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Exploring the links between Social Anxiety and Depression in the Maintenance of Romantic Relationships

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Graduate Program in Psychology
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Abstract

Social anxiety is characterized by fear and avoidance of social encounters and has recently been associated with a variety of difficulties in romantic relationships. Complicating further investigation of these associations is the high degree of comorbidity between social anxiety and depressive symptomatology, which share several similarities in expression despite disparate underlying causes. The present thesis examines the unique influences of social anxiety and depression on a number of central aspects of relationship functioning and provides the first longitudinal investigation of the impacts of actor and partner social anxiety and depression on relationship quality and functioning. In Study 1, three independent samples drawn from Amazon's Mechanical Turk participant pool ($N = 888$) completed measures of social anxiety, depression, relationship satisfaction, perceived social support, commitment, and dyadic trust. Results indicated that both social anxiety and depression were significantly inversely correlated with relationship satisfaction, perceived social support, and dyadic trust. However, hierarchical regression models revealed the variance in relationship satisfaction and dyadic trust to be more appropriately attributed to the influence of depression. Meta-analyses across all three samples revealed similar findings. In Study 2, 122 dyads ($n = 244$) recruited via Prolific Academic completed a series of measures of social anxiety, relationship satisfaction, perceived social support, and commitment over a 60-day time period. Longitudinal actor-partner analyses revealed partner, but not actor, depression predicted lower future relationship satisfaction and actor but not partner depression to predict lower perceived social support from one's spouse. Social anxiety was not a significant predictor of change over time in any observed relationship variables. Academic and clinical implications of these findings are discussed.

Keywords: social anxiety, depression, romantic relationships, satisfaction, social support, commitment, longitudinal, APIM

Summary for Lay Audiences

People facing difficulties with social anxiety tend to be fearful of social situations and avoid these situations as a method of reducing that fear. This pattern of fear and avoidance can cause problems between partners in romantic relationships. Many of those who experience social anxiety also experience a heightened degree of depression. Social anxiety and depression can appear to be very similar at surface level, because of this, research on how they impact interpersonal relationships needs to differentiate the effects of these two constructs. The present thesis looks at the unique influences of social anxiety and depression on relationship satisfaction, perceived social support, trust, and commitment in romantic relationships. In the first of two studies, three independent samples of 888 people completed online measures of social anxiety, depression, relationship satisfaction, perceived social support, commitment, and dyadic trust. Results showed that both social anxiety and depression were linked to lower relationship satisfaction, perceived social support, and dyadic trust. However, more precise statistical models showed that depressive symptoms were driving the lower levels of relationship satisfaction and dyadic trust. In Study 2, 122 couples completed a series of measures of social anxiety, relationship satisfaction, perceived social support, and commitment over a 60-day time period. Statistical models showed that one's partner's depression predicted lower future relationship satisfaction but your own depression did not affect your relationship satisfaction. However, own depression did predict viewing your partner as being less supportive.

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Table of Contents

<i>Abstract</i>	<i>ii</i>
<i>Summary for Lay Audiences</i>	<i>iii</i>
<i>Acknowledgements</i>	<i>iv</i>
<i>Chapter 1: General Introduction</i>	<i>1</i>
Social Anxiety	2
Cognitive-behavioral Model of Social Anxiety	2
Interpersonal impacts of social anxiety	3
Depression in social anxiety.....	5
Sub-Processes in Romantic Relationships	8
Relationship satisfaction.....	10
Social support	12
Trust.....	14
Commitment.....	15
Gaps in the Literature	15
Present Research	16
Study 1	17
Study 2	20
<i>Chapter 2: Study 1 Methods</i>	<i>24</i>
Participants	24
Measures	24
Relationship satisfaction.....	24
Social interaction anxiety scale	24
Depression.....	25
Trust.....	25
Global support	26
Commitment.....	26
Attention checks	27
Procedure	27
Data Analytic Strategy	27
<i>Study 1: Results</i>	<i>28</i>
Objective 1: To investigate the associations between social anxiety and romantic relationship functioning	28
Sample Characteristics	31
Objective 2: To differentiate the variance in relationship functioning attributable to social anxiety and depression	33
Hierarchical analyses of social anxiety	33
Influence of gender.....	36
Objective 3: To synthesize results across the three samples of the study	39
Meta-analytic results	39

Objective 4: To identify the association of brief measures of social anxiety with full-scale scores	39
<i>Study 1 Discussion</i>	41
Relationship Satisfaction.....	42
Social Support.....	43
Commitment	44
Dyadic Trust.....	45
Strengths and Implications.....	46
Limitations and Future Directions.....	47
Conclusions	49
<i>Chapter 3: Study 2.....</i>	50
<i>Methods</i>	50
Sample.....	50
Power.....	50
Recruitment.....	50
Participants.....	51
Measures	51
Procedure	54
Phase 1.....	54
Phase 2.....	55
<i>Study 2 Results.....</i>	55
Analytic Strategy	55
Preliminary Analyses.....	58
Objective 1: Examination of actor-partner effects of social anxiety and depression on romantic relationship functioning.....	61
Preliminary analyses	61
Cross-sectional APIM.....	61
Objective 2: Examination of causal effects of social anxiety and depression on romantic relationship functioning.....	65
Phase 1.....	65
Phase 2.....	65
Exploratory Analyses.....	72
<i>Study 2 Discussion</i>	74
Relationship satisfaction	75
Perceived Social Support.....	78
Commitment	80
Exploratory Analysis: Perceived Social Self-Efficacy	81
Strengths and Implications.....	82

Limitations and Future Directions	85
Conclusions	88
<i>Chapter 4: General Discussion.....</i>	<i>89</i>
<i>References.....</i>	<i>93</i>
<i>Appendices.....</i>	<i>110</i>
<i>Curriculum Vitae</i>	<i>121</i>

List of Tables

Table 1: Zero Order Correlations Between Study 1 Variables.....	34
Table 2: Characteristics of the Samples.....	36
Table 3: Predicting Relationship Satisfaction from Relationship Length, Social Anxiety, and Depression.....	38
Table 4: Predicting Perceived Social Support from Relationship Length, Social Anxiety, and Depression.....	39
Table 5: Predicting Commitment from Relationship Length, Social Anxiety, and Depression.....	41
Table 6: Predicting Dyadic Trust from Relationship Length, Social Anxiety, and Depression.....	42
Table 7: Meta-Analysis of Social Anxiety and Depression.....	44
Table 8: Descriptive Statistics for Study 2 Variables by Gender.....	63
Table 9: Study 2 Zero Order Correlations.....	64
Table 10: Cross-sectional actor partner effects of social anxiety and depression on romantic relationship functioning variables.....	67
Table 11: Effects of state social anxiety on next day relationship satisfaction.....	70
Table 12: APIM of gender, anxiety, and depression as predictors of next month relationship satisfaction.....	72
Table 13: APIM of gender, anxiety, and depression as predictors of next month perceived general social support.....	73
Table 14: APIM of gender, anxiety, and depression as predictors of next month perceived spouse social support.....	74
Table 15: APIM of gender, anxiety, and depression as predictors of next month commitment.....	75
Table 16: APIM of gender, anxiety, and depression as predictors of next month perceived social self-efficacy.....	77

Exploring the links between Social Anxiety and Depression in the Maintenance of Romantic Relationships

Chapter 1: General Introduction

Social Anxiety is a prevalent condition that exists on a continuum of severity; the high extreme of this continuum is represented by social anxiety disorder (SAD; Heimberg, Brozovich, & Rapee, 2010). SAD and subclinical levels of social anxiety are characterized by fear and avoidance of social situations (Clark & Wells, 1995; Rapee & Heimberg, 1997). The current literature identifies a broad link between social anxiety and many pronounced difficulties in interpersonal functioning and achievement (e.g., Schneider et al., 2002; Sparrevojn & Rapee, 2009; Torgrud et al., 2004).

The interpersonal difficulties experienced by individuals high in social anxiety vary according to the type of interpersonal relationship. The more central a relationship is to one's self-identity (e.g., spouse), the more attention will be devoted to that relationship, and the more that that relationship may impact one's mental health (Coombs, 1991; Cotten, 1999; Simon, 2002; Simon & Marcussen, 1999). It is these central, romantic relationships that often have the most pervasive influence on a person's life. The dissolution, or threat of dissolution, of these relationships is often met with the most distress. High levels of social anxiety are associated with difficulties forming and maintaining romantic relationships, which worsen as the intensity of the anxiety increases (Davidson, Hughes, George, & Blazer, 1994; Lampe, Slade, Issakidis, & Andrews, 2003; Wittchen, Fuetsch, Sonntag, Muller, & Liebowitz, 2000). Indeed, individuals reporting high levels of social anxiety are less likely to marry and more likely to divorce than are those experiencing lower levels of social anxiety. A subset of socially anxious individuals, however, do maintain long-term romantic relationships, but relatively little is known about the ways in which social anxiety may impact the overall quality and functioning of these

relationships. Complicating investigation of these phenomena is the presence of comorbid symptoms of depression, which have been elsewhere demonstrated to have similar effects on relationship functioning (Kessler et al., 2005).

Social Anxiety

Social anxiety has existed throughout human history (Burton, 1621) but has only been studied in depth for the past half century. From its first medical conceptualization as a specific phobia to its current place as an anxiety disorder in its own right, social anxiety has been subjected to considerable investigation (e.g., APA, 1980; Clarke & Wells, 1995; Liebowitz, 1985; Rapee & Heimberg, 1997; Schlenker & Leary, 1982). This work has culminated in a contemporary cognitive-behavioural model that exists as one of the most widely accepted conceptualizations of social anxiety today (Clarke & Wells, 1995; Rapee & Heimberg, 1997; Heimberg, Brozovich, & Rapee, 2010).

Cognitive-behavioral Model of Social Anxiety

The cognitive-behavioural model of social anxiety disorder posits that social anxiety, triggered by social stimuli, activates a perception of danger of behaving in a socially inadequate manner and that this will result in undesired and often catastrophic outcomes that center around social evaluations levelled by others (Clarke & Wells, 1995; Rapee & Heimberg, 1997; Heimberg, Brozovich, & Rapee, 2010). In addition, the model identifies low perceived control of anxious responses in social situations and a tendency to underestimate one's social skill (Hofmann, 2007). The result of this is an anticipation of social rejection (i.e., failure to meet the perceived requirements for the social interaction) and the enactment of behaviours (e.g., inhibiting self-disclosure, avoiding eye-contact) intended to reduce the likelihood of social rejection. Paradoxically, these behaviours are often generative of the outcomes that they were

enacted in order to prevent (Mellings & Alden, 2000; Rachmann, Grüter-Andrew, & Shafran, 2000; Wells et al., 1998).

The perpetuation of social anxiety is closely linked with one's mental representation of the self as seen by an audience (Heimberg, Brozovich, & Rapee, 2010; Wells & Papageorgiou, 1999; Wells, Clark, & Ahmad, 1998). In a given social interaction, individuals experiencing social anxiety use both external (e.g., body language of social other) and internal (e.g., subjective anxiety) cues to inform their evaluations of how they are perceived by the audience at hand. These assumptions are in turn evaluated against a perceived standard of performance that is constructed by the individual (i.e., expectations and social goals). Socially anxious individuals simultaneously perceive this standard to be unreasonably high and their social self-efficacy to be unrealistically low (Clark & Wells, 1995; Gaudino & Hebert, 2007). Therefore, the probability of negative consequences resulting from the social interaction is overestimated. This perceived social failure increases the cognitive and behavioural symptoms of anxiety and the process is renewed. The degree to which anxious thoughts or feelings are activated may vary by type of social relationship, with relationships of greater personal importance (e.g., romantic relationships) sharing a closer link to social anxiety and overall mental health (Coombs, 1991). Despite the centrality of romantic relationships to an individual's sense of self and overall mental health, there is little empirical research in this domain, relative to other social bonds.

Interpersonal impacts of social anxiety

Due to the inherently social nature of the disorder, the social experiences of persons with elevated levels of social anxiety deviate markedly from their non-anxious counterparts. Despite this, there are relatively few studies examining its interpersonal consequences and fewer still on romantic relationships (e.g., Whisman, 1999). Much of the existing literature on social anxiety lends its focus to the formation of new relationships or the quality of social interactions (e.g.,

Bruch & Pearl, 1995; Heerey & Kring, 2007). Research in this stream has consistently identified an overall difficulty in forming social relationships (e.g., friendships) and several specific areas of difficulty in social functioning. For example, when social anxiety is triggered during an interaction, an increase in attention to socially-threatening stimuli and one's own behaviour inhibits attention and concentration, causing the social interaction to become fragmented (for a review see Heinrichs & Hofman, 2001). The degree to which social anxiety impacts interpersonal functioning and success (e.g., forming new friendships) has been demonstrated to be attributable to the overall intensity of social anxiety experienced, rather than the specific social anxieties that an individual may have (e.g., conversing with strangers, public speaking; Clark & Wells, 1995).

The degree of importance that is placed on a particular relationship may be an important consideration in the study of the interpersonal consequences of social anxiety. Romantic relationships represent a uniquely powerful bond that is more closely linked to mental health outcomes than other interpersonal relationships (e.g., Bennett, 2005; Coombs, 1991). Research has shown the broad impacts of social anxiety to be present within the contexts of romantic relationships. In a study of communication patterns in socially anxious couples, socially anxious participants displayed more negative behaviours and fewer positive behaviours than did non-anxious participants (Wenzel, Graff-Dolezal, Macho, & Brendle, 2005). Furthermore, romantic relationships are regarded as extensions of the self and as such hold a more central importance to an individual's self-worth, which may indicate the presence of a closer link to one's mental health than would more peripheral relationships (Aron, Lewandowski, Mashek, & Aron, 2013).

The ways by which social anxiety severity influences romantic relationships is broadly reflected in poorer long-term relational outcomes. Key among these is divorce. The likelihood of divorce increases alongside increases in social anxiety, with those above the clinical cut-off for

social anxiety being 2.4 times more likely to divorce than their non-anxious counterparts (e.g., Davidson, Hughes, George, & Blazer, 1994; Lampe, Slade, Issakidis, & Andrews, 2003; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992; Wittchen, Fuetsch, Sonntag, Muller, & Liebowitz, 1999).

Despite the presence of established associations between social anxiety and romantic relationship success (e.g., maintenance) or failure (e.g., divorce), relatively little is known about how specific aspects of romantic relationship functioning may be impacted by social anxiety. Less still is understood about the mechanisms of action through which social anxiety may cause undesirable long-term outcomes. Overall relationship satisfaction (i.e., the subjective evaluation of the favourability of one's romantic relationship) or quality and social anxiety have been investigated in several empirical studies but findings have been inconclusive (e.g., Porter & Chambless, 2014; Wenzel, 2002; Whisman, 1999). Social support has been demonstrated to be inversely associated with social anxiety in several studies (e.g., Porter & Chambless, 2016). Less explored constructs such as commitment to partner and dyadic trust have close theoretical links to social anxiety but no empirical support to date. These areas of research are not only underexplored but also complicated by the need to differentiate the influence of social anxiety from that of comorbid psychopathologies with similar presentation, such as depression. Indeed, the influence of comorbid depression has been identified as one potential source of the inconsistencies observed in the existing literature (e.g., Whisman, 1999).

Depression in social anxiety. The majority of individuals with SAD will receive one or more additional psychiatric diagnoses in their lifetime (Bruce et al., 2005; Kessler, Chiu, Demler, & Walters, 2005). Between 15% and 21% of those with a diagnosis of SAD will have comorbid Major Depressive Disorder (MDD), with SAD preceding MDD in 65% of comorbid cases (Kaufman & Charney, 2000). SAD and MDD share considerable overlap of symptom expression

despite having differing underlying causes. For example, social isolation is commonly observed occurrence in both SAD and MDD. However, for the socially anxious individual, social isolation is driven by a desire to reduce the anxiety experienced in social situations via behavioural avoidance. For the depressed individual, social isolation may be a byproduct of a loss of interest in social others.

In romantic relationships, depression is associated with a tendency to perceive partner interactions as overly negative and engagement in self-blame following interactions (Jackman-Cram, Dobson, & Martin, 2006; Whisman, Weinstock, & Uebelacker, 2002). This bias in cognition closely mirrors that observed in social anxiety, described above. Indeed, several studies have observed corresponding self-criticism among both socially anxious and depressed individuals (e.g., Rosser et al., 2003). In the case of depression, feelings of failure and engagement in self-blame following interactions may be attributable to feelings of low self-worth, whereas in the case of social anxiety, feelings of social failure are attributable to an adoption of the perspective of a critical observer when evaluating one's social performance (Spurr & Stopa, 2002; Stopa & Clark, 1993).

Relational dysfunction and depression. Relational outcomes observed for depressed individuals closely mirror those of their socially anxious counterparts and may be more robust than the associations between social anxiety and relationship outcomes. Compared to the general population, depressed individuals are nine times more likely to divorce whereas socially anxious individuals are 2.4 times more likely to divorce (Kessler et al., 2003; Lampe, Slade, Issakidis, & Andrews, 2003). Research on the divorce rate among depressed individuals has benefitted from a greater level of attention than research on social anxiety and divorce. This research has illuminated several potential pathways from depression to divorce.

Researchers have observed an overall deterioration of marital quality among depressed

individuals (Gotlib & Whiffen, 1989). Furthermore, this deterioration appears to be unaffected by clinical intervention that targets depression itself. Adding context to this change in marital quality is evidence that interpersonal dysfunction in depressed individuals persists outside of diagnostic major depressive episodes (Davila, Stroud, & Starr, 2009). Furthermore, despite the general buffering effects that the social support of romantic partners provides against stressors, individuals reporting heightened levels of depression perceive lower levels of social support to be available from their romantic partners (Porter & Chambless, 2014).

In a similar fashion to that of social anxiety, the depression and romantic relationships literature reveals several general findings that center on increased risk of relational dissolution and decreased satisfaction (e.g., O’Leary, Christian, & Mendell, 1999). However, in both bodies of literature, the other psychopathology is often neglected. This represents a significant gap in the existing literature; specifically, the unique contributions of social anxiety and depression in observed deficits in romantic relationship functioning are largely unknown. Furthermore, despite differences in the underlying psychopathologies themselves, social anxiety and depression share several features that are implicated in romantic relationship functioning (e.g., social withdrawal, overly attuning to negative inhibition of self-disclosure). These similarities, paired with the high rate of comorbidity of these illnesses, underscore the necessity of research to differentiate the unique contributions of both social anxiety and depression in romantic relationship functioning. To date, the two constructs are rarely measured simultaneously, with many studies lending their sole focus to one or the other.

Summary. Understanding the nature of social anxiety represents an important first step in identifying its impacts on romantic relationships. An equally important step involves a robust examination of the central components of these bonds. Specifically, which factors provide the best indication of the quality and likelihood of successful maintenance (i.e., non-dissolution) of

romantic relationships. Endeavours to bring new understanding to this field must be drawn from a strong foundation of theoretical understanding of both the nature of social anxiety and of sub-processes in romantic relationship functioning.

Sub-Processes in Romantic Relationships

The existing literature establishes elevated presence of undesirable long-term romantic relationship outcomes among individuals experiencing high levels of social anxiety and/or depression (e.g., Kessler et al., 2003; Lampe, Slade, Issakidis, & Andrews, 2003). The success or failure of a romantic relationship is contingent on a variety of unique sub-processes within the relationship but the impacts of social anxiety on these sub-processes are largely unknown.

Relationship satisfaction is one of the most robust predictors of successful relationship maintenance (e.g., LeBel & Campbell, 2009). Social support, a unique but related construct, has also been identified as a reliable predictor of relationship maintenance (Coombs, 1991). Both relationship satisfaction and social support have received a considerable amount of attention in the broader romantic relationships literature. However, the manner in which social anxiety may impair these sub-processes is less well explored.

Dyadic trust and commitment to one's relational partner represent two additional unique but related constructs central to the successful maintenance of romantic relationships. Both of these constructs vary over the course of a romantic relationship and have significant bearing on the maintenance or dissolution of that relationship (Larzelere & Huston, 1980; Rempel, Holmes, & Zanna, 1985). A major source of variance in trust and commitment lies within the ways that an individual perceives the self and of others (including relationship partners; Simpson, 2007). However, very little research has explored the ways that individual differences in social anxiety or depression may influence these relational sub-processes.

Each of relationship satisfaction, social support, dyadic trust, and commitment are

associated with stable interpersonal dynamics and prosocial perceptions of one's partner that are at odds with the experience of social anxiety (Amato, Booth, Johnson, & Rogers, 2007; Rempel, Ross, & Holmes, 2001; Rhoades, Stanley, & Markman, 2010). Furthermore, relational sub-processes are influenced not only by the features of the individual, but also by the attitudes, beliefs, and feelings of their partners (Thibaut & Kelly, 1959). Indeed, the mutual influence that romantic partners have on one another is pervasive across all aspects of the romantic relationship, far beyond those of interest in the present study. As a result, investigation of these sub-processes should make efforts to evaluate the interdependence that exists between relational partners (Berscheid, 1999).

