score on this factor, the better their task performance was during the preparatory interaction. A dyad’s score on this factor will subsequently be referred to as their “dyadic task performance” score. The internal consistency reliability of the scale based on the two items that comprised this factor was .89.

**Ratings of the final presentation.** The fourth and last coding scheme used in this study was applied to the final presentations delivered by the dyads. Four observers (2 graduate students and 2 upper-year undergraduate students), who were mostly different from the previous coders (one coder overlapped), independently watched each dyad’s presentation and made a series of ratings that assessed presentation quality and rapport. On average, the presentations were 2 minutes and 39 seconds long. There were two major components to observers’ ratings of the presentations: one component was more general and involved assigning grades to major aspects

of the presentation, and the second component was more specific and had observers use a 19-item scale to rate the presentation.

*Grades.* Similar to what students rating one another's presentations would be asked to do, observers were asked to provide a grade from 0 – 100 on four different aspects of each dyad's presentation (see Appendix R). Three of the aspects that observers graded were about the quality of the presentation, and observers were asked to provide separate grades for the arguments used in the presentation by the dyad, the flow of the presentation, and the style of the presenters. The fourth aspect of the presentation that observers were asked to grade was the rapport of the dyad while presenting. For each of these four categories, observers were given a paragraph description to consider when making their ratings, as well as information on what would warrant an outstanding grade (i.e., 90-100) in that specific category.

The first three grades that observers completed (i.e., arguments used in the presentation, presentation flow, and style of presenters) were all designed to assess the quality of the presentation. Because these three ratings were highly correlated ( $r$ 's ranging from .79 - .88), we averaged across these three grades for each observer to obtain one overall grade of presentation quality for each observer for each dyad. Subsequently, we assessed inter-rater reliability by entering each observer's means on the overall quality grade into a reliability analysis. Inter-rater reliability was .83, suggesting that observers had very good agreement with one another in rating the quality of the presentations. Because observers agreed well with one another, we averaged across the four raters to create one overall grade of presentation quality for each dyad.

The fourth grade that observers gave assessed dyadic rapport during the presentation. To assess the inter-rater reliability of observers' grades for the rapport category, we entered each observer's grades for this category into a reliability analysis. Inter-rater reliability was .84,

suggesting that observers agreed well with one another in assigning grades for this category. Given the very good inter-rater reliability, we averaged across the four raters to create one grade for rapport for each dyad.

**Ratings.** Observers were also asked to use a 5-point scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), to make ratings on specific aspects of each dyad's presentation (see Appendix S). More specifically, 14 items assessed the quality of the presentation (e.g., the dyad presented convincing arguments for their topic) and five items assessed the rapport of the dyad while presenting (e.g., the dyad had rapport).

To assess the inter-rater reliability of observers' presentation-quality ratings, each observer's mean across the 14 items was computed and entered into a reliability analysis. The inter-rater reliability was .88, suggesting that observers agreed very well with one another when rating the quality of the presentations. Because observers displayed very good inter-rater reliability, we averaged across the four observers' ratings, creating one score for each dyad, representing a rating-based assessment of the quality of their presentation. This 14-item scale had a Cronbach's alpha of .90, suggesting that these items had excellent internal consistency.

To assess the inter-rater reliability of observers' rapport ratings, each observer's mean across the five items was computed and entered into a reliability analysis. The inter-rater reliability was .82. Given the good inter-rater reliability, we averaged across the four observers' ratings and created one score for each dyad that represented a rating-based assessment of dyadic rapport during the presentation. This five-item scale had a Cronbach's alpha of .97, suggesting that these items had excellent internal consistency.

## **Results**

The results section is organized into five subsections. The first section discusses the overarching modeling strategy that we used to answer our research questions. The second section discusses how we modeled participants' anxiety during the interaction (i.e., their situational social anxiety) as a latent variable comprised of participants' self-reported anxiety, partners' perceptions of participants' anxiety, and observers' ratings of participants' anxiety. This section also examines how the situational social anxiety levels of participants are related to each other (Research Question 4). The third section examines the relationships between participants' situational social anxiety and their own dominance and affiliation behaviours (Research Question 1), as well as their partners (Research Question 2). In addition this section looks at the relationship between participants' situational social anxiety and overall levels of complementarity (Research Question 3A). The fourth section examines the relationship between participants' situational social anxiety and moment-to-moment indices of complementarity (Research Question 3B). Finally, the fifth section assesses how participants' situational social anxiety and dyads' moment-to-moment patterns of complementarity relate to our dyadic outcome measures.

### **Overarching Modeling Strategy**

Structural Equation Modeling (SEM) was the primary strategy used to answer our research questions. This method of analysis provides two main benefits over standard methods of statistical analysis. First, because the current study involves two people freely interacting, the behaviours of the two dyad members are interdependent. Unlike standard methods of statistical analysis, which assume independence among participants, SEM accounts for the interdependence among dyad members.

Second, SEM allows us to take account of the “indistinguishability” of our dyads. Dyad members can be distinguished if there is a meaningful way to differentiate the two dyad members (e.g., male or female). Because we had two females interact with each other, there is no meaningful variable to differentiate the dyad members, and as a result, we distinguished the dyad members in an arbitrary fashion, labelling them Female 1 and Female 2. Because such designation is arbitrary, and anyone labelled as Female 1 could have been labelled as Female 2 and vice versa, results from analyses using this classification would vary if the dyad members had been assigned differently. For example, if we were to calculate the reliability of a scale for all dyad members labelled Female 1 and the reliability of the same scale for all dyad members labelled as Female 2, the calculated reliability estimates would differ for the two sets of females if even just one pair of dyad members had been assigned the opposite roles (i.e., Female 1 assigned as Female 2, and Female 2 assigned as Female 1). Thus, in accordance with published guidelines (Olsen & Kenny, 2006; Woody & Sadler, 2005), to take account of the indistinguishability of our dyads, we imposed certain constraints on our SEM models. More specifically, we set every pair of parameters (e.g., means, variances, actor effects, partner effects, slopes, intercepts, etc.) equal across Female 1 and Female 2. When we set these equalities and estimated our models, the parameter estimates obtained for the models were correct; however, the fit indices were incorrect and required adjustment. All of the fit indices presented below have been corrected for the indistinguishability of our dyads following the procedure advanced by Olsen and Kenny (2006).

### **Modeling Participants’ Situational Social Anxiety During the Preparatory Interaction**

**Modeling strategy.** The model used to represent participants’ situational social anxiety during the preparatory interaction can be found in *Figure 4*. There are three noteworthy things about this model. First, the latent constructs of Female 1’s and Female 2’s situational anxiety

(depicted in large ovals) were measured in three ways (shown in rectangles). More specifically, the three measures of participants' situational social anxiety during the preparatory interaction include: participants' self-reported anxiety, interaction partners' perceptions of anxiety, and observers' ratings of anxiety. Further, each measure of situational social anxiety did not measure participants' situational social anxiety perfectly, thus necessitating the error variables labeled  $e_1$  through  $e_6$ .

Second, there are three systematic measurement errors. Two of the systematic measurement errors reflect the fact that the measures were obtained by the same person. To be specific, there are two correlated errors (both labelled d) between  $e_1$  and  $e_5$  and  $e_2$  and  $e_4$ . A third correlated error (labelled e) was added because the measure of participants' self-reported situational social anxiety was semantically distinct from the other two measures of situational social anxiety. More specifically, partners' and observers' ratings of situational social anxiety were captured using measures on which higher scores indicated more situational social anxiety; whereas the self-report measure of situational social anxiety had participants rate how comfortable and at ease they were during the interaction, with a higher score indicating more calmness during the interaction. Although we reverse-coded participants' scores on the self-report measure (so that higher scores indicate more situational social anxiety), the different wording of this measure compared to the other two measures of situational social anxiety represents a possible method effect (i.e., participants' self-report measures of situational social anxiety share some additional shared variance because of the unique semantics of the measure). To account for this, we allowed  $e_1$  and  $e_4$  to covary.

Finally, there is a covariance added between the two latent constructs of Female 1's situational anxiety and Female 2's situational anxiety. This covariance allows us to assess the relationship between participants' situational social anxiety levels during the interaction.

As mentioned earlier, certain constraints had to be set on our models to take account of the indistinguishability of our dyads. Thus, the following parameters were set equal across the two females: the true score variances of the latent variables, pathways with the same letters on them (e.g., Situational Anxiety of Female 1 to Self-Reported and Situational Anxiety of Female 2 to Self-Reported), the intercepts of the measured variables, the error variances of the measured variables, and the two covariances between  $e_1$  and  $e_5$  and between  $e_2$  and  $e_4$ .

**Results.** The results for this model are shown in *Figure 5*. This model fit very well,  $\chi^2(3) = 4.40$ , *ns*, CFI = .98, RMSEA = .06, with positive and moderate loadings of the measures on the latent variables, ranging from .29 to .54. All of the loadings were significantly different from zero ( $ps < .01$ ). In addition, the proportions of variance in the three measures explained by the latent construct of situational anxiety were 28% (self-reported anxiety), 8% (partner's rating of anxiety), and 29% (observers' rating). Taken together, these results suggest that our model of participants' situational social anxiety is reasonable, and all of our measures of anxiety are tapping participants' underlying situational social anxiety during the interaction.

Also noteworthy is the large positive estimate of the correlation between the two latent variables (which is, however, apparently difficult to estimate with precision, given its marginal statistical significance in the model). This result supports our hypothesis for Research Question 4 that participants' social anxiety levels during the interaction would be positively related; such a result suggests that when one dyad member experiences more anxiety, the other dyad member is also likely to experience more anxiety.

## **The Relationships Between Participants' Situational Social Anxiety, Interpersonal Behaviours, and Overall Levels of Complementarity during the Preparatory Interaction**

This next section examines the relationships between participants' situational social anxiety during the preparatory interaction (represented by the measurement model presented in the previous section) and their own and their partners' mean levels of dominance and affiliation during the preparatory interaction. Further, this section discusses the relationship between participants' situational social anxiety and overall levels of correspondence and reciprocity between dyad members during the preparatory interaction.

**Modeling strategy.** The type of model used to assess the relation of situational anxiety during the preparatory interaction to interpersonal variables is shown in *Figure 6*, using overall levels of affiliation and correspondence as an example. This type of model was used for the other sets of interpersonal variables, to follow.

In the models used to assess the relation between situational social anxiety and interpersonal variables, there are three new measured variables (represented by rectangles) that deserve further explanation. In the affiliation model, the two measured variables termed "Female 1's Overall Affiliation" and "Female 2's Overall Affiliation" represent each female's overall level of affiliation throughout the interaction. The other new measured variable quantifies the overall degree of correspondence for each dyad. (For a reminder of how we calculated overall affiliation levels for each female and the overall degree of correspondence for each dyad, see the Methods section.)

These three new measured variables in the model contained errors of prediction (i.e., unexplained variance), represented by  $e_7$  through  $e_9$ . In addition, these errors were allowed to covary, reflecting the possibility of shared errors of prediction among the criterion variables.



Most notable about these models is that we can use them to answer three of our research questions simultaneously. For example, relevant to Research Question 1, we can examine the relationship between participants' situational social anxiety and their overall affiliation levels during the preparatory interaction (the *A* paths in *Figure 6*). Relevant to Research Question 2, we can examine the relationship between participants' situational social anxiety and their *partners'* overall affiliation levels during the preparatory interaction (the *B* paths in *Figure 6*). Finally, relevant to Research Question 3A, we can examine the relationship between participants' situational social anxiety and dyads' overall levels of correspondence during the preparatory interaction (the *C* paths in *Figure 6*).

Similar to the previous model, the indistinguishable nature of our dyads necessitated equality constraints in our models. In addition to the constraints that were set for the situational social anxiety measurement models (described in the previous section), the following parameters were set equal: (1) pathways relating the latent variables for each Female to similar outcome variables for each female (i.e., the pathways with similar letters on them in *Figure 6*), (2) the intercepts of the overall level variables (i.e., the intercepts of Female 1's Overall Affiliation and Female 2's Overall Affiliation were set equal) (3) the variance of  $e_7$  and the variance of  $e_9$ , and (4) the covariance between  $e_7$  and  $e_8$  and the covariance between  $e_8$  and  $e_9$ .

Using a similar type of model, we can answer parallel questions about the relationships between participants' situational social anxiety and their overall dominance levels, their partners' overall dominance levels, and dyads' overall levels of reciprocity during the preparatory interaction.

**Results.** The results for the affiliation model are shown in *Figure 7* (with only relevant results highlighted). The fit of the affiliation model was quite good,  $\chi^2(9) = 16.41$ , *ns*, CFI = .96,

RMSEA = .08. Two interesting results emerged from this model. Participants' situational social anxiety was significantly and negatively related to their overall level of affiliation during the interaction (i.e., more socially anxious participants were less affiliative). Similarly, participants' situational social anxiety was significantly and negatively related to their partners' overall affiliation during the interaction (i.e., more socially anxious participants had less affiliative partners). Combined, these two effects explained 35% of the variance in participants' overall affiliation levels. Contrary to expectations, participants' situational social anxiety was not significantly related to overall patterns of correspondence during the preparatory interaction.

The results for the dominance model are shown in *Figure 8* (with only relevant results highlighted). The fit of this model was approaching adequate  $\chi^2(9) = 26.89$ ,  $p = .001$ , CFI = .92, RMSEA = .14. Upon further investigation, it became apparent that one of the equality constraints imposed on this model was contributing to the lack of fit. Specifically, when we relaxed the assumption that observer anxiety ratings were equal for both Female 1 and Female 2, the model had very good fit,  $\chi^2(7) = 10.29$ , *ns*, CFI = .98, RMSEA = .06. Relaxing this constraint did not change the substantive implications of the model, thus rendering the approaching-adequate fit of the initial model not overly concerning.

As we expected, participants' situational social anxiety was negatively related to their overall dominance level throughout the interaction (i.e., more socially anxious participants were less dominant). We found marginal support ( $p < .10$ ) for our hypothesis regarding how participants' situational social anxiety would relate to their partners' dominance behaviours during the interaction; more situationally socially anxious participants had more dominant partners. Combined, these two effects explained 52% of the variability in participants' overall

dominance levels. Finally, consistent with our hypothesis, participants' situational social anxiety was not significantly related to overall levels of reciprocity during the preparatory interaction.

### **The Relationships Between Participants' Situational Social Anxiety and Moment-to-Moment Complementarity During the Preparatory Interaction**

**Modeling strategy.** The model used to assess the impact of participants' situational social anxiety on patterns of moment-to-moment complementarity is displayed in *Figure 9*. In comparison to the two previous models, the three measured dependent variables on the right hand side have been replaced by two new measured variables, which capture the degree of correspondence (i.e., similarity on affiliation) and reciprocity (i.e., oppositeness on dominance) between dyad members at a moment-to-moment level. (For a reminder of how we calculated these two new measured variables indexing moment-to-moment correspondence and reciprocity, see the Methods section.)

The moment-to-moment correspondence and moment-to-moment reciprocity variables contained errors of prediction, represented by  $e_7$  and  $e_8$  in *Figure 9*. These errors were allowed to covary, reflecting the possibility of shared errors of prediction between the two criterion measures.

This model allowed us to examine how participants' situational social anxiety is related to the degree of moment-to-moment correspondence (A paths in *Figure 9*) and reciprocity (B paths in *Figure 9*) between dyad members during the preparatory interaction. In addition to the equality constraints that were set for the situational anxiety measurement models (described previously), because we have indistinguishable dyads, the pathways that have the same letters on them in *Figure 9* were set equal.

**Results.** The results for this model can be found in *Figure 10* (with estimates on relevant pathways). The fit of this model was reasonably good,  $\chi^2(7) = 12.49$ , *ns*, CFI = .96, RMSEA = .08. Consistent with our expectations, participants' situational social anxiety was significantly and negatively related to patterns of moment-to-moment reciprocity; the more social anxiety experienced by participants during the preparatory interaction, the less moment-to-moment reciprocity displayed by dyads. Participants' situational anxiety predicted 52% of the variance in the moment-to-moment patterns of reciprocity in dyads. Inconsistent with our predictions, there was a significant and positive relationship between participants' situational social anxiety and patterns of moment-to-moment correspondence; the more social anxiety experienced by participants during the preparatory interaction, the more moment-to-moment correspondence displayed by dyads. Participants' situational social anxiety predicted 11% of the variance in the moment-to-moment patterns of correspondence in dyads.

### **The Relationships Between Participants' Situational Social Anxiety During the Preparatory Interaction, Moment-to-Moment Indices of Complementarity, and Outcome Measures**

This section begins by examining how participants' situational social anxiety and dyads' patterns of moment-to-moment complementarity relate to various dyadic outcome measures. Recall that we assessed four different dyadic outcomes: two related to the preparatory interaction (i.e., dyadic enjoyment and dyadic task performance) and two related to the final presentation (i.e., presentation quality and presentation rapport). A separate model was estimated for each dyadic outcome variable and we discuss the two outcomes related to the preparatory interaction separate from the two outcomes related to the final presentation. The four new models discussed below (i.e., one for each dyadic outcome variable) are an extension of the model described in the

previous section, in which participants' situational social anxiety was used to predict moment-to-moment correspondence and reciprocity.

After examining how participants' situational social anxiety and dyads' patterns of moment-to-moment complementarity relate to our dyadic outcome variables, we conclude this section by discussing the relationship between participants' situational anxiety and their self-reported willingness to form a future relationship with their interaction partner.

**Preparatory interaction outcomes.** The section below describes the results for the preparatory interaction outcome variables of dyadic enjoyment and dyadic task performance.

***Dyadic enjoyment and dyadic task performance modeling strategy.*** The type of model used to assess the relation of situational social anxiety and moment-to-moment indices of complementarity with outcome variables related to the preparatory interaction is shown in *Figure 11*, using dyadic enjoyment as an example. Recall that the measured variable of "Dyadic Enjoyment" was computed from observers' ratings on nine items about how much the dyad seemed to enjoy themselves during the interaction. This outcome variable contained errors of prediction, represented by  $e_9$  in the model.

In *Figure 11*, the *A* pathways represent the relationship between situational social anxiety and dyadic enjoyment, the *B* pathway represents the relationship between moment-to-moment correspondence and dyadic enjoyment, and the *C* pathway represents the relationship between moment-to-moment reciprocity and dyadic enjoyment.

In addition to the equality constraints mentioned in previous sections, within each model, the pathways leading directly from the latent variables to the outcome variables were set equal (e.g., the *A* pathways in *Figure 11*).

***Dyadic enjoyment and dyadic task performance results.*** The results for the dyadic enjoyment model can be found in *Figure 12* (with estimates on relevant pathways). This model was a very good fit to the data,  $\chi^2(9) = 12.83$ , *ns*, CFI = .98, RMSEA = .06. There was a negative and significant relationship between participants' situational social anxiety and dyadic enjoyment; the more social anxiety participants experienced, the less the dyad enjoyed the interaction. In addition, there was a positive and significant relationship between moment-to-moment correspondence and dyadic enjoyment; the more moment-to-moment correspondence a dyad had, the more they enjoyed the interaction. Combined, these two effects predicted 79% of the variance in the dyadic enjoyment variable. Unexpectedly, there was no significant relationship between moment-to-moment reciprocity and dyadic enjoyment.

The results for the dyadic task performance model can be found in *Figure 13* (with estimates on relevant pathways). This model was also a very good fit to the data,  $\chi^2(9) = 13.70$ , *ns*, CFI = .97, RMSEA = .07. There was a negative and significant relationship between participants' situational social anxiety levels and dyadic task performance; the more social anxiety participants experienced, the worse the dyad did at completing the task. In addition, there was a positive and significant relationship between moment-to-moment correspondence and dyadic task performance; the more moment-to-moment correspondence a dyad had, the better their performance on the task. Combined, these two effects predicted 32% of the variance in the Dyadic Task Performance variable. There was no significant relationship between moment-to-moment reciprocity and dyadic task performance.

**Final presentation outcomes.** The section below describes the results for the outcome variables related to the final presentation.

***Presentation quality and rapport modeling strategy.*** The type of model used to assess the relation of situational social anxiety and moment-to-moment indices of complementarity during the preparatory interaction with outcome variables related to the final presentation is shown in *Figure 14*, using presentation quality as an example. Recall that we assessed two outcome variables related to the final presentation (presentation quality and presentation rapport) and we assessed these two variables using two different types of scales: a grade-based scale in which observers provided a grade from 0 – 100 and a Likert-score rating-based scale in which observers made ratings on a series of items. Because the grade-based scale and the rating-based scale were expected to measure the same underlying construct, they are represented as indicators (i.e., measures) of the latent variable, called presentation quality. Each of these two indicators have measurement error associated with them (represented by the error variables  $e_9$  and  $e_{10}$ ), and the unexplained variance in the presentation quality latent variable is represented by  $Z_1$ .

In this model, the *A* pathways represent the relationship between social anxiety during the preparatory interaction and the quality of the final presentation, the *B* pathway represents the relationship between moment-to-moment correspondence during the preparatory interaction and the quality of the final presentation, and the *C* pathway represents the relationship between moment-to-moment reciprocity during the preparatory interaction and the quality of the final presentation.

In addition to the same equality constraints described for the previous models in *Figures 4* and *9*, the pathways between the situational anxiety latent variables and the final presentation outcome latent variable (e.g., the *A* pathways in *Figure 14*) were set equal.

***Presentation quality and rapport results.*** The results of the presentation quality model can be found in *Figure 15* (with estimates on relevant pathways). This model had excellent fit,

$\chi^2(14) = 14.64$ , *ns*, CFI = 1.00, RMSEA = .02. The measurement model for presentation quality consisted of extremely high loadings of the two measures on the latent variable, and the proportions of variance explained in the grade-based measure of quality and the rating-based measure of quality by the latent variable were 95% and 93%, respectively. Regarding the path estimates for this model, results show a negative and significant relationship between the situational social anxiety of participants and the quality of their presentations; the more social anxiety participants experienced during the interaction, the lower the quality of their presentation. This effect predicted 22% of the variance in the quality of dyads' presentations. There was no significant relationship between moment-to-moment correspondence and reciprocity during the preparatory period and the quality of the final presentations delivered by the dyads.

The results of the presentation rapport model can be found in *Figure 16* (with estimates on relevant pathways). This model had very good fit,  $\chi^2(14) = 21.34$ , *ns*, CFI = .98, RMSEA = .07. The measurement model for presentation rapport consisted of extremely high loadings of the two measures on the latent variable, and the proportions of variance explained in the grade-based measure of rapport and the rating-based measure of rapport by the latent variable were 98% and 92%, respectively. Regarding the path estimates for this model, results show a negative and significant relationship between the situational social anxiety of participants and the rapport displayed by participants during the presentation; the more social anxiety participants experienced during the interaction, the less rapport they had during the presentation. In addition, there was a positive and marginally significant relationship between moment-to-moment correspondence and presentation rapport; dyads that had higher levels of moment-to-moment correspondence during the interaction had higher levels of rapport during the presentation.



Combined, these two effects predicted 12% of the variance in the presentation rapport latent variable. There was no significant relationship between moment-to-moment reciprocity during the preparatory interaction and the amount of rapport displayed by dyads during the final presentation.

**Desire for future relationship.** Recall that we asked participants to self-report how willing they would be to form a future relationship with their interaction partner. This outcome variable is different from the previously reported outcome variables (presented above) in two ways. First, this outcome variable is a self-reported outcome variable, not an observer-reported outcome variable. Second, this outcome variable is an individual outcome variable (i.e., related to each individual participant), not a dyadic outcome variable. To parallel analyses from the previous two studies (in which we looked at how the anxiety level of an interaction partner related to participants' desire to form a future relationship with that partner), we correlated participants' self-reported anxiety with their partners' scores on the Desire for Future Relationship scale. Results revealed a significant and negative correlation,  $r(111) = -.23, p = .003$ , indicating that the more situational social anxiety a participant was reporting, the less their partner wanted to form a future relationship with them. We also found a significant and negative correlation between participants' anxiety and their desire to form a future relationship with their partner,  $r(111) = -.43, p < .001$ . This result suggests that the more anxiety participants reported experiencing during the interaction, the less they wanted to form a future relationship with their interaction partner.

