

Blending in at the Cost of Losing Oneself:
The Cyclical Relationship between Social Anxiety, Self-Disclosure, and Self-Uncertainty

by

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Abstract

Recent research has demonstrated that high social anxiety is associated with uncertainty about one's self views and self-concept (Moscovitch et al., 2009; Stopa et al., 2010; Wilson & Rapee, 2006). However, no research has addressed potential mechanisms underlying the link between high social anxiety and low self-certainty nor has research examined whether this relationship is bi-directional. In the current research, I propose a *cyclical* model in which high social anxiety leads to low self-certainty, which in turn, feeds back into higher levels of social anxiety. I also propose that the relationship between high social anxiety and low self-certainty is mediated by the self-protective self-disclosure patterns employed by socially anxious individuals. In three interconnected studies, I examine the hypothesis that social anxiety, self-disclosure and self-certainty operate in a cyclical model. Study 1 provided a correlational test of the hypothesized feedback model in its entirety and demonstrated that *honesty of self-disclosure* was the most important and influential mechanism underlying the link between high social anxiety and low self-certainty. Experimentally manipulating the honesty of participants' self-disclosures in Study 2 demonstrated that dishonest self-disclosures during a social task led to low self-certainty, but only amongst individuals high in trait performance anxiety. Finally, experimentally manipulating self-certainty in Study 3 demonstrated that low self-certainty led to high anticipatory anxiety about an upcoming self-disclosure task. Together, these results elucidate a cyclical maladaptive pattern in which low self-certainty as a result of self-protective self-disclosure leads to high social anxiety and a greater reluctance to self-disclose. Results from the three studies are discussed with respect to their theoretical implications and in relation to clinical applications for individuals with social anxiety disorder.

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This thesis is dedicated to anyone who has struggled with symptoms of social anxiety or social anxiety disorder. It has been my great pleasure to focus my dissertation on understanding this disorder, and it is my hope that these results may aid in treatments for such individuals at some point along the way.

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Introduction

Social Anxiety

Research has shown that nearly all people experience social anxiety at some point in their lives (Buss, 1980; Stein, Walker & Forde, 1994; Zimbardo, 1977), whether in the context of social performance (e.g., giving a public speech at school or work) or social interaction (e.g., meeting a potential romantic partner on a blind date). The experience of social anxiety within these types of situations usually represents an occasional disturbance in social confidence with little to no lasting repercussions. However, for some individuals (approximately 12% of the population; Kessler et al., 2005; Stein & Kean, 2000), social anxiety becomes excessive and debilitating, thereby meeting DSM-IV-TR diagnostic criteria for social anxiety disorder (SAD). SAD is characterized by the DSM-IV-TR as “a marked and persistent fear of social and performance situations in which embarrassment may occur” (American Psychiatric Association, 2000) and lies on the extreme upper end of the social anxiety continuum (Ruscio, 2010). It is associated not only with high levels of distress and anxiety, but also significant impairments and dissatisfaction in normal routines, occupational functioning, scholastic activities, and interpersonal relationships (Katzelnick et al., 2001; Stein & Kean, 2000, Schneier et al. 1994).

Phenomenology of Social Anxiety: Negative Self-Perception

In light of the high prevalence rate and impairing symptoms of SAD, researchers have focused on understanding the unique, subjective experience of social anxiety. How do individuals with high levels of social anxiety understand and process self-related information and how do these processes maintain and perpetuate SAD? Influential in addressing questions of this nature are cognitive models of social anxiety which highlight the role of negative self-

perception in the development and maintenance of social anxiety symptoms (Clark & Wells, 1995; Rapee & Heimberg, 1997; Hofmann, 2007; Moscovitch, 2009). According to cognitive models, individuals with SAD view their attributes and abilities negatively (e.g. “I’m boring;” “I’m unintelligent;” “I appear anxious”). Such views, often formed as a result of earlier experiences, are represented in negative self-focused thoughts and images, which are activated recurrently in the face of social threat. Motivated to conceal negative aspects of themselves from others in order to avoid feared interpersonal outcomes such as rejection or loss of approval (Moscovitch, 2009), individuals with SAD shift their attention inward in social situations and engage in a detailed monitoring of their perceived public appearance and internal symptoms of anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997; Hofmann, 2007; Moscovitch, 2009). In addition, Clark and Wells (1995) suggested that individuals with SAD direct relatively limited attention to objective factors such as social cues, which, in combination with hypervigilance to internal symptoms of anxiety, leads to overestimations of how anxious they appear and underestimations of how well they come across (Mansell & Clark, 1999). Rapee and Heimberg (1997) postulated that negative self-representations may also be maintained by a tendency to allocate heightened attention to external social cues, which are typically processed in a negatively distorted manner. Collectively, therefore, cognitive models of SAD emphasize the role of negative self-perception in the development of SAD and the maintenance of its symptoms.