Although there are several investigations of the ways that social anxiety and depression are associated with romantic relationship functioning, very few of these adequately account for the interdependence inherent in romantic dyads. The best-practice methodological approach to model the interdependence between members of a dyad (e.g., romantic partners) is the Actor-Partner Interdependence Model (APIM; Kashy & Kenny, 2000; Kenny, 1996; Kenny & Cook, 1999). The APIM provides researchers with a means to investigate the mutual influence that two individuals (e.g., romantic partners) have on one another. This may take the form of a direct association between a characteristic of an individual's partner and a characteristic of the individual him/her-self (i.e., a partner effect). Even when a direct partner effect is not hypothesized, use of the APIM presents a meaningful way to control for the statistical influence of partner characteristics. Such approaches facilitate a more meaningful interpretation of within-persons results (i.e., actor effects) due to the interdependence that is inherent in romantic relationships.

Very few studies have attempted to investigate the mutual influence of romantic partners in the social anxiety and depression literatures. Among the studies in this field that do examine

characteristics of both partners, most do not adequately model this interdependence. For example, in an investigation of the association between relationship satisfaction and social anxiety, Porter and Chambless (2014) analyzed the degree to which satisfaction in one member was correlated with that individual's social anxiety and the social anxiety of his or her partner. In this particular study, these associations were modelled as independent from one another. As such, interesting questions regarding the interdependence of actor and partner in these variables remain. This pattern of analyses is quite in the existing body of literature in social anxiety and depression, and romantic relationships functioning.

Relationship satisfaction. Relationship satisfaction is a hallmark indicator of overall relationship quality (Gottman & Levenson, 1992; Hendrick, 1988). The degree to which one is subjectively satisfied with one's romantic relationship depends on several factors, including evaluations of one's own relationship in comparison to those of others, the perception of problems within the relationship, and how well a partner meets one's needs (Hendrick, Dicke, & Hendrick, 1998). The parallels between cognitive features of social anxiety and these factors that drive relationship satisfaction may be seen upon close inspection. Relationship satisfaction is enhanced via self-disclosure, expression of emotion, open communication, and shared pleasurable experiences (Kashdan, Volkmann, Breen, & Han, 2007). The presence of overly and unrealistically negative self-perception may impact one's ability to make positive social comparisons. Self-focused attention and the perception of others as overly hostile are closely linked with the perceptions of problems within the relationship. Specifically, it seems likely that the failure to identify positive cues characteristic of self-focused attention and subsequent hypervigilance to negative cues may generate a perception that the relationship has more bad than good. Although there are theoretical links between social anxiety and relationship satisfaction, empirical research has struggled to find supporting evidence.

The common features of social anxiety and relationship satisfaction indicate the possible presence of an inverse association between these constructs. However, research investigating this association has yielded mixed and inconclusive results. For example, the national comorbidity survey (NCS; Whisman, 1999) demonstrated that greater social anxiety predicts higher levels of marital dissatisfaction, but only when comorbid diagnoses are not statistically controlled. Other researchers have identified significant associations between relationship satisfaction and social anxiety in females, but not in males (Porter & Chambless, 2014). There has been additional research investigating constructs related to relationship satisfaction (e.g., marital adjustment that have also found significant associations with social anxiety (e.g., Filsinger & Wilson, 1983). Other studies have observed a negative trend between social anxiety and relationship satisfaction that failed to cross the threshold of significance (e.g., Wenzel, Graff-Dolezal, Macho, & Brendle, 2005). Montesi et al. (2013) identified an indirect pathway from social anxiety to sexual satisfaction, but not relationship satisfaction. It is important to note that none of these studies utilized the APIM.

Failure to adequately model actor and partner effects presents one possible explanation for the inconsistency in results observed across the above-mentioned studies. The interdependence of relationship satisfaction has been established in prior research. Given the degree to which this mutual influence is present, failure to include it in analyses represents a major limitation in the interpretability and generalizability of findings. Another potential explanation for the variation of findings observed in past studies of relationship quality and social anxiety are the widely varied approaches to investigation (e.g., measures used, data source [dyadic or single partner], population [clinical, non-clinical], statistical control for comorbid psychopathology). Differences in methods and statistical power may partially account for the mixed results previously mentioned, despite similarity in conceptualization of constructs and

interpretation of underlying theory.

The theoretical rationale for a hypothesized association between relationship satisfaction and social anxiety is clear: the fear of social situations and evaluation, tendency to avoid social interactions, inhibition of self-disclosure and emotional expression, and perceptions of others as overly critical or hostile may impede the normative development of relationship satisfaction. Comorbid psychopathology may further complicate investigations of the associations between relationship satisfaction and social anxiety. Some disorders (e.g., depression) have similar phenotypic expressions to social anxiety (e.g., social isolation), despite having disparate underlying causes (Beidel, 1998; Edvardsen et al., 2009). For example, depression and social anxiety may both present with social withdrawal, but the driving forces behind this withdrawal are distinct for each disorder (Rubin & Burgess, 2001; Sanders, Field, Miguel, & Kaplan, 2000). Therefore, accounting for the presence of comorbid depressive symptomatology is crucial when studying associations between social anxiety and relationship satisfaction.

Social support. Social support in romantic relationships is comprised of the supportive behaviours received by a member of a dyad (i.e., received support; Haber, Cohen, Lucas, & Baltes, 2007) and the subjective satisfaction with the amount and availability of support (i.e., perceived support; Sarason, Sarason, & Pierce, 1990; Wills, 1991). Support from a romantic partner may take many forms (e.g., expressions of love, compliments, expression of willingness to help) and individuals who perceive greater social support to be available, particularly in times of distress, report greater personal and relational (e.g., Coombs, 1991; Cramer, 2004; Cutrona, Suhr, & MacFarlane, 1990; Melrose, Brown, & Wood, 2015; Pasch & Bradbury, 1998; Umberson, Chen, House, Hopkins, & Slaten, 1996).

The construct of social support is a dynamic process. The support that is received or perceived from a romantic partner in turn impacts the support that is reciprocated (Porter &

Chambles, 2016). If Partner A perceives a low level of support provided by Partner B, Partner A will in turn provide less support to Partner B, creating a downward spiral that leaves neither partner feeling supported. Social support is an important factor in relationships, and a perceived dearth of support can have unintended negative consequences for the dyad (e.g., Cohen, 2004; Prati & Pietrantoni, 2010).

Researchers have provided some explanation of how social anxiety may influence perceptions of social support by romantic partners. Specifically, there are several indications that social anxiety affects perceptions of support in a manner distinct from other psychopathologies. For example, Torgrud et al. (2004) reported a negative association between social anxiety and overall perceptions of support, that may be attributable to the self-focused attention and perceptions of others as hostile that are characteristic of social anxiety. At a conceptual level, differences in perceived social support fit well with the cognitive biases characteristic of social anxiety (e.g., perceptions of others as hostile; Leary, 2010; Heimberg, Brozovich, & Rapee, 2010; Rapee & Heimberg, 1997; Stopa & Clark, 1993).

The perception of available social support may be particularly salient in stressful situations (Cohen & Hoberman, 1982). The existing literature examining social anxiety and social support generally focuses on support perceptions from all sources simultaneously and in non-specific circumstances. There is some indication that the value of instrumental or functional support varies between broader social systems and specific interpersonal relationships (Cohen et al., 1985). The perceived availability of social support in distressing situations and from varied sources represents an important area of investigation as perceived unavailability of support in times of heightened need (e.g., in the presence of a family crisis) may amplify the negative impact of the situation. It is therefore important to investigate the association between social anxiety and social support in domains that may have particularly strong impact.

Involvement in a romantic relationship also presents a unique set of questions regarding the links between social anxiety and perceived social support. Much of the existing literature examines support across broad social groups. A romantic partner is often a primary source of social support and introduces the possibility of social support not available to those without a romantic partner. It is not yet well understood what, if any, differences exist between the support perceived to be available from romantic partners versus from a broader social circle.

Trust. Dyadic trust involves the belief that one's partner will act in the best interests of the dyad (Deutsch, 1973; Simpson, 2007a, 2007b). Traits and behavioural tendencies that exist outside of the relationship (e.g., perceptions of intent, previous propensity to trust) play a key role in the development of trust within the relationship. Dyadic trust is a function of both a partner's propensity to trust and the degree to which he or she perceives the opposite partner to be trustworthy. High levels of trust are associated with optimism, assumptions of the benevolence of others, and expectations of prosocial behaviour from romantic partners (Rempel, Ross, & Holmes, 2001). These assumptions and expectations are diametrically opposed to the assumptions and expectations characteristic of social anxiety (e.g., perceptions of others as hostile, expectation of critical evaluation by others; Leary, 2010; Heimberg, Brozovich, & Rapee, 2010; Rapee & Heimberg, 1997). Social anxiety involves biased working models of others that may promote pessimistic views of their benevolence.

Prior research in the romantic relationships literature indicates that pre-existing biases in trust may impair the quality of relationships and how much that relationship quality fluctuates over short periods of time (e.g., Campbell, Simpson, Boldry, & Rubin, 2010). Although the link between dyadic trust and relationship quality has been established, studies on dyadic trust have not examined social anxiety. Conflicting relational behaviours and differences in relationship expectations can impair the establishment of dyadic trust (Towner, Dolcini, & Harper, 2015).

Individuals typically have stable tendencies toward trust or distrust. People high in chronic trust are characterized by optimism, assumptions of the benevolence of others, and expectations of prosocial behaviour from their partners (Rempel, Ross, & Holmes, 2001). Additionally, such individuals have balanced views of relationships and are open to assimilating new information into their current view of their own relationships (Simpson, 2007a, 2007b). Socially anxious individuals may trust their romantic partners less due to the biased models of perception that lead to focus expectations of personal social failures and the unwillingness of others to accommodate or to have benevolent intentions.

Commitment. Romantic relationship commitment is an amalgam of four factors: (1) psychological attachment, (2) desire for relationship longevity, (3) long-term relationship orientation, and (4) availability of attractive alternatives (Rusbult & Buunk, 1993). The degree to which these four factors are endorsed has a strong, positive association with relationship commitment and monogamy (Buunk & Bakker, 1997). Using this framework, we may anticipate that low levels of endorsement for these four factors is indicative of lower levels of commitment. Social anxiety may uniquely influence psychological attachment to a partner and the ability to find an alternate partner (Darcy, Davilla, & Beck, 2005). Although behavioural avoidance is a key feature of social anxiety, researchers have found evidence that high social anxiety is associated with elevated interpersonal dependence and higher rates of dependent personality disorder (Bornstein, 1995; Darcy, Davilla, & Beck, 2005). Furthermore, these associations may be unique to individuals involved in romantic relationships, perhaps due to the distinct significance that is attributed to these bonds. The congruence between social anxiety and three of the four factors of commitment described by Rusbult and Bunnk (1993) suggests a potential association between social anxiety and enhanced relational commitment.

Gaps in the Literature

The existing literature on social anxiety and romantic relationship functioning suggests a series of difficulties experienced by those high in social anxiety. These difficulties appear to play a role in lower rates of marriage and higher rates of divorce observed among individuals high in social anxiety (Lampe, Slade, Issakidis, & Andrews, 2003). Although there are theoretical links between the symptoms of social anxiety (e.g., social withdrawal, biased perceptions of the self and others) and romantic relationship functioning, empirical research has utilized varied methodological approaches and has yielded inconsistent results. There is an absence of replication and reproduction of research methods and results in this field. The first step in addressing these gaps is to conduct research with adequate statistical power and to attempt to replicate findings across multiple samples. The second step is to differentiate the influence of social anxiety from that of depression, which is a highly comorbid psychopathology. Third, the mutual influence of both partners in a dyad should be accounted for in analyses in order to properly model the interdependence that exists between romantic partners. Finally, longitudinal designs are best suited to identify the over-time effects of social anxiety and depression that may play a role in the increased likelihood of relational dissolution observed among those experiencing heightened social anxiety and/or depression.

Present Research

The primary purpose of the present research is to provide a methodologically rigorous investigation of the associations between social anxiety and specific sub-processes of romantic relationship functioning in high-powered and diverse samples of adults in long-term, monogamous relationships. This research aims to clarify the ambiguities and inconsistencies in the existing literature identified above. Due to high rates of comorbidity and similarity in phenotypic expression between depression and social anxiety, associations between depression

and measures of relationship quality will also be assessed, and depressive symptomatology will be statistically controlled for in relevant analyses.

The present research is carried out across two separate studies. The first of these aims to identify meaningful associations between social anxiety, depression, and romantic relationship functioning. The second study aims to identify actor-partner effects in social anxiety, depression, and romantic relationship functioning.

Study 1. Study 1 of the present thesis employs a cross-sectional design to investigate associations between social anxiety and each of four sub-processes in romantic relationship functioning that share similarities with social anxiety (i.e., relationship satisfaction, commitment, dyadic trust, and perceived social support; e.g., Clark & Wells, 1995; Porter & Chambless, 2014; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005; Whisman, 1999). Furthermore, this study uses statistical methods to differentiate the influence of social anxiety from that of depression. Finally, three independent samples are collected in order to investigate the replicability of findings.

Objective 1: To investigate the associations between social anxiety and romantic relationship functioning. The first objective of this study is to identify the associations between social anxiety and each of relationship satisfaction, commitment, dyadic trust, and perceived social support across three independent samples. Past studies have inconsistently identified associations between social anxiety and relationship satisfaction as either significant in an inverse direction or non-significant (e.g., Filsinger & Wilson, 1983; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005; Whisman, 1999). The operationalization of relationship satisfaction incorporates open and direct communication, self-disclosure, and engagement in outside activities (Spanier, 1976). The inherent fear and avoidance of social anxiety inhibits

interpersonal self-disclosure and engagement in social activities, it is therefore hypothesized that social anxiety will be inversely associated with relationship satisfaction (Hypothesis 1).

People high in chronic trust are characterized by optimism, assumptions of the benevolence of others, and expectations of prosocial behaviour from their partners (Rempel, Ross, & Holmes, 2001). Additionally, these individuals have balanced views of relationships and are open to the assimilation of new information to their current view of their own relationships (Simpson, 2007a, 2007b). Socially anxious individuals may have less trust toward their romantic partners due to the biased working models of others that they have. These biases favour memories and expectations of personal social failures and the unwillingness of others to accommodate or to have benevolent intentions. It is therefore hypothesized that social anxiety will be inversely associated with dyadic trust (Hypothesis 2)

Similar to relationship satisfaction, the fundamental structure of social support suggests that this construct is likely influenced by social anxiety. Indeed, the withdrawal and avoidance behaviours characteristic of social anxiety likely reduce opportunities for social support and the cognitive biases characteristic of social anxiety (e.g., perceptions of others as overly hostile and critical) may hinder an individual's ability to correctly identify support that is provided or estimate support that is available. Prior research identifying significant discrepancies between support perceived and received by socially anxious individuals supports this notion (Cuming & Rapee, 2010; Torgrud et al., 2004). Study 1 study investigates an amalgam of social support perceived from both romantic and non-romantic social sources (i.e., global social support). It is expected that higher social anxiety will be associated with significantly lower perceived social support (Hypothesis 3).

Commitment to a romantic partner is a function of several factors including availability of attractive alternatives and psychological attachment to a romantic partner (Levinger, 1976;

Rusbult, 1983; Rusbult et al., 1991). High social anxiety is associated with fewer available alternative partners and increased psychological attachment or dependence on the relationship (Darcy, Davila, & Beck, 2005). Therefore, it is anticipated that commitment be positively associated with social anxiety (Hypothesis 4).

Objective 2: To differentiate the contributions to relationship functioning of social anxiety and depression. The existing literature on social anxiety and relationship functioning is fraught with inconsistent findings. One potential source of romantic relationship disharmony is the impact of comorbid psychopathology. Indeed, some differences in the relationship satisfaction literature may be attributable to the inclusion or exclusion of comorbid psychopathology in statistical analyses (e.g., Whisman, 1999). The most common comorbidity of SAD is Major Depressive Disorder (Kessler et al., 2004). Furthermore, several symptoms of each disorder appear, at surface level, to be similar (e.g., social withdrawal). As such, it is anticipated that depressive symptoms will share associations with study variables of relationship functioning. It is expected that both social anxiety and depression will account for unique incremental variance in each of relationship satisfaction (Hypothesis 5), dyadic trust (Hypothesis 6), perceived social support (Hypothesis 7), and commitment (Hypothesis 8).

Objective 3: To synthesize results across the three samples of the study. The above-mentioned inconsistencies in the literature highlight the need for replication and reproducibility of findings. For this reason, three independent samples are collected in the present research. Results of analyses testing Hypotheses 5-8 will be meta-analyzed to determine an estimate of each effect. Objective 3 will be pursued in an exploratory fashion and as such, directional hypotheses are not made (Hypothesis 9).

Objective 4: To establish statistical correspondence of brief measures of social anxiety with full-scale scores of social anxiety. Assessment of social anxiety in non-clinical populations

has been approached with varied measurement tools. One of the most commonly used in the romantic relationships literature is the full-scale 20-item Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). An abbreviated 6-item version of this scale has since been developed and validated elsewhere (SIAS-6; Peters, Sunderland, Andrews, Rapee, & Mattick, 2012). However, the psychometric properties of the abbreviated scale have not been investigated in online research populations who, at the group-level, are more socially anxious than are their offline counterparts (Bargh & McKenna, 2004; Shapiro, Chandler, & Mueller, 2013; Shepherd & Edelmann, 2005; Stevens & Morris, 2007; Weidman et al., 2012). Abbreviated measures have considerable utility in online research as a means to reduce the burden of the time commitment involved in participation. Therefore, the convergent validity and internal consistency of the SIAS-6 are investigated here. The SIAS-6 is expected to correlate strongly ($\alpha > .80$) with the full scale SIAS (Hypothesis 10) and will demonstrate good internal consistency ($\alpha > .80$; Hypothesis 11).

Study 2. Study 2 employs a longitudinal dyadic methodology to facilitate investigation of both actor and partner effects of social anxiety on variables of interest. The longitudinal approach employed allows for inferences of the causal roles of both depression and anxiety in romantic relationship functioning. The purpose of Study 2 is to expand upon the findings of Study 1 and provide novel insights into the ways in which social anxiety and depression impact both partners of heterosexual romantic dyads.

Objective 1: Cross-sectional examination of actor-partner effects of social anxiety and depression on romantic relationship functioning. Given the interdependent nature of romantic relationships, exploration of the mutual influence of romantic partners is an important step in understanding relationship relevant phenomena (Kashy & Kenny, 2000; Kenny, 1996; Kenny & Cook, 1999). However, the existing literature has not investigated the phenomena of social

anxiety and depression in romantic relationships through an actor-partner model. As stated above, both social anxiety and depression have been linked to reduced relationship satisfaction, lower perceived social support from one's partner, and may impact the degree of commitment to one's romantic partner (e.g., Gotlib & Whiffen, 1989; Porter & Chambless, 2014). One study explored the associations between actor and partner social anxiety and relationship satisfaction, finding significant gender differences, but did not utilize the APIM to fully account for interdependence (Porter & Chambless, 2014). As women are more strongly impacted by social anxiety, investigation of the effects of gender is an important consideration (for review see Asher, Asnaani, & Aderka, 2017).

Following the rationale outlined for Study 1, the first objective in Study 2 is to examine the impacts of both actor and partner social anxiety and depression on relationship satisfaction, commitment, perceived general social support, and perceived partner social support at a single time point. The mutual influence of both members of the dyad is addressed using the APIM. In line with findings from Study 1, it is anticipated that both actor and partner depression will be inversely associated with relationship satisfaction (Hypothesis 12), perceived general social support (Hypothesis 13), and perceived spouse social support (Hypothesis 14). Social anxiety is expected to be positively associated with commitment whereas depression is anticipated to be inversely associated with commitment (Hypothesis 15). Participant gender will be included as a covariate in all analyses but is not hypothesized to relate to outcome variables in a meaningful way. As the symptoms of social anxiety have a more severe functional impact on women than on men, it is anticipated that social anxiety and gender will interact in the prediction of relationship satisfaction such that women will experience less relationship satisfaction in the presence of social anxiety (Asher, Asnaani, & Aderka, 2017; Hypothesis 16). Similarly, as depression has been demonstrated to be more common among women than men a significant interaction

between gender and depression in the prediction of relationship satisfaction is hypothesized (Nolen-Hoeksema, 2001; Hypothesis 17).

Objective 2: Examination of predictive effects of social anxiety and depression on romantic relationship functioning. Longitudinal APIM approaches are employed to test the impacts of social anxiety and depression on the above aspects of relationship functioning over time. Cross-lagged APIMs will be run to determine the unique predictive value of both actor and partner social anxiety and depression on each of relationship satisfaction, perceived general social support, perceived spouse social support, and commitment. Past research has primarily relied on cross-sectional methods of investigation (e.g., Montesi et al., 2013; Porter & Chambless, 2014). Longitudinal approaches to investigation will provide novel insights regarding the ways that social anxiety and depression may precipitate changes in the functioning of romantic relationships.