## **Discussion**

In this study, both members of the dyad were free to influence, and be influenced throughout the interaction, providing a more naturalistic context in which to test our hypotheses

about the impact of social anxiety on interpersonal behaviours and processes. This study had several added strengths over the previous two studies, including the measurement of participants' situational social anxiety using three different measurement techniques (self-report, partner-perception, and observer-coded) and applying four different coding schemes to the data.

Arguably, the most noteworthy coding method applied was the CAID approach, which allowed us to examine the fine nuances of participants' moment-to-moment behaviours and the degree to which these behaviours are entrained within dyads. Applying the CAID approach allowed us to examine novel research questions regarding how social anxiety relates to moment-to-moment patterns of complementarity, and further, how these moment-to-moment indices relate to relationship and task outcome variables.

The results for this study clearly supported many of our hypotheses (for a summary, see Table 5). As predicted for Research Question 1, we found that the more socially anxious a person was during the interaction the less affiliative and dominant they were. This finding is consistent with previous literature, which has shown that people who have higher levels of social anxiety tend to act in more unfriendly and submissive ways during interactions. For example, people who are higher on social anxiety tend to avoid eye contact during interactions, indicating lower levels of dominance, and fail to reciprocate instances of self-disclosure with interaction partners, indicating lower levels of friendliness (Beidel et al., 1985; Meleshko & Alden, 1993).

Concerning our second research question, we found that the situational social anxiety level of a person also impacts their interaction partners' dominance and affiliation behaviours. Consistent with previous literature (e.g., Creed & Funder, 1998), and with the observer coded results from Study 2, the more anxious a participant was, the more overall dominance their partner displayed towards them (although this finding was marginal in Study 3). Recall that we

did not have a directional hypothesis regarding how a person's level of social anxiety would impact their partner's affiliative responses, but results from the current study suggest that when a person is more anxious, their partners are less affiliative towards them. This finding is not completely inconsistent with previous literature, which has shown that people act with irritability towards a person with higher levels of social anxiety (Creed & Funder, 1998), but it is inconsistent with our findings from Studies 1 and 2, in which people reported acting with more affiliation towards a high social anxiety target. It is possible the discrepancy in results arises because of differences in how participants' overall levels of affiliation were measured between studies. In Studies 1 and 2, participants were *reporting* their affiliative responses (i.e., participants provided self-reported perceptions of affiliative behaviours), whereas in Study 3, participants overall affiliation levels were derived from observer ratings (i.e., participants' actual affiliative behaviours). The implications of this discrepancy will be expanded on in the General Discussion.

To our knowledge, this is the first study to address the hypothesis that social anxiety impacts patterns of moment-to-moment complementarity (Research Question 3B). Results from the current study show that, consistent with our hypothesis, increased situational social anxiety dampened patterns of moment-to-moment reciprocity. This finding supports cognitive behavioural models of social anxiety, which suggest that increased social anxiety during an interaction will increase a person's self-focused attention and, as a result, decrease their external cue processing. Decreased processing of dominance cues could explain the lower levels of moment-to-moment reciprocity of dyads in which participants' situational social anxiety was heightened.

We also found that increased situational social anxiety impacted patterns of moment-to-moment correspondence, but in the opposite direction of what was predicted. More specifically, we found that increased situational social anxiety resulted in *increased* moment-to-moment correspondence between dyad members. We suspect that this finding might be, in part, due to the nature of the task assigned to participants. The goal of the interaction in Study 3 was cooperative: participants were told to work together to come up with a joint presentation that both partners were to be equally involved in. Given the cooperative nature of the task, perhaps anxious participants experienced heightened judgment concerns about their affiliation behaviours during the interaction. This heightened concern could result in anxious participants focusing their energy on monitoring their own affiliation behaviours in the interaction, as well as the affiliation cues that were being displayed by their partners. Increased vigilance for tracking affiliation cues could help explain why heightened anxiety was associated with increased patterns of moment-to-moment correspondence.

It is worth noting that the majority of participants were displaying moderately friendly behaviour through the entirety of the interaction (as can be seen from the means presented in Table 3). It is possible that if participants were more hostile throughout the interaction, the relationship between situational social anxiety and moment-to-moment correspondence may have been altered. For example, if anxious participants were experiencing heightened judgment concerns over their affiliation behaviours (as we have suggested above), and their interaction partners were reacting in a consistently hostile manner towards them, it seems possible that judgment concerns about affiliation would continue to escalate, increasing the self-focus of anxious participants, and precluding them from responding with appropriate levels of affiliation to establish correspondence at a moment-to-moment level.

As expected, participants' situational social anxiety did not significantly predict dyads' overall levels of dominance reciprocity; however, contrary to our predictions (and the results from Study 2), participants' situational social anxiety also did not predict dyads' overall levels of affiliation correspondence. We suspect that the discrepancy between findings in Study 2 (in which we found that high levels of social anxiety dampened patterns of overall correspondence) and the current study is a result of the difference in intensity of anxiety. We elaborate on the interpretation of our findings regarding participants' situational social anxiety and indices of complementarity (both moment-to-moment and overall levels) in the General Discussion.

Consistent with our predictions for Research Question 4, we found a marginally significant and positive correlation between participants' situational social anxiety levels; the more anxiety one dyad member experienced, the more anxiety the other dyad member experienced. This result is consistent with findings from Studies 1 and 2, and helps to expand the literature on anxiety contagion, which we discuss further in the General Discussion.

Our final research question (Research Question 5) concerned the impact of participants' situational social anxiety on relationship and task outcome measures. We found strong support for our hypothesis that participants' situational social anxiety would be negatively related to our outcome measures. Indeed, we found that the more social anxiety experienced by participants during the interaction, the less they enjoyed the interaction and the worse they did on completing the task assigned to them. The negative effects of participants' social anxiety during the interaction carried forward to the dyadic presentations, in which higher social anxiety during the interaction period predicted lower quality presentations and less rapport between dyad members as they were presenting. We also found that increased social anxiety was negatively related to the desire to form a future relationship with an interaction partner. Specifically, participants who had

more social anxiety during the interaction expressed less of a desire to form a future relationship with their interaction partner. Further, we found that the more social anxiety participants reported during the interaction, the less their partners wanted to form a future relationship with them.

Because the CAID approach is still relatively novel, it is useful to establish the predictive validity of the unique indices derived from this approach (i.e., indices of moment-to-moment correspondence and reciprocity) on outcome measures. Consistent with predictions made by interpersonal theory, we hypothesized that there would be positive relationships between moment-to-moment patterns of complementarity and our dyadic outcome measures. We found that stronger patterns of moment-to-moment correspondence were associated with higher levels of dyadic enjoyment and better task performance. In addition, higher levels of moment-to-moment correspondence marginally predicted better rapport between dyad members during the presentation. Interestingly, moment-to-moment reciprocity was not related to any of our outcome measures. Similar findings were obtained by Markey et al. (2010), in which moment-to-moment correspondence predicted outcome variables, but moment-to-moment reciprocity did not. Similar to the task used in the Markey et al. (2010) study, our task required participants to be cooperative, and we posit that the cooperative nature of the interaction can help explain the lack of relationships found between moment-to-moment reciprocity and our outcome variables. Because the task was cooperative, the focus of participants may have been on affiliative cues of their partner, and thus accurate tracking of affiliative cues (which is related to moment-to-moment correspondence) could play a larger role in predicting task outcomes. In contrast, if participants were put in a competitive situation, where the focus would be more on dominance or agentic-oriented cues, perhaps better tracking of dominance cues (which would be related to moment-to-moment reciprocity) would predict outcomes. It is also interesting to consider

whether certain outcomes (e.g., efficient completion of decision-making tasks) would be uniquely predicted by indices of moment-to-moment reciprocity versus moment-to-moment correspondence.

### **General Discussion**

The main purpose of this thesis was to investigate the influence of social anxiety within the interpersonal space. In particular, we wanted to explore the possibility that a person's social anxiety level during an interaction is an important factor to consider for understanding interpersonal behaviours and dynamics. Previous research on social anxiety and interpersonal interactions has typically concentrated on studying a particular interpersonal effect of social anxiety in isolation, such as how social anxiety impacts a person's own interpersonal behaviours during an interaction. Unlike previous work, we took a multi-faceted approach, examining the impact of social anxiety on various domains related to interpersonal interactions. Results from the current work allow us to draw broader and, in some cases, novel conclusions about the relationships between social anxiety and important processes that define interpersonal interactions. For instance, we investigated relatively understudied topics in the literature, such as anxiety contagion and the interpersonal responses people have towards individuals who are higher on social anxiety. We also addressed novel research questions; most notably, our work is the first to examine the impact of social anxiety on patterns of complementarity at the overall level (Studies 1 – 3) and the moment-to-moment level (Study 3).

Overall, the results from this work strongly support the notion that people's levels of social anxiety during an interaction have important implications for their own behaviour, their partners' behaviour, interpersonal processes, and relationship and task outcomes. Although our results are somewhat disparate across studies, the methodologies of the studies were scaffolded

in such a way that allowed for stronger tests of our hypotheses with each subsequent study. Several interesting findings emerged from our studies, which are detailed below.

### **The Impact of People's Social Anxiety on Their Own Interpersonal Behaviours**

Our first overarching research question addressed how social anxiety impacts a person's dominance and affiliation behaviours during an interpersonal interaction. We hypothesized that when a person experiences increased levels of social anxiety, they would tend to be less dominant and less affiliative. Support for our hypotheses was mixed across the three studies. In particular, we found that increased anxiety was *unrelated* to dominance behaviours in Study 1, but led to *fewer* dominance behaviours in Studies 2 and 3. With regards to affiliation, we found that increased anxiety led to *more* affiliative behaviours in Study 1, was *unrelated* to affiliative behaviours in Study 2, and led to *fewer* affiliative behaviours in Study 3.

There may be two major reasons for the inconsistent support of our hypotheses across studies. First, we suspect that the motivation for participants' anxiety was different across the studies. Social anxiety is purportedly activated when there is a threat of social evaluation (Clark & Wells, 1995). Across the three studies, the strongest threat of social evaluation took place in Study 3; participants were explicitly told that their ability to work with the other person, and their presentation were going to be evaluated. In contrast, in Studies 1 and 2, the threat of social evaluation was more pronounced for the *other* person in the interaction (i.e., the target in Study 1 and the confederate in Study 2), rather than the participants themselves. Perhaps the anxiety that participants reported in Studies 1 and 2 was less motivated by the threat of social evaluation, and more so empathy for their interaction partner (i.e., they reported feeling more anxious because they were witnessing someone going through an evaluative situation). It is conceivable that



different motivations for anxiety might aid in understanding the disparate results found for our first research question.

A second possibility for why the results for our first research question are discrepant across studies is because of the manner in which participants' anxiety was assessed. In Study 1, participants completed a self-report measure of how anxious they would be in the fictitious interaction with the target, and in Study 2, participants self-reported how anxious they were in the interaction with the confederate. In contrast, the assessment of participants' anxiety in Study 3 was more comprehensive, consisting of a self-report measure, partners' perceptions of anxiety, and an observer-rated assessment of anxiety. Thus, perhaps participants' self-reported anxiety in Studies 1 and 2 was not measured as well as we would have liked, and had participants' anxiety in the first two studies been more thoroughly assessed, perhaps we would have obtained more consistent results across our studies.

Given that Study 3 was the most likely to elicit social anxiety in participants (because of its evaluative component), and also had the most thorough assessment of participants' anxiety, it was the best test of our hypothesis regarding how social anxiety impacts participants' interpersonal behaviours. The results obtained from Study 3 were entirely consistent with the hypotheses we set forth for Research Question 1. The finding that higher levels of situational social anxiety are associated with less dominance during interpersonal encounters mirrors previous findings from the social anxiety literature. For example, people who are higher on social anxiety tend to self-report being more submissive during interactions (Russell et al., 2011), report having more submissive interpersonal problems (Cain et al., 2010), and are observed by others as being more submissive during interactions (Oakman et al., 2003). Although the motivation for expressing submissive behaviour during an interaction differs between models of

social anxiety (e.g., evolutionary versus cognitive-behavioural models), our work adds to the growing body of evidence linking social anxiety with submissive interpersonal behaviours.

The negative relationship found between participants' situational social anxiety and affiliation behaviours in Study 3 is also consistent with previous literature. For example, using an event-contingent recording methodology, Russell and colleagues (2011) demonstrated that people who experience situational elevations in anxiety during an interaction report behaving with less agreeableness towards their interaction partners. Specifically, people with increased situational anxiety were less likely to endorse items such as "I expressed affection with gestures and words." Similarly, Alden and Wallace (1995) found that observers rated people with social anxiety disorder as being less warm during a "getting acquainted" task with an unfamiliar person. Notably, people with higher levels of social anxiety are not necessarily overtly hostile, but, rather they tend to display a lack of friendly behaviours. For instance, people who have higher levels of social anxiety have been shown to talk less during an interaction (Leary et al., 1987), and fail to reciprocate appropriate levels of self-disclosure and intimacy during discussions (Meleshko & Alden, 1993).

In sum, the current work detailed the impact of social anxiety on a person's own interpersonal behaviours, and results consistent with previous research and our hypotheses were obtained in Study 3. Previous work has shown that during initial interactions between unacquainted dyads, trait levels of social anxiety predicted a person's levels of dominance and affiliation during the interaction (e.g., Alden & Wallace, 1995; Oakman et al., 2003). Our findings extend this work by showing that *situational elevations* in social anxiety result in similar effects on people's levels of dominance and affiliation during initial interactions with unfamiliar people.

### **The Impact of a Partner's Social Anxiety on Interpersonal Behaviours**

Our second research question addressed how an *interaction partner's* level of social anxiety might alter a person's dominance and affiliation behaviours during an interaction. We hypothesized that a person would respond with more dominance if they were interacting with a person who was higher on social anxiety. We also hypothesized that interacting with a person who was higher on social anxiety would impact a person's affiliative responses, but we did not have a directional hypothesis for this effect.

We found mixed support for our hypothesis regarding participants' dominance responses towards a socially anxious person. In Studies 1 and 2, participants' self-reported dominance responses were unrelated to their interaction partners' social anxiety level. However, in Studies 2 and 3, consistent with our predictions, participants were coded by observers as responding with more dominance when their interaction partner was higher on social anxiety. Recall that the part of the interaction in Study 2 that was coded by observers was a unique point in the research session in which the participant was able to freely interact with the confederate and express their dominant behaviours (e.g., start a conversation with the confederate, give the confederate feedback on the presentation, etc.). Further, recall that in Study 3, participants were free to interact with their partner throughout the entirety of the research session, thus allowing the opportunity for participants to unreservedly express their dominance behaviours as they saw fit. Thus, dominance behaviours in response to a partner's social anxiety were most clearly evident in situations where the person was particularly free to interact in any way he or she chose. They also seem to have been more evident to observers than in self-report. These findings suggest that employing methodologies in which participants are free to express a wide range of dominance behaviours might be the most fruitful for capturing how an interaction partner's social anxiety

impacts a person's own dominance behaviours. Further, these results suggest that perhaps people are not overly accurate in their assessments of how they respond to anxious people during an interaction; implications that follow from this inaccurate assessment will be discussed shortly.

When we look at the affiliative responses of participants towards their socially anxious interaction partners, the results are again mixed. We found that participants reported being more affiliative towards the high social anxiety target in Study 1 and the high social anxiety confederate in Study 2, but were not seen by observers as being more affiliative towards the socially anxious confederate in Study 2, and were actually seen as being *less* affiliative towards partners who had higher levels of situational social anxiety in Study 3. Thus, people's perceptions of how affiliative they are towards an anxious person seems to differ from an outside observer's perspective. Previous work has shown that there is a discrepancy between how friendly a socially anxious person thinks they are during an interaction and how friendly they actually are, as assessed by outside observers (Oakman et al., 2003). Our work suggests that there may also be a discrepancy for the affiliation behaviours of *interaction partners* towards people who have higher levels of social anxiety (i.e., interaction partners think they are showing high levels of affiliation towards an anxious partner, but ratings of their actual behaviour by outside observers suggests otherwise).

Overall, these results point to a potentially interesting discrepancy between how people report they will respond to a socially anxious person and how they actually respond. Despite participants reporting that their dominance levels would be unaffected by the socially anxious target in Study 1 and the socially anxious confederate in Study 2, they were observed as displaying *more* dominance towards the socially anxious confederate in Study 2 and their socially anxious partners in Study 3. Similarly, participants reported that they would respond

with *more* affiliation to the socially anxious target in Study 1 and the socially anxious confederate in Study 2, yet they were observed as being *less* affiliative towards partners with higher levels of situational social anxiety in Study 3. A discrepancy between how people perceive themselves acting during an interaction and how they appear to outside observers (or their interaction partners) is a potentially important phenomenon to consider when discussing self-fulfilling prophecies. With regards to interpersonal interactions, the self-fulfilling prophecy asserts that our behaviour “pulls” for behaviour from other people that maintain our assumptions, expectations, and behavioural patterns in social interactions (Kiesler, 1996). For example, if a socially anxious person is expecting others to be unfriendly towards them, they will behave in particular ways (e.g., employ self-protective strategies that make them look disengaged) that will elicit unfriendly responses from their interaction partners (as was observed in Study 3). Similarly, if a socially anxious person assumes that others will behave dominantly towards them, they will confirm this assumption by behaving in ways that will elicit dominant responses from others (as was observed in Study 3). Thus, the reactions of interaction partners contribute to the maintenance of the socially anxious person’s self-fulfilling prophecies, but presumably interaction partners are unaware of their maintaining role given that their self-reported responses seem to be inconsistent with how they actually behave.

In sum, we found support for our hypothesis regarding people’s dominance responses towards people with higher levels of social anxiety in Studies 2 and 3. Further, as we predicted, participants’ affiliative responses were influenced by their interaction partners’ social anxiety level, but the direction of this effect was inconsistent across studies. These findings have implications for informing future study designs. For example, our work suggests that studies would be more informative if they included self-report and observer-coded measures of

interpersonal behaviour. Further, the discrepancies found between self- and observer- rated interpersonal behaviours of interaction partners may have a potentially interesting maintaining role in the self-fulfilling prophecies of people with higher levels of social anxiety.

### **The Impact of Social Anxiety on Patterns of Interpersonal Complementarity**

The most novel research contribution from the current set of studies is its investigation into how social anxiety impacts patterns of interpersonal complementarity (Research Question 3). Recall that we examined the impact of social anxiety on complementarity of overall levels (i.e., how people adjust their overall levels of dominance and affiliation to complement the overall dominance and affiliation levels of their interaction partners) and moment-to-moment complementarity (i.e., how people adjust their moment-to-moment dominance and affiliation behaviours to complement the moment-to-moment dominance and affiliation behaviours of their partners).

For complementarity of overall levels, we hypothesized that social anxiety would be unrelated to overall levels of reciprocity (i.e., oppositeness on dominance), and would dampen overall levels of correspondence (i.e., sameness on affiliation). Consistent with our expectations, across all three studies, social anxiety did not significantly impact overall levels of reciprocity. There is agreement in the literature (and partial support from our results) that people who have higher levels of social anxiety tend to behave submissively during interactions (Russell et al., 2011), and people who are interacting with socially anxious individuals tend to behave rather dominantly (Creed & Funder, 1998). Thus, it seems that rather than interpreting the submissive stance of a socially anxious person as an expression of anxiety (that perhaps warrants a different response than dominance), people respond to the socially anxious person as if their submissive

stance is simply a bid for dominant responses. As a result, overall patterns of reciprocity are not moderated by social anxiety.

Our hypothesis regarding the dampening effect of social anxiety on overall levels of correspondence was supported in Study 2. Consistent with our expectations, participants responded with lower levels of correspondence when they were interacting with the high social anxiety confederate versus when they were interacting with the low social anxiety confederate. However, this expected pattern was not observed in Studies 1 or 3, and a possible reason for the inconsistency in our results is the variability across studies in how anxiety was displayed by interaction partners. In particular, as pointed out in the Discussion section of Study 1, the scenario methodology is somewhat problematic because participants are not necessarily good at reporting what they would *actually* do during an interpersonal interaction. Given that participants could not see their interaction partner (as they could in Studies 2 and 3), it is conceivable that the social anxiety of participants' fictitious interaction partner was not salient enough to interfere with processes of complementarity in Study 1. In Study 2, the confederates were trained to display high or low levels of social anxiety. To make the manipulation obvious to participants, the confederate's social anxiety cues were quite striking. In contrast, the anxiety cues of participants in Study 3 were much more subtle, presumably because we did not recruit participants with clinical levels of social anxiety. Thus, perhaps for social anxiety to interfere with overall levels of correspondence, the anxiety behaviours of the interactants must be highly visible to their interaction partners (as they were in Study 2). That is, perhaps if anxiety signs are subtle, interaction partners simply react to the affiliation levels of the anxious person at face level and in a manner that is consistent with the principle of correspondence; if the anxious person is friendly, interaction partners will be friendly, and if the anxious person is more unfriendly,

interaction partners will be relatively more unfriendly. If, however, the anxious cues of the person are quite vivid, interaction partners may not use the affiliation level of the anxious person to determine their own affiliation level, but rather, they may use the anxiety level of their interaction partner to determine how much affiliation they will display. In sum, perhaps when the behavioural cues of anxiety reach a certain threshold of visibility, people abandon the principle of correspondence as a guiding factor for their affiliation displays, and instead use their partner's anxiety levels as the determining factor for their affiliation levels. This finding suggests an important qualification to the principle of interpersonal correspondence; perhaps how affiliative people are during interactions is predicted by both their partner's affiliation level and how apparent their partner's anxiety is.

When we examined the impact of situational social anxiety on moment-to-moment patterns of reciprocity and correspondence, interesting results emerged. We hypothesized that the more situational social anxiety participants experienced, the less moment-to-moment reciprocity and correspondence the dyad would display. Results confirmed our prediction for moment-to-moment reciprocity; the more situational social anxiety participants experienced during the interaction, the less moment-to-moment reciprocity dyads displayed. As mentioned in the Study 3 Discussion, this finding is consistent with theorizing from cognitive behavioural models of social anxiety, in which it is posited that social anxiety increases a person's self-focused attention, which, in turn, results in decreased external cue processing (Clark & Wells, 1995). Diminished processing of external cues by people who are experiencing situational elevations in social anxiety could contribute to a lack of moment-to-moment coordination in agency.

It is also interesting to interpret this finding in the context of an evolutionary model of social anxiety. According to a theoretical model put forth by Trower and Gilbert (1989), a



socially anxious person is psychologically locked into a defense system that is designed to perceive threats or changes to one's status. A person who is socially anxious has an overarching goal of avoiding harm and rejection by dominant others, and achieves this goal by remaining in a state of submissiveness. If a person with high levels of social anxiety is rigidly set in a state of submissiveness during an interaction, patterns of moment-to-moment reciprocity would be dampened between interactants. Consider that in order to achieve good moment-to-moment reciprocity, both interactants must successfully pass agency back and forth throughout the interaction, responding appropriately to each other's bids for dominance and submission as the interaction unfolds. If, however, a person's social anxiety is activated, and that person's primary strategy to avoid rejection is to remain in a perpetual state of submissiveness, then the natural ebb and flow of dominance that is required to achieve moment-to-moment reciprocity would not occur in the interaction. As pointed out by Kiesler (1996), the more rigid a person's interpersonal behaviour is (e.g., if the socially anxious person only displays submissive behaviours), the less likely that person is to show predicted complementary behaviours to their interaction partner.

