THE RELATIONSHIP BETWEEN SAFETY-SEEKING, SELF-AUTHENTICITY, SELF-ESTEEM, AND RELATEDNESS IN SOCIAL ANXIETY

by

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A THESIS SUBMITTED IN PARTIAL FULLFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE AND POSTDOCTORAL STUDIES

(Psychology)

THE UNIVERISTY OF BRITISH COLUMBIA

(Vancouver)

August 2014

Abstract

Cognitive models of Social Anxiety Disorder (SAD) emphasize the role of safety behaviours in maintaining the negative sense of self hypothesized to be at the core of SAD. The social psychology literature contains theories regarding the self that might enrich clinical cognitive models by addressing the interplay between aspects of self and social functioning. The first theory pertains to authenticity: being able to engage in self-congruent behaviours is associated with better social functioning and self-esteem. The second pertains to the contribution of social belonging to self-esteem. My goal in this dissertation was to examine the links between safety-seeking, authenticity, relatedness, and self-esteem suggested by an integration of these theories.

In Study 1, individuals seeking treatment for SAD participated in an experiment designed to manipulate use of safety behaviours in laboratory-based social interactions (N = 93). Consistent with study predictions, reduction in safety behaviours was related to increase in self-authenticity. Additionally, increased authenticity mediated the relationship between condition and enhanced interpersonal functioning (i.e., prosocial behaviour and perceived partner reaction).

In Study 2, structural equation modeling was used to evaluate two potential models of the interrelationships between safety behaviours, authenticity, relatedness, and self-esteem in a nonclinical sample (N = 279): (a) a "self-protection model," based on the hypothesis that less reliance on safety behaviours would be linked to greater self-authenticity, which, in turn, would be linked to stronger relatedness and self-esteem, or (b) a "relatedness model" in which relatedness was hypothesized to be linked to higher self-esteem, which was linked to less safety-seeking behaviour and, thereby, greater authenticity. Results found preliminary support for both models.

Study 3 extended the investigation to a clinical sample (N = 49) to examine temporal relationship between these variables during the course of interpersonal cognitive-behavioural treatment (ICBT) for SAD. Multilevel mediational modeling was used to test whether change in mediators predicted subsequent change in outcome variables. Greater support was found for the "relatedness" model from Study 2. Implications of the present findings for understanding the role of safety behaviours in maintaining the negative self-system and how clinical and social models might be usefully integrated are discussed.

Preface

No part of this research has been previously published. The data used in Study 1 were part of a large previously collected dataset, and portions of this data have been used in previously published works (e.g., Taylor & Alden, 2010, 2011; Plasencia, Alden, & Taylor, 2011). However, the research questions in the current study differ from these previous works.

Data used in studies 2 and 3 were collected with the aid of the laboratory team. I held primary responsibility for supervising data collection, in addition to directly contributing to data collection. The ICBT treatment protocol in Study 3 was developed by Drs. Lynn Alden, Charles Taylor, and Kristin Buhr (2007). I served as primary clinical supervisor for the current ICBT groups, under the supervision of Dr. Lynn Alden.

Across studies, I had the primary role in proposing research questions, research design, data analysis, and drafting the manuscript. Structural Equation Modeling analyses in Study 2 were conducted with assistance and recommendations from Dr. Patricia Brosseau-Liard, based on my specified hypotheses. Dr. Lynn Alden was the supervisor for the entire project and provided feedback throughout the process in the refining of ideas, recommendations for analysis and composition, and manuscript editing.

All 3 studies were approved by the Behavioural Research Ethics Board of the University of British Columbia, certificate numbers: B04-0068 (Study 1), H12-03655 (Study 2), and H06-80806 (Study 3).

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Acknowledgements

I would like acknowledge and thank the many people who helped make this research possible. Foremost, my thanks go to my supervisor, Dr. Lynn Alden, for her guidance, wisdom, support and encouragement throughout this project and my graduate school journey. I would also like to thank my committee members, Drs. E. David Klonsky and Todd Handy for their insightful feedback and assistance through this process. I am grateful to Dr. Kristin Buhr for providing outstanding ICBT clinical training. I would also like to thank the strong research team of graduate student therapists and assessors for their dedication and excellent clinical skills: Audrey Aiken, Karen Auyeung, Heather Baker, Sabrina Chang, Morag Yule, Klint Fung, Heather Morton, Marci Regambal, and Jane Woo. Many thanks go to the research coordinators and assistants for their hard work and conscientious attention to detail: Carrie Cheung, Chelsea Eades, Chris Gorczynski, Nai Louza, Victoria Michalowski, and Kailee Penner. Particular thanks to Victoria Michalowski for her role in Study 2 data collection. I also wish to thank Dr. Charles Taylor for his previous work on the Study 1 dataset that lay the groundwork for the current investigation. Much thanks to Dr. Patricia Brosseau-Liard for sharing her time and extensive knowledge of SEM. This research was funded through grants from Social Sciences and Humanities Research Council and financial support from UBC Graduate Fellowships. Additionally, this research could not have been achieved without the hundreds of individuals who participated in the studies. Finally, dearest thanks go to my family and friends for their unwavering support and encouragement. Thank you!

Chapter One: Introduction

Overview

Social Anxiety Disorder (SAD) is a clinical condition marked by debilitating anxiety in social situations that arises from fear of negative evaluation and functions to impair the person's interpersonal interactions (APA, 2013). According to contemporary cognitive theories, a central feature of SAD is a negative sense of self that is maintained in part by unnecessary safety-seeking behaviours (*safety behaviours, self-protective* strategies), which impede processing of information that might correct overly-negative self-views. Although a body of empirical studies has addressed various aspects of the self (see Alden, Auyeung & Plasencia, 2014), relatively little is known about the relationship between safety behaviours and the socially anxious person's self-views. A broader understanding of the negative self that is protected by safety behaviours might offer leads as to how negative self-views can be modified thereby enhancing relational functioning.

The over-arching goal of my dissertation is to explore the interaction between safety behaviours and three factors postulated by social psychologists to be important features of the person's sense of self, *authenticity*, i.e., the subjective sense that one's behaviour reflects one's genuine self, *social belonging*, the subjective sense that one is connected to the social group, and *self-esteem* (self-valuation), i.e., the judgment that one is a worthwhile person. In this dissertation, I report three studies that examine the relationship between safety behaviours and the self-facets described above. These studies build on my ongoing research interest in the role of safety-seeking behaviours in maintaining anxiety (e.g., Plasencia, Alden, & Taylor, 2011).

The research draws on three bodies of literature. The first arises from cognitive models of SAD, which underscore the contribution of safety behaviours to the maintenance of SAD (e.g.,

Clark & Wells, 1995). The second encompasses Kernis and Goldman's writings on authenticity (e.g., Kernis & Goldman, 2006). The third relevant body of work pertains to the social belongingness model of Leary and colleagues, which underscores the role of social belonging to self-esteem and social anxiety (e.g., Baumeister & Leary, 1995). In this introduction, I begin with a description of SAD, ending this section with a discussion of the social impairment caused by this disorder. I then briefly describe the three bodies of literature outlined above. I end the introduction with an outline of the primary questions addressed in the studies and an overview of the studies themselves.

Social Anxiety Disorder

In the U.S. and Canada, the professional standard for classification and diagnosis of mental disorders is the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM–5*; American Psychiatric Association [APA], 2013). The current DSM-5 classifies Social Anxiety Disorder (SAD) as one of the anxiety disorders and requires 10 criteria to be met for an individual to qualify for a diagnosis, including: 1) intense fear or anxiety about one or more social situations, such as social interactions (e.g., conversations), being observed by others (e.g., when eating or writing), or performance situations (e.g., public speaking); 2) the core fear involves fear of being negatively evaluated (e.g., doing something embarrassing or humiliating, showing anxiety symptoms, or being rejected) or offending others; 3) social situations almost always trigger this fear or anxiety; 4) the social situations are either avoided or endured with great distress; 5) the amount of fear or anxiety experienced is greater than the situations truly warrant; 6) the fear, anxiety, or avoidance is persistent, e.g., usually lasting 6 months or more; 7) the fear, anxiety, or avoidance causes clinically significant distress or impairment in important areas of functioning (e.g., social, occupational); 8) the difficulty is not primarily due to a medical

condition or the physiological effects of a substance; 9) the difficulty is not better captured by another DSM-5 mental disorder (e.g., Agoraphobia, Separation Anxiety Disorder); 10) if a medical condition is present (e.g., stuttering, disfigurement from injury), then the social fear is either unrelated to the condition or greater than would be typically expected as a result of the medical condition (APA, 2013, p. 202-203). An additional specifier that might apply is whether the fear only occurs in performance situations (e.g., public speaking). While the DSM-5 has only recently been published, DSM-5 criteria are largely unchanged from the previous DSM edition (i.e., DSM-IV-TR), with only minor revisions (e.g., previously termed "Social Phobia" in DSM-IV-TR, now changed to Social Anxiety Disorder; typical time-frame of at least 6 months was previously only mentioned for those under 18 years and has been extended to include all ages in DSM-5; DSM-5 no longer requires the person to recognize that the fear is excessive or unreasonable).

The lifetime prevalence of SAD in the general American population is estimated to be 12.1% (Kessler et al., 2005), while in the Canadian population, the lifetime prevalence is estimated to be 8% (Statistics Canada 2002; as cited in Hollander, Simeon, & Parthasarathi, 2012). The disorder is slightly more common in women than men (Magee, Eaton, Wittchen, McGonagle, & Kessler, 1996). Symptoms typically first occur in childhood and adolescence, with a median age of onset of 13 years (Kessler et al., 2005). The course is typically chronic. Only 37% ever receive treatment for SAD, and the mean age of first treatment is approximately 14 years after onset (Shields, 2004). Approximately one-half of these individuals are believed to recover within 25 years after onset. Poorer prognosis may be predicted by earlier age at onset (before age 8-11 years), psychiatric comorbidity, medical comorbidity, lower level of education completed, or higher number of symptoms at first assessment (Hollander et al., 2012).

Approximately one-third of individuals with SAD report fear limited exclusively to public speaking, while others report at least one additional social fear (Magee, et al. 1996). When social fears are more generalized, rather than limited to performance situations, the disorder tends to be more persistent and impairing, and with more comorbid presentation. Common comorbidities include alcohol dependence (two-fold higher risk; Hollander et al. 2012), mood disorders (three- to six-fold higher risk; Kessler et al., 1999), generalized anxiety disorder, and avoidant and dependent personality disorders (Grant et al., 2005). SAD almost always predates mood disorders and predicts both higher likelihood of future mood disorder as well as higher severity and chronicity for the mood disorder (Kessler et al., 1999). There is also evidence that SAD, avoidant personality disorder, and shyness may represent different conceptualizations of the same underlying condition (Ralevski et al., 2005) or may exist on a continuum (Rettew, 2000).

Both psychosocial and biological processes are implicated in the development of SAD. There is a tendency for SAD to run in families, which is thought to be due in part to heritable vulnerabilities and in part to environmental factors (Hollander et al., 2012). The risk of developing SAD or avoidant personality disorder is approximately 10 times higher in first degree relatives with SAD. Twin studies indicate that genetic contributors are shared with other anxiety disorders and depression (e.g., Smoller, Gardner-Schuster, & Misiaszek, 2008). Learning theorists propose that children might develop SAD through various mechanisms, including exposure to traumatic events that are social in nature, vicarious learning through observation of others undergoing socially traumatic events, lack of sufficient exposure to social situations and therefore lack of adequate development of social skills, parental modeling of socially anxious behaviour, and information transfer (e.g., things heard or taught about social interactions) (e.g.,

Hollander et al., 2012; Hudson & Rapee, 2000). Additional risk factors for SAD include parental psychiatric history (particularly SAD, but also other anxiety disorders, depression, or alcohol use disorder), parental marital conflict, parental overprotectiveness/controlling or critical behaviour, childhood abuse, lack of any close relationship with an adult in childhood, not being firstborn (for males), frequent moves in childhood, doing poorly in school, and running away from home (Hollander et al., 2012; Chartier et al., 2001). The onset of symptoms sometimes occurs after a humiliating event, but often is insidious, with the condition arising over months or years. There may be multiple contributing events or no clear precipitating factors.

There is a growing body of research examining biological and neurochemical correlates of SAD. A number of neurotransmitter systems have been implicated, including noradrenergic, GABAergic, dopaminergic, and serotonergic systems (e.g., Tancer, Stein, & Uhde, 1993; Johnson et al., 1998; Argyropoulos et al., 2004; Hollander & Simeon, 2008). Neuroimaging studies have shown heightened brain activation in individuals with SAD in brain regions associated with emotional processing, such as the amygdala (e.g., Birbaumer et al., 1998; Stein et al., 2002; Phan et al., 2006). Additionally, individuals with SAD who carried the short allele of the serotonin transporter gene, which has been implicated in vulnerability to mood disorders (Hariri et al., 2005), showed higher trait and state anxiety and higher right amygdala activation during a public speaking task than individuals with SAD who were homozygous for the long allele (Furmark et al., 2004).

First-line treatments for social anxiety disorder, based on clinical practice guidelines (Canadian Psychiatric Association, 2006), are pharmacotherapy (e.g., SSRIs) and Cognitive-Behavioural Therapy (CBT; described below in Clark & Wells 1995 Cognitive Model of SAD). In a study looking at combined treatment (i.e., both medication and psychotherapy), the

combination did not appear to offer advantages over medication (fluoxetine) or psychotherapy (CBT) alone (Davidson et al., 2004). Studies have found little to no difference between medications (i.e., phenelzine, fluoxetine) and CBT during active treatment phases (Heimberg, Dodge, & Hope, 1990; Davidson et al., 2004). After conclusion of treatment, CBT is associated with a greater likelihood of maintaining benefits or continued improvement, while discontinuation of medications (i.e., phenelzine, sertraline) shows a tendency towards deterioration (Liebowitz et al., 1999; Haug et al., 2003). The evidence that CBT leads to long-lasting gains may be particularly relevant to social anxiety disorder, given its generally chronic nature (Turner et al., 1995).

SAD and social impairment. Considering the importance of relationships to psychological well-being and quality of life, one of the most devastating consequences of social anxiety disorder is its disruptive influence on social relationships. People with social phobia have fewer social relationships than other people, including fewer friends and fewer dating and sexual relationships, and are also less likely to marry (e.g., Hart, Turk, Heimberg, & Liebowitz, 1999; Sanderson, DiNardo, Rapee, & Barlow, 1990; Schneier et al., 1994; Turner, Beidel, Dancu, & Keys, 1986). For the relationships they do develop, people with social anxiety report lower levels of intimacy, self-disclosure, satisfaction, and quality of relationship, and report greater distress and dysfunctional relational strategies (e.g., Davila & Beck, 2002; Heinrichs 2003; Sparrevohn & Rapee, 2009; Rodebaugh 2009b; Wenzel, 2002). Research examining the roots of social anxiety have found that SAD is related to negative parenting styles (e.g., less caring, more rejecting) and less social interaction in childhood, (e.g., Bruch & Heimberg, 1994; Bruch, Heimberg, Berger, & Collins, 1989; Alden, Taylor, Laposa & Mellings, 2006). Bullying and peer victimization in childhood are also related to higher social anxiety, and memories of

childhood teasing are related to higher social anxiety in adulthood (Roth, Coles, & Heimberg, 2002).

This body of work points to the value of considering interpersonal functioning in treatment change. As yet, relatively little research has examined relational changes during treatment. One notable exception is research by Eng, Coles, Heimberg, and Safren, (2005), who found that although group CBT increased satisfaction with social functioning, it still fell below normative levels. Clearly, more work is warranted.

Theoretical Framework

This research draws on concepts from three major theories, Clark and Wells (1995) cognitive model of SAD, Kernis and Goldman's (2006) model of self-authenticity, and Baumeister and Leary's (1995) model of social belonging. I will now describe each of these models and briefly discuss empirical studies that address their central components.

Clark and Wells (1995) Cognitive Model of SAD

Contemporary clinical models of SAD are based in cognitive-behavioural theory. One of the major tenets of this theory for anxiety disorders is that avoidance of feared situations maintains fear while exposure to phobic situations leads to extinction learning and fear reduction. Historically, one of the puzzles of SAD was its persistence in spite of the repeated exposures to social situations that generally occur in daily life. Clark and Wells (1995) developed their influential *cognitive* model to explain this phenomenon. According to the model, individuals with SAD develop maladaptive beliefs about themselves and the world, often based in early social experiences. Examples include excessively negative and inflexible beliefs about the self ("I'm boring/odd/awkward/different/socially incompetent/unlikeable"), beliefs about the consequences of not meeting certain social standards ("If I show anxiety, others will think I'm

weak", "others won't like me once they get to know me"), or unreasonable expectations for social performance (e.g., "I must always sound interesting and intelligent."). These beliefs lead those with SAD to anticipate that social situations will result in negative outcomes (e.g., "I will be humiliated"), which results in anxiety prior to entering social situations.

Several cognitive processes are hypothesized to maintain negative beliefs and perpetuate anxiety, including anticipatory worry, selective attention, biased self-judgments, and post-event processing. According to Clark and Wells, prior to social events, individuals with SAD engage in repetitive thinking about feared outcomes and ruminate about past perceived social failures. Anticipatory thinking can lead the person to avoid the situation completely or create a state of apprehension so that the person enters the event already anxious. Faced with perceived social threat, the person directs attention toward the self and begins to engage in self-monitoring. Heightened self-focused attention increases the salience of negative internal information (e.g., anxiety symptoms, negative self-images), which in turn leads to negatively biased self-judgments (e.g., "I feel anxious, so I must look anxious", or believing that a mental image of oneself looking "stupid" must be true), and neglect of relevant external information, such as how others' are actually responding to them. This *anxiety program* can become cyclical, as evidence for fears is self-generated and possible disconfirming evidence is missed. Following social events, individuals with SAD are hypothesized to engage in post-event processing (PEP), or repeated rumination about the event. PEP is dominated by negatively-biased self-images and judgments and thereby leads the individual to conclude that the event was more negative than it actually was. The result can be persistent feelings of shame, even as the acute anxiety subsides, and confirmation of the negative self-views that underlie this anxiety program.

A growing body of research provides support for these tenets of the cognitive model.

An extensive literature shows that people with SAD tend to overestimate both the likelihood and cost of negative social outcomes, and that changes in these biases mediate treatment changes (see Foa, Franklin, Perry, & Herbert, 1996; Hofmann, 2004; McManus, Clark, & Hackmann, 2000; Smits, Rosenfield, McDonald, & Telch, 2006). People with SAD are also more likely to dwell on negative thoughts and make catastrophic predictions when anticipating a social interaction (Hinrichsen & Clark, 2003), and number of negative self-related thoughts prior to a social encounter is correlated with social anxiety symptoms (Hofmann, Moscovitch, Kim, & Taylor, 2004).

Social anxiety and SAD are related to greater public self-consciousness (Fenigstein, Scheier, & Buss, 1975; Hope & Heimberg, 1988; Bruch et al., 1989; Bruch & Heimberg, 1994; Saboonchi, Lundh, & Öst,1999), and greater self-focused attention in social situations (Mellings &Alden, 2000). Additionally, social anxiety is associated with reduced processing of external information. Under social-evaluative threat, individuals with high social anxiety show an attentional bias away from faces (Mansell, Clark, Ehlers, & Chen, 1999), show reduced processing of faces (Chen, Ehlers, Clark, & Mansell, 2000) , and have poorer memory for external social information (Mellings & Alden, 2000).