Objective 2 is pursued across two phases. In Phase 1, the influence of day-to-day fluctuations in social anxiety on relationship satisfaction are assessed. Past research has shown state social anxiety to fluctuate within a 24-hour timeframe and can adversely impact the perceived quality of the relationship (Kashdan et al., 2014). The present study will provide the first dyadic investigation of this effect. It is anticipated that increases in actor and partner social anxiety will be inversely associated with next day relationship satisfaction (Hypothesis 18).

In Phase 2, more long-term associations between anxiety and depression, and broader relationship functioning are investigated over a three-month period. Specifically, the unique influences of both actor and partner social anxiety and depression on future relationship satisfaction, perceived general social support, perceived spouse social support, and commitment are investigated. Data are collected at three monthly intervals. The link between social anxiety and relationship satisfaction has not been reliably demonstrated despite theoretical links between

these two constructs (e.g., Porter & Chambless, 2014; Whisman, 1999). It is hypothesized that actor social anxiety will be inversely associated with next month relationship satisfaction (Hypothesis 19). Prior research has linked one's own depression with poor relationship satisfaction and the depression of a close other with impairment to the overall quality of the relationship (e.g., O'Leary, Christian, & Mendell, 1999). Actor and partner depression are anticipated to be inversely associated with next month relationship satisfaction (Hypothesis 20). Actor social anxiety is hypothesized to be inversely associated with next month perceived social support (Hypothesis 21).

Both social anxiety and depression have been linked to perceptions of social support as unavailable (Cuming & Rapee, 2010; Cramer, 2004). In the case of social anxiety, this is driven by a perception of others as overly critical and lacking concern for the wellbeing of others (Clark & Wells, 1995). In the case of depression, this association may be driven by a tendency to excessively seek reassurance and support due to feelings of isolation and abandonment that may not be reflective of their reality (Starr & Davila, 2008). In the prior literature, social support is generally examined under a single umbrella (i.e., the total support available from all social others). Similarly, it is hypothesized that actor social anxiety (Hypothesis 22) and actor depression (Hypothesis 23) will be associated with lower perceived social support. Exploratory analyses will be conducted to examine the links between social anxiety and depression, and spouse-specific social support (i.e., the social support available solely from one's spouse).

Social anxiety is associated with reduced availability of potential romantic partners and increased dependence on any relationships that are formed (Darcy, Davila, & Beck, 2005). Commitment has been elsewhere shown to decrease in the presence of attractive alternatives (e.g., Levinger, 1976; Rusbult, 1983; Rusbult et al., 1991). Therefore, it is anticipated that commitment be positively associated with social anxiety (Hypothesis 24).

Chapter 2: Study 1 Methods

Participants

An *a priori* power analysis using G-Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) indicated that each sample required $n = 176$ to achieve 95% statistical power ($1 - \beta$) for a multiple linear regression model with three predictors, an anticipated effect size of $f^2 = .10$ (small), and $\alpha = .05$. Three independent samples ($n = 315$; $n = 339$; $n = 433$; $N = 1011$) were drawn from Amazon's Mechanical Turk (MTurk) at three different time periods. Across the three samples, 195 participants failed the attention checks embedded within the survey and were removed from the study leaving a final $N = 888$ (Sample one $n = 288$; sample two $n = 267$; sample three $n = 337$; 53.7% female; $M_{\text{age}} = 35.09$ years). All participants reported currently being engaged in a monogamous romantic relationship at time of participation. Participants were required to have demonstrated good standing in previous MTurk participation (i.e., 95% approval rating) and were only permitted to participate in one of the three samples to ensure independence of data.

Measures

Relationship satisfaction. The Relationship Assessment Scale (RAS; Hendrick, Dicke, & Hendrick, 1998) is a seven-item self-report measure used to assess relationship satisfaction in individual members of romantic dyads (e.g., *How well does your partner meet your needs*). This scale uses a 7-point Likert response mechanism (1 = *not at all*, 7 = *very well*). The RAS has demonstrated acceptable reliability, and is correlated with other established measures of love and relationship quality such as the Dyadic Adjustment Scale ($r = .80 - .88$; Hendrick, Dicke, & Hendrick, 1998). In the present sample, observed internal consistency was strong (Cronbach's $\alpha = .85$).

Social interaction anxiety scale. The Social Interaction Anxiety Scale (SIAS; Mattick &

Clarke, 1998) is a measure to evaluate the level of distress individuals experience during interpersonal contact. Items deal specifically with worries of poor social performance and negative judgements in social interactions. This 20-item measure uses a five-point Likert response mechanism to denote level of agreement with each item statement (e.g., *I am tense mixing in a group*), ranked from zero to four (0 = *not at all*; 4 = *extremely*). Strong psychometric properties were reported in the initial validation study with test-retest reliability of $\alpha = .92$ and strong discriminant validity (Mattick & Clarke, 1998). SIAS scores correlate with established measures of social anxiety and fear of negative evaluation, providing evidence of convergent validity (Mattick & Clarke, 1998). Comorbid mood disorders do not have a significant impact on SIAS scores (Brown et al., 1997). The internal consistency coefficient obtained for the present sample indicated strong reliability ($\alpha = .96$).

Depression. The Zung Self-report Depression Scale (SDS; Zung, 1965) is a 20-item (e.g., *I feel down-hearted and blue*) self-report measure of affective, psychological, and physiological symptoms of depression. The scale uses a 4-point Likert response mechanism (1 = *a little of the time*; 4 = *most of the time*) where participants rate degree to which symptoms (e.g., *I feel down-hearted and blue*) are experienced. The SDS correlates strongly with related depression scales such as the Beck Depression Inventory 2 ($r = .68$) and the Depression Anxiety Stress Scale ($r = .78$) and has strong sensitivity in determining depression severity (Biggs, Wylie, & Ziegler, 1978; Dunstan, Scott, & Todd, 2017; Shafer, 2006). The SDS is particularly well-suited to investigation of depression as a continuous variable due to its exceptional sensitivity (Dunstan, Scott, & Scott, 2017). The internal consistency coefficient obtained for the present sample indicated strong reliability ($\alpha = .88$).

Trust. The Dyadic Trust Scale (DTS; Larzelere & Huston, 1980) is an 8-item (e.g., *I feel that I can trust my partner completely*) self-report measure of trust of a romantic partner, defined

as belief in a partner's honesty and benevolence. The scale uses a seven-point likert scale response mechanism (i.e., 1 = *Strongly disagree*; 7 = *Strongly agree*). Inter-item correlations ranges are high (r 's = 0.72-0.89). There is evidence of convergent validity between the DTS and other measures of trust and love ($r = .51 - .58$; Larzelere & Huston, 1980). The internal consistency coefficient obtained for the present sample indicated strong reliability (Cronbach's $\alpha = .94$).

Global support. The Interpersonal Support Evaluation List – General Population (ISEL; Cohen & Hoberman, 1983; Cohen, Mermelstein, Kamarck, & Hoberman, 1985) contains 40 items to assess perceptions of the availability of current social support in distressing situations. Items consist of statements indicating the availability of support in different situations in which support may be expected or desired (e.g., *There is no one that I feel comfortable to talking about intimate personal problems*). Positive correlations with previous measures of social support (e.g., Inventory of socially supportive behaviours, $r = .46$) provides evidence of convergent validity with other measures of social support (Cohen & Hoberman, 1983). The internal consistency coefficient obtained for the present sample indicated strong reliability (Cronbach's $\alpha = .96$).

Commitment. Commitment was assessed with the Commitment Scale – 15 Item Version (Rusbult, Kumashiro, Kubacka, & Finkel, 2009) an elaborated version of the Investment Model Scale (Rusbult, Martz, & Agnew, 1998). This self-report measure uses a 9-point likert scale response mechanism (0 = *Do not agree at all*; 8 = *Agree completely*) and evaluates the degree to which an individual desires their current romantic relationship to continue (e.g., *I will do everything I can to make our relationship last for the rest of our lives*). Positive correlations with measures of relationship investment provides evidence of convergent validity (Rusbult, Kumashiro, Kubacka, & Finkel, 2009). The internal consistency coefficient obtained for the full scale in the present sample indicated strong reliability (Cronbach's $\alpha = .95$).

Attention checks. Five attention check questions developed for the present research were embedded within the study questionnaires for each sample (e.g., *please select “4 = extremely” for this item*). Attention checks provide a means to identify careless responding, and in the case of online research help to identify “bots”. Use of multiple attention check items has been supported as good practices for establishing strong internal and external validity (Berinsky, Margolis, & Sances, 2014). In sample one, 27 participants failed these attention checks. In sample two, 72 participants failed these attention checks. In sample three, 96 participants failed these attention checks.

Procedure

Participants are recruited online via Amazon’s Mechanical Turk (MTurk). The study description was visible only to MTurk workers with a 95% approval rating of their past participation. Interested workers were invited to follow a survey link to the Qualtrics project page that hosted the present study. Participants were first presented with the electronic letter of information and consent. Following this, participants were presented with a series of questionnaires. After the questionnaires were completed, participants were presented with a debriefing form providing researcher contact information should participants have any questions or concerns about the study. All study procedures were approved by the University of Western Ontario Research Ethics Board. Participants were compensated \$1 (USD) regardless of degree of study completion.

Data Analytic Strategy

To test the associations between social anxiety and our dependent variables (DVs; i.e., relationship satisfaction, social support, dyadic trust, and commitment) of interest, linear regression analyses were planned for each sample to predict each of relationship satisfaction, commitment, trust, and support, from social anxiety. For each model, the DV was regressed onto

social anxiety, created by summing participant responses across the 20 items of the SIAS. Relationship length was included as an associated covariate in analyses of the associations between social anxiety and the study DVs. Predictor variables were mean centered in accordance with the recommendations of Aiken and West (1991).

When initial regression results were significant, a subsequent hierarchical regression analysis was run. Hierarchical models were selected in order to identify the incremental variance in each of the study DVs accounted for by social anxiety and depression. Order of input was theoretically determined (Cohen & Cohen, 1975), with the research goal being to investigate the associations between social anxiety and each of the study DVs, and then to evaluate the nature of these associations in the presence of comorbid depression. In these models relationship length (i.e., duration of current romantic relationship) is entered as the step 1 predictor, social anxiety is entered as the step 2 predictor, and depression (i.e., total score generated from the Zung SDS) as the step 3 predictor. Therefore, at step 1 for each model, the DV is regressed onto participant relationship length, at step 2 the DV is additionally regressed onto participant social anxiety, and at step 3, the DV is additionally regressed onto participant depression. This analytic procedure is repeated for each sample.

Fixed effects meta-analyses are run to determine the consistency and robustness of the findings of hierarchical models. Analyses were conducted with R statistics software using the metaphor package (Viechtbauer, 2019). Coefficients used in these analyses were taken from the step 3 results of hierarchical models for both social anxiety and depression on each of the study DVs.

Study 1: Results

Objective 1: To investigate the associations between social anxiety and romantic relationship functioning

Zero-order correlations of all study variables are presented in Table 1. Of primary interest in Objective 1 are the links between social anxiety and the relationship-level variables of relationship satisfaction, perceived social support, dyadic trust, and commitment. As anticipated, social anxiety and depression shared a large positive correlation ($r = .61, p > .001$). This high degree of relatedness observed between social anxiety and depression scores provides empirical support for inclusion of depression in subsequent regression models. Social anxiety shared a significant inverse correlation with relationship satisfaction in each of the three Study 1 samples. Social anxiety was also found to be negatively correlated with perceived social support and dyadic trust in each sample. Social anxiety was negatively correlated with commitment in two of the three samples and negatively correlated with relationship length in one of the three samples. Participant depression was significantly negatively associated with relationship satisfaction, dyadic trust, perceived social support, and commitment in each of the three Study 1 samples. Depression and relationship length shared a significant negative correlation in only the third sample.

Table 1

Zero order correlations between Study 1 variables

Variables	Sample	SIAS <i>r</i>	SDS <i>r</i>	RAS <i>r</i>	DTS <i>r</i>	ISEL <i>r</i>	COMM <i>r</i>	LENGTH <i>r</i>
SIAS	1	-						
	2	-						
	3	-						
SDS	1	.61***	-					
	2	.66***	-					
	3	.65***	-					
RAS	1	-.31***	-.38***	-				
	2	-.42***	-.57***	-				
	3	-.24***	-.48***	-				
DTS	1	-.38***	-.48***	.75***	-			
	2	-.42***	-.53***	.80***	-			
	3	-.25***	-.48***	.79***	-			
ISEL	1	-.57***	-.64***	.43***	.51***	-		
	2	-.59***	-.66***	.66***	.64***	-		
	3	-.57***	-.64***	.48***	.54***	-		
COMM	1	-.20***	-.26***	.62***	.58***	.39***	-	
	2	-.18**	-.27***	.66***	.61***	.43***	-	
	3	.01	-.21***	.68***	.63***	.24***	-	
LENGTH	1	-.08	-.09	-.01	.08	.14*	.19**	-
	2	-.12	-.02	.10	.09	.09	.20**	-
	3	-.12*	-.18*	.14*	.13*	-.12*	.16**	-

Note: SIAS = Social anxiety; SDS = Depression; RAS = Relationship satisfaction; DTS = Dyadic trust; ISEL = Social support; COMM = Commitment; LENGTH = length of relationship

* $p < .05$; ** $p < .01$; *** $p < .001$

Sample Characteristics

Demographic information for the study samples is presented in Table 2. Social interaction anxiety scores obtained in these sample ($M = 27.95$, $SD = 19.33$) were somewhat higher than those obtained in other non-clinical samples (e.g., Kashdan & Elhai, 2008; Mattick & Clarke, 1998). However, other researchers have noted that clinically significant levels of social anxiety are overrepresented in MTurk samples, and the majority of MTurk participants score in the clinical range on measures of social anxiety (Shapiro, Chandler, & Mueller, 2013). Furthermore, individuals with social anxiety disorder have a greater online presence than do their non-anxious counterparts (Bargh & McKenna, 2004; Shepherd & Edelman, 2005; Stevens & Morris, 2007; Weidman et al., 2012). The average depression score in this sample ($M = 36.53$, $SD = 10.39$) was similar to other scores obtained in non-clinical samples (e.g., Sakamoto, Kijima, Tomoda, & Kambara, 1998).

Table 2.

Characteristics of the Samples.

	Sample 1 (n = 287)	Sample 2 (n = 264)	Sample 3 (n = 337)	Total Sample (N = 888)
	<i>n</i> (%) or <i>M</i> (<i>SD</i>)	<i>n</i> (%) or <i>M</i> (<i>SD</i>)	<i>n</i> (%) or <i>M</i> (<i>SD</i>)	<i>n</i> (%) or <i>M</i> (<i>SD</i>)
Sex				
Female	146 (50.9%)	135 (51.1%)	196 (58.2%)	477 (53.7%)
Male	141 (49.1%)	129 (48.9%)	140 (41.5%)	311 (46.3%)
Ethnicity/Nationality				
Asian	61 (21.2%)	33 (12.5%)	50 (14.8%)	144 (16.2%)
White	194 (67.6%)	204 (77.3%)	246 (72.9%)	644 (72.5%)
Black	28(9.8%)	14 (5.3%)	26 (7.7%)	68 (7.7%)
Latin American	10 (3.5%)	13 (4.9%)	15 (4.4%)	38 (4.3%)
Sexual Orientation				
Heterosexual	268 (93.4%)	243 (92%)	304 (90.2%)	815 (91.8%)
Homosexual	5 (1.7%)	8 (3%)	7 (2.1%)	20 (2.2%)
Bisexual	8 (2.8%)	10 (3.8%)	23 (6.8%)	41 (4.6%)
Other (i.e., uncertain, pansexual)	4 (1.4%)	1 (0.4%)	3 (0.9%)	8 (0.9%)
Age	36.37 (11.11)	32.85 (10.15)	35.75 (10.30)	35.09 (10.64)
Relationship Length (years)	8.95(8.88)	6.67 (7.71)	9.20 (8.57)	8.37 (8.41)
Psychopathology				
Social Anxiety	27.17 (18.97)	26.38 (17.79)	29.87 (19.47)	27.95 (19.33)
Depression	36.03 (9.77)	37.19 (10.51)	36.46 (10.19)	36.53 (10.39)
Relationship Variables				
Relationship Satisfaction	36.45 (7.24)	39.40 (8.367)	39.18 (7.71)	38.36 (7.93)
Social Support	88.34 (28.89)	86.75 (28.19)	91.42 (29.25)	89.04 (28.96)
Dyadic Trust	40.58 (13.31)	42.07 (12.31)	41.54 (12.48)	41.38 (12.71)
Commitment (average score)	7.07 (1.59)	7.20 (1.51)	7.29 (1.57)	7.19 (1.57)

Note: Values for age, relationship length, psychopathology, and relationship variables are *M*(*SD*)

Objective 2: To differentiate the variance in relationship functioning attributable to social anxiety and depression

Hierarchical analyses of social anxiety. Hierarchical linear regression analyses were run to determine the unique incremental variance attributable to social anxiety and depression in each of relationship satisfaction, perceived social support, commitment, and dyadic trust.

Relationship length was entered as a covariate at level one, social anxiety at level two, and depression at level three. Identical statistical models were run for each dependent variable of interest and in each of the three samples.

Relationship satisfaction is the criterion variable in the first hierarchical model (Table 3). Across all three samples the model significantly improved at step two with higher social anxiety being associated with lower reported levels of relationship satisfaction. The models were further improved by the inclusion of depression at step three. In all step three models, depression emerged as the only statistically significant predictor of relationship satisfaction, displaying an inverse association.

The second criterion investigated is perceived social support (Table 4). A uniform pattern of results was observed across all three Study 1 samples. Relationship length was not a significant predictor at level one. The inclusion of social anxiety at step two significantly improved the model, with significant inverse associations between social anxiety and perceived social support emerging. Models were further improved by the inclusion of depression at step three, with both social anxiety and depression were significantly associated with lower degrees of perceived social support.

Table 3.

Hierarchical Regression Predicting Relationship Satisfaction from Relationship Length, Social Anxiety, and Depression.

Criterion	Sample	Step	Predictor	<i>b</i>	β	<i>SE</i>	<i>t</i>	ΔR^2	Adj. <i>R</i> ²	ΔF
Relationship Satisfaction	1	1	Length	-.01	-.01	.05	-.03	.00	-.01	.01
		2	Length	-.02	-.03	.05	-.45	.09	.09	23.87***
			Social Anxiety	-.12	-.31	.02	-4.88***			
	3	3	Length	-.03	-.04	.05	-.68	.06	.14	15.80***
			Social Anxiety	-.05	-.12	.03	-1.57			
			Depression	-.23	-.31	.06	-3.98***			
	2	1	Length	.01	.12	.01	1.82	.01	.01	3.31
		2	Length	.01	.07	.01	1.21	.15	.16	43.02***
		2	Social Anxiety	-.18	-.39	.03	-6.56***			
		3	Length	.01	.11	.01	2.01*	.18	.34	67.55***
		3	Social Anxiety	-.01	-.01	.03	-.18			
	3	3	Depression	-.44	-.57	.01	-8.22***			
		1	Length	.01	.13	.01	2.28*	.02	.01	5.22*
		2	Length	.01	.11	.01	1.94	.05	.06	16.30***
		2	Social Anxiety	-.09	-.23	.02	-4.04***			
3		Length	.01	.05	.01	.93	.17	.23	66.09***	
	3	Social Anxiety	.05	.12	.03	1.81				
	3	Depression	-.41	-.55	.05	-8.13***				

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 4.

Hierarchical Regression Predicting Perceived Social Support from Relationship Length, Social Anxiety, and Depression.