It is likely that the person who is experiencing a situational elevation in social anxiety is not the only contributor to diminished patterns of moment-to-moment reciprocity. Indeed, *interaction partners* of socially anxious individuals could also contribute to patterns of low moment-to-moment reciprocity. Consider an interaction where a person who is experiencing social anxiety is displaying little variability in their dominance behaviours, and the interaction partner is trying to solicit changes in the anxious person's dominance levels (e.g., by asking them questions, asking them to take charge of the interaction, etc.). The constant unmet bids for changes in dominance put forth by the interaction partner would become a trying endeavor, resulting in the interaction partner eventually assuming a continual state of dominance or

submissiveness with little variability. Ultimately, if both partners are displaying low variability in dominance, their moment-to-moment reciprocity is virtually non-existent.

Inconsistent with our predictions, the more situational social anxiety participants experienced, the more moment-to-moment correspondence dyads displayed. This finding suggests that, rather than social anxiety decreasing external cue processing (as we would have predicted), participants who were experiencing more situational social anxiety were vigilantly tracking and responding to the affiliation cues of their interaction partners. Such a finding prompts us to consider the idea that perhaps the way in which anxiety interacts with the processing of external cues is dependent on the goal of the interaction. As mentioned in the Study 3 Discussion, the goal of the interaction in Study 3 was quite cooperative, and perhaps people who had increased situational social anxiety were focusing their energy on vigilantly tracking affiliation cues in their partners. In contrast, if the goal of the interaction had been competitive in nature, perhaps people who were experiencing increased situational social anxiety would concentrate on tracking the dominance cues of their interaction partners (which would ultimately increase moment-to-moment reciprocity).

An alternative explanation for our unexpected finding is that the tracking abilities of the person who was experiencing increased situational social anxiety did not necessarily improve, but that interaction partners were more effective in tracking the affiliation cues of their anxious partners. Some research suggests that when people perceive anxiety in another person, their ability to track the behaviours of that person is enhanced. For example, research by West and colleagues (2013) demonstrated that when same-race roommates perceived each other to be more anxious, they were better at tracking each other's desire to remain roommates across a 6-week period.

In sum, our work demonstrates that anxiety does have differential effects on the two separate interpersonal phenomenon of complementarity of overall levels and complementarity at the moment-to-moment level. With regards to complementarity at the overall level, we demonstrated that social anxiety does not interfere with overall levels of reciprocity, but it does seem to dampen patterns of overall levels of correspondence if the behavioural cues of anxiety are quite noticeable (as they were in Study 2). These findings support the notion that the principle of interpersonal correspondence may not apply to interactions when signs of anxiety in an interaction partner are highly visible. For complementarity at the moment-to-moment level, we demonstrated that increased social anxiety during an interaction resulted in lower levels of moment-to-moment reciprocity, but higher levels of moment-to-moment correspondence. These findings suggest that when social anxiety is activated in a person, the anxious person, or their interaction partners, exhibit behavioural patterns that make it difficult to establish reciprocity at a moment-to-moment level. This finding is consistent with cognitive behavioural models and evolutionary models of social anxiety. The finding that increased social anxiety enhances patterns of moment-to-moment correspondence is somewhat surprising and inconsistent with cognitive behavioural models of social anxiety. Such a finding suggests that perhaps elevations in situational anxiety leads to enhanced processing of certain cues, such as those related to affiliation. It is also conceivable that interaction partners of anxious individuals show enhanced tracking of their partners' affiliation cues, in turn, leading to stronger patterns of moment-to-moment correspondence.

### **The Relationship Between People's Social Anxiety Levels**

Our fourth overarching research question concerned how the social anxiety levels of people become related during interpersonal interactions. Akin to the idea that people's affiliation

levels tend to become more similar during an interaction, and people's dominance levels tend to become more opposite, we hypothesized that people's social anxiety levels would be related in a predictable manner. In particular, we hypothesized that people's social anxiety levels would be positively related: the more anxiety one person experiences in an interaction, the more anxiety their interaction partner would experience. We found support for this hypothesis across all of our studies.

Our findings are consistent with other work that has shown that merely interacting with a person who is higher on anxiety is enough to increase one's own self-reported anxiety (Gump & Kulik, 1997) and anxious behaviours (Heerey & Kring, 2007). The mechanism through which anxiety contagion occurred in our studies is unknown; however, there are some useful and interesting interpretations that can be drawn from extant literature. For example, it has been suggested that one of the ways in which anxiety can be transferred between interaction partners is empathic worry (Parkinson & Simons, 2012). If a person has an anxious interaction partner, his or her own anxiety may increase because of concern about the interaction partner's ability to cope with the anxiety. This empathy-driven mechanism for anxiety contagion would most likely apply to our findings from Studies 1 and 2. As noted earlier, in these studies, participants were not experiencing the evaluative threat of the social situation, but they were witnessing someone else experiencing the threat. Thus, perhaps the increased anxiety that participants reported in Studies 1 and 2 was driven by empathy for the socially anxious target in Study 1 and the socially anxious confederate in Study 2. Although it is possible that empathy-driven anxiety contagion also occurred in Study 3, we suspect that the anxiety contagion in this latter study was in part due to changed perceptions about how threatening the situation was. Parkinson and Simons (2012) argue that anxiety can be transferred if an interaction partner's anxiety leads you to appraise the

object of his or her anxiety as riskier or more threatening than you otherwise might have. For example, if one interactant was vocal about her anxiety regarding the upcoming presentation, then her interaction partner may have begun to see the presentation as more threatening than she originally had, leading to an increase in her own anxiety.

In sum, using three different methodologies, we demonstrated that when people imagine themselves interacting with a socially anxious person, or actually do interact with a more socially anxious person, their own anxiety increases. Our findings suggest that anxiety contagion can occur even when the person is not facing the evaluative threat themselves (as in Studies 1 and 2). More importantly, our findings suggest that the principle of interpersonal complementarity should perhaps be updated to include people's anxiety levels during an interaction as a third class of interpersonal behaviours (in addition to dominance and affiliation behaviours) that produce predictable responses in interaction partners.

### **The Impact of Social Anxiety on Relationship and Task Outcome Measures**

Our final research question concerned the impact of social anxiety on relationship and task outcomes. Consistent with prior research, we hypothesized that when participants were reading about (Study 1) or interacting with (Studies 2 and 3) a person who had higher levels of social anxiety, they would experience more negative relationship outcomes. We found support for this hypothesis in Studies 1 and 3. In particular, in Study 1, participants reported less of a desire to form a future relationship with the high social anxiety target, and in Study 3, we found that the more situational social anxiety participants experienced, the less they appeared to enjoy the interaction, the less rapport the dyad had while delivering their presentation, the less they wanted to form a future relationship with their interaction partner, and the less their interaction partner wanted to form a future relationship with them.

There are several reasons why interacting with a person who has higher levels of social anxiety may result in negative relationship outcomes. One reason is that some of the behavioural cues associated with anxiety (e.g., averting eye contact, lack of self-disclosure) are similar to those that signal low levels of affiliation. If people misinterpret their interaction partners' cues of anxiety as low affiliation, it seems quite reasonable that people would not want to form a future relationship with that interaction partner. Another potential reason why social anxiety may lead to negative relationship outcomes is because of the dissimilarity between the anxious person and their partner. If interaction partners see the socially anxious person as dissimilar to them, negative interpersonal consequences may arise. A strong predictor of whether we like someone is how similar we see ourselves as being to that person (Byrne, 1961). Consistent with this notion, Papsdorf and Alden (1998) found that people with higher levels of social anxiety were perceived as being less similar to their interaction partners, which resulted in partners expressing less of a desire to form a future relationship with the anxious person.

Similar to the hypothesis regarding relationship outcomes, we also predicted that anxiety would be negatively related to task outcomes in Study 3. Consistent with this hypothesis, we found that the more social anxiety participants were experiencing in the interaction in Study 3, the worse they did during the presentation-preparation phase of the study and the worse they did during the actual presentation. To our knowledge, this study was the first to examine the impact of situational social anxiety on the task performance of a dyad. Prior work has documented that anxiety impairs an individual's performance (e.g., Losiak et al., 2016), and our findings extend this work to also document adverse effects of situational social anxiety on dyadic outcomes.

## **Implications**

One of the main driving forces behind the current research was to establish the merits of incorporating the variable of social anxiety into the interpersonal space. As laid out in the introduction, interpersonal theory asserts that the most important variations in people's interpersonal behaviours can be captured by the two main dimensions of dominance and affiliation. However, we argued that people's social anxiety during an interaction is another important variable to consider when predicting interpersonal behaviours and outcomes. Indeed, our work suggests that anxiety during an interaction is related to a host of interpersonal effects.

Arguably, the interpersonal effect we demonstrated that has the most far-reaching implications is the finding that increases in situational social anxiety negatively relates to patterns of interpersonal reciprocity at the moment-to-moment level. Such a finding suggests that when social anxiety is activated in an individual they exhibit interpersonal behaviours and patterns that make it difficult to establish reciprocity at the moment-to-moment level with an interaction partner. For example, it could be that people who experience social anxiety during an interaction are too rigid in their dominance behaviours and continually fail to respond to their partners' bids for changes in dominance. Data obtained from the CAID approach has been used to identify maladaptive interpersonal patterns in previous research (e.g., Sadler, Woody, McDonald, Lizdek, & Little, 2015; Thomas et al., 2014), and could fruitfully be applied to identify the particular maladaptive interpersonal dominance behaviours of people with high levels of social anxiety. For example, if people with high levels of social anxiety are too rigid in their dominance behaviours and are in a perpetual state of submissiveness, such a pattern could be identified by creating density plots using CAID ratings. Density plots using CAID ratings (for an example, see Thomas et al., 2014) are useful for illustrating a person's interpersonal set point

during an interaction (i.e., their mean level of dominance and affiliation during an interaction), as well as how much they vary around that set point. We might expect the density plot of a person who is experiencing high levels of social anxiety during an interaction to have a set point in the hostile-submissive quadrant of the circumplex, with little variation on the dominance dimension.

The consideration of how anxiety impacts moment-to-moment patterns of dominance could also be useful for treatment purposes. For instance, perhaps having a person with clinically high levels of social anxiety apply the CAID approach to a video-recorded interaction of themselves would aid in fostering greater awareness of how interpersonal behaviours and responses contribute to the natural ebb and flow of an interaction that takes place at a moment-to-moment level. Such insight may serve as a potential vehicle for change in establishing more healthy interpersonal interactions.

Our work also has implications for cognitive behavioural models of social anxiety. As mentioned earlier, the influential model by Clark and Wells (1995) suggests that people with high levels of social anxiety show reduced processing of external cues when they are anxious. Research has supported this proposition, finding that people with higher levels of social anxiety show reduced processing of others' faces (Chen, Ehlers, Clark & Mansell, 2000), and have reduced memory for details of a recent social interaction (Mellings & Alden, 2000). However, our work suggests that perhaps people who experience increased social anxiety during an interaction show reduced or inaccurate processing of specific cues, like those related to dominance, and perhaps more enhanced processing of other cues, such as those related to affiliation. The lower moment-to-moment reciprocity that occurs when at least one member of the dyad is experiencing anxiety suggests that anxious individuals are not adequately processing and responding to their partners' *changes in dominance* at a moment-to-moment level. For



example, perhaps anxious people do not process changes in their partners' postural stance or tone of voice throughout the interaction, both of which are important dominance cues. The idea that socially anxious individuals have inadequate processing of dominance cues in particular is consistent with Trower and Gilbert's (1989) evolutionary model of social anxiety. In their model, people with high levels of social anxiety over-utilize their social-rank system, which leads anxious people to view situations from a competitive standpoint and constantly monitor for signals of threat to their status (Weisman, Aderka, Marom, Hermesh, & Gilboa-Schechtman, 2011). It is conceivable that an overactive social-rank system may disrupt the smooth passing of agency back and forth between interaction partners. In sum, important information could be gleaned by focusing on what types of cues people with high levels of social anxiety are not processing optimally, and our work suggests that dominance cues might be a particularly worthwhile area to investigate.

Our work also has important implications for interpersonal theory. In particular, our work demonstrates that people's social anxiety levels ought to be considered when discussing interpersonal behaviours and processes. We have taken the approach of looking at a person's anxiety level as a moderator of interpersonal effects. That is, we have viewed people's anxiety levels during an interaction as a variable that impacts typical interpersonal behaviours and processes that occur within the two-dimensional space of the interpersonal circumplex. The results from this thesis lend themselves to the potential consideration of expanding the interpersonal space to include another Big Five personality trait. Recall that two of the Big Five traits, extraversion and agreeableness, are currently represented on the interpersonal circumplex, while the remaining three, neuroticism, conscientiousness, and openness, are not. If we consider the evidence that we have gathered as supportive of the notion that social anxiety ought to be a

variable integrated into the interpersonal space, it seems reasonable to conclude that the Big Five trait most closely akin to anxiety, neuroticism, may also belong in the interpersonal space. However, because the Big Five traits are theorized to be orthogonal to one another, there is currently no room within the two-dimensional interpersonal circumplex to incorporate the trait of neuroticism. One option would be to make the interpersonal space three-dimensional, with the added dimension of neuroticism creating an interpersonal sphere. Alternatively, perhaps only particular facets of the trait of neuroticism (e.g., the anxiety facet) are relevant to interpersonal behaviour and could be incorporated into the interpersonal space in such a way that preserves the two-dimensional structure of the interpersonal circumplex. Our work provides an empirical stepping-stone for the theoretical expansion of the interpersonal circumplex to include aspects of the Big Five trait of neuroticism.

Our work also adds to the growing literature elucidating the benefits of the relatively novel Continuous Assessment of Interpersonal Dynamics (CAID) approach. In previous research, interpersonal theorists have found that complementarity at the overall level is distinct from complementarity at the moment-to-moment level (Sadler et al., 2009). Indeed, if our work had only examined complementarity of overall levels, we would have concluded that, largely, levels of anxiety did not seem to interfere with overall levels of complementarity (except for overall patterns of correspondence in Study 2). However, using the CAID approach, we were able to examine the more fine-grained behavioural exchanges that took place between dyad members, and draw inferences about the impact of people's anxiety on moment-to-moment patterns of complementarity. Further, our work helps to illustrate the predictive validity of data obtained using the CAID approach. Recall that a core tenant of interpersonal theory is that patterns of complementarity during interactions ought to be related to positive outcomes

(Kiesler, 1996). This positive relationship has been demonstrated for overall levels of complementarity (e.g., Dryer & Horowitz, 1997; Locke & Sadler, 2007), but few studies have examined the impact of moment-to-moment complementarity on outcome measures. Our work has helped to fill this gap in the literature, and demonstrated the usefulness of some CAID-derived indices in predicting relationship and task outcome measures.

Finally, our work helps to expand the literature on anxiety contagion. Anxiety contagion represents an interesting and relatively unexplored area that could help explain some of the negative interpersonal consequences anxious people experience. For instance, perhaps one reason why people find interactions to be less satisfying with a socially anxious person (Alden & Taylor, 2004) is because their own anxiety increases throughout the course of the interaction.

### **Limitations and Future Directions**

There are several limitations that ought to be considered in interpreting the results from this research. Some of the limitations of the methodologies used in this research have already been addressed in the discussion sections of the relevant studies, and thus we will only expand on limitations that have not previously been addressed.

First, our samples did not consist of people with high trait levels of social anxiety. By recruiting an undergraduate sample, we were able to make more generalized conclusions about how situational social anxiety influenced interpersonal behaviours and processes; however, it precludes us from making strong conclusions about whether our findings would apply in samples of people with high trait levels of social anxiety. We suspect that the interpersonal effects of social anxiety would be more consequential in a sample of participants who had high trait levels of social anxiety. For example, perhaps our finding that higher levels of situational anxiety resulted in stronger moment-to-moment correspondence between dyad members would be

reversed if the interactions involved at least one member with high trait social anxiety. Such speculations regarding the different interpersonal effects for those with high trait levels of social anxiety should be tested in future work. This could be done by conducting a dyadic study in which a portion of the dyads contain people with elevated levels of trait social anxiety. For instance, consistent with prior research examining the interpersonal consequences of high trait social anxiety (e.g., Heerey & Kring, 2007; Oakman et al., 2003), we could recruit people, for example, who fall in the top and bottom 20<sup>th</sup> percentiles on a standardized scale assessing trait social anxiety. We could then create dyads comprised of two people who are high on trait social anxiety, two people who are low on trait social anxiety, and one person who is high on trait social anxiety and one person who is low on trait social anxiety. Examining how the interpersonal behaviours and patterns differ across the three dyad types would allow us to draw stronger conclusions regarding the interpersonal consequences of people with high trait levels of social anxiety.

Throughout the thesis, and particularly in Study 3, we have assumed that social anxiety impacts patterns of complementarity in a unidirectional fashion. However, it should be noted that this inference goes beyond the scope of our work because participants' anxiety and interpersonal complementarity were measured simultaneously. Although the notion that people's social anxiety levels impact interpersonal processes is consistent with prior reasoning (e.g., Alden & Taylor, 2004), the relationship between people's anxiety levels and patterns of complementarity is perhaps a more bidirectional relationship. For example, it is conceivable that the relationship is best represented as a feedback loop, in which people's anxiety levels influence the degree of complementarity between dyad members, and the extent of complementarity, in turn, influences people's anxiety levels. Recall that Zanna and Fazio (1982) suggested that as a field of research

advances, the questions in that field go through successive generations. The first two generations of questions address whether relationships exist and, if so, the boundary conditions of these relationships. Third-generation questions concern issues of mediation and address the processes that underlie relations between variables. A potentially interesting third-generation question for the current line of work could focus on the feedback loop between people's social anxiety levels and patterns of interpersonal complementarity.

The use of same-sex dyads in Study 3 was strategic and purposeful; however, it also presents a limitation because the results obtained from the study may not generalize to male-male dyads or female-male dyads. Kiesler (1996) contends that complementarity is strongest between same-sex interaction partners, and past research has found that female-female dyads display stronger patterns of complementarity (Ansell, Kurtz, & Markey, 2008). It would be beneficial to replicate the methodology of Study 3 using same-sex male dyads and opposite-sex dyads to explore the potential influence of gender on our variables of interest.

Across our three studies, we obtained convincing evidence that there is a contagious component to social anxiety. As mentioned previously, the mechanism through which anxiety contagion occurred in our studies is unknown. Future work should explore potential mechanisms and strive to answer interesting questions about *how* anxiety contagion occurs. For example, is anxiety contagion primarily driven by the nonverbal or verbal behaviours of the person with high levels of anxiety? At what point does a person "catch" the anxiety of their anxious interaction partner? Are people's fluctuations in anxiety related at a moment-to-moment level? With regards to this last question, similar to how a dyad's affiliation behaviours tend to be positively related at a moment-to-moment level, it seems possible that people's fluctuations in anxiety over the

course of an interaction may also be related at a moment-to-moment level. Future work should explore this possibility.

## **Conclusions**

This thesis began by describing a late evening sketch of the interpersonal circumplex by Timothy Leary. The idea behind this seemingly simple sketch has fostered immense amounts of progress in the theoretical development and empirical understanding of the principles and boundaries of interpersonal theory. The work described in this thesis contributes to such progress by showcasing the merits of considering people's social anxiety levels when discussing interpersonal behaviours and processes. Across three studies, we have provided a comprehensive overview of the impact of situational social anxiety on people's own interpersonal behaviours, the interpersonal behaviours of their interaction partners, on patterns of overall and moment-to-moment complementarity, and relationship and task outcomes. Ultimately, the current thesis demonstrates that studying anxiety using an interpersonal lens provides valuable insight into the interpersonal effects of social anxiety.

## References

- Alden, L. E., & Bieling, P. (1998). Interpersonal consequences of the pursuit of safety. *Behaviour Research and Therapy, 36*(1), 53-64.
- Alden, L., & Phillips, N. (1990). An interpersonal analysis of social anxiety and depression. *Cognitive Therapy and Research, 14*(5), 499-513.
- Alden, L. E., & Taylor, C. T. (2004). Interpersonal processes in social phobia. *Clinical Psychology Review, 24*(7), 857- 882.
- Alden, L. E., & Wallace, S. T. (1995). Social phobia and social appraisal in successful and unsuccessful social interactions. *Behavior Research and Therapy, 33*(5), 497-505.
- Altenstein, D., Krieger, T., & Grosse Holtforth, M. (2013). Interpersonal microprocesses predict cognitive-emotional processing and the therapeutic alliance in psychotherapy for depression. *Journal of Counseling Psychology, 60*(3), 445-452.
- Ansell, E. B., & Pincus A. L. (2004). Interpersonal perceptions of the five-factor model of personality: An examination using the structural summary method for circumplex data. *Multivariate Behavioral Research, 39*(2), 167-201.
- Ansell, E. B., Kurtz, J. E., & Markey, P. M. (2008). Gender differences in interpersonal complementarity within roommate dyads. *Personality and Social Psychology Bulletin, 34*(4), 502-512.
- Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements. Whatever happened to actual behaviour? *Perspectives on Psychological Science, 2*(4), 396-403.
- Beidel, D. C., Turner, S. M., Dancu, C. V. (1985). Physiological, cognitive, and behavioral aspects of social anxiety. *Behaviour Research and Therapy, 23*(2), 109-117.

- Bluhm, C., Widiger, T. A., & Miele, G. M. (1990). Interpersonal complementarity and individual differences. *Journal of Personality and Social Psychology, 58*(3), 464-471.
- Buss, D. M., Gomes, M., Higgins, D. S., & Lauterbach, K. (1987). Tactics of manipulation. *Journal of Personality and Social Psychology, 52*(6), 1219-1229.
- Byrne, D. (1961). Interpersonal attraction and attitude similarity. *Journal of Abnormal and Social Psychology, 62*(3), 713- 715.
- Cain, N. M., Pincus, A. L., & Grosse Holtforth, M. (2010). Interpersonal subtypes in social phobia: Diagnostic and treatment implications. *Journal of Personality Assessment, 92*(6), 514-527.
- Carson, R. C. (1969). *Interaction concepts of personality*. Chicago: Aldine.
- Chen, Y. P., Ehlers, A., Clark, D. M., & Mansell, W. (2002). Patients with generalized social phobia direct their attention away from faces. *Behaviour Research and Therapy, 40*(6), 677-687.
- Creed, A. T., & Funder, D. C. (1998). Social anxiety: From the inside and outside. *Personality and Individual Differences, 25*(1), 19-33.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. Heimberg, M. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment, and treatment* (pp. 69-93). New York: Guildford Press.
- Cundiff, J. M., Smith, T. W., Butner, J., Critchfield, K. L., & Nealey-Moore, J. (2015). Affiliation and control in marital interaction: Interpersonal complementarity is present but is not associated with affect or relationship quality. *Personality and Social Psychology Bulletin, 41*(1), 35-51.
- Cuperman, R., & Ickes, W. (2009). Big five predictors of behavior and perceptions in initial



- dyadic interactions: Personality similarity helps extraverts and introverts, but hurts “disagreeables”. *Journal of Personality and Social Psychology*, 97(4), 667-684.
- Davila, J., & Beck, J. G. (2002). Is social anxiety associated with impairment in close relationships? A preliminary investigation. *Behavior Therapy*, 33(3), 427-446.
- Dobson, K. S. (1989). Real and perceived interpersonal responses to subclinically anxious and depressed targets. *Cognitive Therapy and Research*, 13(1), 37-47.
- Dryer, D. C., & Horowitz, L. M. (1997). When do opposites attract? Interpersonal complementarity versus similarity. *Journal of Personality and Social Psychology*, 72(3), 592-603.
- Elliot, A. J., & Thrash, T. M. (2002). Approach-avoidance motivation in personality: Approach and avoidance temperaments and goals. *Journal of Personality and Social Psychology*, 82(5), 804-818.
- Epley, N., & Dunning, D. (2000). Feeling “holier than thou”: Are self-serving assessments produced by errors in self- or social prediction? *Journal of Personality and Social Psychology*, 79(6), 861-875.
- Evans, F. B. (1996). *Harry Stack Sullivan: Interpersonal theory and psychotherapy*. London: Routledge.
- Fydreich, T., Chambless, D. L., Perry, K. J., Buergenea, F., & Beazley, M. B. (1998). Behavioural assessment of social performance: a rating system for social phobia. *Behaviour Research and Therapy*, 36(10), 995-1010.
- Goldberg, L. R. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4(1), 26-42.