In support of their emphasis on negative self-perception, research has consistently demonstrated that, across social situations such as one-on-one conversations, role-plays, daily interactions, and public speaking performances, socially anxious individuals underestimate their level of social and performance skills (i.e., when self-ratings are compared to those from

objective observers), and also rate themselves more negatively than do non-socially anxious controls (Beidel, Turner & Dancu, 1985; Borkovec, Stone, O'Brien, Kaloupek, 1974; Dodge, Heimberg, Nyman & O'Brien, 1987; Moscovitch & Hofmann, 2007; Norton & Hope, 2001; Rapee & Lim, 1992). Moreover, recent research has demonstrated that not only do socially anxious individuals rate their *social* and *performance* skills more negatively than do individuals with lower levels of social anxiety, but they also hold significantly less favourable beliefs about their personality traits and other attributes *more generally*. That is, several studies have found that individuals with higher levels of social anxiety consistently rate themselves more negatively than those with lower levels of social anxiety not only on social skills and visible signs of anxiety but also on their personality, intelligence, physical appearance, general quality of life, quality of relationships, artistic abilities, athletic abilities, current happiness, possessions/wealth, achievements, and sense of humour (Wilson & Rapee, 2006; Moscovitch, Orr, Rowa, Gehring Reimer & Antony, 2009; Stopa, Brown, Luke & Hirsch, 2010). The findings from these studies suggest that elevated social anxiety symptoms are associated with *generalized* negative beliefs about one's capabilities and characteristics rather than more specific negative beliefs in the domains of social skills and behavioural performance.

It is a matter of debate whether such generalized negative beliefs are related to social anxiety per se or whether they are, perhaps, driven more specifically by comorbid symptoms of depression. For example, research on the cognitive specificity of social anxiety and depression has shown that individuals high in symptoms of *both* social anxiety and depression report significantly more negative cognitions than individuals high in either social anxiety (Ingram, 1989) or depression (Bruch, Mattia, Heimberg & Holt, 1993) alone. When examining the frequency of negative cognitions between individuals with "pure" social anxiety vs. "pure"

dysphoria, Bruch et al. (1993) found that individuals with pure dysphoria showed a higher frequency of negative cognitions when thought content was specific to depression (e.g., thoughts about disappointment and hopelessness). However, when thought content was specific to social anxiety (e.g. thoughts about social incompetence), individuals with pure social anxiety did not differ from individuals with pure dysphoria; that is, both groups demonstrated significantly more negative socially relevant cognitions than non-anxious, non-depressed controls (Bruch et al., 1993). These results suggest that negative beliefs in social anxiety beyond the social domain may be driven by comorbid symptoms of dysphoria or depression.

Ingram (1989) proposed, however, that the self-focused negative cognitions of individuals with pure social anxiety might not differ fundamentally from those with pure depression in terms of their content per se but, rather, in terms of the level of certainty with which they are held. That is, he suggested that individuals high in depressive symptoms may phrase their negative thoughts as declarations: e.g. “I am a failure” whereas individuals high in social anxiety may phrase their negative thoughts as questions: e.g. “Am I a failure?” Therefore, individuals high in social anxiety and depression may share similar self-related cognitions but differ from one another in the certainty or conviction with which such beliefs are held. Such differences in self-certainty may help explain why some individuals develop anxious symptomatology and others develop depressive symptomatology despite sharing similar underlying beliefs, attitudes, and cognitions.

Self-Certainty

Recently, researchers have begun investigating not only the content of self-views (i.e. self-knowledge) but also the way in which negative and positive self-views are framed or

structured by self-certainty (Brinol, DeMarree & Petty, 2010; Moscovitch et al., 2009; Pelham & Swann, 1989; Stopa, 2009; Stopa et al., 2010). Self-certainty is defined as a subjective sense of conviction or validity about one's attitude or opinion (Gross et al., 1995, p. 215). In relation to the self, it is a meta-cognition about the extent to which one's own beliefs about oneself (e.g. "I'm an introvert") are valid. The term *self-concept clarity* has also been used in the literature to refer to self-certainty (Campbell, 1996; Stopa, 2009; Stopa et al., 2010) and is defined as "the extent to which the contents of an individual's self-concept (e.g., perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable" (Campbell, 1996, p. 141). Internal consistency refers to the extent to which an individual's beliefs and personality attributes converge vs. conflict with one another. For example, a person who describes his/her personality as both timid and outgoing would be less internally consistent than a person who describes him/herself as both extroverted and outgoing. Here, the terms self-certainty and self-concept clarity will be used interchangeably to refer to the extent to which an individual's self-concept is clearly defined, stable, and internally consistent.

The importance of examining meta-cognitive certainty about self-views is illustrated by the research literature on attitudes, which demonstrates that attitudes held with relative certainty impact thought, behaviour and self-evaluation more than attitudes held with relative uncertainty (Pelham & Swann, 1989; Petty, Haugtvedt & Smith, 1995; Setterlund & Niedenthal, 1993). Studies that have manipulated self-concept certainty, for example, have found that individuals led to feel more confident in their own self-views are more likely to act in line with these views than individuals led to feel less certain (Brinol & Petty, 2003; Setterlund & Niedenthal, 1993). Among these studies, Setterlund and Niedenthal (1993) manipulated self-certainty by asking participants to recall either three situations in which they

demonstrated a self-descriptive trait (high certainty condition) or three situations in which they demonstrated a non-self-descriptive trait (low certainty condition). Participants were then asked to pick a car and a restaurant from a list of five cars and five restaurants, each of which were paired with personality traits. For example, Car C was paired with Logical and Practical and Car M was paired with Adventurous and Impulsive. The authors found that participants in the high certainty condition chose the cars and restaurants with personality traits that were more in line with their *own* self-descriptive traits than those in the low certainty condition. The authors concluded, therefore, that those who were manipulated to feel more certain were more likely to act in line with their own self views than were those who were made to feel less certain.