Evidence also indicates that people with SAD make negatively biased self-judgments. Researchers have found that socially anxious individuals overestimate negative features of their social performance (e.g., visibility of anxiety) (e.g., Alden & Wallace, 1995; Ashbaugh, Antony, McCabe, Schmidt, & Swinson, 2005; Norton & Hope, 2001; Rapee & Lim, 1992; Stopa & Clark, 1993; Taylor & Alden, 2005; Mellings & Alden, 2000), and make biased judgments about social events. They interpret hypothetical ambiguous (or mildly negative) social events in a more negative way than non-patients or patients with other anxiety disorders, whereas they do not

differ in their interpretation of ambiguous non-social events (Stopa & Clark, 2000; Amir, Foa, & Coles,1998). Additionally, people with SAD assume others will judge them more negatively than is actually the case (e.g., Alden & Wallace, 1995). Finally, individuals with SAD engage in more post-event processing than those low in social anxiety and greater PEP is associated with greater recall of negative self-information and more subsequent social avoidance (Rachman, Grüter-Andrew, & Shafran, 2000; Mellings & Alden, 2000).

Safety behaviours. Particularly relevant to this research, the Clark-Wells model incorporates the concept of safety behaviours (safety-seeking behaviour), which are defined as overt or covert acts designed to minimize or prevent a perceived threatening outcome and to increase the person's sense of safety (Salkovskis, 1991). Unlike complete avoidance or escape, safety behaviours are used within a feared situation and can be thought of as *subtle avoidance* behaviours, intended to protect the person from feared outcomes or consequences. Although safety behaviours may be adaptive in the face of a realistic threat, in anxiety disordered individuals the perceived threat is exaggerated and thus safety behaviours are unnecessary or excessive. Types of safety behaviours used tend to be tied to specific feared outcomes. For example, if the fear concerns other people noticing blushing, the safety behaviour might be to wear clothes or makeup to disguise blushing or cover one's face.

According to cognitive theorists, safety behaviours maintain SAD via a number of possible paths. First, if the feared event does not occur, the person may attribute their safety to the use of safety behaviours (rather than the situation not being dangerous in the first place), which reinforces safety behaviour use. Reliance on safety behaviours can also increase self-focused attention and thereby fuel the anxiety program. In addition, safety behaviours can increase the likelihood that feared outcomes will occur. For example, wearing additional clothes

to hide sweating can lead to increased sweating; covering one's face to hide blushing can increase others' attention to the person; self-monitoring can convey the appearance of being disinterested and unfriendly, and thereby lead others to disengage.

Several other writers have also underscored the role of self-concealment in SAD, (Rodebaugh, 2009; Moscovitch, 2009). Moscovitch (2009) argued that the core fear in SAD is fear of revealing the self to others. Because people with SAD perceive themselves to be deficient or flawed in some way (e.g., in social skill, physical appearance, personality, or character), they engage in self-protective behaviours (i.e., safety behaviours) to prevent perceived deficient self-attributes being exposed to public scrutiny and to try to prevent feared consequences such as negative evaluation, rejection, loss of status, or embarrassment. In a similar vein, Rodebaugh (2009) argued that social anxiety arises from the belief that one will be rejected if the true self is revealed, and consequently, these individuals engage in behaviours to hide the self. His theory is based in part on evolutionary theories of social anxiety suggesting that fear of negative evaluation is adaptive and can result in attempts to hide undesirable aspects of self to prevent exclusion (e.g., Gilbert, 2001). Both writers note that the resultant self-concealment may lead to interpersonal difficulties, particularly when negative perceptions of self are exaggerated or unjustified (as is typically the case in SAD).

A small body of empirical work has examined safety behaviours and self-concealment in SAD. Consistent with Clark and Wells, individuals with SAD report more frequent reliance on safety behaviours when faced with social threat relative to various controls (e.g., Cumming et al., 2009; McManus, Sacadura, & Clark, 2008). Reducing safety behaviours has been shown to reduce fear-related beliefs and anxiety (Kim, 2005; Wells et al., 1995) and judgment biases (Taylor & Alden, 2010), and to result in more positive social outcomes (Taylor & Alden, 2010;

2011) in SAD populations. Moreover, reductions in safety behaviours have been shown to predict treatment response in patients with SAD (e.g., McManus et al., 2009). Rodebaugh (2009) created a self-report measure (i.e, the Core Extrusion Schema measure) to assess aspects of self-concealment he hypothesized were relevant to social anxiety, and found that attempts to hide the self are strongly related to social anxiety. Additionally, the belief that one's true self would be rejected predicted interpersonal dysfunction (i.e., self-concealment and lower perceived social support; Rodebaugh, 2009). Although researchers are beginning to understand the role of safety behaviours in maintaining social anxiety and the processes thought to be central to SAD (e.g., self-monitoring, biased processing of threat-relevant information, negative social outcomes), little is known about how safety behaviours impact the socially anxious person's general sense of self, global self-worth, or sense of relatedness to others.

Treatment. Cognitive-behavioural therapy (CBT) based on this cognitive model involves targeting the various processes (i.e., self-focused attention, safety behaviours, biased processing, and PEP) with the goal of collecting information that disconfirms negative beliefs and judgments. One central treatment strategy is to encourage clients to engage in *behavioural experiments* in which they do and do not engage in safety behaviours, and then compare how anxious they felt, how they think they appeared, and how well they performed in the two situations. Behavioural experiments may first be completed in role-plays and then extended to real-life social interactions. Similar to other anxiety treatments, clients are encouraged to gradually and systematically confront feared social situations. However, the purpose of repeated exposures goes beyond habituation. The exposures are strategically formulated as experiments to test specific feared predictions, and to engage in the collection of evidence to confirm or disprove these predictions, thereby ultimately changing maladaptive beliefs. Additional aims of

treatment may include reduction of pre- and post-event rumination and additional cognitive restructuring for negative self-beliefs (see Beck, Shaw, Rush, & Emery, 1979; Burns, 1980; Beck 1995; Fennell, 1999).

Treatments based on the cognitive model have been shown to be effective in reducing SAD symptoms (Clark et al., 2003; Clark et al., 2006). Moreover, reduction in safety behaviours has been shown to partially mediate treatment improvement (McManus et al, 2009). This work is consistent with the hypothesis that safety behaviours function to maintain maladaptive self-beliefs and that reducing SBs may help to overcome the individual's negative sense of self. Although intent-to-treat analyses from clinical trials indicate that CBT for SAD results in high end state functioning for many patients (e.g., 25% in Otto et al., 2000; 54% in Davidson et al., 2004; 58% in Heimberg et al., 1998), a large number remain symptomatic following treatment, indicating there is still work to be done in improving treatment outcomes. A broader understanding of the relationship between safety behaviours and the socially anxious person's sense of self may point to ways to augment treatment to overcome negative self-views and facilitate social functioning.

Kernis and Goldman's (2006) Model of Self Authenticity

Historically, the concept of authenticity has been alluded to in numerous philosophical and psychological writings, as well as across a variety of other disciplines within the arts and sciences (see Kernis & Goldman, 2006 for a thorough review). Authenticity has also been incorporated in current psychological theories. Self-determination theory (SDT) (Deci & Ryan, 1995, 2000) holds that people are authentic when their actions reflect their true- or core- self, that is, when they are autonomous and self-determining (Kernis & Goldman, 2006). Sheldon and Elliot (1999) theorized that "self-concordant" goals, i.e., goals that are congruent with the true-

self, are important to basic need satisfaction, and several studies have shown that highly self-concordant goal strivings enhance psychological adjustment and well-being (Sheldon & Elliot, 1999; Sheldon & Kasser, 1995, 1998).

Kernis and Goldman conceptualized authenticity as "the unimpeded operation of one's core or true self in one's daily enterprise" (Goldman & Kernis, 2002, p. 18; Kernis, 2003). These writers (Kernis & Goldman, 2006; Goldman & Kernis, 2002) proposed that authenticity is composed of four separate but interrelated components: (a) *awareness*—"awareness of, and trust in, one's motives, feelings, desires, and self-relevant cognitions," (b) *unbiased processing*--"being objective when processing information related to one's positive and negative attributes," (c) *behaviour*--"the free and natural expression of one's feelings, motives, and inclinations, rather than acting "falsely" merely to please others, or to attain rewards or avoid punishments," and (d) *relational orientation*—"valuing and engaging in openness and truthfulness in one's close relationships, and allowing close others to see the real you, both good and bad" (Kernis & Heppner, 2008, p. 86). Goldman and Kernis created the 45-item Authenticity Inventory to assess these four aspects of authentic functioning. In addition to adequate internal reliabilities and test-retest correlations, correlation and confirmatory factor analyses provided support that the components of authentic functioning were interrelated yet distinct and were best explained by a broad latent construct of authentic functioning (Kernis & Goldman, 2006).

A series of investigations using this measure found that that higher dispositional authenticity relates to many aspects of adaptive functioning. Authenticity has been found to relate positively to life satisfaction, positive affect, self-actualization, vitality, self-concept clarity, mindfulness, adaptive coping strategies, more positive relationship functioning, and higher and more secure self-esteem (e.g., Brunell et al., 2010; Heppner et al., 2008; Kernis,

2003; Kernis & Goldman, 2006). These authors suggest that authenticity may be necessary for healthy self-esteem. Supporting this theory, daily ratings of authenticity were found to uniquely predict daily self-esteem, independent of ratings of autonomy, competence, and relatedness to others--basic psychological needs posited by self-determination theory (Heppner et al., 2008).

Conceptually, authenticity is thought to have strong ties to healthy relational functioning. Research has supported this assertion, finding that authenticity is associated with better functioning interpersonal relationships (see Brunell et al., 2010). For example, adolescents who believed they engaged in greater ‘‘true-self” behaviours also reported higher self-esteem, positive affect, and unconditional support from close others (Harter, Marold, Whitesell, & Cobbs, 1996). Higher levels of ‘‘felt psychological authenticity” across different social roles has been associated with higher role satisfaction and lower depression (Sheldon, Ryan, Rawsthorne, & Ilardi, 1997). Recent research on authenticity in romantic relationships found that higher levels of unacceptability of deception (unwillingness to take part in false self- and partner representations) and intimate risk-taking (a preference for more intimate and less inhibited self-disclosure to one’s partner) predicted higher relationship satisfaction (Lopez & Rice, 2006). Finally, in a recent study of heterosexual couples, authenticity was related to engaging in healthy relationship behaviours (e.g, self-disclosure), which in turn predicted positive relationship outcomes and greater personal well-being (Brunell, et al., 2010).

Authenticity and SAD. The concept of "authenticity" parallels the concepts of self-concealment and safety behaviours in clinical writings. As mentioned above, research suggests that people with social anxiety are motivated toward self-concealment and believe they must hide their true selves (Rodebaugh, 2009). Additionally, my previous work indicated that use of safety behaviours was associated with a subjective sense of *inauthenticity* (Plasencia et al.,

2011). That finding raises the possibility that reducing safety behaviours may increase socially anxious individuals' willingness to engage in more authentic behaviour with subsequent benefits to their self-esteem and social functioning. However, the concept of authenticity is only just touched on in the clinical literature. Given authenticity shares potential connections to social relatedness and self-esteem, exploring the concept of authenticity in an SAD population may provide leads for overcoming these individuals' negative sense of self.

Baumeister and Leary's Social Belonging Model

Early social psychological models of social anxiety were based on the notion that social anxiety arises when individuals detect a discrepancy between their self-views and their perceptions of others' expectations (e.g., Fenigstein, Scheier, & Buss, 1975). This notion formed the backbone of Schlenker and Leary's (1982) self-presentation model of social anxiety, which stated that social anxiety arises when people doubt their ability to make a desired (usually positive) impression on others (Schlenker & Leary, 1982). Social anxiety was hypothesized to motivate the individual to avoid or withdraw from social events or to engage in self-protective strategies designed to prevent social rejection.

Building on these writings, Baumeister and Leary (1995) developed their influential relational model of the self that included hypotheses pertaining to the evolutionary value of social belonging (i.e., avoiding social exclusion) and the notion of social pain (Baumeister & Leary, 1995). Specifically, they proposed that the need to belong is innate and likely emerges from an evolutionary basis, as cooperation and social bonds would have survival and reproductive benefits. Thus, Baumeister and Leary (1995) argued that belonging is a fundamental need, and that human beings possess a strong desire to form and maintain enduring interpersonal attachments. Conversely, rejection and ostracism are thought to be highly aversive

experiences and result in a powerful and painful emotional response akin to physical pain, i.e., "social pain" (Baumeister & Tice, 1990; Baumeister, Twenge, & Nuss, 2002; Gardner, Gabriel, & Diekman, 2000).

Of note, the importance of relationships is a theme echoed in many other theories. For example, according to self-determination theory, relatedness (defined as "the desire to feel connected to others—to love and care, and to be loved and cared for," Deci & Ryan, 2000, p. 231) is a basic psychological need that must be met in order for individuals to develop and function optimally. Indeed, Maslow (1968) included "love and belongingness needs" in his motivational hierarchy of needs-- ranked after the basic needs of food and safety, but ranked above esteem and self-actualization (Baumeister & Leary, 1995). The need to form and maintain relationships is also underscored in attachment theory (Bowlby, 1969,1973).

A major tenet of social belonging theory was that self-esteem (i.e., the extent to which one values oneself) is closely connected to how people think they are being perceived and evaluated by others. They argued that self-esteem functions as a *sociometer*, i.e., a means to monitor one's acceptance or rejection by relevant social groups (Leary, Tambor, Terdal, & Downs, 1995), with social belonging or relatedness resulting in enhanced self-esteem. In turn, threats of exclusion would result in a decline in self-esteem, the onset of social anxiety, and behavioural attempts to avoid rejection. Thus, the suggested evolutionary purpose of self-esteem is to help people monitor their value to others as a social relationship partner. Lowered self-esteem and its accompanying social anxiety were hypothesized to function to motivate people to take appropriate steps to attain acceptance or avoid rejection (e.g., Leary & Baumeister, 2000; Leary & Jongman-Sereno, 2014).

Empirical support. There is some empirical support for these ideas. Consistent with the self-presentation model, social anxiety is associated with public self-awareness (awareness of oneself as an object of social scrutiny, e.g., Buss, 1980; Cheek & Buss, 1982). Experiments have demonstrated that raising or lowering level of concern with other's impressions influences level of social anxiety (DePaulo et al., 1990; Leary, 1986). Additionally, belief in one's ability to make a desired impression predicts level of social anxiety in both real and imagined situations (Alden & Wallace, 1991; Leary et al., 1988).

Consistent with the social belonging model, extensive evidence supports the physical and psychological benefits of being accepted and valued, while lack of attachments is linked to a variety of ill effects on health, adjustment, and well-being (for a review, see Baumeister & Leary, 1995). Poor quality social bonds have broad negative health implications, affecting immune response, cardiovascular health, and the endocrine system (Cacioppo et al., 2003; Cohen, 2004; Uchino et al., 1996; Pressman et al., 2005; Cohen et al., 1998). Formation of close social bonds is strongly linked to positive emotions and overall happiness in life, whereas absence of social bonds is linked to unhappiness and depression (e.g., McAdams & Bryant,1987; Argyle, 1987; Freedman, 1978; Myers, 1992; Baumeister, 1991). Dissolution of social bonds is particularly linked to negative affect, such as anxiety, grief, and depression (Leary, 1990; Leary & Downs, 1995). Indeed, socially painful events activate many of the same neurocircuits as physical pain (e.g., Eisenberger & Lieberman, 2004; Eisenberger, Gable, & Lieberman, 2007), including activation of the dorsal anterior cingulate cortex and right prefrontal cortex.

Evidence shows that social support is related to ability to cope with distress and the development of psychopathology (Coyne & Downey, 1991; Ozer, Best, Lipsey, & Weiss, 2003; Smith, Fernengel, Holcroft, Gerald, & Marien, 1994). For example, higher incidence of

psychopathology has been observed in rejected children (Bhatti, Derezotes, Kim, & Specht, 1989; Hamachek, 1992). Veterans with higher perceived social support are less likely to experience PTSD (Hobfall & London, 1986; Solomon, Waysman, & Mikulincer, 1990). Social isolation has long been linked to suicidal behaviour (e.g., Durkheim, 1897) and data suggests social support is a protective factor against suicide (e.g., Kaslow et al., 2002; see Van Orden et al., 2010). Indeed, the interpersonal-psychological theory of suicidal behaviour (IPTS; Joiner, 2005) stipulates that, in addition to perceived burdensomeness, lack of belongingness is a major contributor to the desire for suicide.

A large body of evidence connects social relatedness to self-esteem. For example, low self-esteem is associated with more negative relationships across cultures (Abe, 2004), and people with lower self-esteem report less satisfaction and closeness in intimate relationships (Murray, Holmes, & Collins, 2006). Sociometer theory is supported by a number of studies showing that rejection or disapproval lowers self-esteem, both in laboratory experiments (Leary et al.1995, 1998, 2001; Nezlek et al. 1997) and in connection with everyday life events (Baumeister et al. 1993b, Leary et al. 1995, Murray et al. 2003). Furthermore, longitudinal research has shown that perceived relational value predicts changes in self-esteem over time (Srivastava & Beer, 2005). Finally, Stinson et al. (2008) demonstrated that poor-quality social bonds predicted decrease in self-esteem over time, which predicted further reduction in quality of social bonds, ultimately predicting increase in health problems.

High self-esteem tends to be associated with positive outcomes, such as lower anxiety, higher confidence, lower stress, and greater success (Leary, 1999, 2002; however, see Baumeister, Campbell, Kreuger, and Vohs, 2003 for potential negative effects of high self-esteem, e.g., narcissism, risky behaviour). Low self-esteem, on the other hand, is associated with

a number of negative outcomes, including teenage pregnancy, dropping out of school, mental illness, greater unemployment and lower earnings (McManus, Waite, Shafrain, 2009; Leary, 1999, 2002; Baumeister, et al., 2003). While a large-scale review of the self-esteem literature concluded that feelings of self-worth are not strongly or reliably predictive of concrete life outcomes like academic or job success, popularity, the likelihood of marrying or having children, and the propensity to smoke, abuse drugs or alcohol, or commit crimes, the review did find that self-esteem is strongly predictive of happiness, life satisfaction, and other indicators of well-being (Baumeister, et al., 2003). In addition, as mentioned, recent findings indicate that low self-esteem is predictive of increased health problems and poor-quality social bonds over time (Stinson, et al., 2008). Further, low self-esteem has been shown to be a poor prognostic indicator in the treatment of some psychological disorders and to predict relapse following treatment (McManus, Waite, Shafrain, 2009). Thus, while the direction of causality is uncertain in the relationship between self-esteem and various life-outcomes, low self-esteem does appear to be distressing and disabling.

Relatedness and SAD. As discussed above, individuals with SAD have significant problems in social relationships. They are more apt to be socially isolated, to lack close friends, and to have difficulties in intimate relationships (e.g., Davila & Beck, 2002; Heinrichs 2003; Sparrevohn & Rapee, 2009; Rodebaugh 2009; Wenzel, 2002). Laboratory research also demonstrates that people with SAD are more likely to draw negative responses from others. People are less likely to desire future interaction with socially anxious individuals than non-socially anxious individuals, both in student and clinical samples (e.g., Meleshko & Alden, 1993; Papsdorf & Alden, 1998; Alden & Wallace, 1995; Taylor & Alden, 2006).