- Gough, H., & Thorne, A. (1986). Positive, negative, and balanced shyness: Self-definitions and the reactions of others. In W. H. Jones, J. M. Cheek, & S. R. Briggs (Eds.), *Shyness: Perspectives on research and treatment* (pp. 205-225). New York: Plenum Press.
- Graziano, W. G., & Tobin, R. M. (2009). Agreeableness. In M.R. Leary and R.H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp.46-61). New York: Guilford.
- Gump, B. B., & Kulik, J. A. (1997). Stress, affiliation, and emotional contagion. *Journal of Personality and Social Psychology*, 72(2), 305-319.
- Gurtman, M. B. (1995). Personality structure and interpersonal problems: A theoretically-guided item analysis of the Inventory of Interpersonal Problems. *Assessment*, 2(4), 343-361.
- Gurtman, M. B., Martin, K. M., & Hintzman, N. M. (1990). Interpersonal reactions to displays of depression and anxiety, *Journal of Social and Clinical Psychology*, 9(2), 256-267.
- Heerey, E. A., & Kring, A. M. (2007). Interpersonal consequences of social anxiety. *Journal of Abnormal Psychology*, 116(1), 125-134.
- Jensen-Campbell, L. A., & Malcolm, K. T. (2007). The importance of conscientiousness in adolescent interpersonal relationships. *Personality and Social Psychology Bulletin*, 33(3), 368-383.
- Karney, B. R., & Bradbury, T. N. (1995). The longitudinal course of marital quality and stability: A review of theory, method, and research. *Psychological Bulletin*, 118(1), 3-34.
- Kelly, E. L., & Conley, J. J. (1987). Personality and compatibility: A prospective analysis of marital stability and marital satisfaction. *Journal of Personality and Social Psychology*, 52(1), 27-40.
- Kiesler, D. J. (1983). The 1982 Interpersonal Circle: A taxonomy for complementarity in human transactions. *Psychological Review*, 90(3), 185-214.

- Kiesler, D. J. (1984). *Checklist of Psychotherapy Transactions (CLOPT) and Checklist of Interpersonal Transactions (CLOIT)*. Richmond: Virginia Commonwealth University.
- Kiesler, D. J. (1996). *Contemporary interpersonal theory and research: Personality, psychopathology, and psychotherapy*. New York: Wiley.
- Kurtz, J. E., & Sherker, J. L. (2003). Relationship quality, trait similarity, and self-other agreement on personality ratings in college roommates. *Journal of Personality, 71*(1), 21-48.
- Leary, T. (1957). *The interpersonal diagnosis of personality*. New York: Roland.
- Leary, M. R. (2010). Social anxiety as an early warning system: A refinement and extension of the self-presentation theory of social anxiety. In S. G. Hofmann, & P. M. DiBartolo (Eds.), *Social Anxiety: Clinical, Developmental, and Social Perspectives* (pp. 471-486). London: Elsevier.
- Leary, M. R., Knight, P. D., & Johnson, K. A. (1987). Social anxiety and dyadic conversation: A verbal response analysis. *Journal of Social and Clinical Psychology, 5*(1), 34-50.
- Lichtenberg, J. W., & Tracey, T. J. G. (2003). Interaction rules and strategies in psychotherapy. *Journal of Counseling Psychology, 50*(3), 267-275.
- Lizdek, I. (2016). *Temporal dynamics in the interpersonal behaviour and perceptions of romantic partners*. (Unpublished doctoral dissertation). University of Waterloo, Waterloo, Ontario.
- Lizdek, I., Woody, E., Sadler, P., & Rehman, U. (2016). How do depressive symptoms in husbands and wives relate to the interpersonal dynamics of marital interactions? *Journal of Counselling Psychology, 63*(6), 721-735.
- Locke, K. D., & Sadler, P. (2007). Self-efficacy, values, and complementarity in dyadic

- interactions: Integrating interpersonal and social-cognitive theory. *Personality and Social Psychology Bulletin*, 33(1), 94-109.
- Losiak, W., Blaut, A., Klosowska, J., & Slowik, N. (2016). Social anxiety, affect, cortisol response and performance on a speech task. *Psychopathology*, 49(1), 24- 30.
- Markey, P. M., Funder D. C., & Ozer, D. J. (2003). Complementarity of interpersonal behaviours in dyadic interactions. *Personality and Social Psychology Bulletin*, 29(9), 1082-1090.
- Markey, P. M., Lowmaster, S., & Eichler, W. (2010). A real-time assessment of interpersonal complementarity. *Personal Relationships*, 17(1), 13-25.
- Markey, P. M., & Markey, C. N. (2006). A spherical conceptualization of personality traits. *European Journal of Personality*, 20(3), 169-193.
- McCrae, R. R. (1996). Social consequences of experiential openness. *Psychological Bulletin*, 120(3), 323-337.
- Meleshko, K. G. A., & Alden, L. E. (1993). Anxiety and self-disclosure: Toward a motivational model. *Journal of Personality and Social Psychology*, 64(6), 1000-1009.
- Mellings, T. M. B., & Alden, L. E. (2000). Cognitive processes in social anxiety: the effects of self-focus, rumination, and anticipatory processing. *Behaviour Research and Therapy*, 38(3), 243-257.
- Moskowitz, D. S. (1994). Cross-situational generality and the interpersonal circumplex. *Journal of Personality and Social Psychology*, 66(5), 921-933.
- Moskowitz, D. S., Ho, M. R., & Turcotte-Trembley, A. (2007). Contextual influences on interpersonal complementarity. *Personality and Social Psychology Bulletin*, 33(8), 1051-1063.

- Murray, H. A. (1943). *Thematic Apperception Test manual*. Cambridge, MA: Harvard University Press.
- Nilsen, E. S., Lizdek, I., & Ethier, N. (2015). Mother-child interpersonal dynamics: The influence of maternal and child ADHD symptoms. *Journal of Experimental Psychopathology*, 6(4), 1-17.
- Oakman, J., Gifford, S., & Chlebowsky, N. (2003). A multilevel analysis of the interpersonal behavior of social anxious people. *Journal of Personality*, 71(3), 397-434.
- O'Conner, B. P., & Dyce, J. (1997). Interpersonal rigidity, hostility, and complementarity in musical bands. *Journal of Personality and Social Psychology*, 72(2), 362-372.
- Olsen, J. A., & Kenny, D. A. (2006). Structural equation modeling with interchangeable dyads. *Psychological Methods*, 11(2), 127-141.
- Orford, J. (1986). The rules of interpersonal complementarity: Does hostility beget hostility and dominance, submission? *Psychological Review*, 93(3), 365-377.
- Ozer, D. J., & Benet-Martinez, V. (2006). Personality and the prediction of consequential outcomes. *Annual Review of Psychology*, 57(8), 1-21.
- Papsdorf, M., & Alden, L. (1998). Mediators of social rejection in social anxiety: Similarity, self-disclosure, and overt signs of anxiety. *Journal of Research in Personality*, 32(3), 351-369.
- Park, A, Sharp, N., & Ickes, W. (2009). Social anxiety is contagious. In T. M. Robinson, *Social Anxiety: Symptoms, causes and techniques* (pp. 79-91). Hauppauge, NY: Nova Science Publishers.
- Parkinson, B., & Simons, G. (2012). Worry spreads: Interpersonal transfer of problem-related anxiety. *Cognition and Emotion*, 26(3), 462-479.

- Pilkonis, P. A. (1977). The behavioral consequences of shyness. *Journal of Personality, 45*(40), 596-611.
- Pincus, A. L., & Gurtman, M. B. (1995). The three faces of interpersonal dependency: Structural analyses of self-report dependency measures. *Journal of Personality and Social Psychology, 69*(4), 744-758.
- Pincus, A. L., Gurtman, M. B., & Ruiz, M. A. (1998). Structural analysis of social behaviour (SASB): Circumplex analyses and structural relations with the interpersonal circle and the five-factor model of personality. *Journal of Personality and Social Psychology, 74*(6), 1629-1645.
- Robins, W. W., Caspi, A., & Moffitt, T. E. (2002). It's not just who you're with, it's who you are: Personality and relationship experiences across multiple relationships, *Journal of Personality, 70*(6), 925-964.
- Rodebaugh, T. L., Bielak, T., Vidovic, V., & Moscovitch, D. A. (2016). The effects of social anxiety on interpersonal evaluations of warmth and dominance. *Journal of Anxiety Disorders, 38*(1), 68-78.
- Russell, J. J., Moskowitz, D. S., Zuroff, D. C., Bleau, P., Pinard, G., & Young, S. (2011). Anxiety, emotional security, and the interpersonal behaviour of individuals with social anxiety disorder. *Psychological Medicine, 41*(3), 545-554.
- Sadler, P., Ethier, N., Gunn, G. R., Duong, D., & Woody, E. (2009). Are we on the same wavelength? Interpersonal complementarity as shared cyclical patterns during interactions. *Journal of Personality and Social Psychology, 97*(6), 1005-1020.
- Sadler, P., Ethier, N., & Woody, E. (2011). Interpersonal complementarity. In L. M. Horowitz, & S. Strack (Eds.), *Handbook of interpersonal psychology: Theory, research, assessment,*

- and therapeutic intervention* (pp. 123-142). NY: Wiley.
- Sadler, P., & Woody, E. (2003). Is who you are who you're talking to? Interpersonal style and complementarity in mixed-sex interactions. *Journal of Personality and Social Psychology, 84*(1), 80-96.
- Sadler, P., Woody, E., McDonald, K., Lizdek, I., & Little, J. (2015). A lot can happen in a few minutes: Examining dynamic patterns within an interaction to illuminate the interpersonal nature of personality disorders. *Journal of Personality Disorders, 29*(4), 526-546.
- Schmidt, J.A., Wagner, C.C., & Kiesler, D.J. (1999). Psychometric and circumplex properties of the Octant Scale Impact Message Inventory (IMI-C): A structural evaluation. *Journal of Counseling Psychology, 46*(3), 325-334.
- Schroeder, J. E., & Ketrow, S. M. (1997). Social anxiety and performance in an interpersonal perception task. *Psychological Reports, 81*(3), 991-996.
- Spielberger, C. D. (1966). The effects of anxiety on complex learning and academic achievement. In: C. D. Spielberger (Eds.), *Anxiety and behavior* (pp. 361-396). New York: Academic Press.
- Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory*. Palo Alto, CA: Consulting Psychologists Press.
- Strong, S. R., Hills, H. I., Kilmartin, C. T., DeVries, H., Lanier, K., Nelson, B. N., ... Meyer, C. W. (1988). The dynamic relations among interpersonal behaviors: A test of complementarity and anticomplementarity. *Journal of Personality and Social Psychology, 54*(5), 798-810.
- Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York: Norton.
- Sullivan, H. S. (1964). *The fusion of psychiatry and the social sciences*. New York: Norton.

- Taylor, C. T., & Alden, L. E. (2011). To see ourselves as others see us: An experimental integration of the intra and interpersonal consequences of self-protection in social anxiety disorder. *Journal of Abnormal Psychology, 120*(1), 129-141.
- Thijs, J., Koomen, H. M. Y., Roorda, D., & Ten Hagen, J. (2011). Explaining teacher-student interactions in early childhood: An interpersonal theoretical approach. *Journal of Applied Developmental Psychology, 32*(1), 34-43.
- Tiedens, L. Z., & Fragale, A. R. (2003). Power moves: Complementarity in dominant and submissive behavior. *Journal of Personality and Social Psychology, 84*(3), 558-568.
- Thomas, K. M. (2015). *Understanding the interpersonal processes associated with marital satisfaction*. (Unpublished doctoral dissertation). Michigan State University, East Lansing, MI.
- Thomas, K. M., Hopwood, C. J., Woody, E., Ethier, N., & Sadler, P. (2014). Momentary assessment of interpersonal process in psychotherapy. *Journal of Counseling Psychology, 61*(1), 1-14.
- Tracey, T. J. (2004). Levels of interpersonal complementarity: A simplex representation. *Personality and Social Psychology Bulletin, 30*(9), 1211-1225.
- Tracey, T. J. (2005). Interpersonal rigidity and complementarity. *Journal of Research in Personality, 39*(6), 592-614.
- Tracey, T. J., Sherry, P., & Albright, J. M. (1999). The interpersonal process of cognitive behavioral therapy: An examination of complementarity over the course of treatment. *Journal of Counseling Psychology, 46*(1), 80-91.



- Trapnell, P. D., & Wiggins, J. S. (1990). Extension of the interpersonal adjective scale to include the big five dimensions of personality. *Journal of Personality and Social Psychology*, 59(4), 781-790.
- Trower, P., & Gilbert, P. (1989). New theoretical conceptions of social anxiety and social phobia. *Clinical Psychology Review*, 9(1), 19-35.
- Warner, R. M. (1998). *Spectral analysis of time-series data*. New York: Guilford.
- Weisman, O., Aderka, I. M., Marom, S., Hermesh, H., Gilboa-Schechtman, E. (2011). Social rank and affiliation in social anxiety disorder. *Behaviour Research and Therapy*, 49(6), 399-405.
- West, T. V., Dovidio, J. F., & Pearson, A. R. (2013). Accuracy and bias in perceptions of relationship interest for intergroup and intragroup roommates. *Social Psychological and Personality Science*, 5(2), 1-8.
- Widiger, T. A. (2009). Neuroticism. In M.R. Leary and R.H. Hoyle (Eds.), *Handbook of individual differences in social behavior* (pp.129-146). New York: Guildford.
- Wiggins, J. S. (1982). Circumplex models of interpersonal behavior in clinical psychology. In P. C. Kendall & J. N. Butcher (Eds.), *Handbook of research methods in clinical psychology* (pp. 183-221). New York: Wiley.
- Wiggins, J. S. (1996). An informal history of the interpersonal circumplex tradition. *Journal of Personality Assessment*, 66(2), 217-233.
- Wiggins, J. S., & Pincus, A. L. (1994). Personality structure and the structure of personality disorders. In P. T. Costa & T. A. Widiger (Eds.), *Personality disorders and the five factor model of personality* (pp. 73-93). Washington: American Psychological Association.

- Woody, E., & Sadler, P. (2015). Structural equation models for interchangeable dyads: Being the same makes a difference. *Psychological Methods, 10*(2), 139-158.
- Yao, Q., & Moskowitz, D. S. (2015). Trait agreeableness and social status moderate behavioral responsiveness to communal behavior. *Journal of Personality, 83*(2), 191–201.
- Zanna, M. P., & Fazio, R. H. (1982). The attitude-behavior relation: Moving toward a third generation of research. In M. P. Zanna, E. T. Higgins, & C. P. Herman (Eds.), *Consistency in social behavior: The Ontario Symposium* (Vol 2, pp. 283-301). Hillsdale, NJ: Erlbaum.

*Summary of Hypotheses and Findings for Study 1*

<b>Research Question</b>	<b>Hypotheses</b>	<b>Results from Study 1</b>
1. How does social anxiety impact a person's dominance and affiliation behaviours?	Participants' anxiety would be negatively related to their self-reported affiliation and dominance responses towards the target.	Participants' anxiety was positively related to their self-reported affiliation responses (i.e., the more anxiety participants reported, the more affiliative responses they reported), and unrelated to their self-reported dominance responses.
2. How does an interaction partner's social anxiety impact a person's dominance and affiliation behaviours?	<p>Participants who read about the high social anxiety target (versus the low social anxiety target) would indicate responding with more dominance towards the target.</p> <p>It was also expected that the social anxiety of the target in the scenarios but impact participants' self-reported affiliation responses, but we did not have a directional hypothesis for this effect.</p>	<p>The social anxiety level of the target in the scenario was unrelated to participants' self-reported dominance responses.</p> <p>Participants reported that they would have more affiliative responses towards the high social anxiety target than the low social anxiety target.</p>
3. How does social anxiety impact overall levels of complementarity?	<p>Overall patterns of interpersonal correspondence would be dampened when participants were reading about the high social anxiety target (versus the low social anxiety target).</p> <p>Overall patterns of interpersonal reciprocity would not be impacted by the social anxiety level of the target in the scenarios.</p>	The anxiety level of the target in the scenario was unrelated to overall levels of correspondence and reciprocity.
4. To what degree is there a relationship between people's social anxiety levels?	Participants would report that they would experience more anxiety when they read about the high social anxiety target (versus the low social anxiety target).	Participants reported that they would experience more anxiety when interacting with the high social anxiety target compared to the low social anxiety target.
5. How does anxiety during an interaction impact relationship outcomes?	Participants would express less of a desire to form a future relationship with the high social anxiety target (versus the low social anxiety target).	Participants' expressed less of a desire to form a future relationship with the high social anxiety target versus the low social anxiety target.

*Summary of Hypotheses and Findings for Study 2*

<b>Research Question</b>	<b>Hypotheses</b>	<b>Results from Study 2</b>
1. How does social anxiety impact a person's dominance and affiliation behaviours?	Participants' anxiety would be negatively related to their self-reported affiliation and dominance responses towards the confederate.	Participants' anxiety was unrelated to their self-reported affiliation responses and negatively related to their self-reported dominance responses (i.e., the more anxiety participants reported, the less dominance they reported).
2. How does an interaction partner's social anxiety impact a person's dominance and affiliation behaviours?	<p>Participants who interacted with the high social anxiety confederate (versus the low social anxiety confederate) would respond with more dominance towards the confederate.</p> <p>It was also expected that the social anxiety level of the confederate would impact participants' affiliation responses during the interaction, but we did not have a directional hypothesis for this effect.</p>	<p>The social anxiety level of the confederate was unrelated to participants' self-reported dominance responses. However, participants were seen by observers as responding with more dominance towards the high social anxiety confederate (versus the low social anxiety confederate).</p> <p>Participants self-reported that they were more affiliative towards the high social anxiety confederate than the low social anxiety confederate. Observers saw no difference in how much affiliation participants responded with towards the high and low social anxiety confederate.</p>
3. How does social anxiety impact overall levels of complementarity?	<p>Overall patterns of interpersonal correspondence would be dampened when participants interacted with the high social anxiety confederate (versus the low social anxiety confederate).</p> <p>Overall patterns of interpersonal reciprocity would not be impacted by the anxiety level of the confederate.</p>	<p>Overall patterns of correspondence were dampened when the confederate was high in social anxiety. This finding held for self-reported and observer-coded correspondence.</p> <p>Overall patterns of reciprocity were not influenced by the confederate's anxiety level. This finding held for self-reported reciprocity and observer-coded reciprocity.</p>
4. To what degree is there a relationship between people's social anxiety levels?	Participants would report experiencing more anxiety when they interacted with the high social anxiety confederate (versus the low social anxiety confederate).	Participants reported more anxiety when they interacted with the high social anxiety confederate versus the low social anxiety confederate.
5. How does anxiety during an interaction impact relationship outcomes?	Participants would express less of a desire to form a future relationship with the high social anxiety confederate (versus the low social anxiety confederate).	Participants' desire to form a future relationship with the confederate was unrelated to the confederate's social anxiety level.

Table 3

*Summary Statistics for Participants' Time Series and Dyads' Overall Levels of Complementarity and Moment-to-Moment Complementarity (Study 3)*

Overall Levels			
	<u>Mean of Overall Levels</u>	<u>SD of Means of Overall Levels</u>	<u>Range of Means of Overall Levels</u>
Affiliation	192.62	135.27	- 473.51 to 474.03
Dominance	-92.24	219.18	-732.55 to 549.95
Overall Levels of Complementarity			
	<u>Mean of Overall Levels of Complementarity</u>	<u>SD of Overall Levels of Complementarity</u>	<u>Range of Overall Levels of Complementarity</u>
Affiliation	1409.46	74.92	1164.96 to 1499.05
Dominance	299.88	212.61	10.80 to 1053.83
Moment-to-Moment Complementarity			
	<u>Mean of Cross-Correlations</u>	<u>SD of Cross-Correlations</u>	<u>Range of Cross-Correlations</u>
Affiliation	.46	.23	-.24 to .92
Dominance	-.56	.25	-.93 to .21

Table 4

*Factor Analysis of Preparatory Interaction Outcome Measure: Principal Components Factoring with a Promax Rotation (Study 3)*

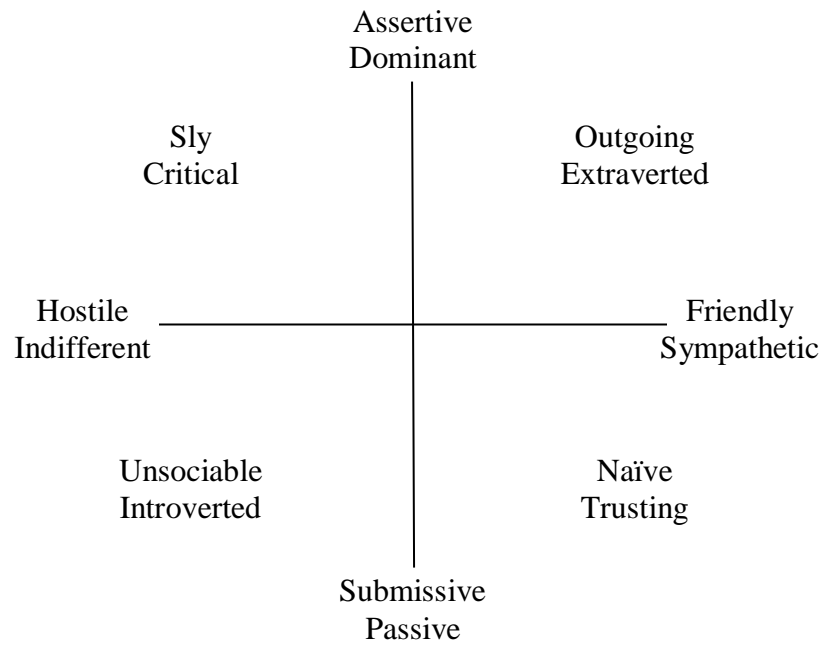
Item	Factor 1	Factor 2
Factor 1: Dyadic Enjoyment		
To what extent does the dyad...		
1. Accept and respect each other	.77	
2. Have rapport	1.01	
3. Seem to want to interact with each other in the future	1.01	
4. Seem to enjoy the interaction	1.00	
5. Show genuine interest in each other's thoughts	.80	
6. Seem to be enjoying each other's company	.99	
9. Seem to be passing the time without really engaging each other (R)	.71	
13. Appear to hit it off (or schmeck, click, mesh, get, etc.)	1.02	
14. Seem to lack chemistry (R)	.92	
Factor 2: Task Performance		
To what extent does the dyad...		
10. Manage the task effectively		.96
11. Seem to accomplish the task at hand		1.03
(R) Reverse-coded item		

*Note.* These are standardized regression weights that can exceed 1.0 (unlike factor loadings that are correlations).