Criterion	Sample	Step	Predictor	<i>b</i>	β	<i>SE</i>	<i>t</i>	ΔR^2	Adj. R^2	ΔF
Perceived Social Support	1	1	Length	.44	.15	.20	2.17	.02	.02	4.72*
		2	Length	.28	.09	.16	1.73	.33	.35	112.58***
			Social Anxiety	-.89	-.58	.08	-10.61***			
		3	Length	.23	.08	.14	1.53	.12	.47	48.85***
			Social Anxiety	-.49	-.32	.09	-5.17***			
			Depression	-1.26	-.43	.18	-6.99***			
	2	1	Length	.02	.07	.02	1.09	.03	.01	1.19
		2	Length	-.01	-.01	.02	-.22	.32	.32	109.56***
		2	Social Anxiety	-.90	-.57	.09	-10.47***			
		3	Length	-.01	-.01	.02	-.09	.14	.46	61.56***
		3	Social Anxiety	-.37	-.23	.11	-3.57***			
		3	Depression	-1.35	-.51	.17	-7.85***			
	3	1	Length	.03	.12	.02	1.96	.01	.01	3.82
		2	Length	.02	.06	.01	1.26	.30	.31	122.54***
		2	Social Anxiety	-.81	-.55	.07	-11.07***			
3		Length	-.01	.01	.01	-.09	.13	.44	66.82***	
3		Social Anxiety	-.36	-.24	.09	-4.16***				
3		Depression	-1.36	-.48	.17	-8.17***				

* $p < .05$; ** $p < .01$; *** $p < .001$

The third set of hierarchical models investigated commitment as the criterion variable (Table 5). Relationship length was significantly positively associated with commitment at all steps in all three samples. In samples one and three, the model significantly improved with the addition of social anxiety as a predictor at step two. Social anxiety was negatively associated with commitment in sample one only. At step three, inclusion of depression as a predictor significantly improved the hierarchical model in each sample. At step three, depression was significantly negatively associated with commitment in all three samples. Social anxiety shared different relationships with commitment in each sample. In sample one, social anxiety had a significant negative association with commitment. In sample two the association was positive but non-significant. In sample three, the association was significant in the positive direction.

The final set of hierarchical models investigated dyadic trust as the criterion variable (Table 6). At step one, relationship length was not significantly associated with dyadic trust in any of the three samples. At step two, the inclusion of social anxiety significantly improved the model in all three samples. At step two, social anxiety was significantly inversely associated with dyadic trust in samples one and two. The inclusion of depression as a predictor variable at step three significantly improved hierarchical models in all three samples. At level three, social anxiety accounted for a unique portion of the variance in dyadic trust only in sample one. Depression was negatively associated with dyadic trust across all three samples at step three.

Influence of gender. All hierarchical analyses were run a second time with participant gender entered as a covariate to identify any potential sex differences. Participant gender did not account for a significant amount of variance, and no tests of significance in the primary analytic results changed as with the inclusion of gender as a covariate. Additionally, no significant effects of gender were found in any constructs measured and there were no significant interactions between sex and social anxiety in predicting any of the study's DVs of interest.

Table 5.

Hierarchical Regression Predicting Commitment from Relationship Length, Social Anxiety, and Depression.

Criterion	Sample	Level	Predictor	<i>b</i>	β	<i>SE</i>	<i>t</i>	ΔR^2	Adj. R^2	ΔF
Commitment	1	1	Length	.06	.19	.02	2.87**	.04	.03	8.25*
		2	Length	.05	.18	.02	2.69**	.03	.06	7.14***
		2	Social Anxiety	-.03	-.18	.01	-2.67**			
		3	Length	.03	.17	.01	2.62*	.03	.09	8.15***
		3	Social Anxiety	-.01	-.04	.01	-.56			
		3	Depression	-.04	-.23	.01	-2.86**			
	2	1	Length	.01	.21	.01	3.28*	.04	.04	10.76**
		2	Length	.01	.19	.01	3.02**	.06	.02	3.53
		2	Social Anxiety	-.01	-.12	.01	-1.88			
		3	Length	.01	.22	.01	3.43***	.12	.11	14.78***
		3	Social Anxiety	.01	-.08	.01	1.01			
		3	Depression	-.04	-.32	.01	-3.85***			
	3	1	Length	.01	.18	.01	3.09**	.03	.03	9.59**
		2	Length	.01	.18	.01	3.11**	.03	.06	9.89**
		2	Social Anxiety	.01	.02	.01	.39			
		3	Length	.01	.14	.01	2.59*	.03	.08	9.79**
		3	Social Anxiety	.02	.22	.01	3.13**			
		3	Depression	-.05	-.32	.01	-4.45***			

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 6.

Hierarchical Regression Predicting Dyadic Trust from Relationship Length, Social Anxiety, and Depression.

Criterion	Sample	Level	Predictor	<i>b</i>	β	<i>SE</i>	<i>t</i>	ΔR^2	Adj. R^2	ΔF
Dyadic Trust	1	1	Length	.11	.08	.09	1.22	.01	.01	1.49
		2	Length	.06	.04	.08	.71	.14	.14	40.01***
		2	Social Anxiety	-.27	-.38	.04	-6.33***			
		3	Length	.04	.03	.08	.47	.09	.23	26.52***
		3	Social Anxiety	-.11	-.16	.05	-2.17*			
		3	Depression	-.51	-.37	.09	-5.15***			
	2	1	Length	.01	.11	.01	1.65	.07	.07	2.73
		2	Length	.01	.06	.01	.99	.16	.16	45.91***
		2	Social Anxiety	-.28	-.40	.04	-6.78***			
		3	Length	.01	.09	.01	1.59	.13	.29	44.59***
		3	Social Anxiety	-.06	-.09	.05	-1.22			
		3	Depression	-.56	-.48	.08	-6.68***			
	3	1	Length	.09	.17	.21	.45	.01	.01	4.45*
		2	Length	.10	.19	.22	.47	.05	.06	17.75***
		2	Social Anxiety	-.06	-.22	.11	-.57			
3		Length	.01	.04	.01	.75	.17	.23	67.75***	
3		Social Anxiety	.07	.11	.04	1.74				
3		Depression	-.66	-.55	.08	-8.23***				

* $p < .05$; ** $p < .01$; *** $p < .001$

Objective 3: To synthesize results across the three samples of the study

Meta-analytic results. Fixed effect meta-analyses were run with the regression estimates from the hierarchical models across the three samples to obtain a more sensitive estimate of each effect. Eight separate meta-analyses were run. The first four of these used estimates of social anxiety as a predictor of 1) relationship satisfaction, 2) social support, 3) dyadic trust, and 4) commitment. All estimates were drawn from the third step of the corresponding hierarchical regression analysis. The second four meta-analyses used estimates of depression as a predictor of 1) relationship satisfaction, 2) social support, 3) dyadic trust, and 4) commitment. Estimates were again drawn from the third step of the corresponding hierarchical regression analysis.

The fixed-effect meta-analytic findings are presented in Table 7. Results indicated a small but robust effect size (.01) for social anxiety as a positive predictor of commitment and a robust medium and robust negative effect for social support (-.39). Depression was a significant predictor for each of the four DVs.

Objective 4: To identify the association of brief measures of social anxiety with full-scale scores

SIAS-6. The correlation between the shortened scale (SIAS-6) and the long form SIAS was examined in each of the three independent samples. Strong and significant correlations between the SIAS-6 and the SIAS were observed in Sample 1 ($r = .94, p < .001$), Sample 2 ($r = .94, p < .001$), and Sample 3 ($r = .95, p < .001$). These observed correlations demonstrate strong convergent validity with the full scale SIAS.

Table 7.

Meta-Analysis of Social Anxiety and Depression Predicting Each Study DV.

Predictor	Criterion	Estimate	SE	<i>z</i>	<i>p</i>	95% CI
Social Anxiety	Relationship Satisfaction	.01	.02	.22	.827	-.03; .04
	Social Support	-.39	.05	-7.23	<.001***	-.49; -.29
	Dyadic Trust	-.01	.03	-.65	.514	-.07; .04
	Commitment	.01	.01	2.77	.006**	.01; .02
Depression	Relationship Satisfaction	-.37	.03	-11.83	<.001***	-.43; -.31
	Social Support	-1.33	.09	-13.33	<.001***	-1.52; -1.13
	Dyadic Trust	-.58	.05	-11.71	<.001***	-.68; -.49
	Commitment	-.04	.01	-6.63	<.001***	-.06; -.34

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Study 1 Discussion

Study 1 investigated the unique influences of social anxiety and depression on a series of constructs central to successful maintenance of romantic relationships. Prior research indicates that social anxiety and depression are significant predictors of the overall success or failure of romantic relationships (e.g., Kessler et al., 2003; Lampe et al., 2003; Merikangas 1984), but does not identify the relationship-level variables that may be responsible. The primary goal of Study 1 was to identify potential sources of relational disharmony that are associated with symptoms of social anxiety and depression, and the unique variance in relationship satisfaction, perceived social support, dyadic trust, and commitment that is attributable to each of these psychopathologies.

Correlational analyses displayed fairly uniform findings across all three samples of the present research. At this level of analysis, the primary hypotheses were mainly supported, with both social anxiety and depression being inversely associated with relationship satisfaction, social support, and dyadic trust. Existing research in this field has largely yielded conflicting results (e.g., Porter & Chambless, 2014; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005; Whisman, 1999). The findings of Study 1 provide a strong clarification of prior research, with robust evidence of specific relational disharmony associated with increased social anxiety. However, inconsistencies within the existing literature highlight the need for a more nuanced investigation before forming tenable conclusions.

The inclusion of a depressive symptom inventory in Study 1 provides a clearer picture of the nature of associations between internalizing psychopathology and romantic relationship dysfunction. Depression and social anxiety share a significant degree of comorbidity and phenotypic overlap. Therefore, inferential analyses were repeated with depression scores entered as the predictor variable and the four DVs in the previous analysis (i.e., relationship satisfaction,

social support, dyadic trust, and commitment) repeated. Depressive symptoms accounted for a unique portion of the observed variance observed in each these criterion variables, beyond that accounted for by social anxiety.

Hierarchical linear regression analyses produced less consistent results between samples than did correlational analyses; several of the predictor coefficients obtained differed in both magnitude and direction of association. Collinearity diagnostics were run for all regression analyses. Across all samples and analyses, no statistically meaningful issues of multicollinearity were detected with all Variance Inflation Factor values falling in acceptable ranges. Meta-analyses were effective in clarifying these inconsistencies. Meta-analytic findings demonstrated that although high social anxiety is correlated with lower relationship satisfaction, social support, dyadic trust, and commitment, social anxiety only robustly accounts for a unique portion of the variance in participant-reported social support and commitment.

Relationship Satisfaction

Results of Study 1 offer clarification of some disagreements in the current literature, particularly with respect to relationship satisfaction. Prior research reveals both negative and nonsignificant associations between social anxiety and relationship satisfaction (e.g., Filsinger & Wilson, 1983; Porter & Chambless, 2014; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005; Whisman et al., 1999). Results of Study 1 may provide new insights that may explain this. A stable and negative correlation between social anxiety and relationship satisfaction was observed in Study 1 that mirrors the results of some past research (e.g., Montesi et al., 2013). However, the failure of social anxiety to account for a unique portion of the variance in relationship satisfaction when accounting for the influence of comorbid depression aligns with other similar findings in some other research (e.g., Wenzel, 2002; Whisman, 1999). Whisman (1999) found a significant inverse association between both of anxiety and mood disorders with relationship

satisfaction in a clinical sample. However, in that study, the strength of the association between diagnosed anxiety disorders and marital dissatisfaction fell below the threshold of significance when controlling for comorbid diagnoses. The association between mood disorders and relationship satisfaction however did remain significant when controlling for comorbid diagnoses. The findings of the Study 1 are aligned closely with those found by Whisman (1999), but provide novel extension. The collection of a non-clinical sample and assessment of social anxiety and depression as continuous constructs, which is more representative of the true nature of these phenomena, represents an important step toward building an understanding that extends beyond purely clinical contexts (Crome, Baillie, Slade, & Rusico, 2010).

Prior research explicitly examining links between depression and relationship satisfaction has been more consistent than that of social anxiety, described above. This research has provided correlational evidence of a negative association between depression and relationship satisfaction (e.g., Cramer, 2004; O’Leary, Christian, & Mendell, 1994; Gotlib & Whiffen, 1989; Whisman, 2001). Results of the present study serve as confirmatory evidence of this association and distinguish between the influences of depression and comorbid social anxiety. This distinction represents a novel element of Study 1.

Social Support

Prior research indicates that social anxiety is associated with perceptions of social support as unavailable (e.g., Porter & Chambless, 2014; Porter & Chambless, 2016; Torgrud et al., 2004). This research has focused largely on perceived and/or received support from a romantic partner in a neutral context. There is some indication that instrumental or functional support from a broader social system, as assessed in Study 1, may be more closely linked with the mental health effects of stress (Cohen et al., 1985). Study 1 therefore investigates perceived social support from a broad social context. The results obtained align well with prior research

identifying a negative association between social anxiety and perceptions of social support (Torgrud, 2004). Social anxiety is consistently associated with lower perceived support, and persons with social anxiety may be less likely or willing to seek support when needed (Porter & Chambless, 2017). By addressing distressing situations, Study 1 fills a gap left by research focusing on neutral contexts.

The broader literature on social support and depression highlights the impact of poor social support on the development of depressive symptoms (Manne, 1999; Manne et al., 1999). The findings of the present study are consistent with past research that identifies a negative association between depression and perceived social support. The findings of the present study may shed new light on the nature of association between social support and depression. Depression has been elsewhere demonstrated have a negative impact on social support (Porter & Chambless, 2014). Despite this, many individuals with elevated levels of depression go on to form romantic relationships. Study 1 shows that once these romantic relationships are formed, the issue of perceived poor social support persists.

Commitment

No prior study had investigated the association between social anxiety and commitment. The meta-analytic finding of a robust positive association between social anxiety and commitment in Study 1 study integrates with our contemporary understanding of social anxiety itself. Despite social anxiety being associated with intimacy impairing behaviours (e.g., reduced self-disclosure), a strong desire for relational closeness remains nonetheless (Schlenker & Leary, 1982; Leary, 2010). The positive association observed may be a representation of the desire to maintain the interpersonal bond shared between partners even though the individual may not be willing to engage in the intimacy-promoting behaviours that would promote the longevity of the relationship.

The association between depression and commitment is not well-explored in the existing literature. However, there is some suggestion in past literature that depressed individuals may engage in relationship sabotaging behaviours due to an expectation that the relationship is doomed to fail from the start (Beach, Jouriles, & O’Leary, 2008). Individuals experiencing higher levels of depression are more likely to engage in extramarital affairs and to have pessimistic views of the futures of their relationships (O’Leary, Christian, & Mendell, 1994). The results of Study 1 build upon existing evidence in the finding of a robust association between depression and reduced commitment explicitly, whereas past research has linked depressive symptomatology with specific behaviours and beliefs associated with commitment.

Dyadic Trust

There have been no studies conducted to date that examine the relationship between social anxiety and dyadic trust. Several researchers have identified inverse associations between depression and trust of social others (e.g., Fujiwara & Kawachi, 2008; Kim, Chung, Perry, Kawachi, & Subramanian, 2012). Social anxiety drives a biased perception of social others as hostile or lacking benevolence, and that others will prioritize own needs at the expense of those around them (e.g., Leary, 2010). In Study 1 a negative association between social anxiety and dyadic trust was hypothesized. It was anticipated that biased perceptions of others driven by social anxiety would impair the degree to which dyadic trust was experienced. This was partially supported as social anxiety was an inverse correlate of dyadic trust; however, hierarchical regression analyses revealed that this association is better explained by the influence of comorbid depression. Meta-analytic results for the influence of social anxiety on dyadic trust failed to cross the threshold of statistical significance. It is therefore concluded that although social anxiety may bias general perceptions of the selfishness or selflessness of others, this does not impact the trust that is built between romantic partners.

Strengths and Implications

The nature of the sample for the present study represented a major strength. Firstly, each of the three samples had adequate statistical power and more precise estimates of effects were facilitated by meta-analytic approaches. Secondly, the diversity in age and ethnicity of the Study 1 samples allows for generalizability not available in similar research involving university students. Additionally, participants' romantic relationships were well established with respect to relationship length at time of participation. This provides an interpretive advantage over studies involving more short-term attachments. Research has demonstrated that partners in briefer relationships may be expected to feel comparatively less commitment and relational closeness than are long-term dyads (Ahmetoglu, Swami, & Chamorro-Premuzic, 2010). Studying more established partners allows us to speak more directly to factors influential in long-term relationships, which may be of use in future research exploring likelihood of divorce.

Another notable strength of the present study is that study procedures, materials, and analytic strategies were pre-registered on the Open Science Framework (OSF; <https://osf.io/jkc69/>). As such, this study was theoretically driven and relied on carefully selected methodologies designed to best answer the research questions at hand. Avoiding data driven analysis and post-hoc theorization should serve to underscore the validity of the present study.

Study 1 provides novel insight into the mechanisms by which social anxiety may drive relational disharmony. Prior research has established both social anxiety and depression to be associated with greater likelihood of romantic relationship dissolution (e.g., Lampe, Slade, Issakidis, & Andrews, 2003). However, little is known about precisely how social anxiety may be harmful to romantic relationships. By investigating four distinct constructs that are closely linked with romantic relationship success or failure, Study 1 illuminates the potential mechanisms through which social anxiety may influence relational success. Specifically, unique

impairments in social support and commitment that are driven by social anxiety symptoms may partially explain the differences observed elsewhere between the relational outcomes of socially anxious and non-anxious individuals. Depression, was strongly associated in lower levels of satisfaction, commitment, trust, and perceived social support. This sheds new light on the breadth of difficulties in romantic relationships that may be faced by depressed individuals.

Understanding the unique nature of relational impairment in socially anxious and depressed individuals may facilitate the success of clinical interventions with these populations. The results of the present study may enhance clinicians' understanding of the experiences that socially anxious individuals have in their romantic relationships and, in the case of clients with comorbid depression, the psychopathological factors that drive different observed relational difficulties. Equipping clinicians with empirical knowledge has been demonstrated to be beneficial to the therapeutic process (Forsetlund et al., 2009). Findings from the present research can be incorporated directly into therapy (e.g., psychoeducational components of cognitive-behavioural therapy) based on the new understanding of the social contexts in which patients exist.

Limitations and Future Directions.

There are some limitations to Study 1 that should be noted. Firstly, the cross-sectional design of this study precludes causal inferences. The hypothesis that social anxiety is an underlying factor that precedes issues in relationship functioning is rooted in established theoretical models (Clark & Wells, 1997). Indeed, the hypotheses of Study 1 are rooted in the assumption that the patterns of behaviour and cognition inherent social anxiety and depression impair the normative dynamics that exist between romantic partners in the absence of these mental health difficulties. Longitudinal research would facilitate the development of a more robust understanding of the manner in which social anxiety and depression influence key

processes in romantic relationships. Such an approach would allow for empirical investigations of the direction of causality absent in the current literature.

The results of the present study help further our understanding of how social anxiety may influence relational functioning. However, there is room to explore constructs that may underlie social anxiety and interpersonal interactions. One avenue that may be explored in future research is intolerance of uncertainty (IU), defined as "an individual's dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty" (p. 31, Carleton, 2016a). IU appears to be a central construct underlying various anxiety disorders (see for review, Carleton, 2016a, 2016b; Hong & Cheung, 2015). Recent evidence indicates that IU accounts for unique variance in social anxiety and associated avoidance and anxiety surrounding interpersonal interactions (Boelen & Reijntjes, 2009; Boelen, Vrinssen, & van Tulder, 2010; Carleton, Collimore, & Asmundson, 2010; Teale Sapach, Carleton, Mulvogue, Weeks, & Heimberg, 2015). Social interactions inherently involve uncertainty (e.g., not knowing how others may act, how one may be evaluated; Carleton et al., 2010; Carleton, 2016b). Accordingly, future investigations may benefit from examining the potential role of IU as an influential factor in romantic relationship functioning, particularly among individuals with social anxiety.

The present study collected data from only one member of each dyad. Due to this design, inferences regarding the mutual influence that romantic partners have on one another cannot be drawn. Rather, conclusions can only be drawn regarding the influence of social anxiety on the individual, and the way that individual views his or her romantic relationship. To further the understanding of the impact that social anxiety has on romantic relationship functioning, it would be worthwhile to collect data from both members of romantic dyads. Researchers could then investigate the associations between the social anxiety and depression of both actor and partner

on romantic relationship functioning. Processes within romantic relationships are interdependent by nature, and investigations addressing this interdependence represent an important step forward in romantic relationships literature at large (Berscheid, 1999). Although dyadic investigation requires greater resources and is more methodologically complex, these types of approaches provide the best means to study romantic relationships.

Conclusions

The present pre-registered study provides novel information regarding the associations of social anxiety and depression with key processes in romantic relationship functioning. Study 1 provides a novel, psychometrically sound, theoretically driven investigation and explanation of the influences of social anxiety and depression on romantic relationships functioning. By using three independent and high-powered samples and meta-analytic approaches to replication, there is empirical support for confidence in the obtained results. Investigations of how social anxiety and depression influence maintenance of romantic relationships helps to inform understanding of romantic relationship functioning among individuals experiencing difficulties related to these common mental health concerns.

Chapter 3: Study 2

Methods

Sample

Power. An a priori power analysis using G-Power 3.1 (Faul, Erdfelder, Buchner, & Lang, 2009) is conducted to determine sample size required to achieve 90% statistical power for within-subjects analyses, assuming a small effect size of $f = 0.10$. Calculations indicated that a sample of $n = 214$ participants are required for analyses of monthly data (3 measurements per participant). A sample of $n = 126$ is required to achieve 90% statistical power for within-subjects analyses of daily diary data (7 measurements).