Moreover, this social exclusion appears to be linked to safety behaviour use. My previous work indicated that the two primary types of safety behaviours are subtle avoidance (e.g., reducing eye contact, self-disclosure, and talk time) and impression-management (e.g., excessive rehearsal and control of visible emotion; Plasencia et al., 2011). I found that safety behaviours that involve subtle avoidance were particularly harmful to social interactions (e.g., Plasencia et al., 2011; Hirsch et al, 2004). Consistent with those findings, socially anxious individuals were found to fail to reciprocate the intimacy of others' self-disclosures (e.g., Alden & Bieling, 1998; Meleshko & Alden, 1993; Vonken, Alden, Bögels, & Roelofs, 2008; Vonken et al., 2010), even in close relationships (Montesi et al, 2013; Sparrevohn & Rapee, 2009), and to avoid expressing emotions (e.g., Gee, Antony, & Koerner, 2013; Kashdan & Steger, 2006; Kashdan, Volkmann, Breen, Han, 2007), both of which are hypothesized to impair emotional closeness and the person's sense of relatedness to others.

Self-esteem and SAD. Given Baumeister and Leary's (1995) hypothesis that self-esteem is inherently linked to perceptions of how much one is valued and accepted by others, self-esteem may be particularly relevant to social anxiety disorder, where the core fear is negative evaluation and rejection by others. There is increasing research interest in self-esteem in clinical SAD populations (Kocovski & Endler, 2000; Rasmussen & Pidgeon, 2010). Of note, negative self-beliefs and self-esteem are related constructs but conceptually distinct. Self-esteem refers to a global feeling of self-worth, whereas self-beliefs may be global ("I am worthless") or more specific (e.g., "I am socially awkward"). It is possible to have some negative self-beliefs but still preserve overall feelings of worth ("although I am awkward, I am a good person").

Researchers have used both explicit and implicit measurement techniques to assess self-esteem. Individuals with social anxiety and SAD were consistently found to have lower explicit

self-esteem than controls (de Jong, 2002; de Jong, Sportel, Hullu, & Nauta, 2012; Rasmussen & Pidgeon, 2010). Using daily report methods, a recent study demonstrated that people with SAD were also characterized by unstable explicit self-esteem, i.e., greater fluctuations and more extreme shifts relative to controls (Farmer & Kashdan, 2014). It is particularly notable that low explicit self-esteem was even implicated as a risk factor for the development of SAD (Acarturk et al, 2009). Implicit measures paint a similar picture. Nonclinical socially anxious individuals were found to display generally positive implicit self-esteem, but to a lesser degree than non-socially anxious controls (de Jong, 2002; Tanner, Stopa, & De Houwer, 2006). Individuals with clinical SAD displayed more negative implicit self-esteem than healthy controls or individuals with panic disorder (Glashouwer, Vroling, de Jong, Lange, & Keijser, 2013).

Recent research has shown that CBT treatment for social anxiety predicts both an increase in positive self-views and a reduction in negative self-views (Goldin, et al. 2013). Further, this study showed that the influence of CBT on reduction of social anxiety symptoms is mediated by change in positive self-views only, not negative self-views, and this increase in positive self-views was associated with reduced social anxiety symptoms even 1 year post-treatment. This research raises the possibility that change in positive self-views may be more critical to treatment gains than reductions in negative self-views, and emphasizes the growing appreciation for the importance of increasing positive self-views (e.g., self-esteem) in addition to reducing negative self-views (Goldin, et al. 2013). Overall, the reviewed research underscores self-esteem as a potentially important factor in SAD.

Summary

In summary, SAD is an anxiety disorder characterized by fears of negative evaluation and social avoidance. SAD is often chronic and can be quite impairing, particularly through

disturbance of social functioning and the development of close relationships. In my review of the literature, I discussed three empirically based theories that may be relevant to SAD and factors that may maintain SAD: Clark and Wells (1995) Cognitive Model of SAD, Kernis and Goldman's (2006) Self-Authenticity Model, and Baumeister and Leary's (1995) Social Belonging Model.

According to the Cognitive Model, social anxiety stems from negative beliefs about the self, which leads to anticipation of negative social outcomes and use of safety behaviours to prevent these outcomes. Use of safety behaviours interferes with processing of disconfirming evidence for social fears and may increase likelihood of negative social outcomes, thus maintaining negative self-beliefs and social fears. Treatment for SAD typically involves behavioural experiments including reduction of safety behaviours to gather evidence which disconfirms negative self-beliefs. Increasing emphasis is being given to the idea of self-concealment as a primary motivation in SAD, that the belief that one is deficient in some way leads to fear of revealing the self to others, and attempts to hide the true-self.

The Authenticity Model discusses the role of authenticity to well-being. Authenticity, i.e., acting in accord with one's true self, is thought to be important to satisfaction of basic human needs, psychological adjustment, and many aspects of adaptive functioning. In particular, authenticity is thought to be important to healthier and more satisfying relationships and to better self-esteem.

The Social Belonging Model proposes that relatedness is a basic psychological need, as evolutionary psychology suggests social belonging would be beneficial to survival. Important to the social belonging theory is the idea that self-esteem functions as a sociometer, providing a means to monitor one's relational value and level of social belonging. Low self-esteem may be

accompanied by social anxiety and the belief that one is not able to make the desired social impression, motivating the individual to engage in self-protective behaviours to prevent rejection.

There are a number of similarities between clinical CBT models of SAD and social/personality models of authenticity and social belonging: (a) All models deal with various aspects of self (e.g., self-beliefs, self-esteem, self-concealment, self-authenticity, self-presentation). The negative self-system is an integral part of the various models. Both the clinical and social literatures refer to low self-esteem in SAD and socially anxious (SA) people, and theorists agree that changes in the self-system will reduce SAD and SA and increase self-esteem and well-being. (b) Self-protection/safety seeking is also an integral part of various models, conceptualized by various theorists in terms of safety behaviours (Clark & Wells, 1995; Rapee & Heimberg, 1997); self-concealment (Moscovitch, 2009; Rodebaugh, 2009); self-protective strategies (Schlenker & Leary, 1982); and low self-disclosure/authenticity (Brunell et al., 2010). Both the clinical and social literatures emphasize the value of reducing self-protective/safety strategies. (c) All models consider how the self relates to social functioning (e.g., interpersonal outcomes, relatedness/belonging).

Although clinical and social/personality models share many of the same conceptual pieces, they tend to have slightly different emphases when considering how these pieces relate and their relative importance. These are not qualitative differences, but rather differences in focus: (a) The contribution of one's sense of relatedness to self-esteem is more strongly emphasized in social-personality literature. (b) The social-personality literature includes the idea of one's subjective sense of authenticity whereas the CBT literature attempts to operationalize self-protection in terms of *behaviours* and self-concealment motivation. (c) While both clinical

and social psychological writers recognize that safety behaviours/self-protective strategies contribute to social impairment, social writers have devoted more attention to the role of self-protection in relational dysfunction, while clinical writers place greater emphasis on the role of safety behaviours in maintaining negative self-beliefs. (d) The clinical literature has understandably placed greater emphasis on treatment strategies for overcoming SAD, with much work demonstrating changes in the self-system (self-efficacy, biased judgments) as a basic mechanism of change. The subjective sense of social belonging/relatedness has not received much attention in the clinical literature. (e) The theories also differ somewhat in the temporal placement of social belonging. Cognitive theories suggest that improvements in interpersonal functioning and social relationships should occur after safety behaviours are reduced. Similarly, authenticity models suggest that authenticity is needed before true relatedness can occur. On the other hand, Leary et al. (1995) suggest relatedness may be required first, and self-protective motivation and behaviours arise as a consequence of a lower sense of relatedness, subsequent lower self-esteem, and the belief that one may not be making the desired impression.

Overall, there are many parallels in the theories, with all models sharing common themes. The differences between models are relatively small and mainly relate to the temporal sequencing of constructs and their relative importance. The goal of the current work is to integrate elements of all these models into a cohesive framework and to examine the temporal process of change in safety behaviours, self-authenticity, relatedness, and self-esteem. I believe integrating theories of relatedness and authenticity into clinical models of SAD may enrich our understanding of how safety behaviours function to maintain negative self-views. The research questions I hope to answer include:

1. Does reducing safety behaviours result in a stronger sense of subjective authenticity? Plasencia et al. (2011) found a link between safety behaviours and inauthenticity. However, this research was correlational, and safety behaviour use was not explicitly manipulated. Additionally, the link between safety behaviours and authenticity has not been examined in relation to treatment.
2. Does increased relatedness precede and predict increased self-esteem in socially anxious populations and specifically over the course of treatment?
3. What is the temporal relationship between the various variables? Little is known about possible temporal relationships; thus these relationships will be explored.

To address these questions, I conducted three studies: Study 1 involved an experimental manipulation of safety behaviour use in individuals with SAD during a first meeting social encounter to determine whether reduction in safety behaviours resulted in an increase in authenticity. An additional goal of Study 1 was to examine the whether increase in authenticity impacted interpersonal functioning in individuals with SAD consistent with the authenticity literature. Study 2 examined global patterns of safety behaviour use, authenticity, relatedness, and self-esteem in a large non-clinical sample to better understand interrelationships between variables. Structural equation modeling (SEM) was used to test two possible models derived from the theories described above. Study 3 examined changes in these variables over the course of treatment for SAD to better understand the temporal relationships between variables.

Chapter Two: Study 1

The main goal of study 1 was to evaluate the hypothesis that safety behaviour reduction leads to increased sense of authenticity. To do so, I examined a previously collected dataset that examined a laboratory interaction in a clinical sample of treatment-seeking individuals diagnosed with SAD. These individuals participated in two laboratory-based conversations with a trained experimental confederate. The initial interaction served as a baseline to assess *in vivo* safety behaviours, and was used here to control for baseline feelings of authenticity. Prior to the second interaction, participants were randomly assigned to either the (1) graduated exposure (control) condition or (2) safety behaviour reduction (experimental) condition. The primary research question was as follows: Does safety behaviour reduction influence participants' subjective sense of authenticity?

Participants were also asked to complete ratings of their use of prosocial behaviour in each interaction, as well as how much they perceived their partner responded positively to them. These measures served to assess how authenticity might relate to interpersonal functioning.

Hypothesis

Based on literature suggesting that people with SAD engage in self-protective behaviours to hide their true-self (Rodebaugh, 2009; Moscovitch, 2009), I predicted that participants in the safety behaviour reduction group would show greater increase in authenticity relative to the graduated exposure group. Additionally, based on research demonstrating that authenticity leads to healthy relationship behaviours, and in turn, greater relatedness in intimate relationships (Brunell et al., 2010), I predicted that change in authenticity would mediate the relationship between experimental condition and aspects of interpersonal functioning (i.e., prosocial behaviours, perception of positive partner response).

Method

Participants. Participants were 93 individuals (50 men, 43 women) seeking treatment for Generalized Social Anxiety Disorder (GSAD) from a treatment research program. Prospective participants completed an initial 45-minute telephone screening interview that provided information about the study and assessed study appropriateness. At this point, applicants with histories of psychosis or brain injury, self-reported suicidal ideation, nonsuicidal self-injury, bipolar episodes, substance abuse, or hospitalization or prolonged outpatient treatment for a mood disorder were eliminated. Suitable applicants participated in a clinical assessment procedure in which the Anxiety Disorders Interview Schedule for DSM-IV(ADIS-IV; Brown, Di Nardo, & Barlow, 1994) was administered to confirm diagnostic status. The ADIS-IV is a semi-structured interview protocol that has demonstrated high interrater reliability and good concurrent validity (Brown et al., 1994). Diagnostic interviews were conducted by two clinical psychology graduate students who had training and experience administering the ADIS-IV. All participants met the following inclusion criteria: (1) a primary DSM-IV-TR diagnosis of GSAD (APA, 2000); (2) no current severe Major Depressive Disorder, suicidal intent or Bipolar Disorder, as assessed by the ADIS-IV; (3) fluent in English; (4) no concurrent psychotherapy, and (5) no change in psychotropic medication within the past 3 months. Age range was restricted to 20 to 55 years to increase group cohesion in the treatment that followed. Intake interviews were recorded and a randomly selection portion (20%) were rated by a second independent clinician, who agreed with the assignment of a primary GSAD diagnosis in all cases (Kappa = 1). The high inter-rater agreement was likely due to the rigor of the initial telephone screening.

Participant demographics are presented in Table 1. As can be seen there, 46.2% of the respondents were female. The average age was 34.42 years (*SD* = 11.89). The average years of

Table 1. Means and Standard Deviations of Demographic and Symptom Measures, Study 1

Variable	SB + EXP	EXP	Total
Gender (% female)	48.9	43.5	46.2
Age	34.64 (12.57)	34.20 (11.32)	34.42 (11.89)
Years of Education	14.27 (1.82)	14.99 (1.67)	14.63 (1.78)
North American Born (%)	71.1	71.1	71.1
Ethnicity (%)			
Caucasian	80.0	71.1	75.6
Asian	11.1	15.6	13.3
Other	8.9	13.3	11.1
Marital Status (%)			
Never Married	73.3	73.3	73.3
Married/Common-law	20.0	20.0	20.0
Separated/Divorced	6.7	6.7	6.7
Employment Status (%)			
Employed or Student	84.4	67.4	75.8
Unemployed	15.6	32.6	24.2
Comorbid Diagnoses (%)			
None	28.6	26.2	27.4
MDD or Dysthymia	38.5	50.1	44.3
GAD	57.4	54.8	56.2
Panic Disorder	2.4	2.4	2.4
PTSD	4.9	2.4	3.6
OCD	4.8	7.1	6.0
Specific Phobia	19.3	14.8	16.8
Eating Disorder	4.8	0	2.4
Currently on Medication (%)	44.4	39.1	41.8
SIAS	53.72 (8.83)	55.41 (11.51)	54.55 (10.21)
SPS	34.51 (14.72)	38.35 (16.88)	36.39 (15.85)
BDI-II	19.68 (12.41)	21.81 (13.87)	20.72 (13.12)

Note. Standard deviations in parentheses. MDD = Major Depressive Disorder; GAD = Generalized Anxiety Disorder; PTSD = Post Traumatic Stress Disorder; OCD = Obsessive Compulsive Disorder. Comorbid diagnoses sum to over 100% because some participants met criteria for multiple comorbid psychiatric disorders.

education was 14.63 (SD = 1.78). Ethnicity was 75.6% Caucasian, 13.3% Asian, and 11.1% Other. With regard to marital status, 73.3% of participants had never been married, 20% were married or in common-law relationships, and 6.7% were separated or divorced. In regards to employment, 75.3% were employed or a student and 24.2% were unemployed. Concerning comorbidity, 27.4% had no comorbid diagnoses, 44.3% had comorbid major depressive disorder or dysthymia, 56.2% had comorbid GAD, 2.4% had comorbid panic disorder, 3.6% had comorbid PTSD, 6% had comorbid OCD, 16.8% had comorbid specific phobia, and 2.4% had a comorbid eating disorder. Medication usage at the time of the study was 41.8%.

Measures.

Symptom measures.

Social anxiety. The Social Phobia Scale (SPS; Mattick & Clarke, 1998) and the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) are 20-item inventories commonly used to assess social anxiety symptoms. The SPS reflects fears of being observed or evaluated by others in social situations, while the SIAS measures anxiety when engaging in social interactions with different kinds of companions. Items on both scales are rated on a five-point Likert-type scale (0 = not at all characteristic or true of me, 4 = extremely characteristic or true of me) to 4 (very much). Previous research indicated that both scales have high internal consistency, Cronbach's α = .89 and .93 for the SPS and SIAS, respectively, and good test-retest reliability (Mattick & Clarke; see also Brown et al., 1997; Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). The scales also demonstrated convergent and discriminant validity (e.g., Mattick & Clarke). The Cronbach's α for the present sample was .89 and .85, for the SPS and SIAS, respectively. These measures were used to ensure that the two experimental groups were comparable in level of social anxiety symptoms. These measures were also used as covariates in

the analyses to determine whether safety behaviours displayed unique relationships with authenticity above and beyond symptom severity.

Depression. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a 21-item self-report inventory that was used to assess severity of depression during the past two weeks. The BDI-II is widely used in psychopathology research and demonstrates excellent psychometric properties (e.g., Beck et al., 1996; Dozois, Dobson, & Ahnberg, 1998). Items are rated on a 4-point scale ranging from 0 to 3, and are summed to yield a total score reflecting severity of depression over the past two weeks (range 0 to 63). The BDI–II demonstrates high internal consistency among college samples and psychiatric outpatients (Cronbach's α = .93 and .92, respectively), and evidence of diagnostic discrimination has been found (Beck et al., 1996; see also Dozois, Dobson, & Ahnberg, 1998). The BDI-II also correlates highly with the original BDI (r = .93), supporting the convergent validity of this measure (Dozois et al., 1998). The Cronbach's α for the present sample was .92. The BDI-II was used to ensure that the two experimental groups were comparable in terms of depressive symptomatology. Measurement of depressive symptoms was also necessary to establish that results were specific to SAD and not emotional pathology in general. This measure was used as a covariate in the analyses to determine whether safety behaviours displayed unique relationships with authenticity above and beyond symptom severity.

Dependent measures.

Authenticity. Participants' subjective sense of how genuine versus artificial they felt during the interaction was assessed with the Self Experience Questionnaire (SEQ; Plasencia, Alden, & Taylor, 2011), an experimental measure developed for this research to assess situational authenticity. The SEQ consisted of four items: "*I felt genuine during the*

conversation," "I felt I was artificial," "I felt I was being me," and "*I felt I was putting on a façade,"* which were rated on seven-point scales (1 = Not at all, 7 = Very much) and summed to yield a total score after reverse-scoring items 2 and 4. In support of construct validity, the SEQ was found to be significantly correlated, $r = .40$, $p < .01$, with the Authenticity Inventory (AI; Kernis & Goldman, 2006), an empirically validated measure of dispositional authenticity (authentic functioning), in an independent undergraduate sample (N = 62) (Plasencia et al., 2011). The AI has been shown to be related to self-esteem, and identity integration (e.g., Kernis & Goldman, 2006). In the current sample, $\alpha = .80$-$.81$.

Prosocial behaviour. Participants rated their behavioural performance during each conversation on five items written to reflect *social approach behaviour* (talk openly about yourself, convey interest in your partner, appear actively engaged in the conversation, appear friendly, talkative). These items are intended to capture behaviours important to facilitating friendship development in first-meeting interactions (e.g., Collins & Miller, 1994) and were taken from prior research (e.g., Stopa & Clark, 1993; Taylor & Alden, 2006; Taylor & Alden, 2011). Items were rated on seven-point scales (1 = Not at all, 7 = Very much) and summed to yield a total score. In the current sample, $\alpha = .80$ -$.91$.

Perceived social outcomes. Participants rated the extent they perceived that their partner responded to them positively during the interaction. Following each interaction, participants rated four items taken from prior research examining interpersonal judgments in social anxiety (e.g., Alden & Wallace, 1995; Taylor & Alden, 2011): "How much do you think your partner . . . enjoyed talking with you, liked you, wanted to get to know you better, thought negatively of you (reverse scored)." Items were rated on seven-point scales (1 = Not at all, 7 = Very much) and

summed to yield a total score. In the current sample, α = .80 and .79 for the baseline and experimental conversations, respectively.

Experimental Checks.

Confederate check. To ensure that confederates behaved in a consistent manner across participants in each condition, an independent observer rated the confederate's behaviour from behind a one-way mirror using items written to reflect confederate warmth and friendliness (5 items: talkative, disinterested, self-disclosive, distant, friendly). Ratings were made on a 7-point scale with anchors of not at all and very much. Items were combined to create a total score representing overall confederate warmth and openness. The scale was found to have adequate internal consistency for a short experimental measure, α = .72-84 (Tayor & Alden, 2010). In the current sample, α = .71-.84.