Table 5

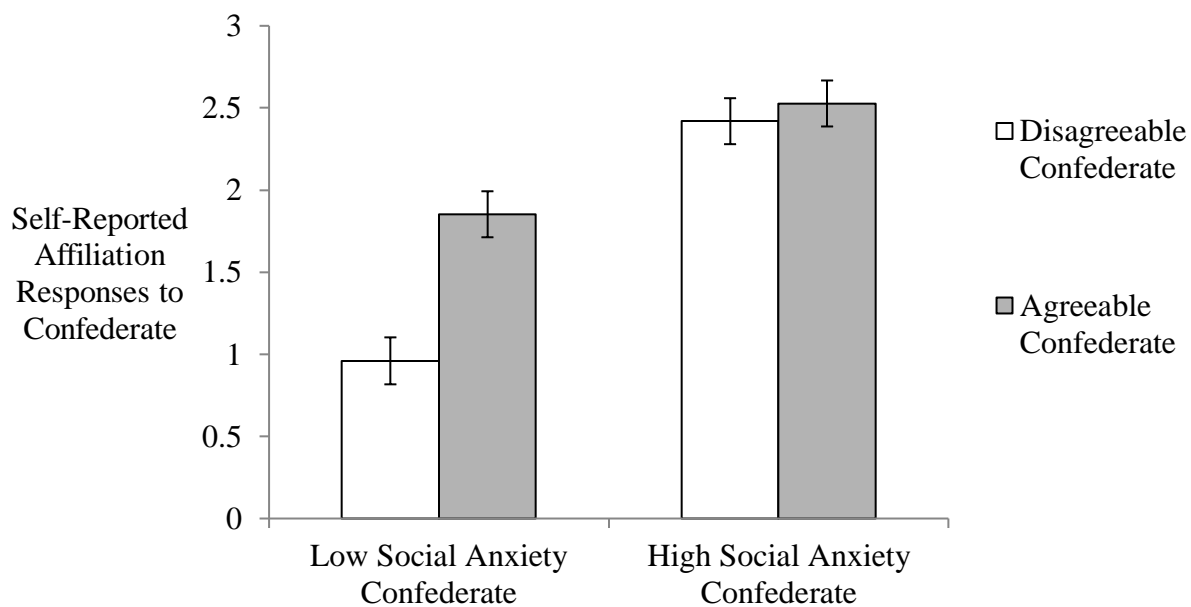
*Summary of Hypotheses and Findings for Study 3*

<b>Research Question</b>	<b>Hypotheses</b>	<b>Results from Study 3</b>
1. How does social anxiety impact a person's dominance and affiliation behaviours?	Participants' situational social anxiety would be negatively related to their overall affiliation and dominance levels throughout the interaction.	Participants' situational social anxiety negatively predicted their overall affiliation and dominance levels (i.e., the more anxious a person was, the less affiliative and dominant they were).
2. How does an interaction partner's social anxiety impact a person's dominance and affiliation behaviours?	There would be a positive relationship between participants' situational social anxiety and their partners overall dominance. It was also expected that participants' social anxiety would impact partners' overall affiliation levels, but we did not have a directional hypothesis for this effect.	Participants' situational social anxiety positively predicted their partners' overall dominance levels and marginally negatively predicted their partners' overall affiliation levels (i.e., the more anxious a participant was, the more dominant and less affiliative her partner was).
3. How does social anxiety impact overall levels of complementarity and moment-to-moment complementarity?	A. Higher levels of situational social anxiety would be negatively related to overall levels of correspondence, but be unrelated to reciprocity.  B. Participants' situational social anxiety would be negatively related to moment-to-moment correspondence and reciprocity.	Participants' levels of situational social anxiety were unrelated to overall levels of correspondence and reciprocity between dyad members.  Participants' situational anxiety positively predicted moment-to-moment correspondence and negatively predicted moment-to-moment reciprocity.
4. To what degree is there a relationship between people's social anxiety levels?	There would be a positive relationship between participants' situational social anxiety levels.	There was a marginally significant positive relationship between participants' situational social anxiety levels.
5. How does anxiety during an interaction, and the degree of moment-to-moment correspondence and reciprocity displayed by dyads impact relationship and task outcome measures?	A. There would be a negative relationship between participants' situational social anxiety and relationship and task outcome measures.  B. Higher levels of moment-to-moment correspondence and reciprocity would be positively related to relationship and task outcome measures.	Participants' situational social anxiety negatively predicted dyadic enjoyment, dyadic task performance, presentation quality, presentation rapport, and their own and their partners' desire for a future relationship. Higher moment-to-moment correspondence in dyads resulted in more dyadic enjoyment, better dyadic task performance, and marginally more presentation rapport. Moment-to-moment reciprocity was not significantly related to any outcome measures.

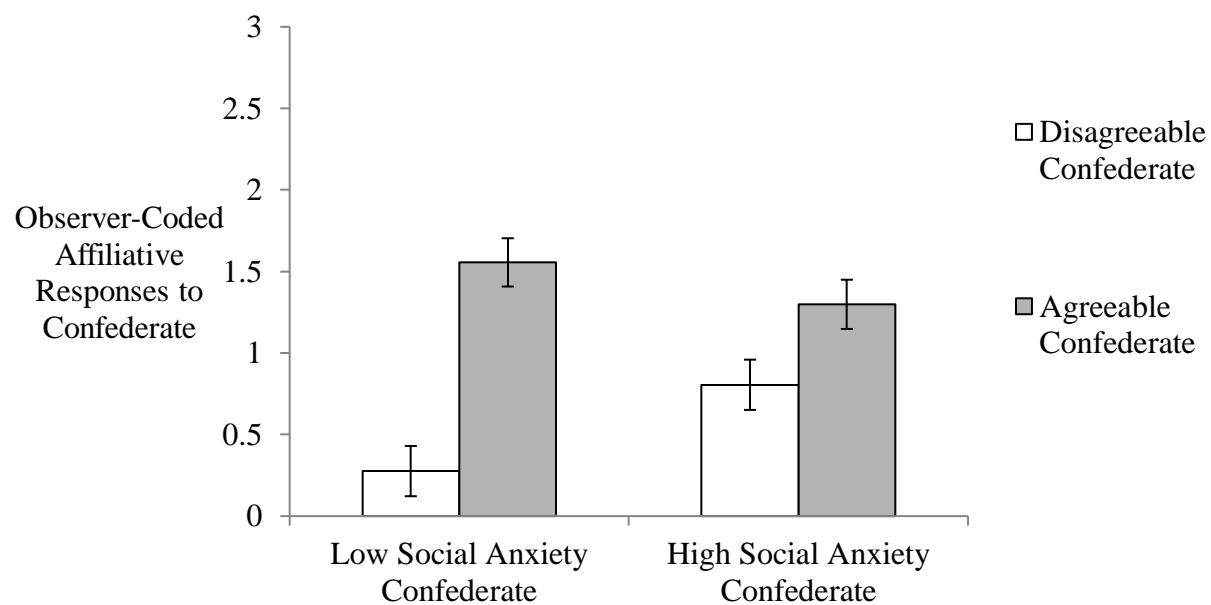


*Figure 1.* The interpersonal circumplex depicting the location of 16 interpersonal behaviours.





*Figure 2.* Results for participants' self-reported affiliation responses towards the confederate (Study 2).



*Figure 3.* Results for observer-coded affiliation responses towards the confederate (Study 2).

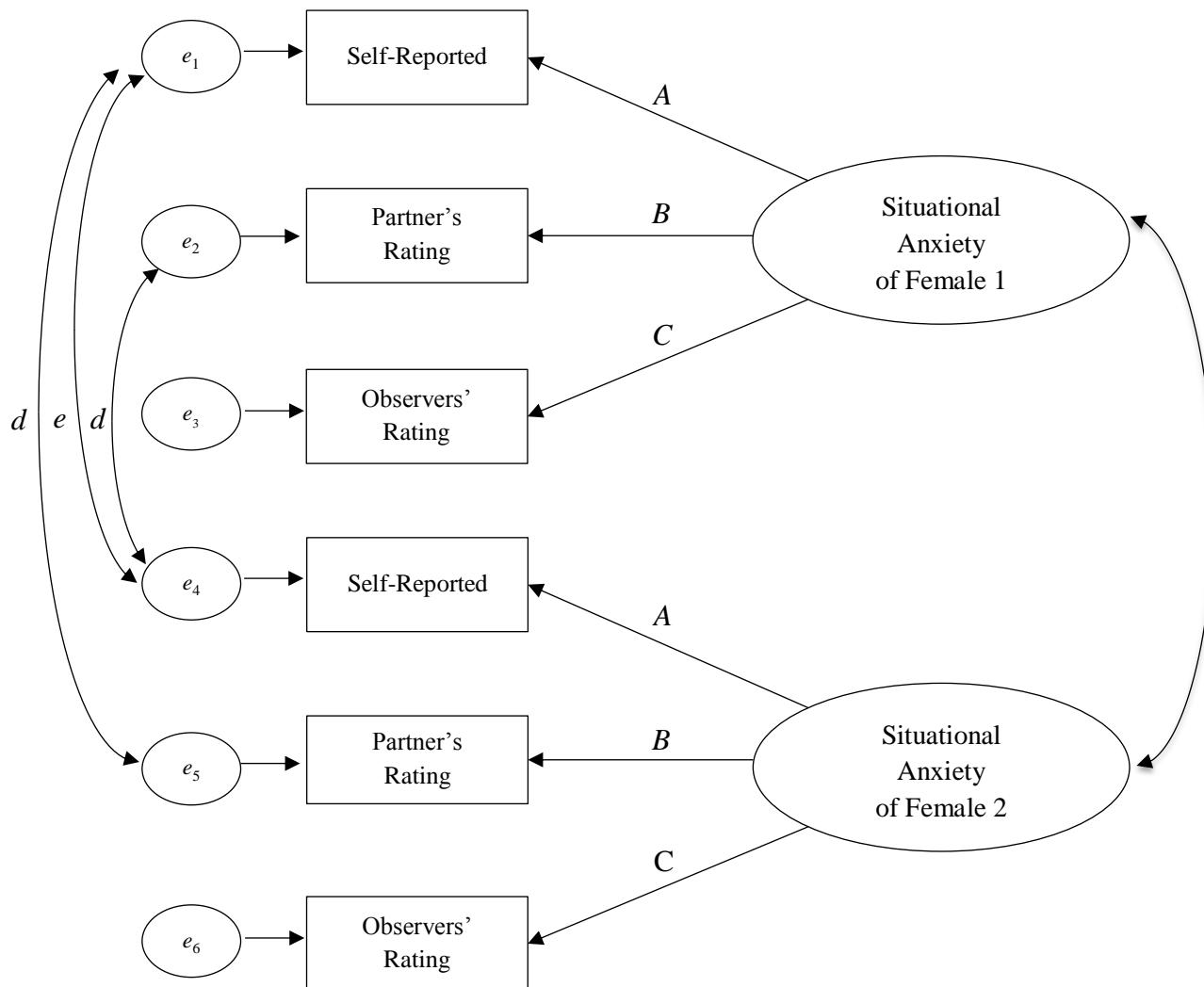


Figure 4. Model used to represent participants' situational social anxiety (Study 3).

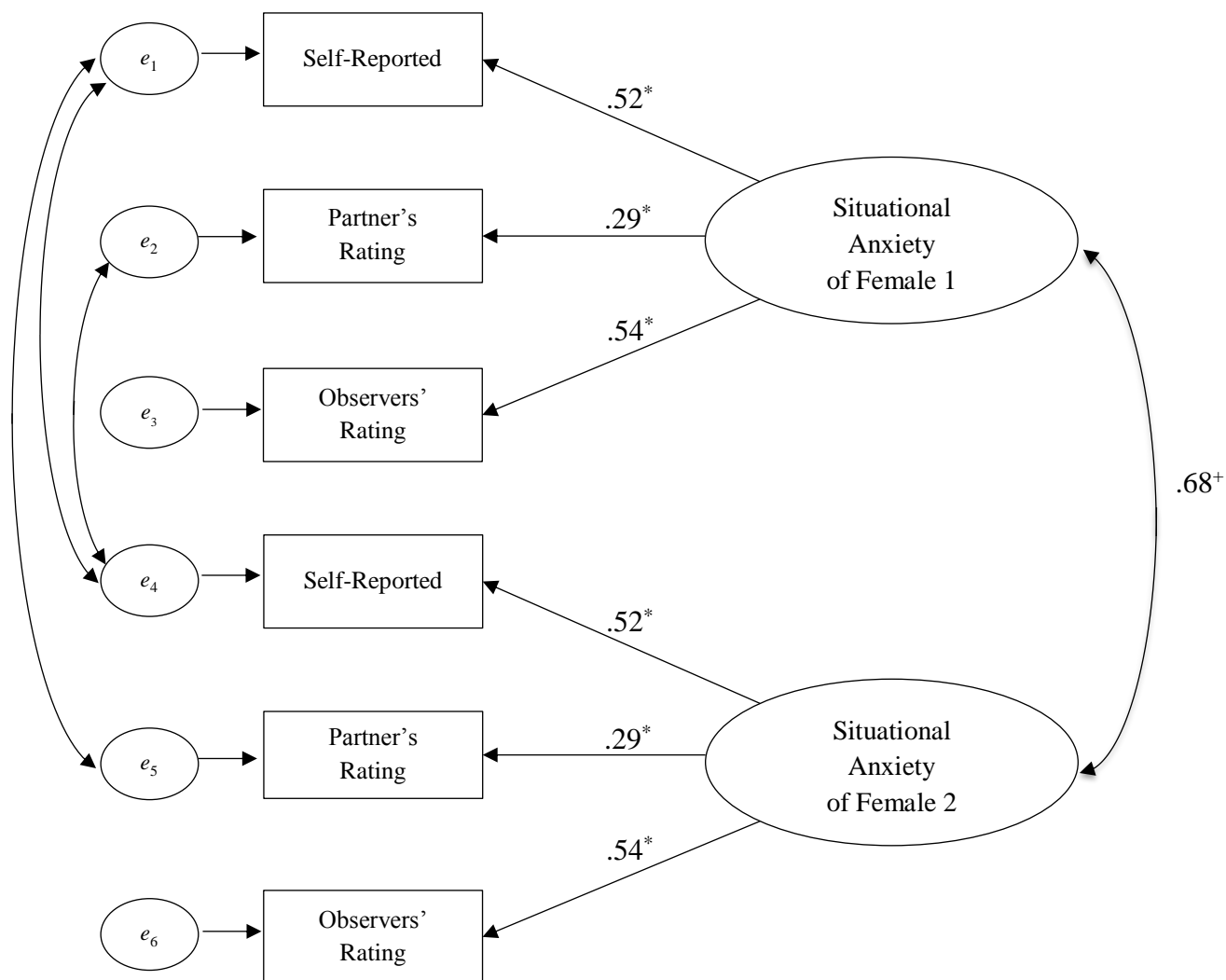


Figure 5. Measurement model for participants' situational social anxiety (Study 3).

Notes: Standardized coefficients provided. <sup>+</sup> $p = .07$ ;  $*p < .01$ . Correlations between error variables for this model were as follows:  $r_{e_1e_5} = .21$ ,  $r_{e_2e_4} = .21$ , and  $r_{e_3e_6} = .21$ , with the first two correlations being significant at  $p < .01$  and the third correlation being non-significant.

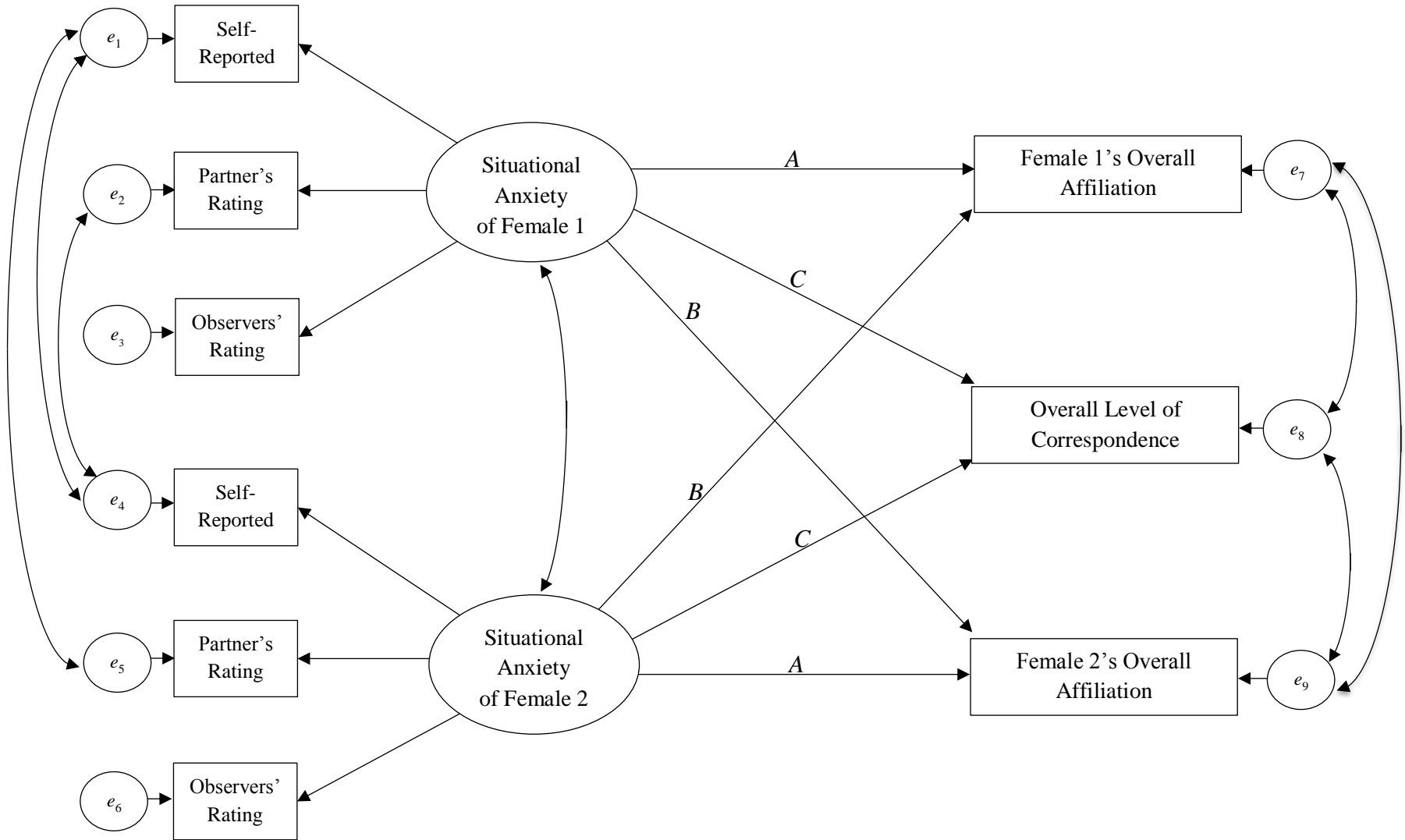


Figure 6. Example of a model used to relate situational social anxiety to interpersonal variables (Study 3).

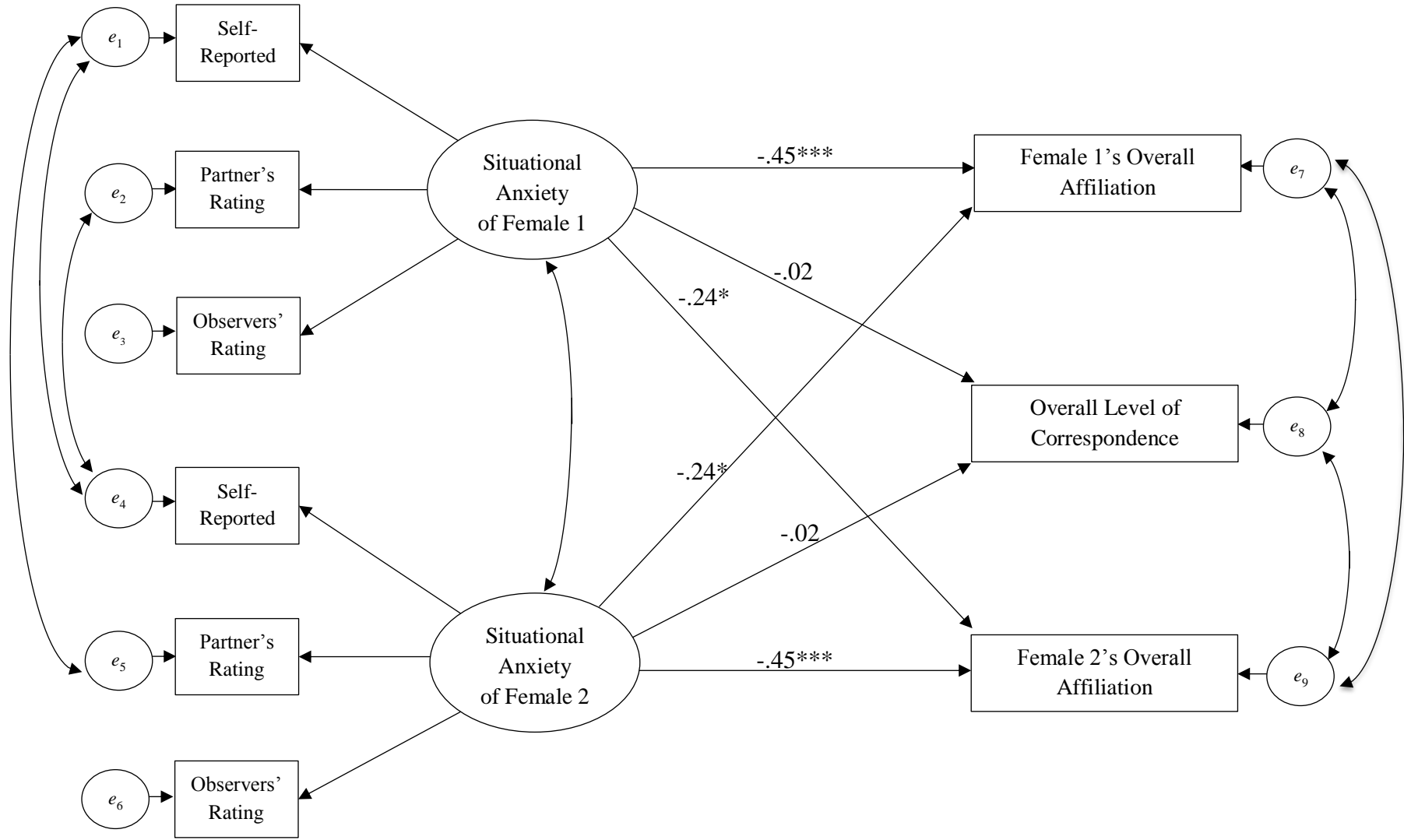


Figure 7. Overall affiliation and correspondence as a function of situational social anxiety (Study 3).

Notes: Standardized coefficients provided. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Correlations between error variables for this model were as follows:  $r_{e_7e_8} = .34$ ,  $r_{e_8e_9} = .34$ , and  $r_{e_7e_9} = .45$ . All of these correlations were significant at  $p < .05$ .