Recruitment. All study participants were recruited via the online survey platform Prolific Academic. A custom screening tool was created by study researchers in collaboration with Prolific Academic staff. Approximately 55,000 workers were enrolled with Prolific Academic at the time of recruitment. These workers were invited to indicate whether or not their romantic partner was also a Prolific Academic worker, and if workers and their partners would be interested in participating in a study as a romantic couple (i.e., dyad). A total of 1,118 dyads responded to this screener in the affirmative.

A new screener for the present study was then created and made visible only to the dyads described above. This screener provided basic study details. Initially, the screener was made visible only to female participants, in order to avoid double screening of interested couples that would occur if both the male and female participant were able to express interest in the initial invitation. The partners of all female participants who had expressed interest were then “whitelisted” (i.e., granted access) for the screener. In cases in which both members of the dyad indicated interest in the present study, both participants were added to a new whitelist for the

study's letter of information and consent. In instances in which only one member of the dyad indicated interest in the study, neither member were added to this whitelist.

Participants. A total of $n = 274$ participants responded to an initial screener for the present study. Partners of all 274 participants were then sent the same screener and $n = 161$ responded. In all, 161 dyads ($n = 322$) were invited to complete the present study. In 28 dyads, one or both member(s) of the dyad did not consent to participate or failed to complete the first measurement (i.e., Time 1). Both members of these dyads ($n = 56$) were subsequently not permitted to continue. Seven dyads contained same-sex partners and were thus removed. Four dyads were identified as fraudulent (i.e., a single participant posing as both members of a couple) and were removed. Following these exclusions, a total of 122 heterosexual dyads ($n = 244$) participated in the present study; of these, 118 dyads ($n = 236$) completed both the first and the final measurement of the series. Couples had been together an average of 10.99 years ($SD = 8.86$ years) and participants' average age was 37.1 years ($SD = 10.73$ years). The majority of participants identified as Caucasian (87%) followed by Asian descent (7%). The remaining 6% was comprised of other ethnic backgrounds.

Measures

Attention checks. See previous description of measure.

Zung self-report depression scale. See previous description of measure. Internal consistency obtained is $\alpha = .84$.

Fifteen item commitment scale. See previous description of measure. Internal consistency obtained is $\alpha = .95$.

Demographics questionnaire. All participants completed a demographics questionnaire. This questionnaire gathered participant information on age, sex, ethnicity, relationship status

(i.e., dating non-exclusively, dating exclusively, married, common-law, engaged, other), relationship length, living arrangement (i.e., cohabitating), and sexual orientation.

Social anxiety. The SIAS-6 (Peters, Sunderland, Andrews, Rapee, & Mattick, 2012) is a six-item form of the SIAS (Mattick & Clarke, 1998). This scale (e.g., *I am tense mixing in a group*) uses a five-point likert-type response mechanism ranked from zero to four (0 = *not at all*; 4 = *extremely*). It has been demonstrated as an effective and efficient tool for assessing social anxiety. Both the SIAS-6 and full scale SIAS have demonstrated convergent validity with the Social Phobia Scale at similar strength of coefficient. The SIAS-6 has also shown good sensitivity to the severity of symptomatology on a dimensional plane (Peters et al., 2012). Internal consistency for the present sample is observed at $\alpha = .91$.

Daily social anxiety. The Daily Social Anxiety scale is a measure of social anxiety experienced within a 24-hour period. This scale is comprised of three items with the highest factor loadings from the Brief Fear of Negative Evaluation Scale (Rodebaugh et al., 2004). These items have been shown to have good convergent validity with the SIAS (Kashdan & Steger, 2006) and have been previously used in daily diary research (Kashdan et al., 2014). The three scale items (i.e., *I worried what people thought of me*; *I was afraid that others did not approve of me*; *I was worried that I would say or do the wrong things*) address general worry about social situations. Daily anxiety scores are generated by summing the three scale items. Prior research has identified significant correlations between this measure of state social anxiety and measures of trait social anxiety in both clinical and subclinical populations (Kashdan & Steger, 2006; Kashdan et al., 2014). Internal consistency observed in the present sample is $\alpha = .86$.

Relationship Satisfaction. The Couples satisfaction index (CSI-32; Funk, & Rogge, 2007) is a 32-item (e.g., *I still feel a strong connection too my partner*) measure designed to assess an individual's satisfaction in his or her romantic relationship. This unidimensional

measure of relationship satisfaction utilizes eight different Likert-type response mechanisms. This scale has been demonstrated as superior, in terms of precision and power, to other measures in assessing the construct of relationship satisfaction (Funk & Rogge, 2007). Internal consistency observed is $\alpha = .97$

A short-form version of this measure has been demonstrated to be an effective means to assess relationship satisfaction (CSI-4; Funk & Rogge, 2007). This four-item (e.g., *please indicate the degree of happiness, all things considered, in your relationship*) measure displays strong reliability and validity. This measure has been demonstrated to be effective in assessing short-term changes in relationship satisfaction. Internal consistency for the present sample is $\alpha = .92$.

Social support. The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988) is a 12-item (e.g., *There is a special person who is around when I am in need*) measure of overall perceived social support in non-stressful situations. The scale uses a seven-point Likert-type response mechanism to denote agreement with each of the presented statements (1 = *very strongly disagree*; 7 = *very strongly agree*). This scale has demonstrated strong internal consistency, and there is evidence supporting the 3-factor structure (Zimet, Powell, Farley, Werkman, & Berkoff, 1990). Internal consistency for the present sample is $\alpha = .93$.

A spouse-specific subscale may be derived from the larger MSPSS. This five-item measure uses the same response mechanism and has demonstrated strong validity in the assessment of social support perceived to be available from one's spouse. Internal consistency for the present sample is $\alpha = .87$.

Perceived social self-efficacy scale (PSSE; Smith & Bets, 2000). The PSSE is a measure of individual expectations of self-efficacy in social contexts. Items specifically address

feelings of adequacy or inadequacy with a number of social behaviours. This five-item measure uses a five-point Likert-type response mechanism to denote belief in ability to perform social tasks (e.g., *express your opinion to people who are talking about something of interest to you*), ranked from one to five (1 = *not well at all*; 5 = *very well*). Strong psychometric properties were reported in the initial measurement development study (Smith and Bets, 2000). Observed test-retest reliability over a three-week interval $r = .82$. Discriminant validity analyses showed a strong relationship between the PSSE and Social Confidence and Enterprising Confidence in the Skills Confidence Inventory (Harmon, Borgen, Berreth, King, Schauer, & Ward, 1996). Internal consistency obtained for the present study is $\alpha = .84$.

Procedure

Study 2 takes place across two distinct phases. Phase 1 involves the collection of dyadic daily diary data. Phase 2 involves the collection of dyadic data at monthly intervals. Both phases are drawn from the same participant sample.

Phase 1. Phase 1 began with an electronic letter of information and consent being sent for both members of each dyad that had expressed interest in the screener described above. Participants were asked to consent to participate in the entire study (i.e., Phase 1 and Phase 2), with the provision that they may voluntarily terminate their participation at any time without loss of compensation. Participants who provided consent to participate were immediately redirected to an online questionnaire of demographics, social anxiety, and relationship satisfaction. Participants were instructed to complete these surveys independent from their romantic partners to maximize candid and honest responding. Participants received daily invitations to complete subsequent online diary entries at 24-hour intervals for six consecutive days (Days 2-7). Participation was monitored for Phase 1 and any participants who failed to complete a day of the diary entry received an electronic reminder via Prolific Academic's messaging platform.

Participants received monetary compensation (£0.40) for each diary entry attempted, regardless of participation in Phase 2.

Phase 2. At the time of consent to participate, all participants were given instructions for completion of two subsequent online surveys occurring 30 and 60 days after the Day 1 survey. The Day 30 and Day 60 surveys contained questionnaires measuring social anxiety, depression, commitment, perceived social support, perceived social self-efficacy, and relationship satisfaction. Twenty-nine days after the completion of the Day 1 survey, participants were electronically granted access to the Day 30 survey. Additionally, on day 30, participants received an electronic message via the Prolific Academic messaging feature reminding them of the availability of the Day 30 survey. Participation reminder messages were sent every 24 hours for a 48-hour survey availability period. Survey entries took participants an average of 12 minutes. Each day was compensated independently at £1.25. Participants who completed all surveys were awarded a bonus payment of £2.00.

Study 2 Results

Analytic Strategy

The data analytic strategy for the present study was guided by the Actor-Partner-Interdependence Model (APIM; Campbell & Stanton, 2015; Kenny, Kashy, & Cook, 2006). The APIM holds that outcomes for individuals in romantic relationships can be associated with individuals' own characteristics and the characteristics of their romantic partners. In this model, the actor refers to the participant for whom the dependent variable is being investigated and the partner refers to the relational companion of the actor. Data have three levels of analysis: time, person, and dyad.

In longitudinal, dyadic investigations, several important considerations must be made.

Firstly, a fundamental concept in analysis of longitudinal dyadic data is *lagging*. Lagging refers to the correspondence of data at one time point, t , to the preceding time point, $t - 1$. Secondly, dyadic nonindependence must be accounted for. Scores from two romantic partners on a given measure at a given time point are likely non-independent and correlated with one another. As such, the parameters estimated in models are expected to correlate with one another. Thirdly, the non-independence of observations within persons must also be addressed. Cross-lagged APIM procedures follow a similar form of *time-lagged* analyses in standard regression (e.g., Kashdan et al., 2013) and represents a means to address both dyadic dependence and within-subjects autocorrelation (Kenny, Kashy, & Cook, 2006).

Cross-lagged analyses (Kenny, Kashy, & Cook, 2006) follow a similar form of *time-lagged* analyses in standard regression (e.g., Kashdan et al., 2013). The basic notation for *cross-lagged* APIM analyses involves dyad i , partners 1 and 2, measured up to t times on variable Y . In cross lagged analyses, a measure of Y_{1ti} measures Y for person 1 at time t in dyad i and has a lagged value of $Y_{1,t-1,i}$. As such, no lagged value is available for the first observation ($t = 1$). In these analyses, within-partner observations are crossed and not nested (i.e., Day 1 for the actor is the same as Day 1 for his or her partner) to allow for investigation of day-specific sources of dependency (Laurenceau & Bolger, 2011). In cross-lagged analyses the centering of quantitative predictor variables takes a unique form. For each partner and observation, a common value must be subtracted off of the mean. The means of Y_1 and Y_2 are computed and then averaged. The model intercepts then estimate a typical value of the dependent variable. Finally, in cross-lagged analyses, actor effects are interpreted as stability effects (i.e., the longitudinal variance unique to the individual), whereas partner effects are interpreted as cross-partner effects (Cook & Kenny, 2005). Effects were pooled across male and female participants, yielding a single actor and a

single partner effect for each predictor variable. Main effects for gender were included in each analysis.

For illustrative purposes, consider a hypothesis that actor and partner social anxiety at Time 1 would be associated with relationship satisfaction at Time 2. This hypothesis involves two levels of equations. At level 1, in which Y_{ij} is satisfaction for actor i on observation j and X_{ij-1} is actor social anxiety at the prior observation, the equation reads:

$$Y_{ij} = b_{0i} + b_{1i}X_{ij-1} + e_{ij}$$

B_{0i} represents the average level of social anxiety across actors and b_{1i} is the coefficient for the association between prior observation ($j - 1$) social anxiety and current observation (j) relationship satisfaction. The Level 2 equation pools effects across the distinguishing variable, gender. This equation takes the form:

$$B_{0ij} = a_{0i} + a_{1i}(\text{actor social anxiety}) + a_{2i}(\text{partner social anxiety}) + a_{3i}(\text{gender}) + d_{ij}$$

This models an individual's current observation (j) relationship satisfaction as a function of the social anxiety of both actor and partner. Gender is included, as it is the distinguishing variable for dyads. Effects of social anxiety are nested within the dyad (a_{1i}).

Fixed effect actor-partner associations were tested, following the Mixed procedure in SPSS 25 (IBM Corp., 2017) for repeated measures of dyadic data, to account for the statistical dependence across distinguishable dyad members (Kenny, Kashy, & Cook, 2006). This approach facilitates the analysis of all three levels of data detailed above (i.e., time, person, and dyad) by grouping data into two levels, as the level of time is the same for both members of the dyad at each time point (Laurenceau & Bolder, 2011).

Data were structured in SPSS such that each participant had a line of data for each observation. Each line of data included actor variables for that day, partner variables for the preceding day, and actor and partner Level 2 variables. Gender was the effect coded

distinguishing variable with -1 = female and +1 = male, and predictor and outcome variables were mean centered.

Preliminary Analyses

Descriptive statistics for predictor and outcome variables are presented in Table 8. Female participants reported significantly higher levels of both depression and social anxiety than did their male counterparts. No other statistically significant sex differences were observed. Zero-order correlations among these variables are displayed in Table 9, organized by participant sex. For both men and women, social anxiety was positively correlated with depression. Social anxiety was negatively correlated with perceived social self-efficacy and perceived social support among both male and female participants. Social anxiety was inversely correlated with commitment and satisfaction among male but not female participants. Depression was inversely correlated with each relationship variable (i.e., social self-efficacy, commitment, satisfaction, and social support) among both men and women. Commitment, satisfaction, and social support were all positively correlated among themselves in both men and women. Actor-partner correlations for all variables were positively correlated with one another.

Table 8.

Descriptive Statistics for Study 2 Variables by Gender

Variable	Men		Women		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Social Anxiety	7.12	5.98	8.83	5.89	2.24*
Depression	36.96	8.41	41.76	9.12	6.89***
Social Self-Efficacy	19.82	3.64	20.29	3.41	1.71
Commitment	6.79	1.19	6.71	1.36	-.71
Satisfaction	121.67	22.41	120.96	25.15	-.355
Social Support	63.21	14.54	65.01	14.89	1.56
Social Support (Spouse)	22.15	4.41	22.39	4.70	.68

Note: all values presented are drawn from data pooled across all observations.

* = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 9.

Zero-order Correlations Between Predictor and Outcome Variables by Sex

	1	2	3	4	5	6	7
1. Social Anxiety	.21*	.45***	.03	.03	-.20***	-.12*	-.56***
2. Depression	.52***	.24*	-.27***	-.39***	-.47***	-.44***	-.36***
3. Commitment	-.21**	-.39***	.56***	.81***	.30**	.36***	.24**
4. Satisfaction	-.19**	-.46***	.75***	.61***	.39***	.50***	.17*
5. Social Support	-.25***	-.47***	.43***	.52***	.33**	.95***	.33***
6. Spouse Support	-.23***	-.46***	.51***	.61***	.95***	.23***	.28***
7. Social Self- efficacy	-.64***	-.49***	.13*	.04	.22***	.17**	.26**

Note: Correlations below the diagonal are for male participants; correlations above the diagonal are for female participants. Actor-partner correlations appear along the diagonal in bold. All correlation coefficients are based on grand means.

* $p < .05$; ** $p < .01$; *** $p < .001$

Objective 1: Examination of actor-partner effects of social anxiety and depression on romantic relationship functioning.

Preliminary analyses. The associations between social anxiety and romantic relationship functioning variables were run with cross-sectional actor-partner data obtained at the first observation point. The standard APIM model for distinguishable dyads was used for analyses. In the first model, relationship satisfaction was modeled as a function of actor and partner social anxiety, fixed effects of both relationship length and gender also were included. Significant actor ($b = -.57, t = -2.06, p = .02$) but not partner effects were found for social anxiety. The first model was re-run with social support entered as the dependent variable. Estimates obtained for gender and relationship length were not significant. Again, significant actor effects were found for actor ($b = -.17, t = -3.52, p < .001$), but not partner, social anxiety. Estimates obtained for gender and relationship length were not significant. The model was run a third time with commitment entered as the dependent variable, and did not yield any significant effects. The fourth and final preliminary model was computed with perceived social self-efficacy entered as the dependent variable. Actor social anxiety was inversely associated with perceived social self-efficacy ($b = -.35, t = -10.01, p < .001$). Gender was also significantly associated with perceived social self-efficacy, such that male gender was associated with increased perceived social self-efficacy ($b = -.51, t = -3.19, p = .002$). Significant results were not obtained for partner social anxiety or relationship length.

Cross-sectional APIM. Study 2 Objective 1 examined the associations between both social anxiety and depression on each of relationship satisfaction, social support, and commitment. Four separate models were run, each with a different dependent variable (i.e., relationship satisfaction, social support, spouse social support, and commitment). In each model, the dependent variable was examined as a function of actor and partner social anxiety and actor

and partner depression. The impacts of gender and relationship length were investigated by including main effects of these variables in the models. Two-way interactions between gender and both actor social anxiety and actor depression were also included. These models were run in hierarchical form, with main effects entered at Step 1 and interactions entered at Step 2. Results are displayed in Table 10.

Table 10.

Cross-sectional actor partner effects of social anxiety and depression on romantic relationship functioning variables.

Variable	Satisfaction			Commitment			General Social Support			Spouse Social Support			PSSE			
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>	
Step 1																
Actor Social Anxiety	.60	.29	2.05*	.03	.02	1.58	.05	.19	.27	.07	.06	1.17	-.33	.04	-8.1***	
Partner Social Anxiety	.37	.28	1.29	.01	.02	.75	.22	.19	1.12	.07	.06	1.21	.01	.04	.19	
Actor Depression	-1.4	.21	-6.98***	-.05	.01	-4.2***	-.89	.14	-6.23***	-.29	.04	-6.79***	-.03	.03	-.94	
Partner Depression	-.59	.20	-2.96**	-.02	.01	-1.66	-.13	.14	-.91	-.03	.04	-.83	-.03	.03	-1.16	
Gender	-.04	1.35	-.03	-.04	.07	-.59	-1.87	.95	-1.98	-.36	.28	-1.27	-.46	.19	-2.39*	
Relationship Length	-.01	.01	-.58	.01	.01	.85	.01	.01	.17	-.01	.01	-.01	-.01	.01	-1.39	
Step 2																
Gender*Social Anxiety	-.57	.27	-2.08*	-.02	.02	-1.03	-.27	.19	-1.41	-.09	.06	-1.65	-.05	.04	-1.22	
Gender*Depression Social Anxiety*Depression	-.11	.19	-.57	-.01	.01	-1.01	-.19	.14	1.41	.06	.04	1.43	-.01	.03	-.16	
Social Anxiety*Depression	-.05	.03	-1.74	-.01	.01	-.92	-.01	.02	-.19	.01	.01	.09	.01	.01	.04	

* $p < .05$; ** $p < .01$; *** $p < .001$

Hypothesis 12 was partially supported with elevated actor and partner depression both significantly associated with lower levels of actor relationship satisfaction. Higher levels of actor social anxiety were associated with higher reported actor relationship satisfaction. Partner social anxiety was not significantly associated with relationship satisfaction. Fixed effects estimates for gender and relationship length were not significant. Analyses of two-way interactions revealed a significant interaction between gender and social anxiety. Hypothesis 16 and 17 were not supported, with the two-way interactions between gender and depression, and gender and social anxiety failing to reach statistical significance.

Actor and partner social anxiety were hypothesized to be positively associated with commitment while depression would be inversely associated with commitment (Hypothesis 15). Consistent with expectations, actor depression was observed to be significantly negatively associated with commitment. The associations between actor and partner social anxiety and commitment were nonsignificant. The two-way interaction between gender and social anxiety was significant. The interaction between gender and depression was not significant.

The third model predicted general social support to be negatively associated with actor and partner social anxiety and depression (Hypothesis 13). Significant coefficients were observed for actor but not partner depression. Actor and partner social anxiety were not significantly associated with perceived general social support. Interaction terms were not significant.

The fourth model predicted actor and partner social anxiety and depression would be negatively associated with perceived spousal social support (Hypothesis 14). A significant negative association between actor depression and perceived spousal social support was observed. All other estimates of main effects were not significant. Two-way interactions were not observed to be statistically significant.

The final, cross-sectional model was exploratory in nature. Actor social anxiety was found to be negatively associated with perceived social self-efficacy. Significant main effects were also obtained for gender, such that male gender was associated with increased perceived social self-efficacy. Two-way interactions tested in this model were nonsignificant.

Objective 2: Examination of causal effects of social anxiety and depression on romantic relationship functioning.

Phase 1. A cross-lagged APIM was run to determine degrees to which actor and partner social anxiety predicted next day relationship satisfaction. Gender, relationship length, and prior day actor and partner relationship satisfaction were included in the model as associated covariates. Hypothesis 18 was not supported. Neither actor nor partner social anxiety were significantly associated with next day relationship satisfaction (see Table 11).

Phase 2. Cross-lagged APIMs were used to test the hypotheses that actor and partner social anxiety and depression would statistically predict next month relationship satisfaction, commitment, and trust. The first model tested the predictive ability of prior month social anxiety and depression on current relationship satisfaction. Effects of relationship length and prior month actor and partner relationship satisfaction were included in the model, in order to statistically control for their effects. The statistical influence of gender was examined as both a standalone fixed effect and as in interaction with each of social anxiety and depression.