Safety behaviours. To evaluate safety behaviour use during each the conversation, participants completed the 22-item modified Social Behaviours Questionnaire following each interaction. The original SBQ (Clark et al., 1995) is a 28-item measure of specific strategies used by socially anxious people in an attempt to prevent feared social outcomes. The original SBQ measure has been shown to have adequate internal consistency, (Cronbach's α = .80; Hirsch et al.; 2004). In support of convergent validity, people high in social anxiety score more highly on the SBQ than people low in social anxiety (McManus, Sacadura, & Clark, 2008). Here, we adapted the measure for the social interaction task by removing items that would not apply to the interaction task (e.g., "stay on the edge of groups," "use alcohol," "grip cups tightly"), and adding items that were identified, through laboratory experience, as relevant to our task (e.g., "try to appear distant," "avoid expressing your opinion"). The modified SBQ was found to correlate highly with the original SBQ in an independent undergraduate sample (r = .95). Thus,

the current modifications did not appear to substantially alter the content of the original measure. In support of divergent validity, the modified SBQ displayed only a modest negative correlation, r = -.35, with adaptive strategies for coping with anxiety-provoking social situations, as assessed by the Brief Ways of Coping Scale in a large undergraduate sample (Baker, Alden & Robichaud, forthcoming; Holtzman, Newth, & Delongis, 2004). Participants completed the SBQ following both interactions to assess the extent participants performed each safety behaviour during the conversation. Items were rated on a 9-point scale ranging from 0 not at all to 8 all the time and were summed to create a total safety behaviour score (see Hirsch et al., 2004). In the current study, α = .86-.93.

Expectancy scale. Following presentation of the experimental rationale, participants rated their expectations about the effectiveness of their respective strategy (i.e., the experimental manipulation) for overcoming their anxiety and fear during the conversation. This was done to assess whether participants perceived their respective experimental manipulation as equally credible. To this end, three questions were taken from Borkovec and Nau's (1972) treatment expectancy scale, a commonly used measure in treatment outcome studies. Those items ask about the logic of the intervention, and its likelihood of helping the participant and other people. The three item scale has demonstrated good internal consistency in past research with socially anxious individuals, α > .80 (Rodebaugh, 2004). In the current study, α = .78.

Personnel.

Experimenters. Two clinical psychology graduate students provided the experimental instructions following a scripted protocol. Experimenters were blind to the study hypotheses.

Confederates. Five undergraduate students (2 male, 3 female) served as confederates in an open-ended "getting acquainted" interaction. Following procedures developed in earlier

studies (e.g., Alden & Wallace, 1995; Stopa & Clark, 1993;Taylor & Alden, 2005), confederates were trained to converse in a pleasant, but reserved social manner using a scripted set of verbal and nonverbal behaviours. The reserved performance was designed to allow participants to display their habitual safety behaviours, which might not have been used by the participant if the situation felt completely safe. As an example of confederate training, confederates were instructed to speak in a warm tone, occasionally provide encouraging comments (e.g., ‘‘Tell me more about that’’), engage in moderate self-disclosure, allow small pauses (i.e.,1–2 s to pass after the participant’s last comment before speaking), and generally maintain steady and comfortable eye contact while looking away briefly at times. Confederates were also provided with a list of prearranged conversation topics. In addition to learning how to maintain consistent performances across participants, the confederates were trained to deliver their role in a natural, rather than staged, manner. Confederates were blind to the study hypotheses and participants’ experimental condition. Observer ratings were used to confirm that confederates adhered to the required performance.

Observers. Two undergraduate students acted as independent observers to assess inter-rater agreement. The observers were trained to rate confederate behaviour using the measure described above and were blind to the study hypotheses and participants’ experimental condition.

Procedure. Participants completed the symptom measures (SIAS, SPS, BDI-II) as part of a clinical assessment procedure prior to the current experiment. Upon arriving to the laboratory, participants were greeted by the experimenter, informed about the study procedures, and provided written informed consent. The experiment procedure involved participants

participating in two conversations with a trained experimental assistant of the opposite sex. One conversation functioned as a baseline and the second involved an experimental manipulation.

Baseline interaction. Participants first completed a baseline (no intervention) conversation. The experimenter informed participants that they would engage in a short conversation with an assistant and then rate their impressions of the interaction. After being informed about the interaction, participants were asked to identify their primary feared outcomes pertaining to the upcoming conversation, i.e., their negative predictions (e.g., ‘‘What are you concerned or afraid might happen during the conversation?’’). Assessment of feared outcomes was done to inform the safety behaviour assessment conducted post-interaction (e.g., Clark, 1999). The confederate then entered and was introduced to the participant. The participant and confederate were told to spend time getting to know each other, talking about subjects typically discussed in a first-time social encounter, but were asked to avoid discussion of the current assessment. The confederate was instructed to begin the conversation, and the pair was told to converse until the experimenter returned. The interaction consisted of a 5-minute, open-ended "getting acquainted" conversation (e.g., Alden & Wallace, 1995; Taylor & Alden, 2005). This task was selected because such conversations are essential first steps in the development of friendships and are often problematic for socially anxious people (Stravynski & Shahar, 1983). An independent observer monitored the interaction from behind a one-way mirror and rated the confederate's behaviour. Following the interaction, the experimenter returned to the room and the confederate left the room. The participants were then asked to complete the dependent measure.

Safety behaviour assessment. After completing the dependent measure pertaining to the baseline interaction, experimenters conducted an assessment of the safety behaviours that

participants used during the previous conversation following the procedure developed by Clark (1999). First, the experimenter reviewed with participants their previously identified feared outcomes. The experimenter then used that information to obtain a list of the behavioural strategies ("safety behaviours") that participants used to prevent or minimize the likelihood of those negative outcomes during the previous conversation (e.g., Clark, 2001; see also Kim, 2005; Wells et al., 1995). Idiosyncratic safety behaviour identification first began with an open-ended query (e.g., ''What did you do to try to make yourself feel safer or to prevent your fears from occurring?''). Next, participants were provided with a list of safety behaviours commonly reported by individuals with SAD, and were asked to rate the extent to which they used each behaviour during the conversation in order to make themselves feel safer or to try to prevent their feared outcome(s) from happening. Items on this list comprised the Safety Behaviours Questionnaire (SBQ; described above). Once completed, the experimenter reviewed the SBQ with participants, and confirmed the participant's primary safety behaviours. This procedure was implemented for participants in both conditions to better isolate the effects of safety behaviour reduction on the primary outcomes from safety behaviour identification per se. The SBQ was used as the measure of safety behaviours in the data analyses.

Experimental interaction. Following the safety behaviour assessment, participants were informed that they would be engaging in a second conversation with the same partner, which served as the experimental session. Prior to the interaction, participants were randomly assigned to either the (1) graduated exposure (EXP; control) condition (20 females, 26 males) or (2) the safety behaviour reduction plus exposure (SB + EXP; experimental) condition (23 females, 24 males). Random assignment was implemented using a coin-flipping procedure. Allocation rules were defined at the outset of the study such that ''heads'' corresponded to one condition and

‘‘tails’’ corresponded to the other condition. A random sequence of condition codes was then generated based on these rules and participants were allocated to condition accordingly.

The experimenter provided the following experimental rationales:

Exposure alone:

> “As part of this study, we are looking at some ways to help people overcome their social fears. We need to explore why you remain anxious in social situations. You have said that you expect that [social prediction/feared outcome] will happen during the upcoming conversation. Normally, when you have been in situations like this before, you may have not remained in the situation for a sufficient amount of time. In order to help overcome your anxiety, it is important that you remain in the anxiety-provoking situation for a set period of time, even if you may feel quite anxious. It works like getting into a bath of hot water: When you first get in it feels unpleasant, but after a while you get used to it and it feels better. So, during the conversation, no matter what happens to your anxiety, do not try to end the conversation early. By doing this, you will be better able to see what happens to your anxiety.”

Safety behaviour reduction:

> “As part of this study, we are looking at some ways to help people overcome their social fears. We need to explore why you remain anxious in social situations. You have said that you expect that [social prediction/feared outcome] will happen during the upcoming conversation. Normally, when you have been in situations like this before, you have attempted to prevent your fears from happening by [safety behaviours]. Because you have done this, you have not really discovered whether [feared outcome] can actually happen. In order to help overcome your anxiety, it is important to discover whether what

> you fear can actually happen. To accomplish this, you should try not to do the things you normally do to prevent [feared outcome]. For example, during the conversation, do nothing to save yourself, do not [safety behaviours]. Just think that you want to discover what will happen when you don't do [safety behaviours]. By doing this, you will be better able to see if your expectations are confirmed."

The experimental rationales were modeled after previous work (Kim, 2005; Wells et al., 1995). Following presentation of the experimental instructions, participants completed ratings pertaining to their expectations about the credibility and effectiveness of their respective experimental strategy (see Expectancy Scale).

Practice interaction. To ensure that participants in each condition comprehended their respective experimental instructions, all participants took part in a 'practice conversation' with the experimenter prior to the experimental session, as specified in Clark's safety behaviour procedure. The rationale for choosing a practice conversation rather than simply requiring participants to provide a verbal summary of the instructions was to permit an opportunity in vivo to assess for and correct misconceptions about the manipulation. Consistency was maintained across participants by selecting a pre-determined conversation topic (i.e., ''Tell me about the most recent holiday or vacation you took''), the duration of which was timed and limited to two minutes. At the completion of the practice session, participants' understanding of the experimental instructions was assessed, and further clarification was provided when necessary.

Following the practice session, the confederate again entered the room and was re-introduced to the participant. The experimenter again told the participant and confederate to spend time getting to know each other, talking about subjects typically discussed in a first-time social encounter, but were asked to avoid discussion of the current assessment. This time,

participants were asked to initiate this conversation, which was otherwise identical in nature to the first conversation. After explaining the nature of the conversation, the experimenter left the room to rate the participant's and confederate's behaviour from behind a one-way mirror. The interaction itself again consisted of a 5-minute open-ended 'getting acquainted' conversation (e.g., Alden & Wallace, 1995; Taylor & Alden, 2005). Following the interaction, the participant again completed the SEQ and SBQ.

Overview of Statistical Analyses

All data analyses were conducted using the Statistical Package for the Social Sciences (SPSS) Version 22. The main analysis for study 1 was a 2 (Condition: SB + EXP, EXP) by 2 (Time: Baseline, Experimental interaction) between-within ANOVA with repeated-measurement of time conducted on the dependent variable of authenticity (SEQ). This analysis was intended to examine the prediction that participants in the SB + EXP group would display a greater increase in ratings of authenticity relative to EXP participants.

I also used mediation models to examine the hypothesized associations among experimental condition, safety behaviour use, authenticity, use of prosocial behaviour, and perceived social outcome. A simple mediation model was conducted to examine whether the relationship between experimental condition and change in authenticity is mediated by change in safety behaviours. A second simple mediation model was used to test whether change in authenticity mediates the effect of condition on change in prosocial behaviour. Finally, a third mediational model was used to test whether change in authenticity mediates the effect of condition on perceived partner response.

Mediation is said to exist if the following criteria are met (Baron & Kenny, 1986): (1) the predictor variable has a significant "total effect" on the criterion variable (path c); (2) the

predictor has a significant effect on the mediator (path a); (3) the mediator predicts the criterion variable, controlling for the predictor variable (path b); and (4) the direct effect from the predictor to the criterion is significantly reduced after controlling for the indirect effect produced by the mediator (path c'). Methodologists have recently suggested the use of bootstrapping to test the significance of the indirect effect of the predictor through the mediator (Shrout & Bolger, 2002). Bootstrapping is a statistically rigorous method for estimating indirect effects, as it does not assume that the sampling distribution of the indirect effect is normal (Shrout & Bolger, 2002). By generating "a very large number of samples of size *n* (where *n* is the original sample size) from the data, *sampling with replacement,* and computing the indirect effect, ab, in each sample" (Preacher & Hayes, 2004, p. 722), bootstrapping allows mediation to be evaluated through the examination of confidence intervals based on the results of these resamples (Shrout & Bolger, 2002). The mediation analyses were conducted using the SPSS macro developed by Preacher and Hayes (2004, 2008).

Results

Preliminary analyses.

Demographics. Separate one-way (condition) analyses of variance (ANOVA) conducted on participant age and years of education revealed no significant between-group differences (age: $F(1, 89) = .032$, $p > .10$, $\eta^2 = .00$; years of education: $F(1, 86) = 3.69$, $p > .05$, $\eta^2 = .04$). Chi-square analyses revealed no differences between participants in the two conditions in terms of the number of men and women participants, and whether participants were born in North America or not (gender: χ^2 (1, N = 93) = .28, $p > .10$; country of birth: χ^2 (1, N = 90) = .00, $p > .10$. Thus, results indicated that the two groups were similar on baseline demographic characteristics. See Table 1.

Symptom measures. A one-way (condition) multivariate analysis of variance (MANOVA) conducted on the SIAS, SPS, and BDI-II revealed that the two experimental groups did not differ in symptom severity, $F(3, 88) = .469$, $p = .705$, $\eta_p^2 = .016$. Thus, the two groups were similar on baseline clinical characteristics. See Table 1.

Expectancy. In support of the integrity of the experimental procedures, a one-way (condition) ANOVA conducted on participant expectancy ratings revealed no between-group differences, $F(1, 91) = 0.032$, $p = .859$, $\eta^2 = .00$. Thus, participants in the two conditions did not differ in their belief about the effectiveness of their respective treatment strategy. See Table 2.

Table 2. Means and Standard Deviations for Experimental Control Measures, Study 1

Variable	Safety Behaviour Reduction	Exposure Alone
Expectancy Check	16.85 (5.35)	17.04 (5.06)
Confederate Consistency		
Baseline Interaction	26.48 (1.55)	26.83 (1.12)
Experimental Interaction	26.37 (2.15)	26.83 (1.34)
Manipulation Check (safety behaviours)		
Baseline Interaction	84.74 (20.30)	83.16 (30.93)
Experimental Interaction	68.81 (24.24)	81.30 (33.28)

Confederate consistency. A 2 (condition) by 2 (time) ANOVA was conducted on experimenter ratings of confederate warmth and openness to ensure that confederates displayed similar behaviour across all participants. Results revealed no significant main effects for condition, time, or the time by condition interaction, $F(1, 90) = 1.80$, .15, .15, respectively, all p

> .10, all η_p^2 < .02. These findings suggest that confederates were consistent in their behavioural performance across participants within each condition. See Table 2.

Manipulation check (safety behaviours). To ensure that the experimental protocol was successful in manipulating safety behaviours during the second conversation, a 2 (time) by 2 (condition) ANOVA was conducted on participant safety behaviour ratings completed following both conversations. Results revealed a significant main effects for time and the time by condition interaction, $F(1, 84) = 23.73, 14.84$, respectively, both $p < .001$, $\eta_p^2 = .22, .15$, respectively. There was no significant main effect for condition, $F(1, 84) = .921$, $p = .340$, $\eta_p^2 = .011$. Follow-up comparisons with paired samples t-tests indicated that the control condition showed no significant difference in level of safety behaviours from interaction 1 to interaction 2 ($t(42) = -.83$, $p > .10$), whereas the experimental condition showed a significant decrease in level of safety behaviours ($t(42) = -5.51$, $p = < .001$). Thus, the significant interaction was explained by the greater reduction in safety behaviours from the first interaction to the second interaction by participants in the experimental condition compared to control participants. As a whole, these findings suggest that the experimental manipulation was successful in decreasing safety behaviours in the experimental group. See Table 2.

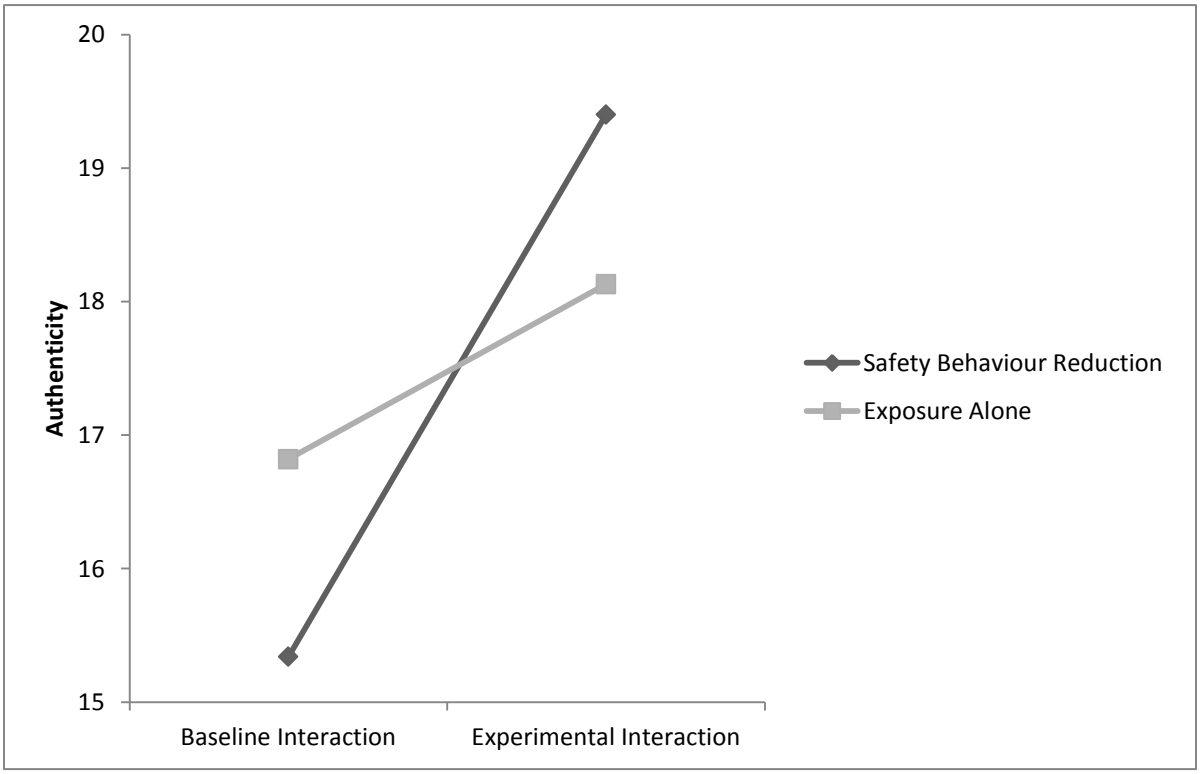
Main analyses. The main analysis for study 1 was a 2 (Condition: SB + EXP, EXP) by 2 (Time: Baseline, Experimental interaction) between-within ANOVA with repeated-measurement of time conducted on the dependent variable of participant level of authenticity (SEQ). This analysis was intended to examine the prediction that participants in the SB + EXP group would display a greater increase in ratings of authenticity relative to EXP participants. Results revealed a significant main effect for time, $F(1, 90) = 28.98$, $p < .001$, $\eta_p^2 = .24$, which indicated that sense of authenticity for all participants increased from the first to the second interaction. A

significant time by condition interaction also emerged, $F(1, 90) = 7.98$, $p < .01$, $\eta_p^2 = .08$, which suggested that participants who were encouraged to eliminate safety behaviours showed a greater increase in authenticity compared to the control group. There was no significant main effect for condition, $F(1, 90) = .012$, $p > .10$, $\eta_p^2 = .00$. See Table 3 and Figure 1.