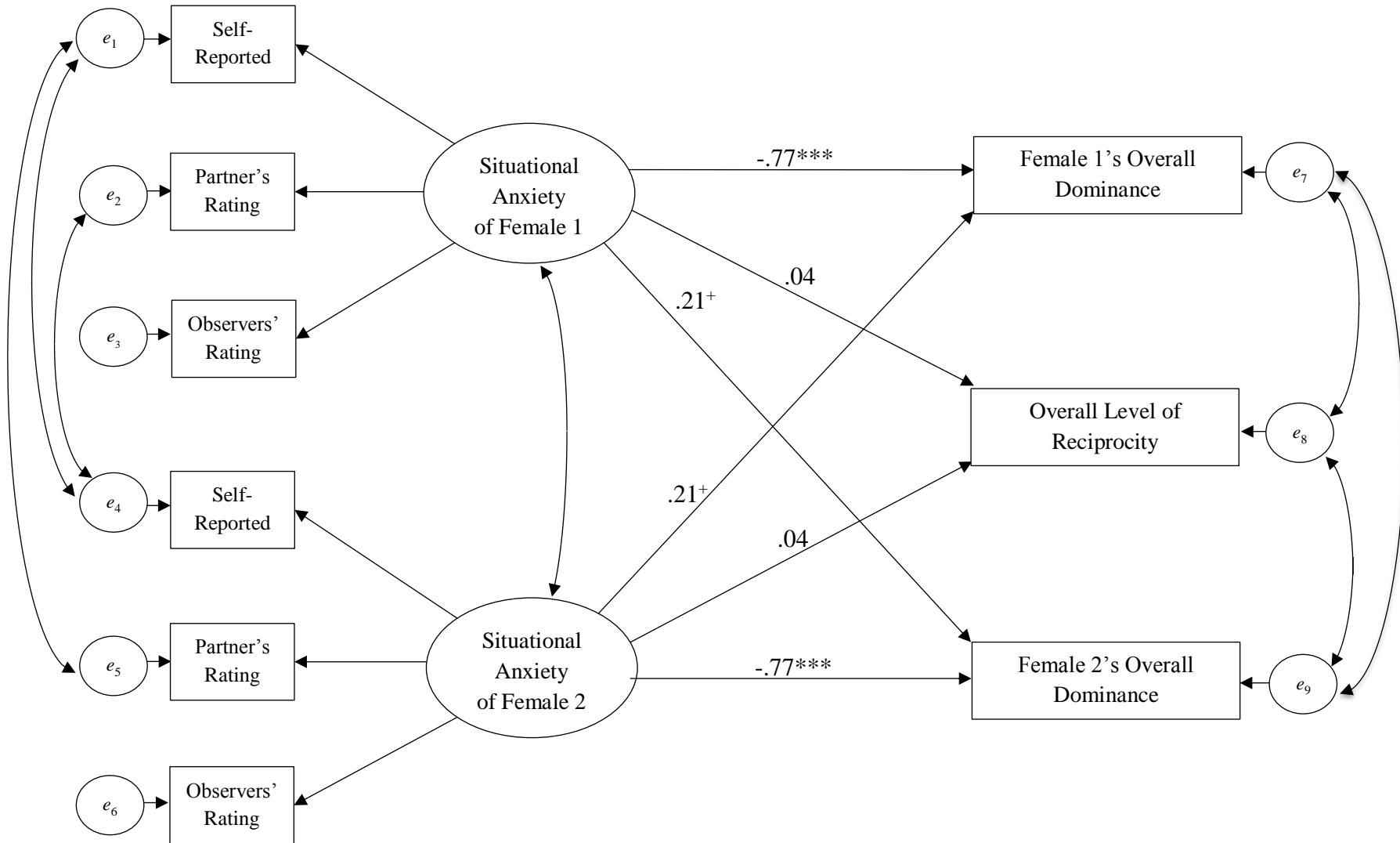


Figure 8. Overall dominance and reciprocity as a function of situational social anxiety (Study 3).

Notes: Standardized coefficients provided.  $^+p < .10$ ;  $^{***}p < .001$ . Correlations between error variables for this model were as follows:

$r_{e_7e_8} = .15$ ,  $r_{e_8e_9} = .15$ , and  $r_{e_7e_9} = -.64$ . All of these correlations were significant at  $p < .05$ .

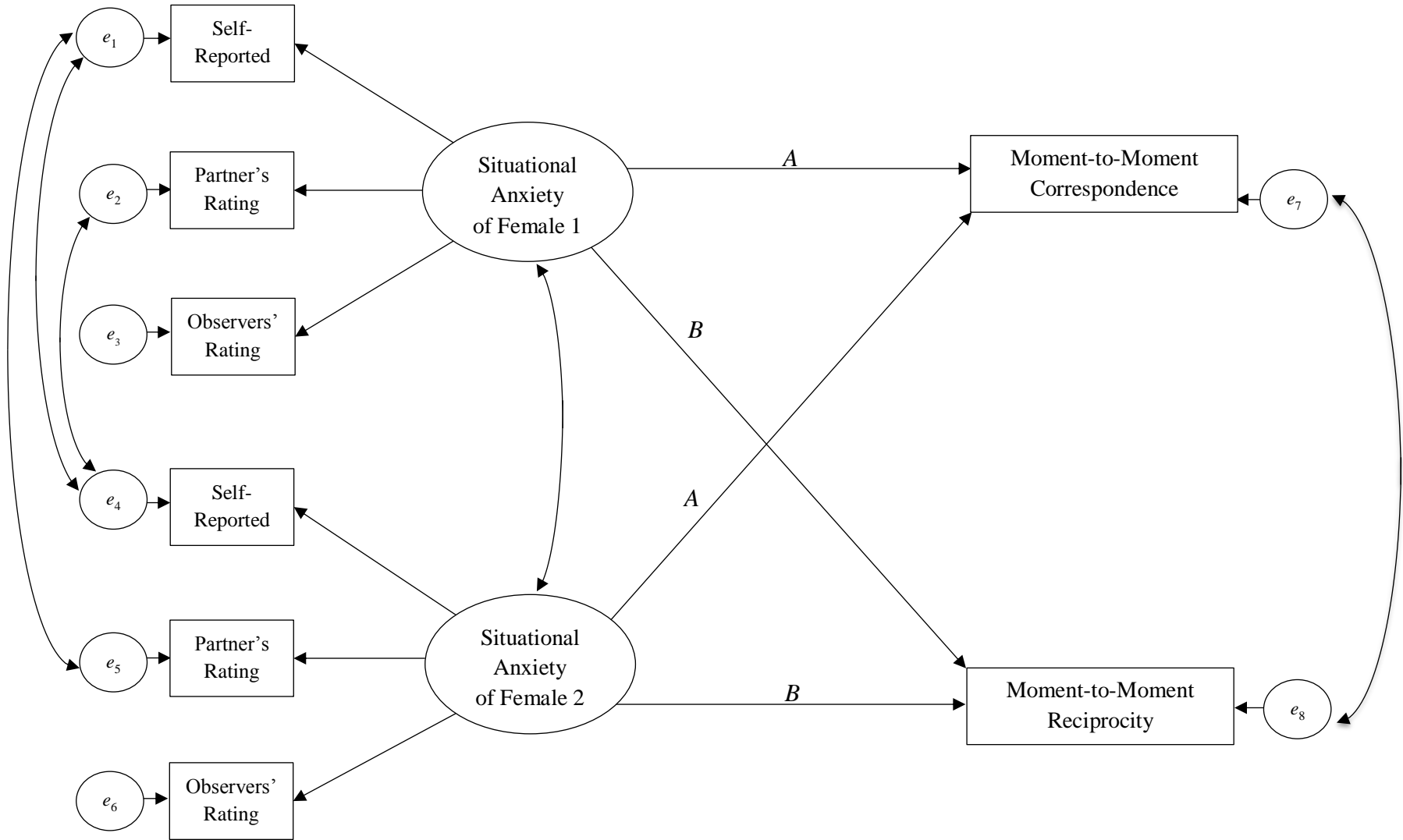


Figure 9. Model for moment-to-moment correspondence and reciprocity as a function of situational social anxiety (Study 3).



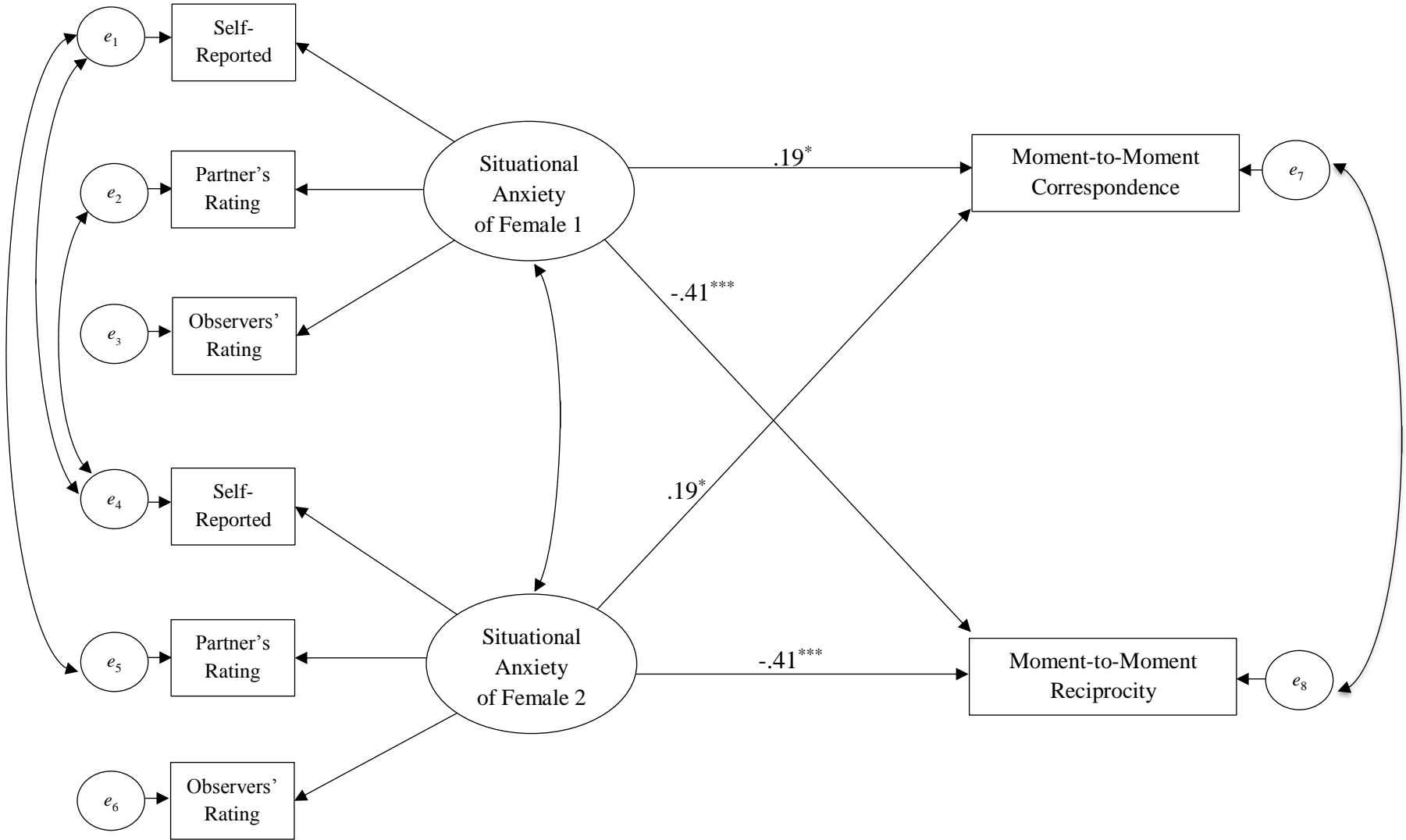


Figure 10. Moment-to-moment correspondence and reciprocity as a function of situational social anxiety (Study 3).

Notes: Standardized coefficients provided. \*  $p < .05$ ; \*\*\*  $p < .001$ . The correlation between  $e_7e_8$  was  $-.29$  and significant at  $p < .05$ .

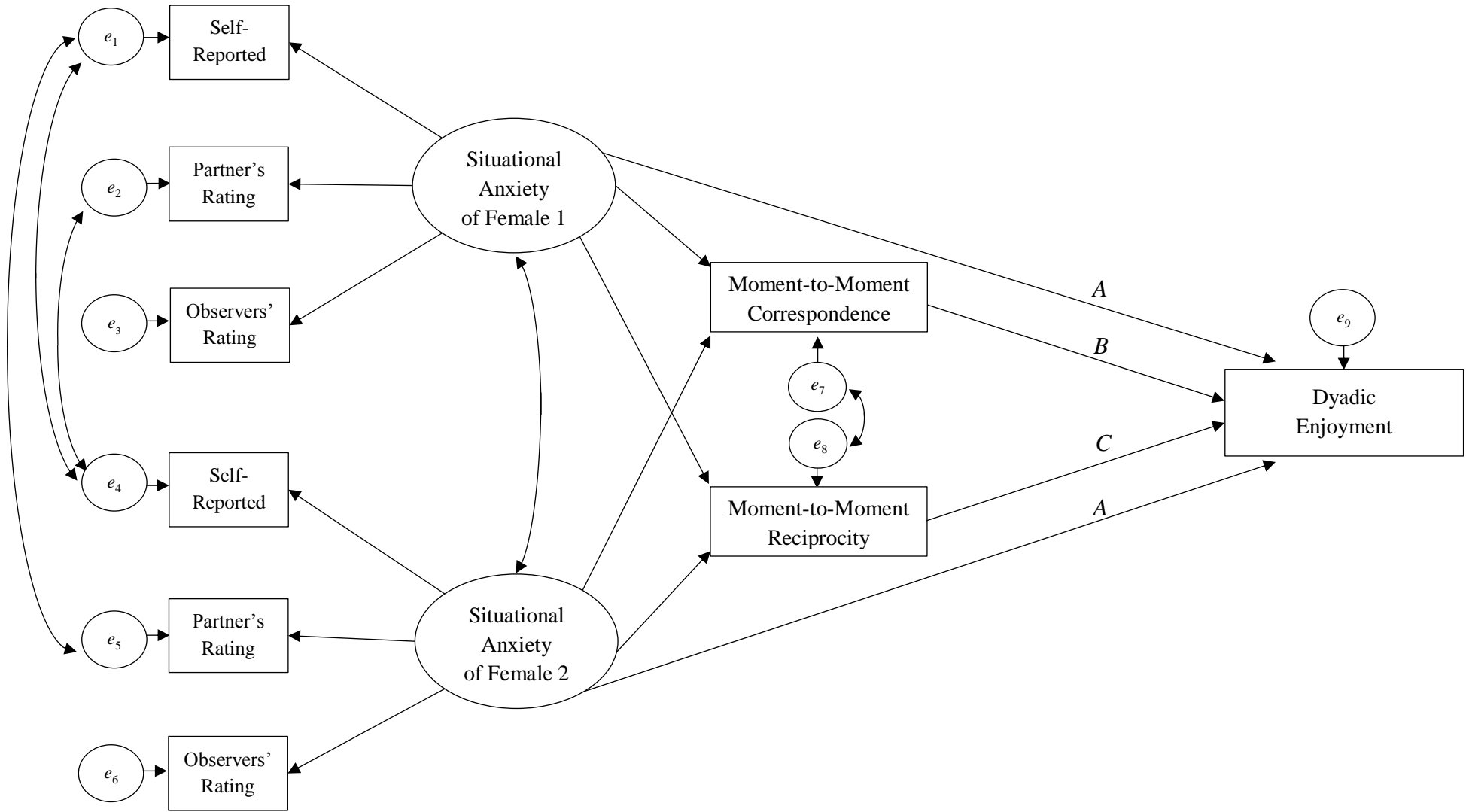


Figure 11. Example of a model used to relate situational social anxiety and moment-to-moment indices of complementarity to preparatory interaction outcome variables (Study 3).

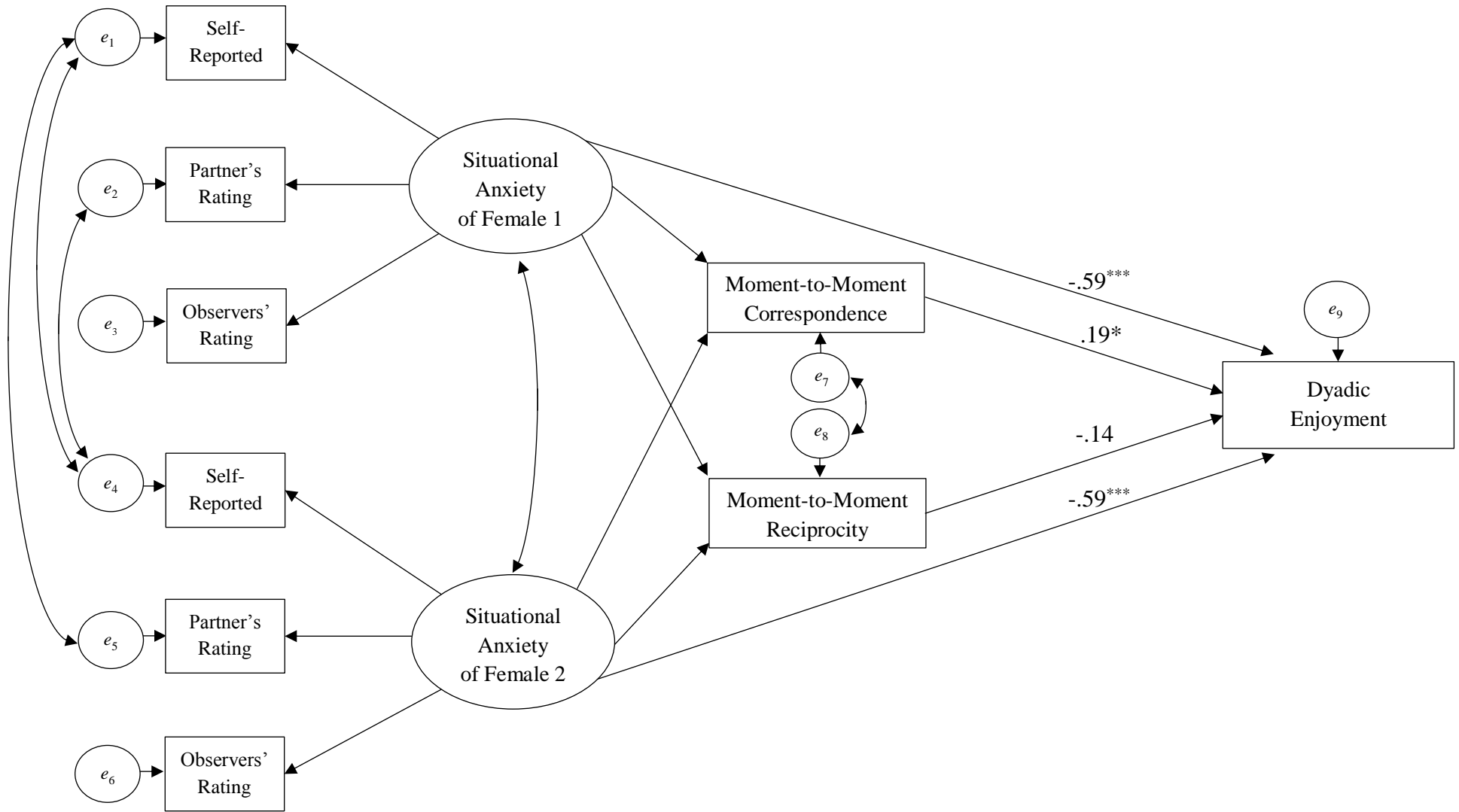


Figure 12. Dyadic enjoyment as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).

Notes: Standardized coefficients provided.  $*p < .05$ ;  $***p < .001$

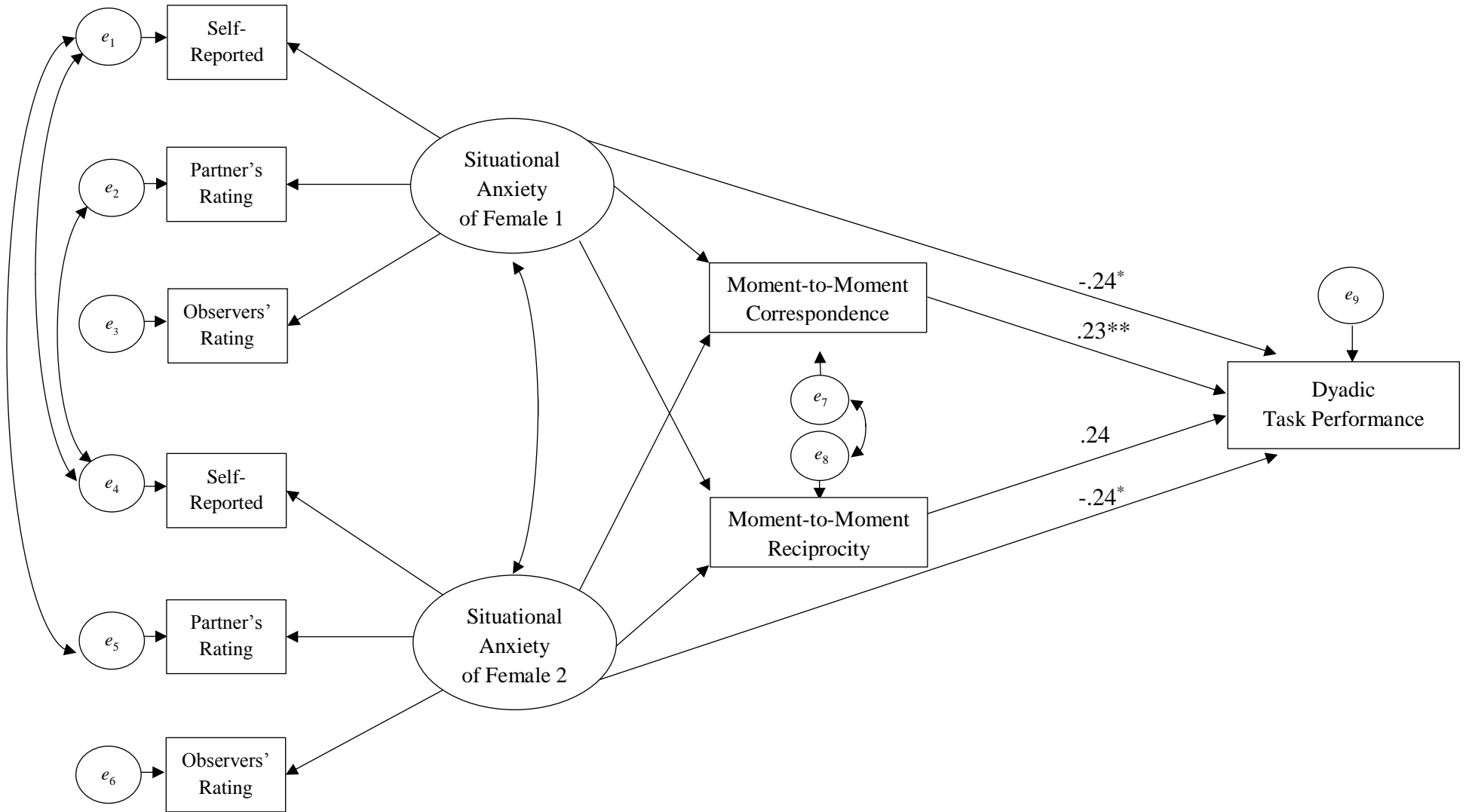


Figure 13. Dyadic task performance as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).