Hypothesis 20 was partially supported (see Table 12). Higher levels of prior month (i.e., $j - 1$) partner depression predicted lower levels of relationship satisfaction one month later (i.e., j). Prior month actor relationship satisfaction was positively associated with current

Table 11.

Effects of state social anxiety on next day relationship satisfaction.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	.12	.13	.95
Relationship Length	.01	.01	-.03
Actor Social Anxiety ($j - 1$)	.02	.01	1.24
Partner Social Anxiety ($j - 1$)	.02	.01	1.69
Actor Satisfaction ($j - 1$)	.58	.02	28.75***
Partner Satisfaction ($j - 1$)	.39	.02	19.37***

* $p < .05$; ** $p < .01$; *** $p < .001$

relationship satisfaction. Hypothesis 19 was not supported, with neither actor nor partner social anxiety being significantly associated with next month relationship satisfaction.

Hypothesis 21 was not supported. Prior month actor social anxiety and depression each approached but did not cross the threshold of significance for general social support (Table 13). Both statistics obtained reflected an inverse association. A significant main effect for gender was also found, such that female gender was associated with lower levels of perceived social support. The associated covariates of prior month actor and partner perceived general social support were both statistically significant in the positive direction. Partner social anxiety, partner depression, time, and relationship length were not significant predictors of perceived general social support.

Results showed perceived spousal social support was predicted by prior month actor depression, such that higher depression at $j - 1$ predicted lower levels of perceived spousal social support at time j (see Table 14). The covariates prior month actor and partner perceived spousal social support were significant positive predictors of perceived spousal social support. No other significant effects were observed.

Commitment to one's romantic partner was significantly predicted by prior month actor and partner commitment (see Table 15). Relationship length was also a statistically significant positive predictor of commitment. No significant results were obtained for other predictor variables.

Table 12.

Actor-partner interdependence model of gender, anxiety, and depression as predictors of next month relationship satisfaction

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	-.69	.82	-.85
Relationship Length	.01	.01	.45
Time	2.98	1.56	1.91
Actor Social Anxiety ($j - 1$)	.26	.20	1.27
Partner Social Anxiety ($j - 1$)	.23	.21	1.11
Actor Depression ($j - 1$)	-.24	.15	-1.58
Partner Depression ($j - 1$)	-.32	.14	-2.31**
Actor Satisfaction ($j - 1$)	.42	.05	8.77***
Partner Satisfaction ($j - 1$)	.07	.02	.97
Step 2			
Gender*Social Anxiety	-.26	.19	-1.34
Gender*Depression	.25	.14	1.80

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 13.

Actor-partner interdependence model of gender, anxiety, and depression as predictors of next month perceived general social support.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	-1.72	.79	-2.17*
Relationship Length	-.01	.01	-.28
Time	-.62	1.09	-.57
Actor Social Anxiety (<i>j</i> – 1)	-.20	.13	-1.57
Partner Social Anxiety (<i>j</i> – 1)	.05	.13	.374
Actor Depression (<i>j</i> – 1)	-.12	.09	-1.35
Partner Depression (<i>j</i> – 1)	.01	.09	.04
Actor Support (<i>j</i> – 1)	.42	.05	8.29***
Partner Support (<i>j</i> – 1)	.21	.05	4.05***
Step 2			
Gender*Social Anxiety	-.19	.12	-1.58
Gender*Depression	.07	.07	.923

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 14.

Actor-partner interdependence model of gender, anxiety, and depression as predictors of next month perceived spouse social support.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	-.44	.29	-1.49
Relationship Length	.01	.01	.77
Time	-.28	.34	-.84
Actor Social Anxiety ($j - 1$)	-.01	.04	-.21
Partner Social Anxiety ($j - 1$)	.05	.04	1.30
Actor Depression ($j - 1$)	-.08	.02	-2.81**
Partner Depression ($j - 1$)	.01	.03	.01
Actor Spouse Support ($j - 1$)	.24	.05	4.68***
Partner Spouse Support ($j - 1$)	.29	.05	5.92***
Step 2			
Gender*Social Anxiety	-.08	.04	-1.97
Gender*Depression	.05	.02	1.99

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 15.

Actor-partner interdependence model of gender, anxiety, and depression as predictors of next month commitment.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	-.01	.16	-.07
Relationship Length	.01	.01	3.02**
Time	-.01	.14	-.09
Actor Social Anxiety (<i>j</i> – 1)	-.01	.02	-.82
Partner Social Anxiety (<i>j</i> – 1)	-.02	.02	-.96
Actor Depression (<i>j</i> – 1)	.01	.01	.27
Partner Depression (<i>j</i> – 1)	.01	.01	.85
Actor Commitment (<i>j</i> – 1)	.25	.09	2.70**
Partner Commitment (<i>j</i> – 1)	.52	.08	6.13***
Step 2			
Gender*Social Anxiety	-.02	.02	-1.29
Gender*Depression	.02	.01	1.82

* $p < .05$; ** $p < .01$; *** $p < .001$

Exploratory Analyses

Exploratory analyses of the links between social anxiety and perceived social self-efficacy were conducted. Results indicated that the degree to which one experiences social anxiety significantly predicts future perceptions of social self-efficacy (Table 16). Partner social anxiety, actor depression, and partner depression were not significantly associated with future perceived social self-efficacy.

Table 16.

Actor-partner interdependence model of gender, anxiety, and depression as predictors of next month perceived social self-efficacy.

Variable	<i>b</i>	<i>SE</i>	<i>t</i>
Step 1			
Gender	.12	.19	.64
Relationship Length	-.01	.01	-.10
Time	-.09	.32	-.29
Actor Social Anxiety (<i>j</i> – 1)	-.13	.03	-3.56***
Partner Social Anxiety (<i>j</i> – 1)	.03	.04	.87
Actor Depression (<i>j</i> – 1)	.01	.02	.46
Partner Depression (<i>j</i> – 1)	-.01	.02	-.37
Actor PSSE (<i>j</i> – 1)	.37	.06	6.43***
Partner PSSE (<i>j</i> – 1)	.16	.06	2.89**
Step 2			
Gender*Social Anxiety	-.17	.17	-.99
Gender*Depression	.11	.13	.86

* $p < .05$; ** $p < .01$; *** $p < .001$

Study 2 Discussion

Social anxiety and depression have been linked to a variety of difficulties in romantic relationships, and have been implicated as potential causal factors in relationship deterioration over time (e.g., Cuming & Rapee, 2010; Lampe, Slade, & Issakidis, 2003; O’Leary, Christian, & Mendell, 1994; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005). Individuals reporting high levels of social anxiety and/or depression tend to experience romantic relationships that are, on average, shorter, and less emotionally deep. These relationships are also more likely to be terminated than are romantic relationships among individuals who endorse relatively few symptoms of social anxiety and depression. However, relatively little is understood about the ways in which social anxiety and depression may cause relational difficulties. Using a dyadic, longitudinal approach, Study 2 provides novel insights into the influences of actor and partner social anxiety and depression on the functioning of romantic relationships.

Both social anxiety and depression were identified as significant correlates of lower reported relationship satisfaction and perceived social support (both in general and specific to one’s romantic partner), in line with prior research (e.g., O’Leary, Christian, & Mendell, 1994; Montesi et al., 2013; Porter & Chambless, 2014). Significant correlations were found between partners on all study variables (e.g., Partner A social anxiety correlating with Partner B social anxiety). This highlights the interdependence that underlies romantic relationships and the need for a data analytic strategy that takes this interdependence into account.

Actor-partner interdependence models were run cross-sectionally and longitudinally. Prior research in this field has often examined either social anxiety or depression, but very rarely have the effects of both psychopathologies been observed concurrently (e.g., Whisman, 1999). Indeed, APIM analyses run with only one of these predictors yielded results that failed to replicate in follow-up analyses that included actor and partner depression and social anxiety as

predictors. This pattern of results highlights the need to consider both of these highly comorbid difficulties, and suggests that some of the inconsistency in results across past research in social anxiety may be due researchers not addressing depressive symptoms. Cross-sectional APIMs demonstrated significant associations between both actor and partner depression with relationship satisfaction, such that the presence of depression in either member of the dyad was linked to lower levels of reported relationship satisfaction.

A similar pattern of results was observed for cross-sectional APIMs for commitment, general social support, and spouse-specific social support. Actor but not partner depression was significantly associated with each dependent variable in the inverse direction. This indicates that the subjective experience of depression is associated with perceptions of social support from general sources and from one's partner as being unavailable, and with a lower degree of commitment to that partner.

Cross-lagged APIM analyses were conducted to assess the effects of anxiety and depression on relationship functioning over time. Partner, but not actor, depression emerged as a significant predictor of declining relationship satisfaction. Actor depression significantly predicted lower levels of perceived spousal social support. Considered in conjunction with first-order and cross-sectional analyses, it becomes apparent that although surface-level associations exist between each of social anxiety and depression, and all romantic relationship outcome variables observed, these predictor variables do not necessarily play a role in changes in functioning over time. Both actor and partner effects appear to be important factors in the functioning of romantic relationships.

Relationship satisfaction

Part of the fifth objective was to examine the hypothesis that actor and partner social anxiety and depression are associated with lower levels of relationship satisfaction. Past research

has identified negative correlations between the social anxiety and relationship satisfaction of the individual, but has failed to account for the interdependence of these constructs that is shared between romantic partners (e.g., Montesi et al., 2013). In the present study, the zero-order correlation between social anxiety and relationship satisfaction was significant for men with negative valence. Depression was also negatively correlated with relationship satisfaction. These findings mirror those of prior research that has identified inverse associations between both of these psychopathologies and satisfaction in romantic relationships (e.g., O’Leary, Christian, & Mendell, 1994; Montesi et al., 2013). This suggests the presence of a trend toward relational dissatisfaction among individuals experiencing higher levels of either or both of social anxiety and depression.

The cross-sectional APIM analyses represent a new form of exploring the phenomena of social anxiety and depression in romantic relationships. These analyses revealed differing findings based on the inclusion or exclusion of comorbid depressive symptoms alongside social anxiety symptoms, suggesting that failure to adequately model both phenomena may explain some of the disagreement in the prior literature. When depression was included in the statistical model, actor social anxiety was associated with higher relationship satisfaction. In prior studies that included comorbid depressive symptoms in predictive models of social anxiety onto relationship satisfaction, the obtained coefficient for social anxiety failed to cross the threshold of statistical significance (e.g., Porter & Chambless, 2014; Whisman, 1999). These past studies also did not include partner effects in statistical analyses to account for the interdependence of these constructs.

Although the findings of several studies (Montesi et al., 2013; Whisman, 1999) demonstrate a negative association between social anxiety and relationship satisfaction, these studies did not account for the influence of comorbid depression. In an exploratory analysis that

excluded depression from the APIM in Study 2, actor social anxiety was significantly associated with lower relationship satisfaction. Comparison of these models with and without depression entered as a predictor indicate the presence of a more complex dynamic, and highlight the need for inclusion of comorbid depression in this field of research.

Cross-sectional APIMs showed an inverse association between the depression of both actor and partner with relationship satisfaction. These results suggest that the presence of heightened depression within a dyad may have negative consequences for the relationship, regardless of which partner is experiencing the depression. Past research has identified a strong and stable association between depression and relationship dissatisfaction but has not used the APIM (Gotlib & Whiffen, 1989; Rehman, Gollan, & Mortimer, 2008; Whisman, 2001). Use of the APIM in Study 2 represents an important statistical consideration, given the interdependence of romantic partners (Berscheid, 1999).

Longitudinal results of Study 2 regarding the links between social anxiety and relationship satisfaction revealed similar findings to cross-sectional analyses. In the present study, neither actor nor partner social anxiety predicted future relationship satisfaction. These findings were consistent in analyses of state social anxiety (i.e., daily diary measures) and trait social anxiety (i.e., monthly measures). Partner but not actor depression predicted a significant decrease in relationship satisfaction over time. No other research to date has investigated the effects of social anxiety and depression on relationship satisfaction over time.

Study 2 did not establish a significant predictive association between social anxiety and relationship satisfaction. This is novel evidence that, although higher levels of social anxiety are correlated with lower levels of relationship satisfaction, this association likely should not be attributed to social anxiety itself. One possible explanation for this finding may be found in earlier models of social anxiety. Prior to the inception of the cognitive-behavioural model of

social anxiety (Clark & Wells, 1995), the self-presentation model of social anxiety received considerable academic attention (Schlenker & Leary, 1982). Present in this older framework but absent in more contemporary models is the notion of the impact of familiarity. Research at the time indicated that anxiety may be more activated in unfamiliar social contexts (e.g., Zimbardo, 1977). It may be the case that among established relational partners, such as those in Study 2 (average relationship length of 10.99 years), benefit from an increased familiarity with their romantic partners. This familiarity may reduce the perceived social danger in interactions with romantic partners and subsequently mitigate the unwanted impacts of social anxiety on relationship satisfaction.

Past research has identified correlational links between depression and relationship satisfaction (e.g., O’Leary, Christian, & Mendell, 1999). Study 2 is the first study to demonstrate a longitudinal link between depressive symptomatology and relationship satisfaction. This result builds upon correlational links observed between these two constructs in past studies by demonstrating that, not only is depression associated with lower relationship satisfaction, but that the depressive symptoms of one’s romantic partner may actually cause dissatisfaction in monogamous romantic relationships.

Perceived Social Support

Study 2 examined the associations between social anxiety and depression, and perceptions of the social support available to the individual. Several prior studies have largely supported an inverse correlation between perceived social support and either of social anxiety or depression (e.g., Torgrud et al., 2004; Porter & Chambless, 2014; Porter & Chambless, 2016). However, these studies have failed to differentiate perceptions of support from social actors in general from the perceived support received from one’s romantic partner, and instead examined either one source of support or the other. Results of the present study demonstrate an inverse

association between each of social anxiety and depression with both general and spouse-specific forms of social support. Cross-sectional APIM analyses identified significant actor, but not partner, effects of depression on general and spouse-specific social support. This indicates that higher levels of depression within an individual may predispose that individual to perceiving less availability of social support, both from social contacts at large and from one's romantic partner. Similar results have been observed in prior research showing depression to be inversely associated with perceived social support (e.g., Henderson, 1991; Peirce, Frone, Russell, Cooper, & Mudar, 1986).

A significant main effect for gender on general social support was observed, indicating that male participants perceive less general social support to be available than do their female counterparts. This finding aligns with prior research that observed women to have larger and more supportive social networks than do their male counterparts (Bebbington, 1998). Indeed, the perception of lower social support to be available to male participants may be reflective of an actual difference in received support.

Longitudinal APIM analyses further illuminated the impacts of depression on perceived social support, from both general sources and from one's spouse. Actor, but not partner, depression was inversely associated with future perceived spouse-specific social support. Prior research has identified a robust, negative association between depression and social support (e.g., Henderson, 1991). Relatively little research has been conducted regarding the impacts of depression on social support over time. One study did investigate longitudinal links between depression and perceived social support. Doormann and Zapf (1999) identified a direction of causality from present depression to future perceived social support, such that higher depression at time one predicted lower perceived social support at time two.

Study 2 represents the first longitudinal dyadic investigation of social anxiety and depression in romantic relationships. Results show a causal relationship from actor depression to actor perceived general social support and to spouse-specific social support. Partner effects were not statistically significant, indicating that the degree to which one's romantic partner is experiencing depression does not have a significant impact on how much support is perceived to be available from that partner. At surface level, this finding appears to contradict prior research demonstrating that higher levels of depression are associated with lower provision of social support (Henderson, 1991). Given these results from prior research, it was anticipated that higher partner depression would predict lower actor perceived social support. One possible explanation for this finding in the present study can be drawn from the larger social support literature. Many prior studies have demonstrated that perceived social support is far more impactful on relational wellbeing than is tangible, received social support and, at times, support can be perceived without actually having been provided (e.g., Cohen, 2004). Therefore, it may be the case that, although depressed partners may indeed provide less social support, partner depression does not impact the degree to which the actor perceives support to be available. Rather, the increased need for social support that come with increasing depression and the associated cognitive bias toward interpretation of ambiguous events as negative lead depressed actors to perceive social support to be less available than it actually is. This likely occurs regardless of how much support is or is not provided by one's spouse, as it is the perception of support that bears greater impact (Eagle, Hybels, & Proeshold-Bell, 2019).

Commitment

In Study 2, commitment was negatively associated with depression and social anxiety. No prior research has investigated these links. Cross-sectional APIMs supported the hypothesis that commitment would be negatively associated with depression. These results align closely

with the meta-analytic findings of Study 1. In both Study 2 and Study 1, a small positive effect of social anxiety on commitment was observed in cross sectional analyses, but in Study 2 this coefficient did not cross the threshold of significance. A predictive relationship between these constructs in longitudinal analysis was not observed. That is to say, although individuals with higher levels of social anxiety may display higher overall levels of commitment to their romantic partners, such displays of commitment are likely explained by an unexplored variable, rather than by either social anxiety or depression.

The only significant coefficient observed for the longitudinal APIM for commitment was for the relationship length covariate. This shows a direct positive link between the length of time that a couple has been together and the degree to which an individual within the dyad feels committed. Prior research has demonstrated similar links between relationship length and commitment (Sprecher, 2002). It appears that the longer couples are together, the more committed they are to one another. This finding aligns with the investment model of romantic relationships (Rusbult, 1980, 1983). This theory suggests that as individuals invest more resources into a given relationship, they will become more committed to that relationship. Over time, increasing resources are poured into a relationship and as such we may expect to see commitment increase as time passes.

Exploratory Analysis: Perceived Social Self-Efficacy

Exploratory analyses examining the effects of social anxiety and depression on perceived social self-efficacy were run. Perceived social self-efficacy can have substantial bearing on the degree to which an individual anticipates positive or negative outcomes in a social interaction or in a social relationship more broadly (De Castella et al., 2015; Gaudino & Herbert, 2006). Heightened social anxiety is believed to adversely influence reduced perceived social self-efficacy (Hoffman, 2000). This analysis was conducted in order to determine whether or not this

association is present among individuals involved in romantic relationships. The absence of a positive association between social anxiety and perceived social self-efficacy would indicate the presence of a potential confound in Study 2's investigation of associations between social anxiety and romantic relationship functioning.

Results of Study 2 demonstrate a strong negative association between social anxiety and perceived social self-efficacy, such that prior month social anxiety predicts lower perceived social self-efficacy at future observations. These results align closely with existing theory and research of the biases in self-perception driven by social anxiety (Hoffman, 2000, 2007). Findings in Study 2 may indicate a failure for highly socially anxious individuals to generalize their social successes. A central component of cognitive-behaviour therapy for social anxiety disorder is the accumulation of social successes in diverse and increasingly anxiety provoking social situations. The result of this is that individuals gain new insight to the likelihood of feared social outcomes actually coming to pass and an appreciation for their own social skills. In Study 2, despite the successful maintenance of long-term romantic relationships, those high in social anxiety continue to perceive themselves to possess inadequate skill to successfully navigate social situations in general.

Strengths and Implications

The methodological approaches employed in the present study are a major source of strength. Collecting data from both members of each dyad reflects a theoretically driven model for romantic relationships research (Brescheid, 1999). Although often unintentional, romantic partners exert a mutual influence on one-another in virtually all domains of their romantic relationship. Due to the interdependent nature of relationship-relevant constructs being investigated, studies that do not employ a dyadic approach would face a major limitation in interpretability of results. Even in cases in which partner effects are not explicitly a part of the

research question, use of a dyadic approach is still advised. Using a holistic investigation of the dyad strengthens statistical results and inferences in Study 2.

Another major strength of the present study is the collection of data over multiple time points. Past research in this field has often yielded conflicting results, and determining which results are most valid is difficult in the cross-sectional designs employed almost unanimously across these studies. By collecting data at multiple time points, longitudinal analyses can be conducted to examine the nature of prediction between variables of interest. Past research has been overly reliant on cross-sectional, correlational research designs. As a result, the links between social anxiety, depression, and romantic relationship functioning have been poorly understood.

Statistical power represents another notable strength of the present study. Inadequate statistical power can be a key factor in failure to replicate research findings. The present study collected a sample of $n = 122$ dyads which, on its own, would provide a statistical power of .95 for correlational analyses for both actors and partners. However, given the mixed nature of the variables of interest, each member of the dyad was able to be treated as a unique individual (albeit, nested within that dyad), giving a sample size of $n = 244$ for cross-sectional analyses. For longitudinal analyses, the amount of available data and statistical power grew again. The cross-lagged regression approach employed in longitudinal analyses effectively treated each observation as unique, while nesting observations within the person. This approach examines a series of associations between two time points (i.e., $T_1 - T_2$, $T_2 - T_3$) rather than a course of time points (i.e., $T_1 - T_2 - T_3$) as is the case in some other statistical approaches (e.g., as growth-curve modelling). This approach provides a greater number of observations to be included in statistical analysis.