Table 3. Means and Standard Deviations for Authenticity, Study 1

Variable	Safety Behaviour Reduction	Exposure Alone
Authenticity (SEQ)		
Baseline Interaction	15.34 (5.64)	16.82 (5.45)
Experimental Interaction	19.40 (4.04)	18.13 (5.38)

Figure 1. Change in Authenticity across Social Interactions



The analysis was repeated including SIAS, SPS, and BDI-II as covariates. There was a significant main effect of SIAS, $F(1, 86) = 8.12$, $p < .01$, $\eta_p^2 = .09$, indicating that SIAS was related to authenticity for all participants at any time point. There were no main effects for any other covariate. There were no interactions between the repeated measure and any covariate. Controlling for symptoms of social anxiety and depression, the significant time by condition interaction remained, $F(1, 86) = 7.68$, $p < .01$, $\eta_p^2 = .08$. Follow-up comparisons with paired samples t-tests indicated that the change in level of authenticity from interaction 1 to interaction 2 in the control condition did not quite meet significance ($t(44) = 1.992$, $p = .053$), whereas the experimental condition showed a significant increase in authenticity ($t(46) = 5.44$, $p = < .001$). Thus, the prediction that participants in the experimental group would display a greater increase in ratings of authenticity compared to the control group was confirmed.

I also conducted a mediational analysis to test whether the effect of condition on change in authenticity is mediated by change in safety behaviours. Following the recommendations by Preacher and Hayes (2004), I used bootstrapping to compute a confidence interval for the indirect effect. Mediation is said to exist if the confidence interval does not contain zero (i.e., the effect is significantly different from zero). An SPSS macro was used to conduct the analysis. Experimental condition was the independent variable, change in SEQ (2^{nd} interaction – baseline interaction) was the outcome, and change in SBQ was the mediator. Results revealed a significant indirect effect of condition on change in SEQ via change in SBQ (95% CI [.67, 3.31]). See Table 4. Analyses were repeated with SIAS and BDI-II included as covariates, and their inclusion did not substantially alter results.

Table 4. Mediational Model Examining whether Change in Safety Behaviours Mediates the Effect of Condition on Change in Authenticity

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Condition	Δ Authenticity	2.83	1.07	2.64	.01
A	Condition	Δ Safety Behaviours	-13.98	3.69	-3.78	<.001
B	Δ Safety Behaviours	Δ Authenticity	-.12	.03	-4.16	<.001
C’	Condition	Δ Authenticity	1.14	1.06	1.07	.29

A second mediational analysis was conducted to test whether change in SEQ mediated the effect of condition on change in participants’ perceptions of how much their partner responded positively to them (i.e., liked them). A significant indirect effect was found (95% CI [.34, 2.58]). See Table 5.

Table 5. Mediational Model Examining whether Change in Authenticity Mediates the Effect of Condition on Change in Perception of Partners’ Response

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Condition	Δ Perceived Liking	1.79	.84	2.13	.04
A	Condition	Δ Authenticity	2.86	1.02	2.81	.006
B	Δ Authenticity	Δ Perceived Liking	.39	.08	5.00	<.001
C’	Condition	Δ Perceived Liking	.68	.78	.87	.39

A final mediational analysis was conducted to test whether change in SEQ mediated the effect of condition on change in participants' report of their use of prosocial behaviour. A significant indirect was found (95% CI [.26, 2.00]). See Table 6.

Table 6. Mediational Model Examining whether Change in Authenticity Mediates the Effect of Condition on Change in Reported Use of Prosocial Behaviour.

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Condition	Δ Prosocials	1.41	1.10	1.28	.20
A	Condition	Δ Authenticity	2.82	1.02	2.76	.007
B	Δ Authenticity	Δ Prosocials	.32	.11	2.90	.005
C'	Condition	Δ Prosocials	.51	1.10	.46	.65

Discussion

Consistent with the hypothesis, participants in the safety behaviour reduction group showed greater increase in authenticity relative to the graduated exposure group, and this effect was mediated by change in safety behaviours. This result is in line with recent clinical theories suggesting that self-concealment is a strong motivator in SAD, and that safety behaviours function to hide the true self (Rodebaugh, 2009; Moscovitch, 2009). This research also builds on these theories, suggesting that by reducing safety behaviours, people with SAD report behaving more in accord with their true self. By reducing protective behaviours, this may allow the true self to emerge, and enable more self-consistent behaviours.

Additionally, change in authenticity was found to mediate the relationship between experimental condition and interpersonal functioning (i.e., use of prosocial behaviour, perception of positive response from partner). This result supports recent work suggesting that authenticity leads to an increase in healthy relationship behaviours, which in turn leads to increased relatedness (Brunell et al., 2010). Given the proposition that relatedness constitutes a basic psychological need, research examining methods to increase interpersonal functioning in SAD patients have the potential for direct valuable applications. This research also presents a novel integration of concepts from clinical models and social/personality theory. Examining related constructs in clinical and social theories creates a bridge between these perspectives and may allow us to develop a more comprehensive understanding of aspects of self.

Study 1 was based on a laboratory getting acquainted task, which used scripted confederate verbal and nonverbal behaviour to increase the consistency of the interpersonal stimulus provided to participants. The strength of this approach is that it allowed for rigorous control of the confederate's behaviour during the conversions and assessment of participant expectancy for each condition. Additionally, the procedure for eliciting safety behaviours ensured that participants understood the concept well and allowed for the opportunity to troubleshoot dropping of safety behaviours.

Still, research examining safety behaviour use in more natural settings and in situations other than first time social encounters is necessary to determine the boundaries of these results. For example, the relationship between increased authenticity predicting increased interpersonal functioning across two controlled interactions may not translate into dispositional authenticity predicting greater overall relatedness to others. In other words, isolated positive social outcomes may not equate to increased connection to others. Further work is needed to determine whether

results generalize to daily life, and whether these relationships apply to the general population.

Study 2 aimed to assess global patterns of safety behaviour use and how this might be related to global authenticity and relatedness in a large non-clinical sample. Additionally, Study 2 aimed to extend these results by: 1) explicitly measuring relatedness, 2) using multiple measures of relatedness and authenticity to better capture these constructs, 3) including measurement of self-esteem, given research demonstrating close ties between self-esteem, relatedness, and authenticity, and 4) examining multiple pathways simultaneously so as to better understand interconnections between aspects of self and interpersonal functioning.

Chapter Three: Study 2

Study 1 demonstrated a link between safety behaviour use and authenticity, finding that reduction in safety behaviours led to an increase in authenticity. Additionally, increased authenticity was related to an increase in prosocial behaviour and perceived positivity of partners' response. These findings provided initial support for the connection of safety behaviours to the individual's sense of self, and pointed to the feasibility of integrating theories that arose from clinical and social/personality perspectives. However, further research is needed to understand how safety behaviours and authenticity might relate to the broader construct of relatedness/belonging. Additionally, research is needed to better understand the relationships between these variables within a theoretical context. In Study 2, I examined the links between variables in an attempt to integrate them within a cohesive framework. I derived two models, integrating ideas from both the clinical and social-personality literatures. The models were formulated based on the extant literature as well as on clinical observation and rational hypotheses regarding the possible sequence of change during treatment.

(1) Self-Protection Model (A): Model A underscored a theme of "self-protection." According to cognitive behavioural theories (Clark & Wells, 1995; Rodebaugh, 2009; Moscovitch, 2009), safety behaviours are used to self-conceal/self-protect, and this self-concealment leads to negative interpersonal outcomes and reinforcement of negative self-beliefs. Study 1 demonstrated that reduction in safety behaviours resulted in increased authenticity and increases in positive social outcomes. Social psychological research has shown that authenticity influences relatedness (Brunell et al., 2010) and that relatedness influences self-esteem (Leary, 2007; Leary et al., 1995). Combining these findings, the "self-protection" model tests the pathway from safety behaviours to authenticity (as in study 1), which, following authenticity

research, is linked to relatedness, which, according to Baumeister and Leary, is linked to self-esteem.

(2) Relatedness Model (B): An alternative model underscored a theme of "social belonging" as the crucial influence on the other variables. Relational writers propose that relatedness/belongingness is a fundamental need (e.g., Baumeister & Leary, 1995), and that relatedness influences level of self-esteem (Leary et al., 1995). Lowered self-esteem, in turn, is proposed to result in self-protective behaviours (Leary & Jongman-Sereno, 2014). Pulling these ideas together, the "relatedness" model predicts that relatedness should be linked to self-esteem, which, in turn, should be linked to safety behaviour use. Lower reliance on safety behaviour (as shown in Study 1) should ultimately be linked to greater self-authenticity. Structural Equation Modeling was used to test both models within a large non-clinical sample.

Hypothesis

I predicted that support would be found for one or both models. Given that both models were derived based on theory and empirical research, both models appeared equally plausible. Indeed, given the cyclical nature of CBT models of social anxiety, both models may represent aspects of a cycle. However, I attempted to determine which pathway best fit the data to aid in understanding the typical sequence and to inform pathways of change to consider in Study 3.

Method

Participants. Participants were recruited from a large subject pool of students enrolled in introductory psychology courses at the University of British Columbia during the spring 2013 academic semester. Entry criteria included being an adult UBC student (aged 18 or older) and willingness to participate. Students received extra course credit for participation.

A total of 279 participants were recruited for the experiment (54% female). Participants ranged in age from 18 to 33 years, with a mean age of 19.93 (SD = 2.05). The ethnic background of the sample was predominantly East Asian (e.g. Chinese, Japanese, Korean; 39.2%), European (32.1%), and South Asian (e.g. East Indian, Sri Lankan, Pakistani; 10.1%). The majority of participants indicated that their marital status was single (85.4%), with the remainder reporting their status as cohabitating (4.7%) or other (9.9%), and no participants reporting as married, separated, or divorced.

Measures.

***Background questionnaire*.** This questionnaire obtained basic demographic information of the sample, e.g., age, gender, marital status, cultural background.

***Social Interaction Anxiety Scale (SIAS)*.** The SIAS comprises 20 items that assess fear of social interactions (Mattick & Clarke, 1998). Items are rated on five-point scales (0 = not at all characteristic or true of me, 4 = extremely characteristic or true of me). The scale has high internal consistency, Cronbach's alpha =.93, and good test–retest reliability (Brown et al., 1997; Heimberg et al., 1992). See Study 1 for further details. In the current study, Cronbach's α = .94.

***Beck Depression Inventory – Second Edition (BDI-II)*.** The BDI-II (Beck, Steer, & Brown, 1996) comprises 21 items that assess depressive symptoms during the past two weeks. Items are rated on a four-point scale of 0-3 and are summed to produce a total depression score ranging from 0 to 63. The BDI-II has good internal consistency, test–retest reliability, and concurrent validity (Beck et al., 1996). See Study 1 for further details. In the current study, α = .93.

Social Behaviour Questionnaire (SBQ; modified). The SBQ is a list of safety behaviours commonly reported by individuals with SAD. It measures specific strategies used in

social situations to prevent negative outcomes. Items for the modified measure were selected from the Social Behaviour Questionnaire developed by Clark and colleagues for use in treatment trials of SAD (see Clark et al., 1995), and from pilot work conducted during our own treatment of patients with SAD (see Study 1 for more detail). The modified SBQ was found to correlate highly with the original SBQ in an independent undergraduate sample (r = .95; Plasencia, Alden, & Taylor, 2011). Thus, the current modifications do not appear to substantially alter the content of the original measure. Items that were removed in study 1 because they did not apply to the laboratory interaction task were again included. Participants completed a total of 33 items, rating how often they utilized certain strategies on a nine-point scale (0 = never, 8 = always). Ratings were summed to create a total safety behaviour score. In the current study, α = .95.

Authenticity Inventory – Behaviour Subscale (AI-B). The AI (Kernis & Goldman, 2006) is a 45-item measure of dispositional authenticity. It assesses the extent to which people function authentically across the four domains: 1) awareness (e.g.,‘‘For better or for worse, I am aware of who I truly am.”), 2) unbiased processing (e.g., ‘‘I find it very difficult to critically assess myself,” reverse scored), 3) behaviour (e.g., ‘‘I rarely if ever, put on a ‘‘false face’’ for others to see.”), and 4) relational orientation (e.g., ‘‘I express to close others how much I truly care for them.”). Responses are made on 5-point scales (1 = strongly disagree and 5 = strongly agree) and summed to create a total score after reverse-scoring negatively-worded items. Extensive data has been reported on the reliability and validity of the AI (Kernis & Goldman, 2006). The current study used the 11-item behaviour subscale, which assesses the degree to which people report acting in accord with their values, preferences, and needs. The behaviour subscale was used for brevity and because the action component of authenticity (i.e., behaving in accord with the true self) appeared most relevant to themes of self-concealment vs. revealing the self and also likely

to have an interpersonal impact. The behaviour subscale has been used in isolation in previous research (Leary & Allen, 2011). In the current study, α = .79.

Self-Experience Questionnaire (SEQ). The SEQ (Plasencia, Alden, & Taylor, 2011) assesses situational authenticity. The SEQ consists of four items: "I felt genuine during conversations," "I felt I was artificial," "I felt I was being me," and "I felt I was putting on a façade," which are rated on 7-point scales (1 = Not at all, 7 = Very much) and summed after reversing appropriate items to yield a total score. Participants' gave ratings of how genuine versus artificial they felt "during conversations over the past 2 weeks." This was identical to the measure given in Study 1, with the exception that the instructed time frame for ratings was altered to "the past 2 weeks" rather than one specific interaction. See study 1 for further detail. In the current study, α = .83.

Rosenberg Self Esteem Scale (RSES). The RSES (Rosenberg, 1962, 1965) is the most commonly used measure of global feelings of self-worth, and has demonstrated good reliability and construct validity in past studies (Crandall, 1973; Blascovich & Tomaka, 1991). Participants respond to 10 items using a 7-point Likert scale (1 = strongly agree, 7 = strongly disagree) that are summed to produce a total score. Higher scores reflect higher trait self-esteem. Sample items include "I feel that I have a number of good qualities" and "On the whole, I am satisfied with myself." In the current study, α = .91.

Basic Psychological Needs Scale – Relatedness Subscale (BPNS-R). The BPNS (Deci & Ryan, 1995, 2000) is a 21-item scale that includes separate subscales measuring the satisfaction of needs for autonomy, competence, and relatedness in life. The concept of autonomy, competence, and relatedness as innate basic psychological needs is central to self-determination theory (Deci & Ryan, 2000). The original BPNS assesses need satisfaction in life

in general, although versions exist which assess need satisfaction in various domains (e.g., work). Although the work version has been used most often in previous research, the general scale has been used in Gagné (2003) and in Kashdan, Julian, Merritt, and Uswatte (2006). The scale has been shown to have adequate reliability (α = .89 for the full general scale and .86 for the relatedness subscale; Gagné, 2003). For the current research, I focused on the relatedness subscale (from the general scale), which contains 8 items rated on a 7-point Likert scale (1 = Not at all True, 7 = Very True) that are summed to produce a total score after reverse-scoring negatively worded items. Higher scores reflect higher feelings of relatedness. An example item from the relatedness subscale is: ‘‘I consider the people I regularly interact with to be my friends.’’ In the current study, α = .87 for the relatedness subscale.

Social Connectedness Scale (SCS). The SCS (Lee & Robbins, 1995) measures the degree of interpersonal closeness that individuals feel between themselves and other people, both friends and society. Participants respond to 8 items using a 6-point Likert scale (1 = agree, 6 = disagree) that are summed to produce a total score. Higher scores reflect higher feelings of connectedness. Sample items include: ‘‘I feel disconnected from the world around me’’ and ‘‘I don’t feel related to anyone.’’ Higher scores represent a stronger sense of belonging. The scale has been shown to have good internal and test-retest reliability in past research (Lee & Robbins, 1995, 1998). In the current study, α = .96.

Procedure. Participants completed a battery of questionnaires online at their discretion. Participants were initially provided a link to an online consent form. Once their consent was submitted, participants were given access to the online questionnaires using a unique identification code. Following completion of the online questionnaires, participants attended an in-person debriefing session. At the session, a research assistant provided participants with both

a written and oral educational summary explaining the purpose of the research and the anticipated findings.

Analytic Overview

Based on results of Study 1 and review of the literature, structural equation modeling (SEM) was used to test two potential models, which I termed the "Self-protection Model" (Model A; see Figure 2) and the "Relatedness Model" (Model B; see Figure 3). In the SEM models, each measured scale loaded on the relevant latent construct. The authenticity construct was comprised of AI-B and SEQ, relatedness was comprised of BPNS-R and SCS, and safety behaviours and self-esteem were comprised of SBQ and RSES, respectively. Means and standard deviations for measures are presented in Table 7. Correlations between measures are presented in Table 8.

Figure 2. Model A

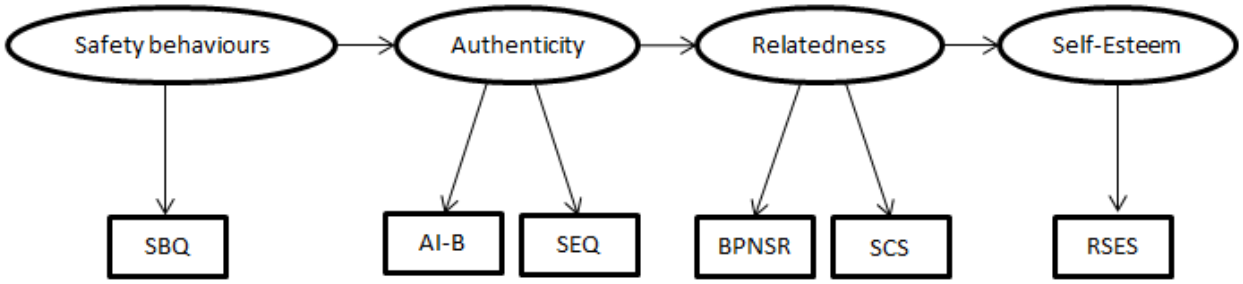


Figure 3. Model B

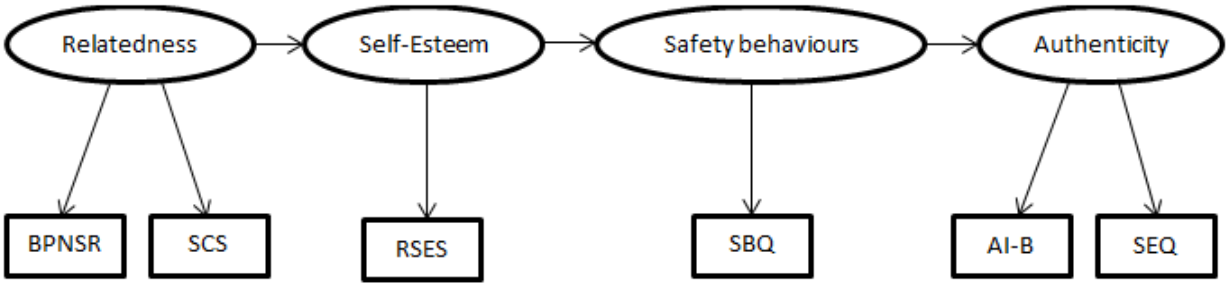


Table 7. Means and Standard Deviations for Measures, Study 2

Measure	Mean (SD)
Authenticity (AI-B)	37.62 (6.79)
Authenticity (SEQ)	21.47 (4.27)
Relatedness (BPNS-R)	43.81 (7.71)
Relatedness (SCS)	36.67 (11.13)
Self-Esteem (RSES)	51.13 (12.20)
Safety Behaviours (SBQ)	102.27 (40.99)
Social Anxiety (SIAS)	27.79 (15.48)
Depression (BDI-II)	11.18 (9.49)

Table 8. Correlations between Measures, Study 2

	1	2	3	4	5	6	7	8
1. AI-B	--							
2. BPNS-R	.48**	--						
3. RSES	.45**	.58**	--					
4. SBQ	-.45**	-.49**	-.48**	--				
5. SEQ	.66**	.62**	.54**	-.52**	--			
6. SCS	.35**	.60**	.47**	-.36**	.47**	--		
7. SIAS	-.50**	-.58**	-.66**	.60**	-.60**	-.44**	--	
8. BDI-II	-.36**	-.43**	-.66**	.41**	-.46**	-.39**	.56**	--

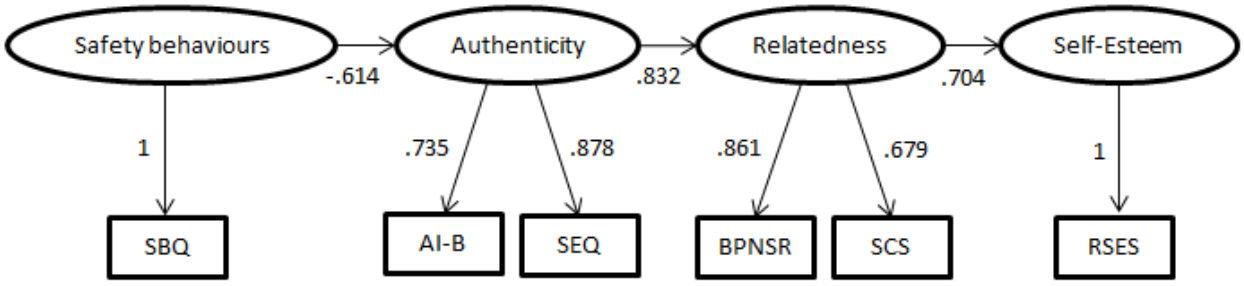
Note. *: $p < .05$ (2-tailed). **: $p < .01$ (2-tailed).