Notes: Standardized coefficients provided.  $*p = .05$ ;  $**p = .01$

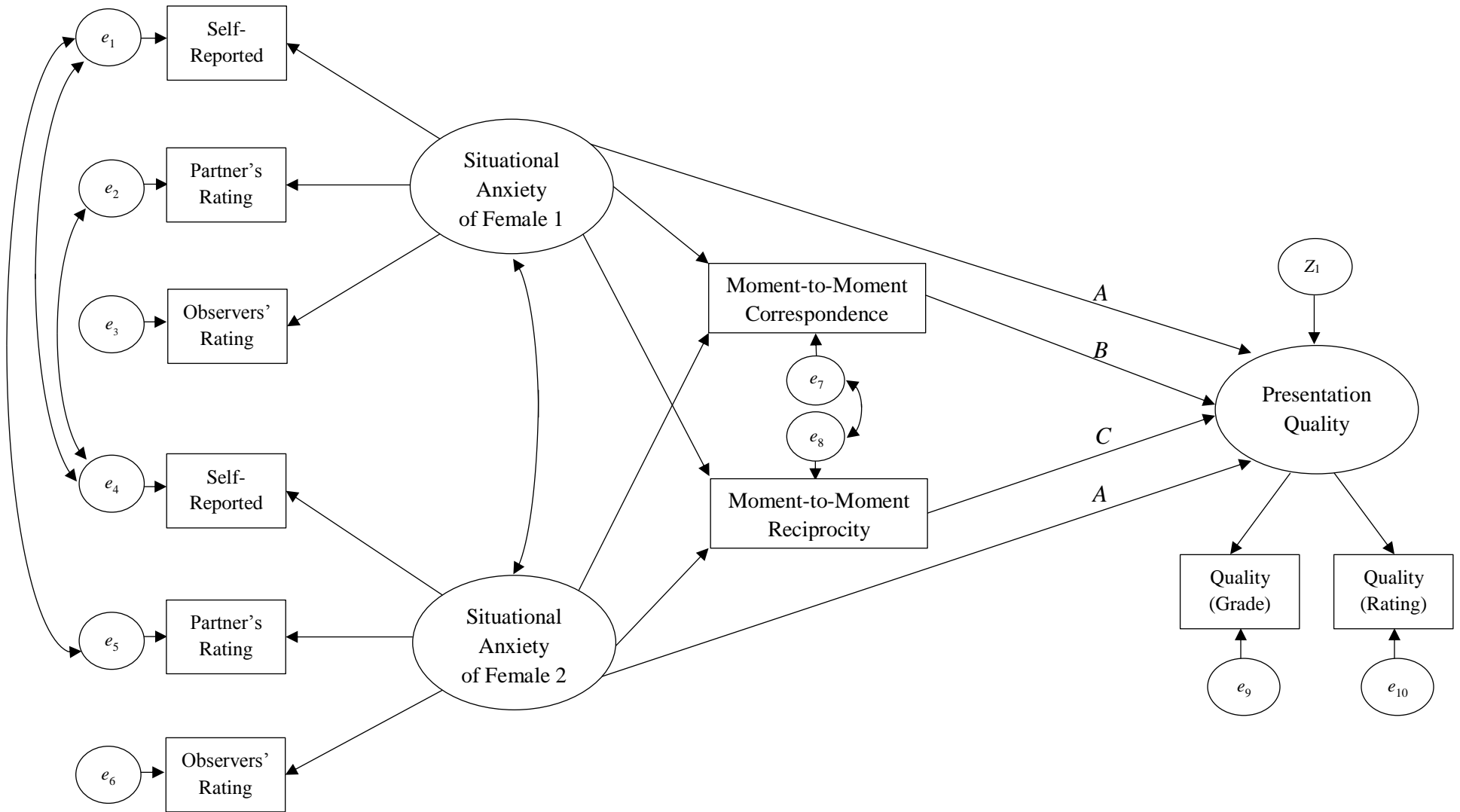


Figure 14. Example of a model used to relate situational social anxiety and moment-to-moment indices of complementarity to final presentation outcome variables (Study 3).

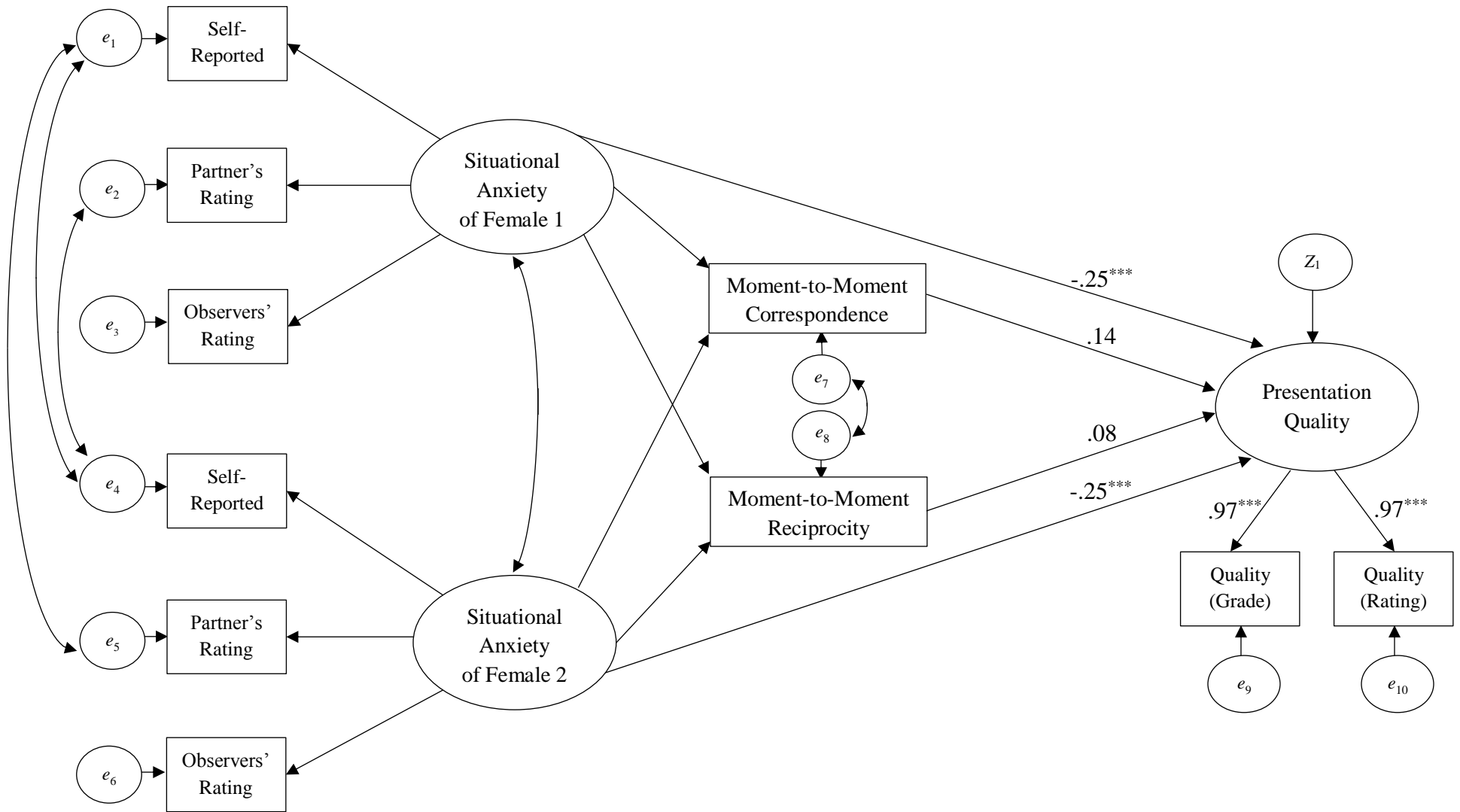


Figure 15. Presentation quality as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3)

Notes: Standardized coefficients provided. \*\*\*  $p < .001$

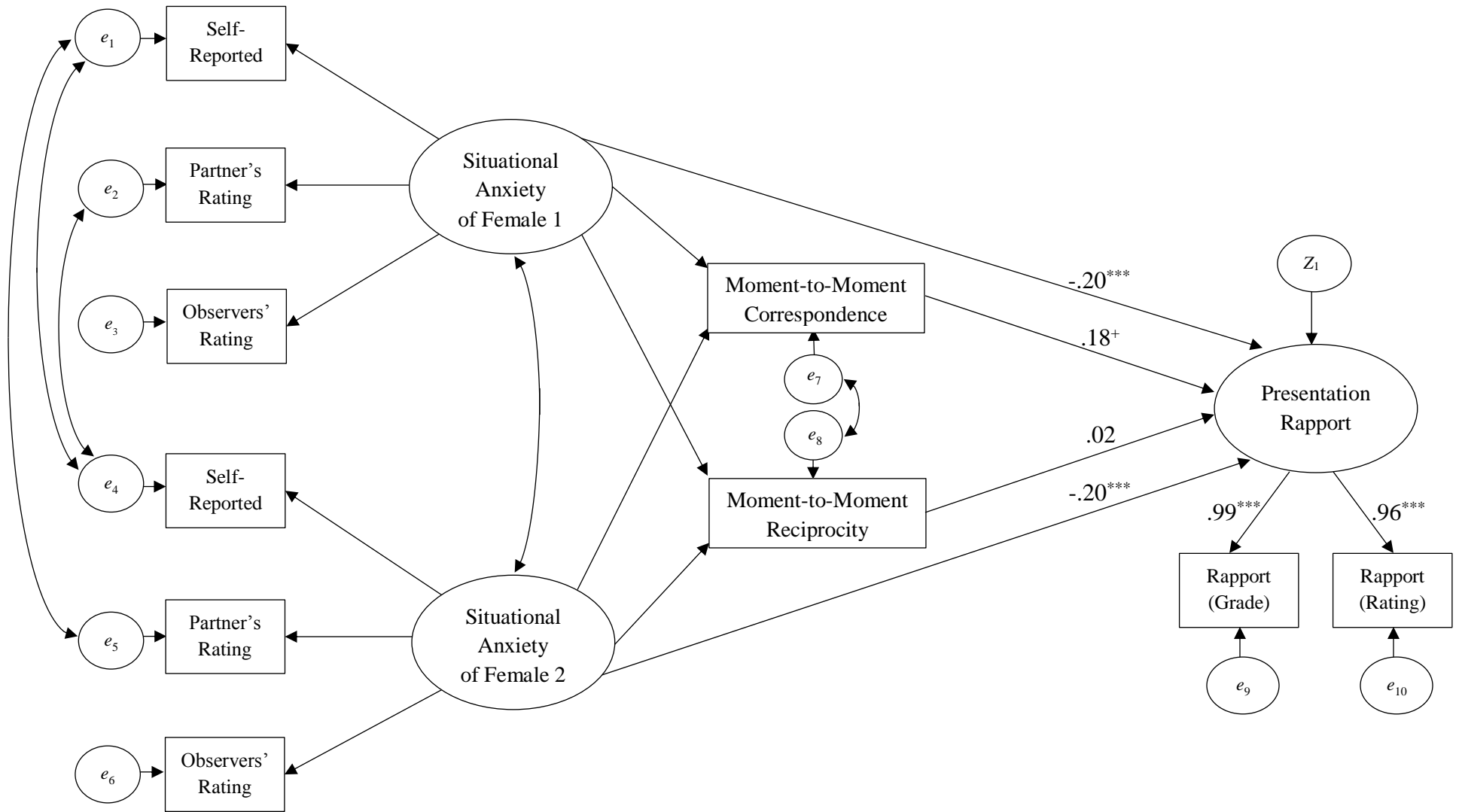


Figure 16. Presentation rapport as a function of situational social anxiety and moment-to-moment indices of complementarity (Study 3).

Notes: Standardized coefficients provided.  $^+ p = .08$ ;  $^{***} p < .001$

### Appendix A: List of Additional Measures Administered

The measures listed below were administered in all of the studies but were not of central interest, and thus are not discussed within the document.

1. The International Personality Item Pool (IPIP) measure of the Big Five (Goldberg, 1999): this scale assessed participants' scores on the Big Five traits of openness, conscientiousness, extraversion, agreeableness, and neuroticism.
2. Social Behavior Inventory (SBI; Moskowitz, 1994): this scale assessed participants' trait interpersonal style.
3. Interpersonal Reactivity Index (IRI; Frias-Navarro, 2009): this scale assessed participants' trait empathy level.

The following measures were also administered in Study 3 but were not discussed within the document:

1. Affiliative Responses to Partner: this scale assessed participants' affiliative responses to their partners during the preparatory interaction.
2. Dominant Responses to Partner: this scale assessed participants' dominant responses to their partners during the preparatory interaction.
3. Perception of Interaction Questionnaire (Cuperman & Ickes, 2009): this scale assessed participants' perceptions of various aspects of their interaction experience.
4. Behavioural Activation System/Behavioural Inhibition System (Carver & White, 1994): this scale assessed individual differences in the sensitivity of people's behavioural approach system (BAS) and behavioural inhibition system (BIS).



## Appendix B: Scenarios used in Study 1

\*Social anxiety manipulations are underlined. Agreeableness manipulations are **bolded**.

High Social Anxiety/Agreeable/Presentation

Adam/Andrea is a 19-year-old male/female university student in one of your classes. You don't know Adam/Andrea that well but you talk to him/her most days in class and he/she usually sits beside you. Today he/she has to give a 15-minute presentation for your professor and the rest of the students in the class. As Adam/Andrea walks into the classroom, you notice that he/she appears to be his/her typical self – **unguarded, trusting, and a bit of an “open book.”** When Adam/Andrea sits down next to you, he/she seems nervous and preoccupied. Knowing that Adam/Andrea has to present in class today, you ask him/her “Are you ready for your presentation?” Adam/Andrea answers, “I'm really nervous. **I hope you like it. Thanks for asking.**” When it is Adam's/Andrea's turn to present, he/she walks up to the front of the class. As Adam/Andrea presents you notice that he/she is speaking at a fast pace in a shaky voice and appears relatively nervous. At one point when Adam/Andrea fumbles his/her words, **he/she smiles, apologizes, and scans the audience for reassurance**. When classmates ask Adam/Andrea questions at the end of the presentation, **he/she welcomes their opinions, appears to be appreciative, and seems to interpret the questions as helpful clarifications**.

Low Social Anxiety/Agreeable/Presentation

Adam/Andrea is a 19-year-old male/female university student in one of your classes. You don't know Adam/Andrea that well but you talk to him/her most days in class and he/she usually sits beside you. Today he/she has to give a 15-minute presentation for your professor and the rest of the students in the class. As Adam/Andrea walks into the classroom, you notice that he/she appears to be his/her typical self – **unguarded, trusting, and a bit of an “open book.”** When Adam/Andrea sits down next to you, he/she seems relaxed and comfortable. Knowing that Adam/Andrea has to present in class today, you ask him/her “Are you ready for your presentation?” Adam/Andrea answers, “Yeah I'm ready to go. **I hope you like it. Thanks for asking.**” When it is Adam's/Andrea's turn to present, he/she walks up to the front of the class. As Adam/Andrea presents you notice that he/she is speaking at a comfortable pace in a clear voice and appears relatively relaxed. At one point when Adam/Andrea fumbles his words, **he/she smiles, apologizes, and scans the audience for reassurance**. When classmates ask Adam/Andrea questions at the end of the presentation, **he/she welcomes their opinions, appears to be appreciative, and seems to interpret the questions as helpful clarifications**.

High Social Anxiety/Disagreeable/Presentation

Adam/Andrea is a 19-year-old male/female university student in one of your classes. You don't know Adam/Andrea that well but you talk to him/her most days in class and he/she usually sits beside you. Today he/she has to give a 15-minute presentation for your professor and the rest of the students in the class. As Adam/Andrea walks into the classroom, you notice that he/she appears to be his/her typical self – **guarded, untrusting, and a bit standoffish**. When Adam/Andrea sits down next to you, he/she seems nervous and preoccupied. Knowing that Adam has to present in class today, you ask him/her “Are you ready for your presentation?” Adam/Andrea answers, “I'm really nervous. **But I don't want to talk about it. I need to concentrate.**” When it is Adam's/Andrea's turn to present, he/she walks up to the front of the

class. As Adam/Andrea presents you notice that he/she is speaking at a fast pace in a shaky voice and appears relatively nervous. At one point when Adam/Andrea fumbles his words, **he/she scowls, moves on, and scans the audience for skepticism**. When classmates ask Adam/Andrea questions at the end of the presentation, **he/she disregards their opinions, appears to be annoyed, and seems to interpret the questions as a personal attack**.

#### Low Social Anxiety/Disagreeable/Presentation

Adam/Andrea is a 19-year-old male/female university student in one of your classes. You don't know Adam/Andrea that well but you talk to him/her most days in class and he/she usually sits beside you. Today he/she has to give a 15-minute presentation for your professor and the rest of the students in the class. As Adam/Andrea walks into the classroom, you notice that he/she appears to be his/her typical self – **guarded, untrusting, and a bit standoffish**. When Adam/Andrea sits down next to you, he/she seems relaxed and comfortable. Knowing that Adam/Andrea has to present in class today, you ask him/her “Are you ready for your presentation?” Adam/Andrea impatiently answers “Yeah I'm ready to go. **But, I don't want to talk about it, I need to concentrate.**” When it is Adam's/Andrea's turn to present, he/she walks up to the front of the class. As Adam/Andrea presents you notice that he/she is speaking at a comfortable pace in a clear voice and appears relatively relaxed. At one point when Adam/Andrea fumbles his words, **he/she scowls, moves on, and scans the audience for skepticism**. When classmates ask Adam/Andrea questions at the end of the presentation, **he/she disregards their opinions, appears to be annoyed, and seems to interpret the questions as a personal attack**.

#### High Social Anxiety/Agreeable/Meeting

Adam/Andrea is a co-worker of yours at a job that you have worked at for three years. You don't know Adam/Andrea that well but you talk to him/her most days and you have worked on projects together before. Today you know that Adam/Andrea has to have a yearly review with his/her boss to discuss his/her accomplishments, future position within the company, and his/her weaknesses. As Adam/Andrea walks into the office you notice that he/she appears to be his/her typical self – **unguarded, trusting, and a bit of an “open book”**. As Adam/Andrea sits down at his/her desk he/she seems nervous and preoccupied. Knowing that Adam/Andrea has his/her yearly review meeting in 15- minutes, you approach him/her at his desk and ask him/her “Are you ready for your meeting?” Adam/Andrea answers, “I'm really nervous” As you are talking to Adam/Andrea about his/her important meeting, you notice that he/she is speaking at a fast pace in a shaky voice and is looking relatively nervous. Because you had your yearly meeting with the boss last week, you thought it would be helpful to offer Adam/Andrea some advice. He/she seems to **welcome your advice and interpret your remarks as helpful**. Shortly after, Adam/Andrea is called into his/her meeting. An hour later Adam/Andrea walks back to his/her desk appearing to be uneasy. As you chat with Adam/Andrea about his/her meeting **he/she seems to be appreciative of your interest**.

#### Low Social Anxiety/Agreeable/Meeting

Adam/Andrea is a co-worker of yours at a job that you have worked at for three years. You don't know Adam/Andrea that well but you talk to him/her most days and you have worked on projects together before. Today you know that Adam/Andrea has to have a yearly review with his/her boss to discuss his/her accomplishments, future position within the company, and his/her weaknesses. As Adam/Andrea walks into the office you notice that he/she appears to be his/her

typical self – **unguarded, trusting, and a bit of an “open book”**. As Adam/Andrea sits down at his/her desk he/she seems relaxed and comfortable. Knowing that Adam/Andrea has his/her yearly review meeting in 15- minutes, you approach him/her at his desk and ask him/her “Are you ready for your meeting?” Adam/Andrea answers, “Yeah I’m ready to go.” As you are talking to Adam/Andrea about his/her important meeting, you notice that he/she is speaking at a comfortable pace in a clear voice and is looking relatively relaxed. Because you had your yearly meeting with the boss last week, you thought it would be helpful to offer Adam/Andrea some advice. He/she seems to **welcome your advice and interpret your remarks as helpful**. Shortly after, Adam/Andrea is called into his/her meeting. An hour later Adam/Andrea walks back to his/her desk appearing to be at ease. As you chat with Adam/Andrea about his/her meeting **he/she seems to be appreciative of your interest**.

#### High Social Anxiety/Disagreeable/Meeting

Adam/Andrea is a co-worker of yours at a job that you have worked at for three years. You don’t know Adam/Andrea that well but you talk to him/her most days and you have worked on projects together before. Today you know that Adam/Andrea has to have a yearly review with his/her boss to discuss his/her accomplishments, future position within the company, and his/her weaknesses. As Adam/Andrea walks into the office you notice that he/she appears to be his/her typical self – **guarded, untrusting, and a bit standoffish**. As Adam/Andrea sits down at his/her desk he/she seems nervous and preoccupied. Knowing that Adam/Andrea has his/her yearly review meeting in 15-minutes, you approach him/her at his/her desk and ask him/her “Are you ready for your meeting with the boss?” Adam/Andrea answers, “I’m really nervous.” As you are talking to Adam/Andrea about his/her important meeting, you notice that he/she is speaking at a fast pace in a shaky voice and is looking relatively anxious. Because you had your yearly meeting with the boss last week you thought it would be helpful to offer Adam/Andrea some advice. He/she seems to **disregard your advice and interpret your remarks as unhelpful**. Shortly after, Adam/Andrea is called into his/her meeting. An hour later Adam/Andrea walks back to his/her desk appearing to be uneasy. As you chat with Adam/Andrea about his/her meeting **he/she seems to be annoyed with your interest**.

#### Low Social Anxiety /Disagreeable/Meeting

Adam/Andrea is a co-worker of yours at a job that you have worked at for three years. You don’t know Adam/Andrea that well but you talk to him/her most days and you have worked on projects together before. Today you know that Adam/Andrea has to have a yearly review with his/her boss to discuss his/her accomplishments, future position within the company, and his/her weaknesses. As Adam/Andrea walks into the office you notice that he/she appears to be his/her typical self – **guarded, untrusting, and a bit standoffish**. As Adam/Andrea sits down at his/her desk he/she seems relaxed and comfortable. Knowing that Adam/Andrea has his/her yearly review meeting in 15-minutes, you approach him/her at his desk and ask him/her “Are you ready for your meeting?” Adam/Andrea answers, “Yeah I’m ready to go.” As you are talking to Adam/Andrea about his/her important meeting, you notice that he/she is speaking at a comfortable pace in a clear voice and is looking relatively relaxed. Because you had your yearly meeting with the boss last week you thought it would be helpful to offer Adam/Andrea some advice. He/she seems to **disregard your advice and interpret your remarks as unhelpful**. Shortly after, Adam/Andrea is called into his/her meeting. An hour later Adam/Andrea walks

back to his/her desk appearing to be at ease. As you chat with Adam/Andrea about his/her meeting he/she seems to be **annoyed with your interest**.

## Appendix C: Participant Self-Reported Anxiety (Study 1)

Rate on the following scale how strongly you would experience the following thoughts and feelings.

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

1. I feel anxious watching Adam/Andrea present OR I feel anxious watching Adam/Andrea prepare for his/her meeting.
2. I feel at ease watching Adam/Andrea present OR I feel at ease watching Adam/Andrea prepare for his/her meeting. (R)
3. I feel comfortable watching Adam/Andrea present OR I feel at ease watching Adam/Andrea prepare for his/her meeting. (R)

(R) Reverse-coded item

## Appendix D: Affiliative Responses to Target Measure (Study 1)

Rate on the following scale how strongly you would experience the following responses towards the target in the scenario:

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

Affiliation Items

1. I want to smile at Adam/Andrea.
2. I want to make Adam/Andrea feel comfortable.
3. I want Adam/Andrea to know that I am paying attention to him/her.
4. I would tell Adam/Andrea that he/she did a great job on his/her presentation OR I would tell Adam/Andrea that I am sure he/she did a great job in his/her meeting.
5. I would try to make Adam/Andrea laugh.
6. I want to comfort Adam/Andrea.
7. I want to reassure Adam/Andrea.
8. I feel sorry for Adam/Andrea.
9. I feel sympathetic towards Adam/Andrea.