Results of the present study provide new insights into the ways in which social anxiety and depressive symptoms are associated with important aspects of romantic relationships. Although prior research has established some links between social anxiety and relationship satisfaction, social support, and commitment, results have varied between studies, and causal links have not been established. The present study provides a methodologically rigorous contribution to this field by investigating these constructs in a longitudinal design and differentiating the effects of social anxiety from those of depression, which facilitates the development of new inferences with both academic and clinical utility.

Scientific investigation in this field has struggled to clarify the associations between social anxiety and romantic relationship functioning. Despite strong evidence that individuals high in social anxiety experience poorer relationship outcomes, efforts to understand how social anxiety may be impacting the relationships themselves have largely failed to yield empirically supported consensus. Understanding that social anxiety does not play a direct role in driving reductions in relationship satisfaction over time despite being a correlate of relationship satisfaction suggests that social anxiety may not directly be involved in the increased likelihood of dissolution observed among socially anxious populations. Furthermore, the emerging trend in the results of the present study is that depression, which is highly comorbid with social anxiety, may be a driving force in some of the relational disharmony observed among socially anxious individuals. Although social anxiety is inversely correlated with relationship satisfaction and social support, investigation of these associations without the inclusion of depressive symptomatology will likely result in findings that will fail to replicate. Without taking depression into account, research conclusions would be poorly informed and may fail to generate new insights into the experiences of individuals faced with distress driven by either or both of these sources of psychological distress.

In clinical contexts, differentiation of underlying causes for clinical distress is of critical importance to treatment planning and achievement of desirable clinical outcomes (Easden & Fletcher, 2018). The issue of comorbid psychopathologies requires a crucial decision of the treating clinician, one that should be carefully informed by empirical research. Patients frequently present to mental health clinics with complaints centered on interpersonal, occupational, or educational difficulties that arise from underlying psychopathology. Results of the present study may provide clinicians with relevant information regarding the nature of disharmony in romantic relationships, and with an understanding of trends in romantic relationship functioning that may arise from presenting social anxiety or depression. For example, an individual receiving psychotherapy for social anxiety disorder is likely to be experiencing low relationship satisfaction and, while the goals for therapy may centre on reduction of social anxiety symptoms, a secondary goal of improvement of the relationship may be introduced. Given the results of Study 2, it is unlikely that a reduction in social anxiety alone would result in improved relationship satisfaction. Further interventions either specific to the relationship (e.g., couples' therapy) or comorbid depression would likely be required to achieve this secondary goal.

Limitations and Future Directions

Despite the numerous strengths of the present study, several important limitations should be acknowledged. The first of these is the use of internet-based data collection approaches. A common concern regarding online data collection is the question of authenticity of participants. As opposed to in-person data collection, in online research the researcher will never meet the participant. Such face-to-face interaction verifies that the participant is a human (as opposed to a 'bot') and that each participant is unique. Online research can never reach 100% certainty that the participants are truly unique individuals. However, several steps were taken in the present

study to maximize the likelihood of authentic participation. Firstly, Prolific Academic employs persons specifically tasked with fraud detection that is carried out via applications of computer forensics. On an ongoing basis, Prolific Academic participants are investigated for electronic fingerprints of fraud that include botting (i.e., the use of automatized accounts programmed to complete surveys whilst fraudulently claiming to be human beings), a single individual masquerading as multiple individuals, and careless responding. No participants who completed the present study were listed in the fraudulent database. Additionally, the inclusion criteria enacted served to prevent high-risk participants (i.e., little past research involvement, history of incomplete participation) from participating. Finally, the longitudinal nature of the present study may have acted as a natural filter for fraudulent participants. In order to proceed in the study, both members of a dyad had to first be identified and second complete the baseline measure. Failure to complete either of these requirements resulted in exclusion from future measurements and discarding of any data that were collected at time one.

Despite the steps taken to minimize the potential for fraudulent participation, 100% certainty that this was achieved cannot be ascertained. Future efforts should be made to replicate the findings of the present study using offline methodologies. Replication of findings is an important step in the academic process and, in this instance, replication not using online participation would provide an important extension of findings to a broader population. Successful replication in this fashion would afford greater confidence in the present results and in the use of similar approaches in future research.

The present study relied on self-report measures as a primary source of data collection. Self-report measures of depression can sometimes yield responses that are influenced by social desirability (Tanaka-Matsumi & Kameoka, 1986). Specifically, individuals experiencing heightened levels of depression tend to overly endorse the intensity of their symptoms, creating

an exaggerated estimate of their depression, which can impede the specificity of these measures (Tanaka-Matsumi & Kameoka, 1986). However, the consequences of this socially desirable response pattern are minimized by the treatment of depression as a continuous, rather than a categorical variable. Self-report measures of psychopathology generally display sub-optimal specificity. This is problematic for any attempts to use cut-off scores to generate discrete categories of clinical and subclinical levels of a given psychopathology (Dunstan, Scott, & Todd, 2017). This limitation of self-report measures prevents investigation of research questions pertaining to diagnostic status. For example, the present study investigates the co-occurring influence of anxiety and depression on several constructs. Differences between participants of differing diagnostic statuses (e.g., Major Depressive Disorder only, Social Anxiety Disorder only, both diagnoses) would provide new insights to the difficulties faced by specific clinical populations. Future research should attempt to supplement the self-report measures used in the present study with baseline diagnostic interviews. Such an approach would allow for investigation of research questions related to diagnostic status as well as questions related to change over time on a dimension of symptom severity, such as those explored in the present study.

Finally, the duration of relationships in the Study 2 sample presents a potential limitation. The average relationship length of participants in Study 2 was nearly 11 years at the beginning of data collection. The results of the present study therefore speak to the influences of social anxiety and depression on maintenance processes in established, long-term romantic relationships. However, inferences regarding newer or emerging romantic relationships cannot be made with confidence. Indeed, romantic relationships still in the early stages of development were not captured in Study 2. In the case of social anxiety, some of the most pronounced social impacts centre on the formation of new interpersonal relationships (e.g., Bruch & Pearl, 1995). It may be

the case that social anxiety and depression have the most pronounced effects on romantic relationships in the earliest stages. Therefore, participant samples involving couples who have been together for several years may unintentionally overrepresent those couples who have successfully navigated the complications that social anxiety and depression introduce to the relationship. Future research could address this limitation by pursuing a longitudinal dyadic study involving couples in the opening months of their romantic relationships.

Conclusions

Social anxiety and depression are each inversely associated with two key indicators of relational wellbeing: relationship satisfaction and perceived social support. Despite the presence of these associations both in Study 2 and in past research, longitudinal analyses reveal the nature of these associations to be more complex than they initially appear. The dyadic, longitudinal approach employed by the present study provides novel insights that illuminate the interplay between romantic relationship functioning and internalizing psychopathology. Although social anxiety is correlated with lower levels of relationship satisfaction, it is not a causal factor. However, the degree of depression experienced by one's relationship partner is a significant predictor of reduced relationship satisfaction. Depression was also predictive of lower perceived social support from romantic partners, specifically. Contrary to expectations, the social anxiety of one's partner did not influence the degree to which participants felt satisfied or supported within their romantic relationship. In sum, the results of the present study suggest that, although social anxiety reliably correlates with several measures of romantic relationship functioning, it does not appear to drive the observed associations. Social anxiety is not likely the root cause of increased rates of relationship dissolution observed among individuals experiencing heightened levels of social anxiety. Conversely, the degree to which an individual experiences the symptoms of depression likely does impact his or her romantic relationship, as does the depression

experienced by his or her partner. These results address two key shortcomings in the existing literature: 1) failure to explore actor-partner effects in what are inherently interdependent constructs; and 2) collection of data at a single time point that precludes inference relating to effects over time.

Chapter 4: General Discussion

Social anxiety has been linked to undesirable outcomes in romantic relationships such as a reduced likelihood to marry and an increased likelihood to divorce (e.g., Lampe, Slade, Issakidis, & Andrews, 2003; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). Despite theoretical links between social anxiety and several important processes in romantic relationship functioning, prior research has yielded inconsistent and at times conflicting results regarding the influence of social anxiety on these bonds. Further complicating the investigation of these constructs is the influence of comorbid depression. Although both depression and social anxiety involve symptoms that share surface-level similarity, the underlying causes of these symptoms are distinct. Recent research implicates both social anxiety and depression as driving forces in relational disharmony (e.g., Cuming & Rapee, 2010; Kessler et al., 2003). However, this research often stops short of differentiating the effects of these two phenomena from one another. Furthermore, much of the existing literature fails to investigate the interdependence shared by romantic partners or to model directions of effect. The present thesis provides a novel exploration in this field via two closely related studies. In Study 1, the unique variances in romantic relationships functioning attributable to symptoms of anxiety and depression are systematically evaluated across three independent, cross-sectional samples. In Study 2, longitudinal actor-partner effects of social anxiety and depression on romantic relationship functioning are explored, illuminating the potential pathways of causality between these constructs.

Results of Studies 1 and 2 show a common trend: although social anxiety is correlated with deficits in several aspects of romantic relationship functioning, many of these associations are better attributed to the influence of comorbid depression, and only depressive symptomatology is predictive of these deficits over time. Across both studies, social anxiety was inversely correlated with relationship satisfaction, a strong indicator of relational wellbeing. Statistical analyses accounting for the influence of depression demonstrated a general influence of depression, but not social anxiety. Differing results on the influence of perceived social support were obtained in Study 1 and Study 2. Social anxiety appears to be a reliable correlate of deficits in perceived broad social support but did not predict perceived social support over time. Depression, on the other hand, correlates cross-sectionally with lower levels of perceived social support and is predictive of lower perceived social support from one's romantic partner over time. This suggests that, at least with regard to social support, the negative effects of social anxiety do hold a direct impact in the same manner as depression.

One possible explanation for the more prominent effects observed for depression versus social anxiety may lie within the nature of romantic relationships and these psychopathologies themselves. The symptoms of depression manifest as an unpleasant mood state characterized by loss of energy, loss of interest in others or activities, and loss of pleasure, among other things. The experience of depression exists across contexts. For example, an individual may wake up with low mood that persists throughout the day regardless of the setting. Alternatively, social anxiety is generally activated or triggered by environmental circumstance and can be temporarily suppressed through the employment of safety behaviours (e.g., remaining in close proximity to a trusted friend at a party rather than interacting with unfamiliar others) or outright avoidance. It may be that the unwanted effects of social anxiety can be minimized or avoided when interacting with a romantic partner in a way that is not possible with depression. In this case, the impacts of

social anxiety would be greater in social relationships outside of the dyad whereas the effects of depression may be more pronounced within it.

Individuals experiencing distress related to social anxiety or depression may have concerns that the burden of these difficulties would adversely affect those around them and harm their relationships. Results of the present thesis provide evidence that the social anxiety of one's partner does not impact the degree to which one is satisfied with or committed to the relationship. Despite the worst fears of some who experience these difficulties, these results may provide some solace as well as relevant information for therapists seeking to address these concerns.

Conclusion. Individuals experiencing heightened levels of social anxiety or depression are likely to experience difficulties in their romantic relationships (Lampe, Slade, Issakidis, & Andrews, 2003; Montesi et al., 2013; Whisman, 1999). These highly comorbid sources of psychological distress have been linked with lower levels of relationship satisfaction and with perceptions of others as unresponsive to one's needs (e.g., Montesi et al., 2013; Porter & Chambless, 2014). The present thesis addressed a number of limitations of the prior research in this field and was the first to employ a longitudinal dyadic methodological approach. In line with the existing social anxiety literature, higher levels of social anxiety are strongly correlated with the degree to which social support was perceived as available from social networks, but new in the present research is the failure to identify a causal link from social anxiety to perceived social support. The degree to which one views him or herself as socially competent was impacted by social anxiety, despite the apparent evidence of competence brought by the maintenance of a long-term romantic relationship. In line with past research, depression negatively impacted relationship satisfaction and perceived social support. These findings represent a novel contribution to the literature by clarifying and differentiating the influences of two commonly

co-occurring types of psychopathology on the functioning of romantic relationships. New understanding of the impacts that social anxiety and depression do and do not have on romantic relationships provides valuable information to clinicians and academics alike.

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**Western University Non-Medical Research Ethics Board
NMREB Amendment Approval Notice**

Principal Investigator: Prof. Lorne Campbell

Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 108185

Study Title: Experiences in Dating Study

NMREB Revision Approval Date: October 06, 2016

NMREB Expiry Date: September 28, 2017

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Revised Western University Protocol		2016/10/06
Instruments	All Study Measures	2016/10/06

The Western University Non-Medical Science Research Ethics Board (NMREB) has reviewed and approved the amendment to the above named study, as of the NMREB Amendment Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

REDACTED

Ethics Officer, on behalf of Dr. Riley Hinson, NMREB Chair

Ethics Officer: Erika Basile ___ Katelyn Harris Nicole Kaniki ___ Grace Kelly ___ Vikki Tran ___ Karen Gopaul ___



Letter of Information and Consent

Experiences in Dating Study

Letter of Information and Consent

Principal Investigator: Dr. Lorne Campbell

Researcher: Christian Hahn

1. Invitation to Participate

You are invited to participate the research study “Experiences in Dating Study”, conducted by Dr. Lorne Campbell of the Department of Psychology at the University of Western Ontario. The purpose of this letter is to provide you with information in order to allow you to make an informed decision regarding participation in this research.

2. Why is this study being done?

This study is being conducted in order to examine the experiences that people have had in romantic relationships, past and present, and examine the roles of individual differences in these experiences.

3. How long will you be in this study?

This study will run approximately 30 minutes.

4. What are the study procedures?

This study consists of several online questionnaires. Questionnaires will be presented on the computer screen one at a time. Following the final questionnaire a debriefing letter will appear and your participation will be concluded.

5. What are the risks and harms of participating in this study?

There are no known or anticipated risks or discomforts associated with participation in this study. However, as some questions relate directly to mental health you may desire more information on mental health, mental illness, or related services. We encourage you to consult the World Health Organization’s mental health webpage (http://www.who.int/mental_health/en/).

6. What are the benefits of participating in this study?

Potential benefits include an opportunity to participate in novel psychological research and to learn more about the science of romantic relationships. directly

via participation and indirectly via study information and progress posted on the study's Open Science Framework page: <https://osf.io/jkc69/>

7. Can participants choose to leave the study?

Your participation in this study is entirely voluntary and you may refuse to participate or withdraw from this study at any point. Additionally, you may refuse to answer any question(s) that the study asks.

8. How will participants information be kept confidential?

All identifying data collected will remain confidential and will be accessible only to the authorized investigator as well as the broader psychology scientific community. Dr-identified data will be posted on the Open Science Framework website (OSF; <https://osf.io>) so that data may be inspected and analyzed by other researchers. The data that will be shared on the OSF website will not contain any information that can identify a participant. If you choose to withdraw from this study before its completion, your data will be removed and deleted from our database. If you choose to withdraw from the study after its completion we will be unable to remove your data from the database because we are not collecting any information that would allow us to identify your particular responses in the database. Representatives of the University of Western Ontario Non-Medical Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of this research.

9. Are participants compensated to be in this study?

You will receive a one-time payment of \$1.00 (USD) credited to your Amazon MTurk account.

10. What are the rights of participants?

Your participation in this study is voluntary. You may decide not to be in this study. Even if you consent to participate you have the right to not answer individual questions or to withdraw from the study at any time. If you choose not to participate or to leave the study at any time it will have no effect on your compensation.

We will give you new information that is learned during the study that might affect your decision to stay in the study.

You do not waive any legal right by signing this consent form

11. Whom do participants contact for questions?

After you complete this study you will receive a debriefing sheet explaining the nature of the research. If you would like any further information regarding this

research project or your participation in the study, you may contact Dr. Lorne Campbell by email REDACTED . If you have any questions about your rights as a research participant or the conduct of this study, you may contact the University of Western Ontario Office of Research Ethics by phone REDACTED or email REDACTED

12. Consent

By selecting the option below to “Continue on to the survey” you are providing implied consent to participate in this study. If at any point you wish to withdraw your consent from this study please close the window or tab in your browser and you will be removed from this study.

This letter is yours to keep for future reference.



DEBRIEFING FORM

Experiences in Dating Study

Thank you for your participation in this study. The purpose of this study was to investigate the associations between social anxiety and romantic relationships experiences (e.g., relationship history, views of past and present relationships). This was carried out by having participants such as yourself complete an online questionnaire. The measures used provided us with an assessment of social anxiety, depression, relationship history, relationship satisfaction, and other relationship-relevant topics.

As part of this study contained questionnaires relating to mental health you may have further questions relating to your mental health or the mental health of someone you know. If you have any questions relating to mental health information or mental health services we encourage you to visit the World Health Organization's mental health webpage (http://www.who.int/mental_health/en/), which provides detailed information on a variety of mental health topics.

If you are interested in learning more about social anxiety and romantic relationships, please consult any of the following resources:

- 1) Kasdan, Volkmann, Breen, & Han (2007)
- 2) Cuming & Rapee (2010)

If you would like to follow the progress of this study and learn more about its results, please feel free to access the study page on the Open Science Framework website (<https://osf.io/jkc69/>).

Again, thank you for your participation in this research. If you have questions about this research please feel free to contact the researchers Christian Hahn REDACTED and Lorne Campbell REDACTED or The University of Western Ontario's Research Ethics Board at REDACTED

**Western University Non-Medical Research Ethics Board
NMREB Delegated Initial Approval Notice**

REDCATED

Principal Investigator: Prof. Lorne Campbell
Department & Institution: Social Science\Psychology, Western University

NMREB File Number: 109648
Study Title: Romantic Relationships Diary Study

NMREB Initial Approval Date: October 25, 2017
NMREB Expiry Date: October 25, 2018

Documents Approved and/or Received for Information:

Document Name	Comments	Version Date
Western University Protocol		2017/10/25
Recruitment Items	Flyer/Slide	2017/10/16
Letter of Information & Consent		2017/10/16
Instruments	Study Measures	2017/07/31
Other	Debriefing Form	2017/10/02

The Western University Non-Medical Research Ethics Board (NMREB) has reviewed and approved the above named study, as of the NMREB Initial Approval Date noted above.

NMREB approval for this study remains valid until the NMREB Expiry Date noted above, conditional to timely submission and acceptance of NMREB Continuing Ethics Review.

The Western University NMREB operates in compliance with the Tri-Council Policy Statement Ethical Conduct for Research Involving Humans (TCPS2), the Ontario Personal Health Information Protection Act (PHIPA, 2004), and the applicable laws and regulations of Ontario.

Members of the NMREB who are named as Investigators in research studies do not participate in discussions related to, nor vote on such studies when they are presented to the REB.

The NMREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000941.

REDCATED

Ethics Officer, on behalf of Dr. Randal Graham, NMREB Chair or delegated board member

EO: Erika Basile __ Grace Kelly__ Katelyn Harris__ Nicola Morphet __ Karen Gopaul __ Patricia Sargeant __ Kelly Patterson



Letter of Information and Consent

Project Title:

Romantic Relationships Diary Study

Investigators:

Lorne Campbell, Ph.D., Department of Psychology, University of Western Ontario (Principal investigator)

Christian Hahn, Ph. D. candidate, Department of Psychology, University of Western Ontario

LETTER OF INFORMATION

1. Invitation to Participate

We invite you to participate in the research study Romantic Relationships Diary Study, conducted by Dr. Lorne Campbell and Christian Hahn of the Department of Psychology at the University of Western Ontario UWO.

2. Purpose of this Letter

The purpose of this letter is to provide you with information in order to allow you to make an informed decision regarding participation in this research. Participation may involve exposure to sensitive questions, and it is advised to conduct the study in a private place. You have the option to decline to take part or to withdraw from the study at any time without threat of penalty.

3. Purpose of this Study

The purpose of this study is to better understand the dating experiences of adults over a two-month period of time.

4. Inclusion Criteria

Individuals interested in joining the study must be at least 18 years of age, speak English fluently, have regular access to the internet, and have been in a romantic relationship with your current partner for a minimum of 6 months.

5. Exclusion Criteria

There are no exclusion criteria.

6. Study Procedures

If you agree to participate, you will be asked to complete three phases of the study. In the first phase, you will complete a 15-minute online survey. Phase two involves the completion of 6 online daily diary entries. Each daily diary entry will contain several multiple choice questions and will take approximately five minutes to complete. Phase three of this study will also be completed online. In this phase participants will be asked to complete two 10-minute

online questionnaires at monthly intervals. Participants will receive electronic reminders to complete their participation.

The total time of your participation will be approximately 1 hour and five minutes.

7. Possible Risks and Harms

Please be aware that certain questions are of a very personal nature and could potentially bring minor discomfort. If for any reason you experience discomfort, you are free to withdraw at any time.