Results

Of the total sample size of 279, there were 16 cases with missing data. These were deleted listwise for simplicity. The analyses were based on the remaining 263 cases. Analyses were run with EQS 6.2 (Bentler, 2008). The maximum likelihood (ML) estimator was used, as this is the most widely used estimator. Since there was significant multivariate nonnormality in the data (Mardia's coefficient, normalized estimate = 4.89), robust statistics were used to test model fit. For factors to be identified, it is important to fix their scale on an observed variable. Thus, each model was run with the factor loadings from relatedness to BPNS-R fixed to 1. Factor loadings from authenticity to AI-B were also fixed to 1. For safety behaviours and self-esteem, the unobserved factor was set to be equal to the observed variable (i.e., SBQ and RSES, respectively) without error variance.

Self-Protection Model (A). The SEM for Model A revealed that the model did not quite fit the data by the Satorra-Bentler (Satorra & Bentler, 1994) chi-square test, $\chi^2(8)=16.23$, $p=.039$. Sample-corrected fit indices (Brosseau-Liard, Savalei & Li, 2012; Brosseau-Liard & Savalei, in press) showed relatively good fit, RMSEA=.064, 90% CI=(.013-.108), CFI =.987. The largest standardized residual was of -.114. As the model fit relatively well by fit indices, no modification was made to the model. Standardized coefficients of the structural paths are presented in Figure 4.

Figure 4. Results – Model A



Note. Standardized coefficients of the structural paths are presented. All paths $p<.05$.

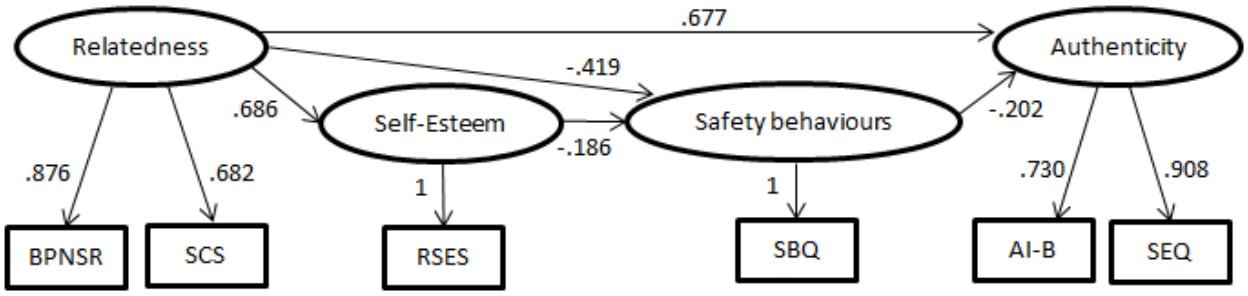
Relatedness Model (B). The SEM for Model B revealed that this model did not fit the data by the Satorra-Bentler chi-square test, $\chi^2(8)=106.03$, $p<.001$. Sample-corrected fit indices also showed poor fit, RMSEA=.229, 90% CI=(.190-.267), CFI =.831. The largest standardized residual was of .490.

In order to improve fit, this model was modified based on theoretical motivations. As the model predicts that relatedness is a primary cause of all other studied constructs, it made sense for theoretical reasons to assume that the path through self-esteem would not entirely mediate the relationship between relatedness and safety behaviours, and in turn not entirely mediate the relationship between relatedness and authenticity, but that there would also be direct paths. Additionally, the three largest standardized residuals were between variables associated with authenticity and relatedness, therefore additionally justifying freeing the path between these constructs.

This modified model fit by the Satorra-Bentler chi-square test, $\chi^2(6)=5.40$, $p=.49$, *ns*. Sample-corrected fit indices also showed excellent fit, RMSEA=.000, 90% CI=(.000-.076), CFI =1.00. The largest standardized residual was of -.043. Standardized coefficients of the structural

paths are presented in Figure 5. This suggests that relatedness is the strongest driver of all other factors, and the mediated paths through self-esteem and safety behaviours, although significant, are comparably small.

Figure 5. Results – Model B (Modified)



Note. Standardized coefficients of the structural paths are presented. All paths $p<.05$.

Discussion

Main findings. This study contrasted two models derived from contemporary theories of SAD and SA, social/evolutionary theories of relatedness and self-esteem, and theories of authenticity: 1) a "self-protection" model, in which use of safety behaviours/self-protective behaviours impacts self-authenticity/genuineness, which in turn can impact feelings of relatedness to others, ultimately impacting self-esteem, and 2) a "relatedness" model, in which relatedness is the driving construct, and that how related we feel exerts a powerful influence on self-esteem, which then influences how we behave and finally, our sense of being authentic to self. In the current study, support was found for both models. Both models fit the data relatively well: the Self-Protection model fit relatively well without modification by sample-corrected fit indices (although did not quite fit by Satorra-Bentler chi-square test). The Relatedness model did not fit unaltered, but showed excellent fit with some modification, i.e., Relatedness was

modeled to have direct paths to safety behaviours and authenticity, in addition to the mediated pathway through self-esteem. Given that relatedness is hypothesized to be a fundamental human need with far reaching implications, this modification is in line with current theory (e.g., Baumeister & Leary, 1995).

The goal of this study was to determine whether it is possible to integrate relationships from empirically supported but disparate theories into a cohesive model of (some aspects of) self. This aim was achieved, indeed with two possible models supported. Of note, that support was found for both models is consistent with cognitive theory, which conceptualizes the factors that maintain social anxiety and negative self-beliefs to be cyclical, with negative self-beliefs (derived from early social experiences) leading to self-protective use of safety behaviours and possible negative social outcomes, ultimately reinforcing negative-self beliefs and feeding into greater motivation to continue use of safety behaviours. The current study provided support for either pathway alone or together as a cycle.

Limitations/directions for future research. There are several limitations to the current study. Firstly, multiple other models are possible based on the number of variables and potential relationships to test. Here, two models were rationally derived from previous conceptual and empirical writings regarding the links between the variables, and both models showed good to excellent fit. However, it is possible that a different model may better capture the relationships among these variables, such as a cyclical pattern. It was not possible to model a cycle in SEM. However, even if a cycle is present, examining distinct pathways may be useful in understanding which forces may most strongly drive this cycle. The current study provides some evidence that relatedness may be a driving factor. Examining distinct pathways had the added use of informing pathways of change to consider in the treatment study (study 3).

Secondly, there are a number of other facets of self and CBT models that could have been included (e.g., self-focused attention, biased self-judgments); however, I opted not to include these variables, as I wanted to confine the study to reasonable number of variables for study 3 clinical participants to complete at multiple time points. Additionally, the variables chosen were highlighted in the literature as being important if not fundamental facets of self, and theory suggested possible testable links between them. These variables appeared most directly related to the question at hand: how do safety behaviours relate to features of self that are emphasized in the social/personality literature?

Thirdly, online completion of measures outside of a controlled environment leaves open the possibility of environmental factors affecting participant responses. Additionally, self-report relies on the assumption that participants were accurately able to report their own behaviuors and experiences, sometimes retrospectively. Further, the current sample was composed of undergraduate students enrolled in an introductory psychology course, which may limit generalizability of results.

Study 2 used a nonclinical sample in order to conduct SEM in a large research sample and thereby have the statistical power to examine the fit of all model paths simultaneously. It is possible, however, that nonclinical individuals show a different pattern of relationships between constructs than a clinical sample. Additionally, Study 2 assessed global patterns at a single time point. It remained to be determined whether these relationships would differ when examining change over time. Study 3 extends this investigation by examining relationships between these variables as they change over time in a clinical sample over the course of treatment.

Chapter Four: Study 3

My primary goal in Study 3 was to determine the relationship between changes in safety behaviours and other aspects of self, specifically authenticity, perceived social relatedness, and self-esteem. Relatively little research has been done on the construct of authenticity in the clinical literature. Because it was so clearly linked to safety behaviours in Study 1, I wanted to examine the relationship between the two variables in a treatment context, specifically to determine whether safety behaviour reduction would precede and predict increased authenticity over the course of treatment.

I also wished to explore the relationship between safety behaviour reduction and participants' sense of social relatedness. An earlier treatment study (Alden & Taylor, 2011) indicated that the interpersonal cognitive-behavioural therapy (ICBT) protocol used here resulted in increases in approach behaviour & relationship satisfaction; however, this study did not formally examine the link between safety behaviour reduction and relational change. Laboratory research indicated that reduction of safety behaviours during an experimental manipulation resulted in increased partner liking (Taylor & Alden 2011). Study 1 also suggested a possible mediated pathway from safety behaviours to relatedness (i.e., mediated by authenticity). This work suggests that safety behaviour reduction should precede and predict increases in social relatedness. On the other hand, Study 2 painted a more complicated picture in that the two models (self-protection and relatedness) found support for two potential sequences, with safety behaviours either predicting OR following social relatedness. The latter sequence (i.e., relatedness to safety behaviours) is consistent with the influential role of social belonging proposed by Baumeister and Leary (1995) and supported by multiple empirical studies. My

objective here was to examine the two variables over time to shed light on the temporal sequencing in treatment.

Cognitive theorists suggest that use of safety behaviours arises from negative beliefs about the self. Consistent with this idea, Acarturk et al. (2009) demonstrated that low self-esteem was a risk factor for the later development and worsening of SAD. That finding points to a pattern in which change in self-esteem would precede and predict change in safety behaviours. However, CBT treatments for SAD are based on the idea that reducing safety behaviours allows for the collection of new information that disconfirms and changes self-views. This scenario suggests that reductions in safety behaviours may precede and predict changes in self-esteem. The findings of study 2 offered support for either scenario.

Another goal of Study 3 was to examine the relationships among the three self-facets. The literature suggests that authenticity leads both to increased relatedness and increased self-esteem (Heppner et al., 2008). The results of study 2, however, raised questions as to whether authenticity predicted relatedness or vice versa in that support was found for both sequences of events. Regarding the relationship between authenticity and self-esteem, a direct path between authenticity and self-esteem was not specifically predicted in either model from Study 2, although mediated paths were present. Given the finding that authenticity uniquely predicts self-esteem, controlling for relatedness (Heppner et al., 2008), it appeared prudent to examine a possible direct link not mediated by relatedness. However, as a direct link was not supported in Study 2, it was considered premature to predict whether authenticity change might directly impact change in self-esteem.

To summarize, theoretical writings and previous findings provide preliminary support for two sets of relationships. Specifically, (1) safety behaviour reduction should precede and predict

increases in authenticity; and (2) increases in relatedness should precede and predict increases in self-esteem. Theoretical writings and empirical studies regarding the nature and direction of the relationships between these two patterns are inconsistent. Thus, a goal of Study 3 was to examine the two possible sequences of events suggested by the models tested in Study 2. This study built on results from Study 1 by looking at the effects of safety behaviour reduction on authenticity and interpersonal outcomes outside of the laboratory and over the duration of treatment for SAD to determine whether results would replicate in a treatment context. I also aimed to build on results from Study 2 by exploring relationships among safety behaviours, authenticity, relatedness, and self-esteem, as they change over the course of treatment. Specifically, I aimed to examine pathways that would be predicted by the two models supported in Study 2: 1) the Self-Protection Model, and 2) the Relatedness Model.

Hypotheses

My hypotheses were as follows: (1) The results from study one would be confirmed, i.e., safety behaviour reduction would be associated with increases in authenticity. (2) In keeping with Baumeister and Leary's (1995) sociometer theory, increased relatedness would precede and predict increases in self-esteem, as this relationship has some of the strongest empirical support and is predicted by both models described in Study 2. (3) Consistent with Study 2, the sequence of change in the variables during treatment would support one or both models formulated for Study 2. Given that both models from Study 2 showed good to excellent fit, I did not have a specific prediction about which model might be more strongly supported in a clinical sample during the course of treatment and therefore conducted analyses consistent with each one.

Method

Participants. Participants were individuals seeking treatment for Generalized Social Anxiety Disorder (GSAD) from a treatment research program. Prospective participants completed an initial 45-minute telephone screening interview that provided information about the study and assessed study appropriateness. At this point, applicants with histories of treatment for psychosis or brain injury, self-reported suicidal ideation, nonsuicidal self-injury, Bipolar episodes, substance abuse within the past year, or hospitalization or prolonged outpatient treatment for a Mood Disorder were eliminated. Suitable applicants participated in a clinical assessment procedure in which the Anxiety Disorders Interview Schedule for DSMIV (ADIS-IV; Brown, Di Nardo, & Barlow, 1994) was administered to confirm diagnostic status. The ADIS-IV is a semi-structured interview protocol that has demonstrated high inter-rater reliability and good concurrent validity (Brown et al., 1994). Diagnostic interviews were conducted by seven clinical psychology graduate students who had training and experience administering the ADIS-IV. All participants met the following inclusion criteria: (1) a primary DSM-IV-TR diagnosis of GSAD (APA, 2000); (2) no current severe Major Depressive Disorder with evidence of suicidal intent or Bipolar Disorder, as assessed by the ADIS-IV; (3) fluent in English; (4) no concurrent psychotherapy, and (5) no change in psychotropic medication within the past three months. Age range was restricted to 20 to 55 years to increase group cohesion in the treatment that followed. Intake interviews were recorded and a randomly selection portion (10%) were rated by a second independent clinician, who agreed with the assignment of a primary GSAD diagnosis in all cases (Kappa = 1). The high inter-rater agreement was likely due to the rigor of the initial telephone screening.

Measures.

Symptom measures. Two measures were included to assess symptom severity: the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), and the Beck Depression Inventory-II (BDI-II; Beck et al., 1996). See Study 1 for information on these measures. These measures were used to assess the effectiveness of the ICBT protocol in reducing social anxiety and depressive symptoms, and to determine whether there were any differences in symptom severity between included and excluded participants. The Cronbach's α for the present sample was .86-.93 and .89-.91 for the SIAS and BDI-II, respectively.

Safety Behaviours. The Social Behaviour Questionnaire (SBQ; modified) is a list of safety behaviours commonly reported by individuals with SAD. It measures specific strategies used in social situations to prevent negative outcomes. Items for this measure were selected from the Social Behaviour Questionnaire developed by Clark and colleagues for use in treatment trials of SAD (see Clark et al., 1995), and from pilot work conducted during our own treatment of patients with SAD (see Study 1 for more detail). Items that were removed in study 1 because they did not apply to the laboratory interaction task were again included. Participants completed a total of 33 items, rating how often they utilized certain strategies on a nine-point scale (0 = never, 8 = always). Ratings were summed to create a total safety behaviour score. For this study, I altered the instructed time-frame for ratings so that participants responded based on "the past two weeks, including today." In the current study, α = .91-.95.

Authenticity.

The Self-Experience Questionnaire (SEQ, Taylor, Alden, Plasencia) consists of four items: "*I felt genuine during conversations," "I felt I was artificial," "I felt I was being me,"* and "*I felt I was putting on a façade,"* which are rated on seven-point scales (1 = Not at all, 7 = Very

much) and summed to yield a total score. Participants' gave ratings of how genuine versus artificial they felt "during conversations over the past two weeks". This was identical to the measure given in Study 1, with the exception that the instructed time frame for ratings was altered to "the past two weeks" rather than one specific interaction. See Study 1 for further detail. In the current study, α = .80-.92.

The Authenticity Inventory (AI; Kernis & Goldman, 2006) is a 45-item measure of dispositional authenticity, i.e., the trait tendency to function in ways that reflect one's underlying sense of self. Responses are made on 5-point scales (1 = strongly disagree and 5 = strongly agree) and summed to create a total score after reverse-scoring negatively worded items. Extensive data has been reported on the reliability and validity of the AI (Kernis & Goldman, 2006). The current study used the 11-item behaviour subscale, which assesses the degree to which people report acting in accord with their values, preferences, and needs. See Study 2 for more information. For this study, the instructed time-frame for ratings was altered so that participants responded based on "the past two weeks, including today". In the current study, α = .76-.84.

Relatedness/connectedness.

The 21-item Basic Psychological Needs Scale (BPNS general scale; Deci & Ryan, 1995, 2000) includes separate subscales measuring the satisfaction of needs for autonomy, competence, and relatedness in life. See Study 2 for more information. For the current research, I used only the relatedness subscale, which contains 8 items rated on a 7-point Likert scale (1 = Not at all True, 7 = Very True) that are summed to produce a total score after reverse-scoring negatively worded items. Higher scores reflect higher feelings of relatedness. An example item from the relatedness subscale is: ''I consider the people I regularly interact with to be my friends.'' For

this study, I altered the instructed time-frame for ratings so that participants responded based on "the past two weeks, including today". In the current study, α = .79-.81.

The Social Connectedness Scale (SCS; Lee & Robbins, 1995) measures the degree of interpersonal closeness that individuals feel between themselves and other people, both friends and society. Participants respond to 8 items using a 6-point Likert scale (1 = agree, 6 = disagree) that are summed to produce a total score. Higher scores reflect higher feelings of connectedness. Sample items include: ''I feel disconnected from the world around me'' and ''I don't feel related to anyone.'' Higher scores represent a stronger sense of belonging. The scale has been shown to have good internal and test-retest reliability in past research (Lee & Robbins, 1995, 1998). For this study, I altered the instructed time-frame for ratings so that participants respond based on "the past two weeks, including today". In the current study, α = .90-.94.

Self-esteem. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1962, 1965) is the most commonly used measure of global feelings of self-worth, and has demonstrated good reliability and construct validity in past studies (Crandall, 1973; Blascovich & Tomaka, 1991). Participants respond to 10 items using a 7-point Likert scale (1 = strongly agree, 7 = strongly disagree) that are summed to produce a total score. Higher scores reflect higher trait self-esteem. Sample items include "I feel that I have a number of good qualities" and "On the whole, I am satisfied with myself." For this study, I altered the instructed time-frame for ratings so that participants respond based on "the past two weeks, including today". In the current study, α = .93-.94.