Hostile Items

10. I want to make Adam/Andrea nervous about his/her presentation OR I want to make Adam/Andrea nervous about his/her meeting.
11. I want to ask Adam/Andrea a tough question that he/she might not be able to answer OR I want to mislead Adam/Andrea about the questions that I was asked in my meeting.
12. I hope Adam/Andrea will mess up his/her presentation OR I hope Adam/Andrea will mess up in his/her meeting.
13. I want Adam/Andrea to get the hint that I don't care about his/her presentation OR I want Adam/Andrea to get the hint that I don't care about his/her meeting.
14. I would give Adam/Andrea verbal or nonverbal cues that I am annoyed with him/her (e.g. rolling my eyes).
15. I would try to make Adam/Andrea feel badly about his/her presentation OR I would try to make Adam/Andrea feel badly about his/her meeting.
16. I would give off hints to Adam/Andrea that I didn't like his/her presentation OR I would give off hints to Adam/Andrea that I didn't care how his/her meeting went.

## Appendix E: Dominant Responses to Target Measure (Study 1)

Rate on the following scale how strongly you would experience the following responses towards the target in the scenario:

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

Dominance Items

1. I would ask Adam/Andrea how he/she felt about his/her presentation OR I would ask Adam/Andrea how he/she felt about his/her meeting.
2. I would express an opinion to Adam/Andrea about his/her presentation OR I would express an opinion to Adam/Andrea about his/her meeting.
3. I would make a point of immediately talking to Adam/Andrea about his/her presentation OR I would make a point of immediately talking to Adam/Andrea about his/her meeting.
4. I would make clear and firm suggestions to Adam/Andrea about his/her presentation OR I would make clear and firm suggestions to Adam/Andrea about his/her meeting.

Submissive Items

1. When Adam/Andrea comes back and sits next to me, I would wait for him to talk or act first OR When Adam/Andrea comes back from his/her meeting, I would wait for him/her to talk or act first.
2. I would not directly say what I really wanted to say to Adam/Andrea.
3. I would not talk to Adam/Andrea about what was truly on my mind.
4. I would have difficulty making eye contact with Adam/Andrea.

## Appendix F: Desire for Future Relationship Scale (Study 1)

Use the following scale to answer the subsequent questions.

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

1. How much do you like Adam/Andrea?
2. How much would you like to get to know Adam/Andrea better?
3. How much do you think you would enjoy Adam/Andrea's company?
4. Students in the class have to work on a paper in small groups together. How much would you want to work with Adam/Andrea on this paper?/ Employees in your office have to work on a project together in small groups. How much would you want to work with Adam/Andrea on this project?
5. Sometimes a group of students take the presenter out for coffee after the presentation. Assuming you have the time, how much would you enjoy taking Adam/Andrea out for coffee? / Your morning break is coming up. Assuming you have the time, how much would you want Adam/Andrea to join you for your break?
6. Next week your class is going on a field trip to a location that is three hours away. How much would you like to sit on the bus beside Adam?/ Next week your department is going to a workshop that is three hours away. How much would you like to carpool with Andrea to the workshop?
7. At the end of the term a student in the class is planning on hosting a party for everyone in the course. How much would you look forward to chatting with Adam there?/ In a couple of weeks, a fellow co-worker is hosting a party for everyone in your department. How much would you look forward to chatting with Andrea there?



## Appendix G: Speech used by Confederate (Study 2)

### Supporting Cell Phone Use

Here's my speech supporting the use of cell phones in class. There are many reasons why I think that cell phones should not be allowed in classrooms but I think the two most convincing arguments are:

First, by allowing cell phones in class, students can be better organized and prepared. In this technological age in which we live, paper-planners are outdated. It is much easier to put your exams and due dates for multiple classes into your phone's calendar. By having a cell phone in class, students are able to enter important dates instantly, so they don't forget about them. Also, many phones now sync up with computers, so you can have all of these important dates in more than one spot. Students can set reminders a couple days before important dates, allowing them to be better prepared for upcoming deadlines. These types of cell phone reminders are likely to be helpful and effective for students' studying and work habits.

Second, allowing cell phones in the classroom can provide safety and contactability in emergency situations. For example, students can be contacted easily by family members in case of emergencies. If students' parents need to contact them immediately, the student can see their parents calling, and quietly leave the lecture hall to answer their cell phone. As long as the phone is on silent, this would not be disruptive to others in the classroom. Not only does cell phone use in the classroom allow students to be contacted in case of emergencies, but students can contact others readily. For example, if the school is in lockdown or if someone faints during a lecture, a student with a cell phone could easily contact the appropriate emergency services.

Therefore the use of cell phones in classrooms is beneficial due to the organizational and safety benefits they offer.

### Opposing Cell Phone Use

Here's my speech opposing the use of cell phones in class. There are many reasons why I think that cell phones should not be allowed in classrooms but I think the two most convincing arguments are:

First, by allowing cell phones in class, students and professors can be distracted. A ringing or vibrating cell phone interrupts the lecture and disrupts people's focus. It makes it quite difficult for students and professors to ignore a ringing or vibrating cell phone. Even if the cell phone is muted while in class, the student's attention becomes divided between the lecture and their phone. This takes away from the student's ability to absorb the material in the lecture. It is also distracting for the professor, who usually notices the students looking at their cell phones, answering text messages, and not paying attention. These distractions and disruptions during lecture are likely to hinder and negatively impact students' learning.

Second, allowing cell phones in the classroom makes it easier for students to cheat. For example, students can communicate with others during tests. If a student has a close friend in the class, and the lecture hall is large, it would be quite easy to text your friend a question from the test that you're unsure about. Not only does cell phone use in the classroom allow students to potentially communicate with others during a test, but students could also readily access the internet from their phone. In this technological age in which we live, it is easy to access the internet from your cell phone and have a question answered in seconds.

Therefore the use of cell phones in classrooms is not beneficial because of the distraction they cause and the favourable environment they provide for cheating.

## Appendix H: Detailed Experimental Manipulation (Study 2)

Note. \*Anxiety manipulations are *italicized*. Agreeableness manipulations are **bolded**.

### 1. After Role Assignment

The confederate's response to the experimenter after being asked if their role in the experiment is clear differed depending on which condition the confederate was enacting.

#### High Social Anxiety/Agreeable Condition

*"I wish I was the audience member. Presentations make me really nervous. I hope it goes okay though."*

#### Low Social Anxiety/Agreeable Condition

*"I am glad I am the speaker. I like giving presentation. I hope it goes okay though."*

#### High Social Anxiety/Disagreeable Condition

*"I wish I was the audience member. Presentations make me really nervous, especially when it's a bad topic."*

#### Low Social Anxiety/Disagreeable Condition

*"I am glad I am the speaker. I like giving presentations, but usually only when it's a good topic."*

### 2. Delivery of the speech

When the confederate was delivering the speech in the high social anxiety condition, he/she was *shaking, fidgeting with the paper, had a tense body posture, and had numerous pauses in his/her speech*. In contrast, when the confederate was delivering the speech in the low social anxiety condition, he/she *did not fidget, had a relaxed body posture, and spoke fluently*.

When the confederate was enacting the agreeable condition, he/she was **smiling, making, eye contact, and exhibiting warm behaviours** towards the participant. In contrast, when the confederate was delivering the speech in the disagreeable condition, he/she scowled, did not make eye contact, and exhibited cold behaviours towards the participant.

There were also verbal cues of the manipulation throughout the speech, which are highlighted below, using the opposing cell phone use in the classroom speech as an example (the content of the manipulation was the same regardless of the speech topic the confederate was delivering). The anxiety manipulation is *italicized*, with the verbal content of the high social anxiety condition presented outside of the brackets, and the verbal content of the low social anxiety condition presented within the brackets directly after. The agreeableness manipulation is **bolded**,

with the verbal content of the agreeable condition presented outside of the brackets, and the verbal content of the disagreeable condition presented within the brackets directly after.

*I'm really nervous [Okay, I'll get started]. I hope this is kind of what you are looking for [I can't believe this is useful for your research].* Here is my speech opposing the use of cell phones in class. There are many reasons why I think that cell phones should not be allowed in classrooms but I think the two most convincing arguments are: first, by allowing cell phones in class, students and professors can be distracted. A ringing or vibrating cell phone interrupts the lecture and disrupts people's focus. It makes it quite difficult for students and professors to ignore a ringing or vibrating cell phone. Even if the computer, I mean cell phone, **oops sorry [uh, this is stupid]**... Even if the cell phone is muted while in class, the student's attention becomes divided between the lecture and their phone. This takes away from the student's ability to absorb the material in the lecture. It is also distracting for the professor, who usually notices the students looking at their cell phones, answering text messages, and not paying attention. These distractions and disruptions during lecture are likely to hinder and negatively impact students' learning. Second, allowing cell phones in the classroom makes it easier for students to cheat. For example, students can communicate with others during tests. If a student has a close friend in the class, and the lecture hall is large, it would be quite easy to text your friend a question from the test that you're unsure about. Not only does cell phone use in the classroom allow students to potentially communicate with others during a test, but students could also readily access the internet from their phone. In this technological age in which we live, it is easy to access the internet from your cell phone and have a question answered in seconds. Therefore the use of cell phones in classrooms is not beneficial because of the distraction they cause and the favourable environment they provide for cheating. **Was that okay? [I'm done].**

### 3. Response to the experimenter's question after the speech

After delivering the speech, the experimenter asked the confederate if they can think of an argument for the speech topic they were not given. For example, if a confederate delivered a speech on the topic of opposing cell phone use, they were asked to think of an argument supporting the use of cell phones in the classroom. The confederate's response to this question was part of the agreeableness manipulation. In the agreeable condition, the confederate answered: **"That's a good question. I am sure there are other arguments, I just can't think of any right now. Sorry."** In contrast, in the disagreeable condition, the confederate answered: **"No you didn't ask me to think of any other arguments. I just did what you asked me to do."**

### 4. Left alone with participant

After the confederate delivered their speech, the confederate and participant were left alone for 45-seconds. After the researcher left the room, the confederate delivered a line that was consistent with the condition they were enacting.

High Social Anxiety/Agreeable Condition

*“I was really nervous. I hope that was okay.”*

Low Social Anxiety/Agreeable Condition

*“I think that went well. I hope that was okay.”*

High Social Anxiety/Disagreeable Condition

*“I was really nervous. That was so dumb. “*

Low Social Anxiety/Disagreeable Condition

*“I think that went well. That was so dumb.”*

### Appendix I: Affiliative Responses to Confederate Measure (Study 2)

Rate on the following scale how strongly you would experience the following responses during and after the speaker's presentation.

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

#### Affiliation Items

1. I wanted to make the speaker feel comfortable.
2. I wanted the speaker to know that I am paying attention to their presentation.
3. I nodded at the speaker.
4. I told the speaker that he/she did a great job on their presentation.
5. I tried to make the speaker laugh.
6. I tried to comfort the speaker.
7. I tried to reassure the speaker.
8. I felt sorry for the speaker.
9. I felt sympathetic towards the speaker.

#### Hostile Items

10. I wanted to make the speaker nervous about their speech.
11. I wanted the speaker to mess up his/her presentation.
12. I wanted to ask the speaker a question about their speech that they may not have been able to answer.
13. I wanted the speaker to get the hint that I didn't care about his/her presentation.
14. I gave the speaker verbal/nonverbal cues that I was annoyed with them.
15. I tried to make the speaker feel badly about their presentation.
16. I gave off hints to the speaker that I didn't like their presentation.

### Appendix J: Dominant Responses to Target Measure (Study 2)

Rate on the following scale how strongly you would experience the following responses during and after the speaker's presentation.

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

#### Dominance Items

1. I told the speaker something about myself.
2. I expressed an opinion to the speaker about their presentation.
3. I gave the speaker advice on how they could have improved on their next presentation.\*
4. When with the speaker, I commented on my own accomplishments, awards, or successes.\*
5. When with the speaker, I seized opportunities to explain things or give them advice.
6. When with the speaker I stated preferences or opinions in an arrogant manner.

#### Submissive Items

1. I waited for the speaker to talk or act first.
2. I did not directly say what I really wanted to say to the speaker.
3. I did not talk to the speaker about what was truly on my mind.
4. When with the speaker, I claimed I didn't have an opinion or that "I don't know"
5. When with the speaker, I was quick to agree with their opinions.
6. When with the speaker, I was hesitant or embarrassed to express my opinion.

\*Participants displayed no variability on these items and thus they were not included in our analyses.

## Appendix K: Desire for Future Relationship Scale (Study 2)

**Use the following scale to answer the subsequent questions.**

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

1. How willing would you be to participate in another study with this person?
2. How willing would you be to go out for coffee with the speaker?
3. How willing would you be to have lunch with the speaker?
4. How willing would you be to go see a movie with the speaker?
5. How willing would you be to go out for dinner with the speaker?
6. How much would you like to get to know the speaker better?
7. How much do you think you would enjoy the speaker's company?
8. How much do you like the speaker?

Appendix L: Social Behaviour Inventory (SBI) for Observers' Assessment of Participants' Behaviours (Study 2)

Please use the scale below to indicate to what degree you feel this person engaged in the following behaviours during his/her interaction with the confederate.

1	2	3	4	5
Never	A little bit	Moderately	A Great Deal	Extremely

This person...

1. set goals for the confederate.
2. waited for the confederate to act or talk first.
3. listened attentively to the confederate.
4. did not respond to the confederate's questions or comments.
5. gave information to the confederate.
6. went along with the views of the confederate.
7. criticized the confederate.
8. expressed an opinion to the confederate.
9. did not express disagreement with the confederate
10. spoke favourably of someone who was not present. \*
11. raised their voice at the confederate.
12. spoke softly to the confederate.
13. compromised about a decision with the confederate. \*
14. made a sarcastic comment towards the confederate.
15. complimented or praised the confederate.
16. demanded that the confederate did what they wanted.
17. gave in to the confederate. \*
18. smiled and laughed with the confederate.
19. discredited what the confederate said.
20. spoke in a clear firm voice to the confederate.
21. spoke only when spoken to by the confederate.
22. showed sympathy towards the confederate.
23. confronted the confederate about something they did not like.
24. asked the confederate to do something.
25. did not say what they wanted to say to the confederate.
26. exchanged pleasantries with the confederate.
27. gave incorrect information to the confederate. \*
28. got immediately to the point with the confederate.
29. did not state their views about the confederate.
30. told the confederate that they agreed with them.
31. stated that they did not like something about the confederate.
32. tried to get the confederate to do something else.
33. did not say how they felt about the confederate.
34. expressed affection with words or gestures towards the confederate.
35. ignored the confederate's comments.



36. made suggestions to the confederate.
37. avoided taking the lead in the conversation with the confederate.
38. avoided unpleasantness with the confederate.
39. withheld useful information from the confederate.
40. did not say what was on their mind about the confederate.
41. expressed reassurance towards the confederate.
42. showed impatience towards the confederate.

Dominance Items: 1, 5, 8, 11, 20, 24, 28, 32, 36

Submissive Items: 2, 6, 9, 12, 17, 21, 25, 29, 33, 37, 40

Agreeableness Items: 3, 6, 10, 13, 15, 18, 22, 26, 30, 34, 38, 41

Quarrelsome Items: 4, 7, 11, 14, 16, 19, 23, 27, 31, 35, 39, 42

\* Participants displayed no variability on these items and thus they were not included in our analyses.

## Appendix M: Trait Neuroticism and Agreeableness (Study 3)

Below there are phrases describing people's behaviours. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age.

1	2	3	4	5
Very Inaccurate	Moderately Inaccurate	Neither Inaccurate nor Accurate	Moderately Accurate	Very Accurate

Neuroticism Scale

1. I often feel blue.
2. I rarely lose my composure. (R)
3. I dislike myself.
4. I remain calm under pressure. (R)
5. I am often down in the dumps.
6. I am not easily frustrated. (R)
7. I have frequent mood swings.
8. I seldom get mad. (R)
9. I panic easily.
10. I seldom feel blue. (R)
11. I am filled with doubts about things.
12. I feel comfortable with myself. (R)
13. I feel threatened easily.
14. I rarely get irritated. (R)
15. I get stressed out easily.
16. I am not easily bothered by things. (R)
17. I fear for the worst.
18. I am very pleased with myself. (R)
19. I worry about things.
20. I am relaxed most of the time. (R)

Agreeableness Scale

1. I have a good word for everyone.
2. I am out for my own personal gain. (R)
3. I believe that others have good intentions.
4. I hold a grudge. (R)
5. I respect others.
6. I make demands on others. (R)
7. I accept others as they are.
8. I contradict others. (R)

9. I make others feel at ease.
10. I believe that I am better than others. (R)
11. I am concerned about others.
12. I have a sharp tongue. (R)
13. I trust what others say.
14. I cut others to pieces. (R)
15. I sympathize with others' feelings.
16. I suspect hidden motives in others. (R)
17. I am easy to satisfy.
18. I get back at others. (R)
19. I treat all people equally.
20. I insult people. (R)

(R) Reverse-coded items

## Appendix N: Perception of Partners' Anxiety Measure (Study 3)

Judge how accurately you think each word describes your interaction partner using the following scale:

1	2	3	4	5	6	7	8
Extremely Inaccurate	Very Inaccurate	Quite Inaccurate	Slightly Inaccurate	Slightly Accurate	Quite Accurate	Very Accurate	Extremely Accurate

1. Anxious
2. Tense
3. High strung
4. Relaxed (R)
5. Worrying
6. At ease (R)
7. Self-conscious
8. Nervous
9. Fretful

(R) Reverse-coded items

### Appendix O: Desire for Future Relationship Scale (Study 3)

Use the following scale to answer the subsequent questions.

1	2	3	4	5
Not at all	A little bit	Moderately	Very	Extremely

1. How willing would you be to participate in another study with this person?
2. How willing would you be to go out for coffee with this person?
3. How willing would you be to have lunch with this person?
4. How willing would you be to go see a movie with this person?
5. How willing would you be to go out for dinner with this person?
6. How much would you like to get to know this person better?
7. How much do you think you would enjoy this person's company?
8. How much do you like this person?

### Appendix P: Coding Scheme for Observers' Ratings of Anxiety (Study 3)

Please use the scale below to indicate the degree to which you feel this person engaged in the following behaviours during the interaction.

1	2	3	4	5	6	7
Not at all			Moderately			Very Much

This person...

1. Showed signs of anxiety
2. Spoke fluently and clearly (R)
3. Trembled or shook
4. Created uncomfortable pauses
5. Fidgeted
6. Appeared tense or rigid
7. Avoided eye contact
8. Had a closed body posture

(R) Reverse-coded item

Appendix Q: Coding Scheme for Observers' Ratings of Preparatory Interaction Outcome Variables (Study 3)

Please answer the following questions with **both members of the dyad** in mind. If both members are engaging in the behaviour, your rating should be quite high. Alternatively, if one partner is engaging less than the other, your rating will be slightly lower to reflect this fact. Likewise, if both members are not engaging in the behaviour, your rating should be even lower.

1	2	3	4	5
Not at all, Does not describe the dyad at all	Very rarely	Sometimes	Often	All the time, Describes the dyad very well

**To what extent does the dyad:**

1. Accept and respect each other?
2. Have rapport?
3. Seem to want to interact with each other in the future?
4. Seem to enjoy the interaction?
5. Show genuine interest in each other's thoughts/ideas?
6. Seem to be enjoying each other's company?
7. Try to reach compromises?
8. Work well together?
9. Seem to be passing the time without really engaging each other? (R)
10. Manage the task effectively?
11. Seem to accomplish the task at hand?
12. Elaborate on each other's thoughts/ideas?
13. Appear to "hit it off" (or schmeck, click, mesh, gel, etc.)?
14. Seem to lack chemistry? (R)

Dyadic enjoyment items: 1, 2, 3, 4, 5, 6, 9, 13, 14

Task performance items: 10, 11

(R) Reverse-coded item

Appendix R: Coding Scheme for Observers' Grade-based Assessment of Dyads' Presentations  
(Study 3)

Similar to how a course instructor grades a student's presentation in class, you will be assigning grades to various aspects of a dyad's presentation. Please keep the following categories in mind when you are rating how well a dyad did in each category:

Inadequate	Generally Fair to Inadequate	Moderately Good	Good	Very Good	Excellent	Outstanding
< 50%	50-65%	65-69%	70-74%	75-79%	80-89%	90-100%

Please assign a specific grade for the following aspects of the dyad's presentation.

- 1. Arguments used in the presentation.** When assigning a grade for this category, consider if the dyad presents sensible and convincing arguments for their assigned topic, if they miss any obvious arguments for their topic, and if they address counter arguments to their topic. In order to receive an *outstanding* grade in this category, the dyad should: clearly address all of the key arguments for their topic, expand on these arguments (e.g., provide an example or anecdotal story), link their arguments back to the main topic, and address counter arguments to their topic.

**Overall grade for this category:** \_\_\_\_\_

- 2. Presentation Flow.** When assigning a grade for this category, consider if there is an obvious structure to the presentation, if the arguments are presented in a logical sequence, and if both dyad members contribute equally to the presentation. In order to receive an *outstanding* grade in this category, the dyad should: have an opening statement about what their topic is, smoothly transition between their arguments, have clearly defined roles in the presentation that are well coordinated (e.g., Person A presents argument 1, Person B presents argument 2, etc.), and have a "take-home" summary statement at the end of their presentation.

**Overall grade for this category:** \_\_\_\_\_

- 3. Style of Presenters.** When assigning a grade for this category, consider how clear the dyad members are when speaking, and the pace, length, and creativity of the presentation. In order to receive an *outstanding* grade in this category, the dyad members should: speak clearly and at a reasonable pace, be relatively enthusiastic in their delivery, be within the 3-5 minute time frame, and attempt to be creative in their delivery (e.g., the dyad may start off their presentation with an anecdotal story or a short skit).

**Overall grade for this category:** \_\_\_\_\_



- 4. Rapport.** When assigning a grade for this category, consider how relaxed the dyad appears to be with each other while presenting, if the dyad seems to be enjoying themselves, and if there seems to be chemistry between the dyad members. In order to receive an *outstanding* grade in this category, the dyad should: appear quite comfortable with their partner throughout the presentation, support their partner (e.g., help their partner if they get stuck), demonstrate a personal connection with their partner (e.g., address their partner by name throughout the presentation), and seem to have a good time with their partner (e.g., laugh).  
**Overall grade for this category:** \_\_\_\_\_

Appendix S: Coding Scheme for Observers' Rating-based Assessment of Dyads' Presentations  
(Study 3)

Use the scale below to make ratings for each dyad's presentation

1	2	3	4	5
Strongly Disagree	Moderately Disagree	Neither Agree nor Disagree	Moderately Agree	Strongly Agree

To what extent do you agree with the following statements...

Quality of Presentation:

1. The dyad presented convincing arguments for their topic.
2. The dyad addressed all of the obvious arguments for their assigned topic.
3. The dyad addressed and managed counter-arguments for their topic.
4. The dyad expanded on their arguments (e.g., provided an example or anecdotal story).
5. The dyad linked their arguments back to the assigned topic.
6. The dyad introduced their topic (e.g., included an opening statement).
7. The dyad smoothly transitioned between their arguments.
8. The dyad coordinated their roles in the presentation (e.g., Person A presented argument 1, Person B presented argument 2).
9. The dyad equally divided up the presentation.
10. The dyad provided a take-home message for the audience.
11. The dyad maintained a reasonable pace throughout the presentation.
12. The dyad spoke clearly throughout the presentation.
13. The dyad attempted to engage the audience (e.g., presented the topic in a creative way).
14. The dyad stayed within the 3-5 minutes time frame.

Presentation Rapport:

1. The dyad had rapport.
2. The dyad seemed to have fun.
3. The dyad seemed to be enjoying themselves.
4. The dyad had chemistry.
5. The dyad supported each other (e.g., If one partner got stuck, the other partner helped out).