Additionally, if you experience discomfort and would like to talk with someone about any emotions that the study may have evoked, we recommend contacting a local mental health hotline.

8. Possible Benefits

You may not directly benefit from participating in this study, but your participation will contribute meaningfully to the body of knowledge in psychology, and will also benefit society by providing greater understanding of romantic relationship processes in Canadian adults.

9. Compensation

Participants will be compensated £1.5 for completion of the first survey, £0.4 for each of the six daily surveys, and £1.25 for each of the monthly follow-up surveys. For a total of £6.15. Participants who complete every questionnaire will receive an additional bonus payment of £2.

10. Voluntary Participation

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions, or withdraw from the study at any time. You do not waive any legal rights by consenting to this study.

11. Confidentiality

All data collected will remain confidential and accessible only to the investigators of this study. Your name will be linked with an alphanumeric participant ID number at the outset of the study period. Only the study researcher will have access to this list and this list will be destroyed 5 years after the conclusion of the study in accordance with the Western University institutional policy. This data is collected in order to ensure that participants are able to withdraw their data from the study at any point during their participation. If the results are published your name will not be used. If you choose to withdraw from this study and you close the program prior to submitting your answers, your data will not be saved in the system and therefore will not exist in our database. Anonymized data will be uploaded to the Open Science Framework. This data cannot be connected to any participants and is uploaded so that researchers may run additional statistical analyses. Once uploaded, this data will not be deleted. Representatives of the University of Western Ontario Non-Medical Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of this research.

12. Contacts for Further Information

After you complete this study you will receive a debriefing sheet explaining the nature of the research. If you would like any further information regarding this research project or your participation in the study, you may contact Dr. Lorne Campbell by email REDACTED REDACTED) or Christian Hahn by email REDACTED REDACTED you have any questions

about your rights as a research participant or the conduct of this study, you may contact the University of Western Ontario Office of Human Research Ethics by phone REDACTED or email

13. Publication

If the results of the study are published your name will not be used. If you would like to receive a copy of any potential study results, you may contact Christian Hahn by email

14. Consent

If you wish to consent to participate in this study, please click to continue to the next page. If you do not give your consent, please exit this online form by closing the current window in your browser.



DEBRIEFING FORM

Romantic Relationships Diary Study

Thank you for your participation in this study. The primary purpose of this study was to investigate the associations between social anxiety and dating experiences of romantic partners. Specifically, we are interested in the ways that different levels of social anxiety may impact different aspects of romantic relationship functioning. Social anxiety is both a stable and a flexible construct and so we are seeking to better understand the ways that changes in social anxiety over time may relate to changes in various aspects of the romantic relationship (e.g., how supported somebody feels). Depression is also assessed in this study because of the high level of comorbidity that depression and social anxiety share. We assessed depression in this study so that we can statistically control for it in our analyses and draw conclusions indicative of the influence of social anxiety and not comorbid depression. This was carried out by having participants such as yourself complete an in-lab session as well as a series of online questionnaires. Statistical analyses of data will be primarily concerned with contrasting the responses of those who scored high on the social anxiety measures with those who scored low on the social anxiety measures.

Participants were not initially informed that we are specifically examining differences between socially anxious and nonanxious participants. The rationale for this is that informing participants that we are particularly interested in social anxiety may in some manner prime participants to respond in a certain way.

As part of this study contained questionnaires relating to mental health you may have further questions relating to your mental health or the mental health of someone you know. If you have any questions relating to mental health information or mental health services we encourage you to visit the World Health Organization's mental health webpage (http://www.who.int/mental_health/en/), which provides detailed information on a variety of mental health topics.

If you are interested in learning more about social anxiety and romantic relationships, please consult any of the following resources:

- 1) Kashdan, T. B., Volkmann, J. R., Breen, W. E., & Han, S. (2007). Social anxiety and romantic relationships: The costs and benefits of negative emotion expression are context-dependent. *Journal of anxiety disorders*, 21(4), 475-492.
- 2) Cuming, S., & Rapee, R. M. (2010). Social anxiety and self-protective communication style in close relationships. *Behaviour Research and Therapy*, 48(2), 87-96.

If you would like to follow the progress of this study and learn more about its results, please feel free to access the study page on the Open Science Framework website (<https://osf.io/d9ym6/>).

Again, thank you for your participation in this research. If you have questions about this research please feel free to contact the researchers Christian Hahn REDCATED and Lorne Campbell REDCATED or The University of Western Ontario's Office of Human Research Ethics at

Curriculum Vitae

Christian Hahn, M.Sc., PhD Candidate

EDUCATION

PhD Present	<p>Doctor of Philosophy, Clinical Psychology</p> <p>University of Western Ontario, London, ON <i>Supervisor:</i> Dr. Lorne J. Campbell, PhD <i>Dissertation:</i> “The Impacts of Social Anxiety on Functioning and Maintenance Processes in Romantic Relationships”</p> <p>Pre-doctoral Residency, September 2018 – August 2019 Halifax Clinical Psychology Residency Program, Halifax, NS Mental Health and Addictions Track Major <i>Rotations:</i> Mood Disorders Clinic (<i>supervisor:</i> Dr. B. Pavlova) Community Mental Health (<i>supervisor:</i> Dr. S. Diamond) Eating Disorders Program (<i>supervisor:</i> Dr. S. Gamberg)</p>	2014-
M.Sc.	<p>Master of Science, Clinical Psychology</p> <p>University of Western Ontario, London, ON <i>Supervisor:</i> Dr. Graham J. Reid, PhD, C. Psych. <i>Thesis:</i> “Multi-sector Service Use by Children in Contact with Ontario Mental Health Agencies”</p>	2012-2014
B.A. (hons)	<p>Bachelor of Arts, with Honours in Psychology</p> <p>Saint Mary’s University, Halifax, NS <i>Supervisor:</i> Darren Fowler, M.A., C. Psych. <i>Thesis:</i> “Moderating Variables in Treatment Decisions for GAD and MDD”</p>	2008-2012

PRE-DOCTORAL RESIDENCY CLINICAL TRAINING

Mood Disorders Clinic – Intervention, Assessment and Research Rotation

Supervisor: Dr. Barbara Pavlova, PhD, DClinPsy, RPsych
Nova Scotia Health Authority, Halifax Infirmary, Halifax, NS
(September 2018 – August 2019)

Community Mental Health – Intervention and Assessment Rotation

Supervisor: Dr. Shaindl Diamond, PhD, C.Psych
Nova Scotia Health Authority, Cobequid Community Mental Health Centre, Halifax, NS
(September 2018 – February 2019)

Eating Disorders Program – Intervention and Assessment Rotation

Supervisor: Dr. Susan Gamberg, PhD, C.Psych
Nova Scotia Health Authority, Halifax Infirmary, Halifax, NS
(February 2019 – August 2019)

DOCTORAL PROGRAM SUPERVISED CLINICAL TRAINING

Operational Stress and Injury Clinic – Intervention and Assessment Practicum –

Supervisor: Dr. Charles Nelson, PhD, C. Psych.
Saint Joseph's Health Care, Parkwood Institute, London, ON
(September 2017 – January 2018)

Adult Neuropsychology – Assessment Practicum

Supervisor: Dr. Michael Harnadek, PhD, C. Psych.
London Health Sciences Centre, University Hospital, London, ON
(May 2017 – August 2017)

Adult Ambulatory Care – Intervention Practicum – Saint Joseph's Health Care

Supervisor: Dr. Farida Spencer, PhD, C. Psych.
Parkwood Institute Mental Health Building, London, ON
(February 2017 – August 2017)

Private Practice – Intervention Practicum

Supervisor: Dr. Kelley Benn, PhD, C. Psych.
Benn Psychological Associates, London, ON
(September 2016 – January 2017)

Student Development Centre Psychological Services – Intervention Practicum

Supervisor: Dr. Kathy Dance, PhD, C. Psych.
University of Western Ontario, London, ON
(June 2016 – August 2016)

Forensic Assessment and Treatment Units – Intervention, Assessment, and Supervision Practicum

Supervisor: Dr. Rod Balsom, PhD, C. Psych.
St. Joseph's Health Care, Southwest Centre for Forensic Mental Health Care, St. Thomas, ON
(September 2015 – May 2016)

Youth Justice Team – Assessment Practicum

Supervisors: Dr. Kim Harris, PhD, C. Psych. and Dr. Joyce Radford, PhD, C. Psych.
London Family Court Clinic, London, ON
(May 2015 – August 2015)

Thames Valley District School Board Psychological Services – Intervention Practicum

Supervisor: Dr. Anthony Folino, PhD, C. Psych.
Thames Valley District School Board, London, ON
(September 2014 – April 2015)

Adult Neuropsychology – Assessment Practicum

Supervisor: Dr. Michael Harnadek, PhD, C. Psych.
London Health Sciences Centre, University Hospital, London, ON
(May 2014 – June 2014)

Thames Valley District School Board Psychological Services – Assessment Practicum

Supervisor: Dr. Colin King, PhD, C. Psych.
Thames Valley District School Board, London, ON
(May 2014 – June 2014)

Student Development Centre Psychological Services – Intervention Practicum

Dr. Susan Ruscher, PhD, C. Psych
University of Western Ontario, London, ON
(May 2013 – August 2013)

RESEARCH: PUBLICATIONS

Peer Reviewed Publications

Campbell, L., Balzarini, R. N., Kohut, T., Dobson, K., **Hahn, C. M.**, Moroz, S. E., & Stanton, S. C. (2017). Self-esteem, relationship threat, and dependency regulation: Independent replication of Murray, Rose, Bellavia, Holmes, and Kusche (2002) Study 3. *Journal of Research in Personality*.

Hahn, C. & Campbell L. (2016). Birds of a feather laugh together: An exploration of similarity in humour styles of married couples. *Europe's Journal of Psychology*. 12(3), 406-419.

Hahn, C. & Reid, G. (2014). Multi-sector service use by children in contact with Ontario mental health agencies. *Electronic Thesis and Dissertation Repository*. 2261. <https://ir.lib.uwo.ca/etd/2261>

Submitted Publications

Hahn, C., Campbell, L., & Hahn, I. (2018). Anxious love: An exploration of social anxiety and romantic relationship functioning. *Journal of Social and Clinical Psychology*.

Publications in Progress

Hahn, C. & Campbell, L. Response to relationship dissolution in socially anxious adults.

Zhu, J., **Hahn, C.,** & Campbell, L. (2019). Social Anxiety and Infidelity in Monogamous Romantic Relationships.

Hahn, C. & Campbell, L. Longitudinal Investigation of Actor-Partner Effects of Social Anxiety
on Romantic Relationship Functioning

OTHER PUBLICATION ACTIVITIES

Journal Review Activities

- Psychological Reports (2018).
- Europe's Journal of Psychology (2016).

Editorial Work

Contributing Author and Editor, anxiety.org

- Eating Disorders: Treatment, Relapse, and Recovery (2017).
<https://www.anxiety.org/eating-disorders-treatment-relapse-recovery-4-key-differences>
- Can Social Anxiety and A Romantic Relationship Co-exist? (2017).
<https://www.anxiety.org/if-social-anxiety-disorder-affects-your-romantic-relationships>
- Healthy Perfectionism: A Mental Health Myth Debunked (2017).
<https://www.anxiety.org/perfectionism-can-lead-to-anxiety-and-depression>
- Anxiety, Depression, and Sexual Dysfunction (2017).
<https://www.anxiety.org/how-to-stop-anxiety-and-depression-from-causing-sexual-dysfunction>
- How to Reduce Workplace Anxiety and Improve Performance (2017).
<https://www.anxiety.org/employers-employees-can-manage-workplace-anxiety-and-improve-job-performance>

Text Interviews

Love Matters, "Why your sexiest feature is your sense of humour" (2016).

<https://lovematters.in/en/love-and-relationships/happy-relationships/why-your-sexiest-feature-is-your-sense-of-humour>

The Evidence Exchange Network for Mental Health and Addictions, "Christian Hahn: Examining multi-sector service use by children in Ontario's mental health system" (2013).

<http://eenet.ca/resource/christian-hahn-examining-multi-sector-service-use-children-in-ontario%E2%80%99s-mental-health>

CONFERENCE PRESENTATIONS

- Hahn, C.** & Campbell, L. (2019). Online and Offline Infidelity: An Exploration of Sex Differences in Attitude and Engagement. European Association of Social Psychology – Tech and Relationships Conference, Annecy, France.
- Hahn, C.** & Campbell, L. (2019). Do you love me? Social anxiety and perceptions of romantic relationship wellbeing. 80th Annual Convention of the Canadian Psychological Association, Halifax, Canada.
- Hahn I, **Hahn C**, Carleton N, Campbell L. (2018). Social Anxiety and Intolerance of Uncertainty in Romantic Relationships. Anxiety and Depression Association of America Annual Conference, Washington DC, United States.
- Zhu J, **Hahn C**, Eckstein J. (2018). Social Anxiety and Attachment Orientation as Predictors of Relationship Satisfaction and Trust. International Congress of Applied Psychology, Montreal, Canada.
- Zhu, J, **Hahn C**, Campbell L, (2018). Social Anxiety and Infidelity in Monogamous Romantic Relationships. Society for the Scientific Study of Sexuality, Annual Meeting, Montreal, Canada.
- Hahn C**, Campbell L. (2017). Response to Relationship Dissolution in Socially Anxious Adults. Canadian Psychological Association 78th Annual Convention, Toronto, Canada
- Hahn C**, Campbell L. (2017). Social Anxiety and Romantic Relationship Functioning. Canadian Psychological Association 78th Annual Convention, Toronto, Canada
- Hahn C**, Campbell L (2017). An Examination of the Unique Contributions of Social Anxiety in Predicting Maintenance Factors in Romantic Relationships. Anxiety and Depression Association of America Annual Conference, San Francisco, United States
- Hahn C**, Campbell L. (2016). Birds of a Feather Laugh Together: An Exploration of Similarity in Humor Styles of Married Couples. International Association of Relationships Research, Toronto, Canada
- Hahn C**, Reid G. (2015). Children's Multi-sector Involvement for Mental Health Services. The Canadian Psychological Association's 76th Annual Convention, Ottawa, Canada

Hahn C, Chen S. (2014). Prioritizing Patients Waiting for Children's Mental Health Services. Second Annual Division of Child and Adolescent Psychiatry Research Half Day, London, Canada

Hahn C, Reid G. (2013). Caring for Children and Youth with Ongoing Mental Health Problems: Perspectives of Providers in Primary Health Care. Trillium Primary Health Care Research Day, Toronto, Canada

Konopasky R, **Hahn C**, Lariviere K. (2013). Bullying: Should Psychology Change the Public Discourse from "Bullying" to "Assault Causing Injury"? National Institute for the Teaching of Psychology, 35th Annual Conference, St. Pete's Beach, United States

Hahn C, Fowler D. (2012). Moderating Variables in Treatment Decisions for GAD and MDD. 73rd Annual Convention of the Canadian Psychological Association, Halifax, Canada

Konopasky B, **Hahn C**. (2012). Punishing Bullying: Young Bullies are Given a Pass Even for Bloodying and Bruising, but the Feet of Older Bullies are Held to the Flames. 73rd Annual Convention of the Canadian Psychological Association, Halifax, Canada

Konopasky B, **Hahn C**, MacKinlay J. (2012). Information Not Tested is Information Not Learned: What Student Researcher Participants Didn't Know, Wouldn't Learn, or Wouldn't Take Seriously. National Institute for the Teaching of Psychology, 34th Annual Conference, St. Pete's Beach, United States

Hahn C, Harris B, Franc J, Verge L. (2011). Layperson Familiarity with Psychotherapeutic Orientations. 26th Annual Saint Mary's University Undergraduate Psychology Conference, Halifax, Canada

Hahn C, Kocum L, MacDonald K. (2011). Impacts of Self-esteem and Feedback on Perceived Fairness of an Evaluator Target. 72nd Annual Convention of the Canadian Psychological Association, Toronto, Canada

Kocum L, MacDonal K, **Hahn C**, Talley A. (2011). When Our Basic Psychological Needs are Threatened (and met): Experimental Evidence of Same- and Opposite-sex Sexism. 72nd Annual Convention of the Canadian Psychological Association, Toronto, Canada

AWARENESS PROMOTION

Presentation Activities

Christian Hahn, Nadia Maiolino, & Kyleigh Schraeder, *Finding Mental Health Help: Navigating*

the System and Accessing Services, London Public Library, London, ON, February 2013.

Christian Hahn, *Close Relationships and Mental Health*, London Public Library, London, ON, February 2015.

SCHOLARSHIPS AND AWARDS

Date	Award	Institution	Value
2017	Research Scholarship	Consumer Brands LLC	\$2,500
2017	Doctoral Scholarship	Ontario Graduate Scholarships	\$15,000
2017/2018	Western Graduate Research Scholarship	University of Western Ontario	\$13,217
2016/2017	Western Graduate Research Scholarship	University of Western Ontario	\$13,000
2016	IARR Conference Student Submission Award	International Association of Relationships Research	\$100
2015/2016	Western Graduate Research Scholarship	University of Western Ontario	\$12,450
2014	Doctoral Scholarship	Ontario Graduate Scholarships	\$15,000
2013	Master's Scholarship	Ontario Graduate Scholarships	\$15,000
2012	Joseph-Armand Bombardier Canada Graduate Scholarships Master's Scholarship	Social Sciences and Humanities Research Council of Canada (SSHRC)	\$17,500
2012	Dean's List Medal	Saint Mary's University	(Received in graduating year, no financial component)
2011	Clinical Psychology Award	Saint Mary's University	\$200
2011	Coy Family Bursary	Saint Mary's University	\$800
2011	Student Leadership Award	Saint Mary's University Student Association	(No financial Component)
2011/2012	Dean's List Medal	Saint Mary's University	\$3,000
2009/2010	Dean's List Medal	Saint Mary's University	\$1,500

TEACHING ACTIVITIES

Course Instructor Roles

Course Instructor, Psychology 3310 – Adult Psychopathology

King's University College at University of Western Ontario, London, ON
(September 2017 – April 2018)

Course Instructor, Psychology 2310 – Abnormal Psychology

University of Western Ontario, London, ON
(September 2017 – December 2017)

Course Instructor, Psychology 3001 – Abnormal Psychology

Fanshawe Community College, Woodstock, ON
(September 2016 – December 2016)

Course Instructor, Psychology 1002 – Interpersonal and Group Dynamics

Fanshawe Community College, Woodstock, ON
(January 2017 – April 2017)

Teaching Assistant Roles

Graduate Teaching Assistant, University of Western Ontario, London, ON

- Psychology 4850 - Honours Thesis in Psychology (September 2015 – April 2016 & September 2016 – April 2017)
- Psychology 2310 – Abnormal Psychology (September 2013 – December 2013; January 2014 – April 2014; September 2014 – December 2014; January 2015 – April 2015)
- Psychology 2800 – Research Methods in Psychology (September 2012 – April 2013)

Undergraduate Teaching Assistant, Saint Mary's University, Halifax, NS

- Psychology 2340 – Research Methods in Psychology (September 2011 – December 2011)
- Psychology 3317 – Group Dynamics and Intergroup Relations (May 2010 – July 2010)

SUPERVISORY ACTIVITIES

Cognitive-Behavioural Therapy Supervision

- *Status:* Seven Clinical Social Workers employed at Community Mental Health Centres in the Nova Scotia Health Authority are currently enrolled in advanced CBT Training under my direct supervision.
- *Duties:* Bi-weekly meetings with Clinical Social Workers who have previously completed a workshop in introductory CBT. These meetings involve case review and consultation, guidance in implementation of CBT for the specific cases that the group's Social Workers currently have on roster. This includes advanced review of audio and video recordings of therapy and the provision of direct feedback on clinical skill development.

Co-supervision of Undergraduate Honours Thesis (with Dr. Lorne Campbell)

- *Status*: Two supervised students have successfully completed their honours theses and graduated from University of Western Ontario, with honours in Psychology.
- *Duties*: Weekly meetings with honours thesis students to provide instruction on study design, data collection, data entry and analysis, academic writing, conference presentation, and research publication.

COMMUNITY AND VOLUNTEER ENGAGEMENT

***Executive, Clinical Student Advisory Council, Clinical Psychology Program, University of Western Ontario, London, ON
(September 2014 – August 2017)***

***Treasurer, London Regional Psychology Association, London, ON
(June 2015 – May 2016)***

***Student Representative, London Regional Psychology Association, London, ON
(June 2014 – May 2015)***

***President, Psychology Graduate Student Association, University of Western Ontario, London, ON
(August 2013 – July 2014)***

***Vice President, Psychology Society, Saint Mary's University, Halifax, NS
(May 2011 – April 2012)***

***Chair, Saint Mary's University Student Association Board of Directors, Halifax, NS
(May 2011 – April 2012)***

***Board Member, Saint Mary's University Student Association Board of Directors, Halifax, NS
(May 2010 – April 2011)***