Personnel. Groups were run by two to three therapists who were graduate students in clinical psychology under the supervision of registered clinical psychologists. Therapists

received extensive training in administering the treatment protocol and received weekly supervision from the author and a registered psychologist.

Procedure. Participants completed self-report measures at pre-treatment, mid-treatment, immediately post-treatment, and 6 months post-treatment. The questionnaire battery included the SBQ, SEQ, AI-behaviour subscale, BPNS-relatedness subscale, SCS, and RSES. Treatment consisted of 13-14 group sessions with 6-8 participants in each group that followed a manualized cognitive-behavioural protocol developed by Alden, Taylor, and Buhr (2007). This protocol is based on contemporary cognitive-behavioural therapy models of SAD (Clark & Wells, 1995; Rapee & Heimberg, 1997), and integrates techniques from cognitive-behavioural therapy with techniques developed from the relational literature. The therapy regimen consisted of the following components: presentation of a cognitive-behavioural model of SAD; self-monitoring of social situations; identifying feared predictions for social events; identification of safety behaviours; prediction testing, including testing the outcomes of dropping safety behaviours; graduated exposure to anxiety-provoking social situations; education about principles of relational behaviour, encouragement of prosocial behaviours and judicious self-disclosure, identification and evaluation of negative beliefs, reappraisal of pre-existing negative beliefs, and group discussion. The behavioural experiment format was used throughout the protocol. Many of the behavioural experiments took the form of reducing safety behaviours and observing the self- and social-outcomes.

Analytic Strategy

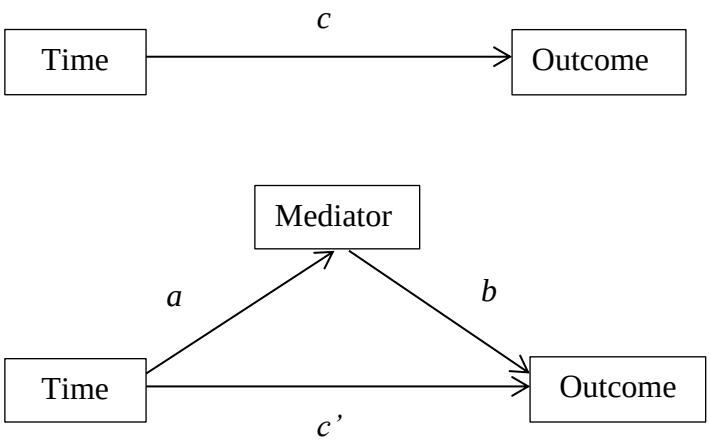
The longitudinal study design resulted in data which formed a multilevel, hierarchical nested structure (Kenny, Kashy, & Bolger, 1998; Raudenbush & Bryk, 2001). The lower level (Level 1) data consisted of the within-person repeated measures that were collected at pre-, mid-,

and post-treatment, and 6 month follow-up (e.g., relatedness, self-esteem, etc.). This Level 1 data was nested within Level 2 units (i.e., participants). This type of data structure is appropriate for hierarchical linear modeling techniques/growth curve modeling techniques (Raudenbush, 2001; Collins & Sayer, 2001). Linear mixed modeling is increasingly the preferred approach for analysis of longitudinal data (Gibbons et al., 1993), as it allows the number of observations to vary between participants, can effectively deal with missing data, and accommodates complex covariance structures. The goal of this approach is to understand how an individual's score changes as a function of time. I first examined outcomes over time to determine whether variables successfully changed over the course of the intervention. I then conducted mediational analyses to investigate possible pathways of change over time, examining the hypothesized associations among safety behaviour use, authenticity, relatedness, and self-esteem.

I followed the procedures reported by Kenny, Korchmaros, and Bolger (2003) to conduct multilevel mediational analyses. These procedures were adapted from those originally described by Baron and Kenny (1986), who outlined the following criteria to establish mediation: (1) the predictor variable has a significant "total effect" on the criterion variable (path c); (2) the predictor has a significant effect on the mediator (path a); (3) the mediator predicts the criterion variable, controlling for the predictor variable (path b); and (4) the direct effect from the predictor to the criterion is significantly reduced after controlling for the indirect effect produced by the mediator (path c'). I used the program PRODCLIN (MacKinnon, Fritz, Williams, & Lockwood, 2007), based on the asymmetric distribution of products test (MacKinnon, Lockwood, & Williams, 2004), to compute confidence intervals for the mediated pathways (a*b). If the 95% confidence interval does not include 0, the mediated effect is considered significant (i.e., significantly different from zero; MacKinnon et al., 2004). Additionally,

demonstration of the temporal occurrence of changes in the mediator before changes in outcomes provides a stronger test of mediation (Kazdin, 2007). Accordingly, I created a "lag" between each mediator and outcome, testing whether changes in the mediator at time t accounted for changes in the outcome at time t +1. This was done following procedures similar to other researchers (e.g., Aderka, Foa, Applebaum, Shafran, & Gilboa-Schechtman, 2011; Donegan & Dugas, 2012; Seidel et al., 2009) so as to directly test the temporal relationship[1]. R software (version 3.0.2) was used to analyze the multi-level models. See Figure 6.

Figure 6. Mediational Model



[1] It has been suggested that it may be useful to control for prior levels of the outcome by modeling outcome at time t as an additional predictor of the outcome at time t + 1 to control for the possibility of ''reverse'' causation (i.e., the possibility that the outcome at time t caused both the mediator at time t and the outcome at time t + 1; see Smits et al., 2006). However, the current study design of 4 time points limits the number of variables allowed in the equations, and I was therefore unable to model the outcome at time t as an additional predictor (i.e., could not have fewer observations than random effects). As a control for the possibility of reverse causation, I explicitly modeled the possibility of mutual, reverse causation in which, in addition to the mediator causing the outcome, the outcome independently causes the mediator. The model examining whether the outcome caused the mediator is similar to the stated mediation model, except with the role of the mediator and the outcome reversed.

Results

Preliminary analyses. Participants who completed only one assessment were excluded, as change cannot be assessed from a single time point. Of 97 initial assessments, 22 were not eligible for the study (e.g., SAD not primary), and 14 refused treatment. Of the 61 individuals who agreed to treatment, 12 participants (19.7%) attended some treatment sessions (i.e., 3 or more) but completed only one assessment. This left a final sample of 49 participants (80.3%) who attended 8 or more sessions and completed at least 2 assessments. Of 4 participants that completed only 2 assessments, only one individual completed assessments that were nonadjacent in time. Data for this participant were retained in the analyses. Demographics for the final sample are presented in Table 9. Chi-square tests and t-tests revealed no significant differences between excluded or included participants on any demographic or outcome measures at baseline. All sessions were audiotaped and the majority of sessions were reviewed by a clinical supervisor who verified that the therapists covered all of the main components specified in the protocol.

Response to ICBT. Forty-three participants completed the SIAS at both pre- and post-treatment. A paired samples t-test indicated that SIAS scores decreased significantly from pre- to post-treatment (SIAS-pre –SIAS-post =17.34, SD = 10.49), $t(42) = 10.84$; $p < .001$, $\eta^2 = .74$. Forty-two (97.7%) of these participants scored above the social phobia screening cutoff score of 34 on the SIAS (Brown et al., 1997) at pre-treatment, compared to only 28 (65.1%) scoring above 34 at post-treatment. Forty-eight participants completed ADIS assessments at both pre- and post-treatment. All 48 participants received a diagnosis of social phobia (clinical severity rating of 4 or above) at pre-treatment, whereas 32 (66.7%) received a social phobia diagnosis at post-treatment. There was a significant overall decrease in clinical severity ratings, from a mean

Table 9. Means and Standard Deviations of Demographic and Symptom Measures, Study 3

Gender (% female)	53.1
Age	30.59 (9.00)
Years of Education	15.79 (2.11)
North American Born (%)	67.3
Ethnicity (%)	
Caucasian	57.2
Asian	24.5
Other	18.3
Marital Status (%)	
Never Married	71.4
Married/Common-law	24.5
Separated/Divorced	4.1
Employment Status (%)	
Employed or Student	79.6
Unemployed	20.4
Comorbid Diagnoses (%)	
None	71.4
MDD or Dysthymia	14.2
GAD	12.3
Specific Phobia	2.0
Currently on Medication (%)	28.6
SIAS	54.43 (9.90)
BDI-II	14.51 (9.60)

Note. Standard deviations in parentheses. MDD = Major Depressive Disorder; GAD = Generalized Anxiety Disorder. Comorbid diagnoses sum to over 100% because some participants met criteria for multiple comorbid psychiatric disorders.

of 5.83 (SD = .72) at pre-treatment to a mean of 4.19 (SD = 1.55) at post-treatment (CSR-pre – CSR-post = 1.65, SD = 1.48), $t(47) = 7.70$, $p < .001$, $\eta^2 = .56$.

Mediators. Means and standard deviations for each measure at pre- and post-treatment are displayed in Table 10. Correlations between each measure at pre-treatment and post-treatment are presented in Tables 11 and 12. To develop a more stable measure of the underlying construct of relatedness for subsequent analyses, BPNS-R and SCS were combined into a single

Table 10. Means and Standard Deviations of Pre- and Post-Treatment Measures, Study 3

Measure	Pre-Treatment	Post-Treatment	Follow-Up
Authenticity (AI-B)	31.68 (6.19)	36.70 (7.07)	36.24 (6.98)
Authenticity (SEQ)	15.94 (4.58)	21.17 (4.00)	19.97 (4.39)
Relatedness (BPNS-R)	34.67 (7.27)	38.80 (7.41)	39.54 (7.36)
Relatedness (SCS)	25.98 (9.22)	33.07 (9.76)	32.13 (9.82)
Self-Esteem (RSES)	39.62 (12.71)	47.36 (13.67)	47.03 (9.62)
Safety Behaviours (SBQ)	137.46 (38.02)	77.35 (42.09)	87.62 (44.67)
Social Anxiety (SIAS)	54.43 (9.90)	36.60 (12.48)	37.71 (12.25)
Depression (BDI-II)	14.51 (9.60)	7.33 (8.14)	8.31 (7.72)

Table 11. Correlations among Pre-Treatment Measures, Study 3

	1	2	3	4	5	6	7	8
1. AI-B	--							
2. BPNS-R	.36*	--						
3. RSES	.31*	.46**	--					
4. SBQ	-.43**	-.29*	-.33*	--				
5. SEQ	.33*	.28	.26	-.38**	--			
6. SCS	.48**	.66**	.45**	-.37**	.29	--		
7. SIAS	-.27	-.33*	-.44**	.73**	-.36*	-.42**	--	
8. BDI-II	-.39**	-.37**	-.52**	.34*	-.11	-.51**	.34*	--

Note. *: $p < .05$ (2-tailed). **: $p < .01$ (2-tailed).

Table 12. Correlations among Post-Treatment Measures, Study 3

	1	2	3	4	5	6	7	8
1. AI-B	--							
2. BPNS-R	.31*	--						
3. RSES	.38**	.63**	--					
4. SBQ	-.44**	-.27	-.52**	--				
5. SEQ	.72**	.25	.25	-.49**	--			
6. SCS	.50**	.77**	.63**	-.38**	.38**	--		
7. SIAS	-.48**	-.51**	-.69**	.78**	-.34*	-.50**	--	
8. BDI-II	-.36*	-.46**	-.65**	.47**	-.26	-.52**	.46**	--

Note. *: $p < .05$ (2-tailed). **: $p < .01$ (2-tailed).

index score (created by dividing each total score by its highest possible Likert rating, and then adding the scores together). A similar index score was created for authenticity by combining AI-B and SEQ. Reducing the number of variables also served to keep the subject to variable ratio as high as possible.

First, I tested whether the variables of interest changed significantly over the course of treatment from pre-treatment to follow-up. All measures changed linearly over time (all ps < 0.05)[2]. Significant mean linear increases were observed in self-esteem, relatedness, and authenticity (self-esteem: $b = 2.74$, *S.E.* $b = .50$, $t(131) = 5.48$, $p < .001$ (intercept = 39.73, $p<.001$); relatedness, $b = .56$, *S.E.* $b = .14$, $t(130) = 4.10$, $p<.001$(intercept = 9.43, $p<.001$);

[2] Non-linear change was assessed with power polynomials. Although quadratic time (Time^2) was a significant predictor of RSES, SBQ, and Authenticity at time t +1 (mid-treatment to follow-up), it was not a significant predictor for any variable at time t (pre-treatment to post-treatment) or for Relatedness at t+1. Given that linear change was significant for all variables at both t and t+1, with the exception of Relatedness at t+1 (which was nonsignificant for both linear and quadratic time), I therefore conducted subsequent analyses with linear time.

authenticity, b = .58, *S.E.* b = .0949, $t(129) = 6.07$, $p<.001$ (intercept = 8.82, $p<.001$)). Safety behaviours showed mean linear decreases over time, b = -18.69, *S.E.* b = 2.00, $t(130) = -9.33$, $p<.001$ (intercept = 131.55, $p<.001$).

I next examined several mediational models to determine if changes in the mediators at time t accounted for changes in outcomes at time t + 1, examining the paths suggested by the SEM analyses in Study 2. I focused first on the Self-Protection Model (Model A, see Figures 2 and 4), as this model showed relatively good fit without modification. I then examined the Relatedness Model (Model B, see Figures 3 and 5), as this model showed excellent fit with some modification.

Mediational models predicted by the Self-Protection Model. I began by examining whether change in safety behaviours accounted for change in authenticity during treatment. I examined a model in which time was the predictor, use of safety behaviours was the mediator, and authenticity was the outcome. Based on the mediation guidelines of Kenny et al. (2003), I first entered time into a Level 1 regression equation predicting authenticity at time t +1(path c). Results indicated that authenticity significantly increased during the course of treatment from mid-treatment to follow-up (time t +1). Next, I entered time into a Level 1 regression equation predicting safety behaviours at time t (path a). Results indicated that safety behaviours significantly decreased during treatment from pre-treatment to post-treatment (time t). I then entered time and safety behaviours (time t) simultaneously into a Level 1 regression predicting authenticity (time t +1). The effect of safety behaviours (path b) was significant, indicating that decreases in safety behaviours significantly predicted subsequent increases in authenticity, controlling for time. The effect of time (path c') on authenticity was no longer significant when controlling for safety behaviours. The pathway between time and authenticity (path c) was

reduced from .36 to -.069 when safety behaviours were entered (path c'). This drop in the regression coefficient for time predicting authenticity when safety behaviours were added to the equation is an indicator of mediation. That its significance level rose above the statistical cutoff of $p < .05$ when safety behaviours were added indicates full or complete mediation.

I further examined multilevel mediation using the program PRODCLIN (MacKinnon, Fritz, Williams, & Lockwood, 2007), which provides asymmetric confidence intervals for the mediated effect. The indirect effect of time on authenticity via safety behaviours was significant (95% CI [0.18, 0.68]), providing evidence of multilevel mediation. The ratio of the indirect effect to the total effect, i.e., proportion of the total effect accounted for by the mediator (P_M = a*b/c), was used to estimate the magnitude of mediated effects (Shrout & Bolger, 2002)[3]. Proportion mediated was 1.16, also suggesting full mediation[4]. See Table 13.

Table 13. Multilevel Mediational Model Examining whether Safety Behaviours Mediate the Effect of Time on Authenticity

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Time	Authenticity	.36	.13	2.71	.008
A	Time	Safety Behaviours	-29.81	2.76	-10.79	<.001
B	Safety Behaviours	Authenticity	-.014	.004	-3.54	<.001
C'	Time	Authenticity	-.069	.17	-.39	.694

[3] This measure of mediation effect size was reported because it frequently used (MacKinnon, 2008). Although often referred to as a proportion, P_M cannot accurately be interpreted as proportion (Preacher & Kelley, 2011). Its quantity can exceed 1.0 or be negative, depending on the relationship of c to c', and a P_M of 1.0 does not mean no other possible mediators exist. Although simulation studies have shown P_M to be unstable in samples of less than 500 data points, smaller sample sizes will yield acceptable standard deviations if the effect is significant (Seidel et al., 2009).

[4] I also examined the reverse model, i.e., switching the position of the mediator and the outcome variable, to test whether changes in authenticity accounted for changes in safety behaviors during treatment. In the reverse model, increases in authenticity did not significantly predict decreases in safety behaviors, controlling for time.

I next examined the mediational model testing whether changes in authenticity accounted for changes in relatedness during treatment. The model was nonsignificant (95% CI [-.28, .26])[5].

In a third mediational model, I examined whether changes in relatedness accounted for changes in self-esteem during treatment. Significant mediation was found (95% CI [0.31, 2.14]). The relationship between time and self-esteem became nonsignificant when controlling for relatedness, an outcome indicative of full mediation. Relatedness accounted for 50.8% of the relationship between time and self-esteem (i.e., $P_M = .51$)[6]. See Table 14.

Table 14. Multilevel Mediational Model Examining whether Relatedness Mediates the Effect of Time on Self-Esteem

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Time	Self-Esteem	2.18	.71	3.08	.003
A	Time	Relatedness	.90	.13	6.80	<.001
B	Relatedness	Self-Esteem	1.23	.42	2.91	.005
C’	Time	Self-Esteem	.69	.80	.86	.39

Mediational models predicted by the Relatedness Model. I next tested the paths predicted by the Relatedness Model (see Study 2). This model begins with the pathway from

[5] The reverse model was specifically tested as part of the Relatedness Model.

[6] In the reverse model, the effect of time on relatedness at t+1 (path c) was not significant, indicating that that relatedness did not change significantly from mid-treatment to follow-up. Despite this, the effect of self-esteem (path b) was significant, indicating that increases in self-esteem significantly predicted subsequent increases in relatedness, and there was evidence for a significant indirect effect, (95% CI [0.12, 0.49]). Some authors have argued that a significant total effect is not necessary for mediation to occur (see Preacher and Hayes 2008). This may indicate some mutual causation.

relatedness to self-esteem. As mentioned above, this mediational model was significant (95% CI [0.35, 1.97], $P_M = .51$).

I then examined whether change in self-esteem accounted for changes in safety behaviours during treatment. Significant mediation was found (95% CI [-6.57, -0.24]). The relationship between time and safety behaviours remained significant, an outcome indicative of partial mediation. Self-esteem accounted for 22.7% of the relationship between time and safety behaviours (i.e., $P_M = .23$)[7]. See Table 15.

Table 15. Multilevel Mediational Model Examining whether Self-Esteem Mediates the Effect of Time on Safety Behaviours

Path	Predictor	Outcome	*b*	*S.E.*	*t*	*p*
C	Time	Safety Behaviours	-13.59	2.78	-4.89	<.001
A	Time	Self-Esteem	4.12	.66	6.26	<.001
B	Self-Esteem	Safety Behaviours	-.75	.35	-2.11	.04
C’	Time	Safety Behaviours	-10.34	3.14	-3.29	.002

I next examined the mediational model testing whether change in safety behaviours accounted for change in authenticity. As mentioned above, this mediational model was significant (95% CI [0.18, 0.68], $P_M = 1.16$).

[7] I also examined the reverse model, testing whether changes in safety behaviours accounted for changes in self-esteem during treatment. In the reverse model, decreases in safety behaviours did not significantly predict increases in self-esteem, controlling for time.

As the SEM for Model 2 in Study 2 suggested additional pathways between relatedness and safety behaviours and relatedness and authenticity, I specifically tested mediational models addressing these pathways as well. The model testing whether changes in safety behaviours accounted for changes in relatedness during treatment was nonsignificant (95% CI [-0.08, 0.63])[8]. However, in the model examining whether changes in relatedness accounted for changes in authenticity during treatment, significant mediation was found (95% CI [0.08, 0.35]). The relationship between time and authenticity became nonsignificant when controlling for relatedness. Relatedness accounted for 66.8% of the relationship between time and authenticity (i.e., $P_M = .67$)[9]. See Table 16.

Table 16. Multilevel Mediational Model Examining whether Relatedness Mediates the Effect of Time on Authenticity

Path	Predictor	Outcome	*B*	*S.E. B*	*t*	*p*
C	Time	Authenticity	.31	.12	2.70	.008
A	Time	Relatedness	.90	.13	6.80	<.001
B	Relatedness	Authenticity	.23	.07	3.23	.002
C’	Time	Authenticity	.17	.15	1.11	.27

Supplementary analyses. While not predicted by either SEM model, given that Kernis and Goldman found that authenticity predicted self-esteem, I examined the mediational model testing whether changes in authenticity accounted for changes in self-esteem during treatment. The model was nonsignificant (95% CI [-.23, 2.19])[10].

[8] The reverse model was also nonsignificant.
[9] In the reverse model, increases in authenticity did not significantly predict increases in relatedness, controlling for time.
[10] The reverse model was also nonsignificant.

Discussion

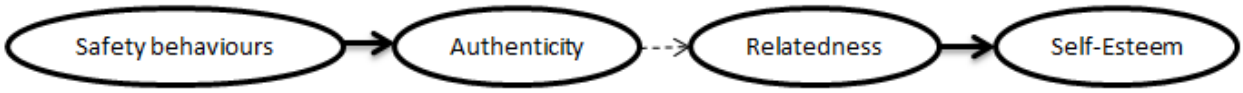
My first goal was examine whether changes in relatedness, self-esteem, safety behaviours, and authenticity occurred over the course of ICBT treatment. This was confirmed, with all variables demonstrating change over the course of treatment in the predicted directed. Secondly, this study aimed to replicate and extend Study 1 to determine whether reduction in safety behaviours over the course of treatment for SAD would predict increase in sense of authenticity. This hypothesis was strongly confirmed, with change in safety behaviours fully mediating the relationship between time and authenticity ($P_M = 1.16$). Thirdly, I endeavored to better understand the mechanisms of change by examining relationships among these variables as they change over time. Specifically, I used multi-level mediational models to examine relationships between variables that would be predicted by the 2 models outlined in Study 2: (1) the Self-Protection Model (Model A), and (2) the Relatedness Model (Model B).

Results of these analyses provided stronger support for Model B. In Model A, there was support for 2 "links" in the chain: change in safety behaviours did indeed account for change in authenticity, and change in relatedness did account for change in self-esteem. However, change in authenticity did not account for change in relatedness (see Figure 7).

All paths hypothesized in the original (unmodified) Model B were supported (see Figure 8): (1) Change in relatedness accounted for change in self-esteem, (2) change in self-esteem accounted for change in safety behaviours, and (3) change in safety behaviours accounted for change in authenticity. Additionally, change in relatedness accounted for change in authenticity, as predicted by the modified Model B. However, change in relatedness did not account for change in safety behaviours, as predicted by the modified Model B. Finally, a significant indirect effect of time on relatedness via self-esteem was found, indicating a possible reciprocal

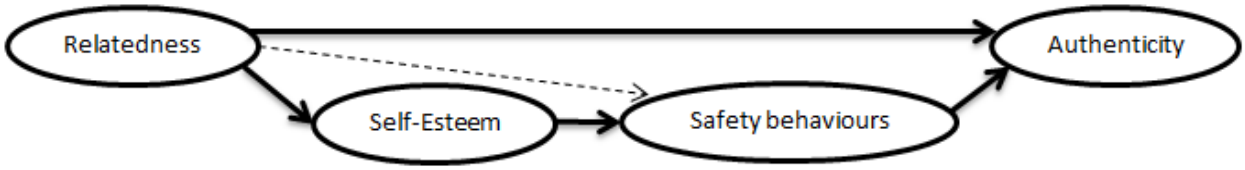
relationship between increase in relatedness and increase in self-esteem. This is in line with research showing that people with high self-esteem often have a relationship-promoting interpersonal style that promotes high-quality social bonds (Stinson et al., 2008). Clinically, this reciprocal relationship is encouraging, as it suggests a possible "upward spiral" effect.

Figure 7. Model A – Paths Supported based on Mediational Analyses



Note: Arrows in bold signify paths supported based on mediational analyses. Broken arrow signifies a path predicted by the model but not supported in this study.

Figure 8. Model B – Paths Supported based on Mediational Analyses



Note: Arrows in bold signify paths supported based on mediational analyses. Broken arrow signifies a path predicted by the model but not supported in this study.

Interestingly, although relatedness increased significantly at time t (pre- to post-treatment), it did not significantly change at time t+1 (mid-treatment to follow-up). This indicates that the majority of change in relatedness occurred from pre-treatment to mid-treatment. One possible reason for this might be that the experience of being in group treatment led to a large initial increase in relatedness, whereas relatedness in outside environments may be slower to increase. In support of this hypothesis, a 7-item group climate measure (alpha = .66)

given at session 3 and session 9 showed correlations with relatedness: group climate at session 3 significantly correlated with relatedness at mid-treatment, $r(47) = .27$, $p < .05$ (one-tailed), and group climate at session 9 significantly correlated with relatedness at mid-treatment, $r(41) = .35$, $p < .05$ (one-tailed), and post-treatment, $r(39) = .29$, $p < .05$ (one-tailed). Group climate did not correlate significantly with authenticity, safety behaviours, or self-esteem at any time point.

Of note, relatedness did not substantially change from post-treatment to follow-up, indicating that gains in feelings of relatedness were maintained. Perhaps initial increases from group treatment generalized to overall sense of relatedness with others.

Limitations of research. Several limitations should be acknowledged concerning the current research. One limitation concerns the number of participants. As this was a treatment study, the achievable *n* was relatively small at 49 participants.

Next, although study 1 employed an experimental manipulation, the research design of Study 3 was correlational in nature. The examination of the temporal relationships was conducted to increase confidence in possible causal relationships; however, we cannot assume a causal relationship between safety behaviour use and changes in authenticity, relatedness, or self-esteem. This analytic method was also limited by the number of time points examined, as more frequent measurement may have allowed for more finely tuned understanding of the timing of changes that occurred during treatment. The number of time points selected was chosen to reduce client burden in completing measures. Similarly, more facets of the self and CBT models (e.g., self-focused attention, biased self-judgments) may have been useful to examine; however, I chose to not to examine these additional variables so as to limit the number of measures administered and increase patient compliance.

Finally, measurement of all variables was done through self-report measures. The utility of self-report measures is dependent on the assumption that people are able to accurately identify their own thoughts, feelings, behaviours. However, this method does have the advantage of allowing assessment of subjective feelings, covert behaviours, and the motivation underlying behaviour, which may be difficult to assess otherwise. In particular, self-report can help ensure that safety behaviours endorsed are behaviours strategically adopted to ward off anticipated negative outcomes. Nonetheless, future work should include information from other sources such as therapist ratings.

In spite of possible limitations, this research makes a novel and valuable contribution to the literature. Understanding potential pathways in which safety behaviours produce therapeutic change may help in improving cognitive-behavioural treatments for social anxiety disorder. This research also helps to clarify what treatment variables influence changes in self-esteem.

Chapter Five: General Discussion

Summary of Research

The aim of this dissertation was to increase understanding of the relationship between social safety behaviours and the negative self-system in individuals with SAD. This aim was accomplished through a novel integration of clinical CBT theory of SAD and social psychology theories of authenticity and relatedness, constructs thought to be essential to self-esteem and well-being. I conducted three studies to examine interrelationships between safety behaviours, authenticity, relatedness, and self-esteem.

My first goal was to examine the hypothesis that safety behaviour reduction leads to increase in authenticity. In a controlled experimental manipulation, Study 1 demonstrated that reduction in safety behaviours in individuals with SAD does indeed result in increased authenticity, which in turn results in more positive relational behaviour and social outcomes. The strength of this study lay in its methodology, which allowed for rigorous controls and increased ability to infer causal relationships. However, this laboratory study was limited in its generalizability to daily life and did not address all variables of interest—both limitations that Study 2 aimed to address.

Study 2 tested two potential models of the interrelationships between safety behaviours, authenticity, relatedness, and self-esteem. These models were derived from the results of Study 1 as well as from the integration of three theories with empirical basis: Clark and Wells (1995) Cognitive Model of SAD, Kernis and Goldman's (2006) Authenticity Model, and Baumeister and Leary's (1995) Social Belonging Model. Based on this literature, two plausible combinations were investigated: A) Does reducing safety behaviours result in an increased sense of authenticity, which in turn increases relatedness and self-esteem? This model was termed the

"self-protection model." B) Does change in relatedness result in change in the self-system (i.e., a more positive sense of self/self-esteem), which motivates people to reduce their safety behaviours and thereby increase their sense of authenticity? This second model under investigation was termed the "relatedness model."

SEM was used to test the above models in a large non-clinical sample. Results found support for both models: the Self-Protection model showed relatively good fit without modification, and the Relatedness model showed excellent fit with some modification (i.e., relatedness was modeled to have direct paths to safety behaviours and authenticity, in addition to the mediated path through self-esteem). This study provided support for testing both models in the treatment study to follow.

Study 3 extended the investigation to a clinical sample to discover how relationships between these variables actually play out in treatment. Individuals with SAD receiving group ICBT treatment completed measures assessing safety behaviour use, authenticity, relatedness, and self-esteem at 4 time points: pre-treatment, mid-treatment, post-treatment, and 6 months following treatment. Multi-level mediational modeling was used to test whether change in mediators predicted subsequent change in outcome variables, controlling for time.

This study showed that: 1) change in all these variables occurred during ICBT treatment, 2) additional support was found that reduction in safety behaviours leads to increase in authenticity, and 3) in regards to the sequence of change that occurs in treatment, greater support was found for the Relatedness model tested in Study 2. Change in relatedness seemed to occur early in treatment and exerted an influence on change in other variables (i.e., self-esteem and authenticity). This lends support to Leary's theory of belongingness being a fundamental need with far reaching implications.

Broader Significance of the Research and Potential Applications

Safety behaviours and the self. The major aim of this work was to investigate the effects of safety behaviours on aspects of the self. The current work underscores the emotional and social benefits of reducing safety behaviours. All three studies support the direct relationship between reduction in social safety behaviours and increase in authenticity. This lends support to new conceptualizations of SAD that suggest that the motivation to hide the true self is at the heart of the disorder. It also supports recent social psychological writings emphasizing the importance of considering the role of the authentic self. Further, these findings suggest an additional benefit of reducing safety behaviours: enabling the person to engage in more authentic, self-congruent behaviour. Research has supported the wide-ranging benefits of being more authentic, such as greater life satisfaction, positive affect, self-concept clarity, mindfulness, adaptive coping strategies, and positive relationship functioning (Kernis & Goldman, 2006). Together these studies and the current results also suggest a possible theme to discuss with clients: life may be more fulfilling when one is able to be one's genuine self and strive after goals that are truly desired by the self. Dropping safety behaviours may enable one to do this.

Study 1 also found that an intervention that encouraged reduction of safety behaviours produced more positive interpersonal outcomes, mediated by increase in authenticity. This is consistent with previous research and theory suggesting that safety behaviours impact situational interpersonal outcomes, and reinforces the usefulness of encouraging patients to notice the relative interpersonal impact of using versus dropping safety behaviours. Understanding the mediational effect of authenticity may lead to a more nuanced interpretation of the relationship between safety behaviours and social outcomes, and represents another theme that may be

discussed during treatment: dropping safety behaviours and being more genuine may allow for more positive social outcomes. Additionally, dropping safety behaviours and being accepted as one's genuine self may be more gratifying than feeling like one is only liked because of a mask or façade.

Ultimately, dropping safety behaviours and increasing authenticity may allow for closer relationships. It is also possible that as individuals with SAD feel a stronger sense of social connection to others, they will be less motivated to use safety behaviours. Mixed results were found regarding the relationship between safety behaviours and the construct of relatedness, with support for both a mediated relationship via authenticity and a direct relationship from relatedness to safety behaviours (Study 2). That the treatment study (Study 3) did not support either relationship may have been due to the differences in the timing of measurements and study contexts. It may be that the time points captured in the current treatment study did not allow for observation of an effect, either requiring more frequent or more long-term measurement. Additionally, changes that occur during the course of treatment reflect one change process and may not capture influences that occur outside treatment. Further work is needed to understand the complex relationship between safety behaviours and relatedness.

This dissertation supports the possibility that change in self-esteem that occurs during treatment may predict reduction in safety behaviours. This pattern is consistent with CBT theory suggesting negative self-beliefs are at the root of SAD. These findings do not rule out the possibility that reduction in safety behaviours may also ultimately lead to decreases in negative self-beliefs (Clark & Wells, 1995) and increases in self-esteem (as suggested by mediated paths in study 2)—rather, it leaves open the possibility of a cyclical relationship. However, this dissertation suggests that initial increases in self-esteem that occur in treatment may be useful in

encouraging patients to drop their safety behaviours. This increase may reduce self-protective motivation and the desire to self-conceal, helping patients feel that they do not need to be as reliant on safety behaviours. Ultimately, this result is encouraging, as it suggests another mode for change to occur in treatment.

Importance of belonging. In addition to the connection of safety behaviours and self, a second important theme emerged. This dissertation brings attention to the importance of relatedness in SAD populations. As predicted from Leary's Belongingness Model, change in relatedness/belonging did indeed predict change in self-esteem. This provides further evidence for the importance of relatedness as a potential fundamental need, impacting well-being and mental health. If relatedness is the key factor in changing self-esteem, given previous research showing that change in self-esteem mediates SAD treatment outcome, this highlights the importance of relatedness to SAD treatment success and overall functioning. The result that group ICBT treatment does impact relatedness is exciting news.

Strengths, Limitations and Future Directions

The major strength of this work lies in its novelty as a contribution. This research enriches the clinical perspective on SAD and the self by introducing facets of self that have not previously been studied in the clinical literature. Furthermore, these aspects of self may represent fundamental influences on the development and maintenance of SAD and overall psychological well-being. Additional strengths of this research include the use of 3 different studies with strong and varied methodology (e.g., controlled experiment; repeated measures across treatment), advanced data analytic procedures, and multiple samples (i.e., general population, two clinical samples) to triangulate in on possible relationships.

Some limitations to the current set of studies would useful to address in future research. As this is a new area of research, it would be useful to see if results hold upon replication. To increase generalizability, this work needs to be replicated in additional samples and contexts. Additionally, in future studies, it may be useful to measure variables at a larger number of time points, such as daily or weekly ratings, to more finely distinguish when and how change occurs. Based on CBT models, it is possible that a cyclical relationship exists between variables. Although this dissertation allowed for examination of temporal relationships and possible driving forces, it was not possible to accurately model a cycle in SEM. Further investigation could include more testing of possible cyclical relationships.

Study 1 used a controlled experimental methodology. However, studies 2 and 3 were correlational in nature. Further examination using experimental controls would be useful to increase confidence in causal relationships. Additional experimental manipulations would be useful to more directly measure relatedness and self-esteem in addition to safety behaviours and authenticity. Treatment with a control condition would allow for understanding specific effects of ICBT on these variables. Of note, ICBT places an explicit emphasis on understanding dynamics of interpersonal relationships and interpersonal cycles. This may have impacted relatedness more than other CBT treatments that do not include this emphasis. Given that these results were conducted in ICBT, it would be interesting to compare change in relatedness in other types of treatments and for other disorders.

Additionally, all studies employed self-reports to measure constructs. Self-report has its utility in its ability to measure aspects of self that would be difficult to otherwise measure. However, further research could use more objective measurement techniques. There are also a number of variables that could have been measured that were not included in the current series of

studies, so as to limit participant burden. There are other facets of self (e.g., additional subscales of authenticity) and CBT models (e.g., self-focused attention, biases in judgments) that would be interesting to investigate.

Interestingly, increase in relatedness occurred early in treatment and was correlated with group cohesion, speaking to the value of group treatments and level of group cohesion. However, this correlation was modest, indicating that other components influenced relatedness, such as alliance with therapists and cognitive restructuring about interpersonal cycles (i.e., changing *perception* of current relationships). Increased understanding of mechanisms that led to this increase in relatedness would be useful.

One area for future research is defining the boundary between safety behaviours and authenticity. The current study and previous work identifies them as separate constructs, with safety behaviours representing behaviours that hide the self, and authenticity representing positive functioning and approach behaviour (e.g., self-concordant goal striving). In support of this, authenticity is correlated with positive coping (Kernis & Goldman, 2006) and some work demonstrates that safety behaviours and positive coping are distinct (Alden & Taylor, 2011). This is consistent with work suggesting that the avoidance and approach systems are partially distinct (e.g., Gable, Reis & Elliot, 2003). However, it is possible that safety behaviours and authenticity represent two sides of the same coin, so to speak, or lie on a continuum. Future research could investigate conceptual boundaries between these constructs.

Can someone be too authentic? The current work emphasized authenticity in relation to SAD, and people with SAD seem to have difficulty with *in*authenticity. However, could the reverse--too much authenticity--be problematic as well? Perhaps being too authentic too quickly or in the wrong contexts could have negative social repercussions, and there may be times it

would be helpful to suppress the authentic self and present a façade. Kernis and Goldman (2006) addressed the question, and suggest that authentic behaviour may be associated with short-term conflicts but healthier relationships and more need satisfaction in the long term. Additionally, the authentic self may be multifaceted, and self-awareness will aid in selecting behaviour that best reflects the authentic self in a particular context (e.g., not expressing one's true opinion to spare a friend's feelings may be in line with the authentic self). Leary and Allen (2011) recently conducted research on numbers of self-presentational personas people tend to use, theorizing that most people have several personas that they employ. These personas may represent different aspects of the self being emphasized, not necessarily false selves, and may be tailored based on context to make a desired impression. They found that people in general use a small number of self-presentational personas (e.g., 3-4), and higher behavioural authenticity was related to more self-congruent personas and less variability in personas. Additionally, higher self-esteem was also related to more self-congruent personas, and personas tended to be more self-congruent when interacting with close others than with strangers. This suggests that some variability in self-presentation is normal and adaptive, although less variability may be related to higher self-esteem and possibly higher relatedness. Finally, given that authenticity is linked to greater well-being, it is possible that people tend to be happier to the extent that they *can* be authentic, and may be less happy when situations often require presenting a false face. For future research, it would be interesting to examine authenticity in other disorders and whether high authenticity can ever be problematic.

Conclusions

Current clinical models describe how safety behaviours and negative self-beliefs interact to maintain the negative self-system in SAD. These models may be enriched by considering

related theories from social psychology regarding the self. Low self-authenticity, relatedness, and self-esteem are themes that are linked to safety behaviours and may underlie processes that maintain SAD. This research points to potential areas where we may strengthen our clinical interventions: Increasing social connectedness may be the most direct and powerful means of increasing self-esteem. Being genuine/authentic can lead not only to closer, healthier relationships but also to greater self-esteem. Dropping safety behaviours may be beneficial, in part, because it allows you to "be yourself." Acting in accord with your true values, thoughts, and feelings can help you feel better about yourself and develop closer, more genuine relationships.

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