Researchers have also found that the certainty with which negative vs. positive self-views are held impacts self-esteem (Brinol and Petty, 2003; Pelham & Swann, 1989). Brinol and Petty (2003; experiment 4) manipulated self-certainty by asking participants to write down their best and worst qualities with either their dominant (high confidence condition) or non-dominant hand (low confidence condition). The authors found that a) writing with the dominant hand led to increased confidence in the validity of participants' thoughts and b) the effect of self-views (best vs. worst qualities) on self-esteem was significantly stronger when participants wrote with the dominant (more confident) than the non-dominant (less confident) hand. That is, participants who wrote their best qualities with their dominant hand experienced higher levels of self-esteem than participants who wrote their best qualities with their non-dominant hand. Similarly, participants who wrote their worst qualities with their dominant hand experienced lower levels of self-esteem than participants who wrote their worst qualities with their non-dominant hand. Pelham and Swann (1989) likewise demonstrated that the

certainty with which negative and positive self-beliefs are held impacts self-esteem above and beyond the valence of self-views alone. Rather than manipulating self-certainty, the authors calculated a “differential certainty index” for each participant by correlating their self-view ratings with ratings of how certain they were of their self-view standings. Higher scores on this index (closer to +1) indicated greater certainty about positive self-ratings while lower scores (closer to -1) represented greater certainty about negative self-attributes. Scores closer to zero indicated no association between the positivity of participants' self-attributes and the level of certainty they ascribed to each rating. Results demonstrated that differential certainty uniquely and significantly predicted self-esteem above and beyond the valence of self-views alone. Participants who were more certain of their positive self views demonstrated higher levels of self-esteem than participants who were more certain of negative self views. Together, the results from these three studies demonstrate that examining not only the content but also the structure of individuals' self views is important because the impact of self-views on thoughts and behaviours depends on the certainty with which they are held. Positive views about one's traits lead to positive behaviours and higher self-esteem when such views are held with greater certainty, whereas less self-certainty may attenuate the influence of positive views on one's self-evaluations (Brinol, DeMarree & Petty, 2010).

Self-Certainty and Social Anxiety

Following from the self-esteem literature, researchers have recently measured the level of certainty that individuals high in social anxiety attach to positive and negative self-attributes (Moscovitch et al., 2009; Stopa et al., 2010; Wilson & Rapee, 2006). Interestingly, Wilson and Rapee (2006) found that individuals diagnosed with SAD reported less confidence on a about their standing on both negative (e.g. boring, cruel, greedy) and positive (e.g. admirable,

attractive, and competent) self-attributes. Individuals with SAD also demonstrated longer reaction times on a “Me/Not Me” computer task (see Markus, 1977) than participants without SAD when making decisions about their standing on both negative and positive self-attributes. Further, participants’ scores on a measure of trait social anxiety (*Social Interaction Anxiety Scale*; SIAS; Mattick & Clarke, 1998) significantly predicted their confidence in their negative self-attributes above and beyond depressive symptoms: As social anxiety increased, confidence in their standing on negative self-attributes decreased. Finally, the authors found that low self-certainty among those with SAD was specific to self-related personality traits rather than reflecting a tendency to be less certain, generally.

Moscovitch et al. (2009) extended Pelham and Swann’s (1989) methodology of calculating the “differential certainty index” (certainty about positive vs. negative self-views) to a clinical population of socially anxious adults. They found that relative to nonanxious controls who showed a positive association between positive self views and certainty, the mean differential certainty value for participants with SAD was close to zero, suggesting that there was no association between the positivity of participants’ self-attributes and the level of certainty they ascribed to each rating. Moscovitch et al. (2009) interpreted the results by suggesting that individuals with SAD may lack the protective positive bias of ascribing certainty to their positive self-attributes and, thus, may fail to experience corresponding boosts in self-esteem and positive affect (Pelham & Swann, 1989).

Finally, Stopa et al. (2010) provided a behavioural measure of internal consistency of self-perception in social anxiety by using the “Me/Not Me” paradigm (Markus, 1977), in which participants high and low in social anxiety responded “Y” or “N” to self attributes presented in the centre of a computer screen (e.g. confident; friendly; lonely). High internal consistency

involved saying “yes” to an attribute and “no” to its paired antonym. Results showed that high socially anxious participants offered significantly fewer consistent responses than non-socially anxious participants, suggesting that individuals high in social anxiety were less certain of their personality traits than individuals low in social anxiety.

The authors further divided the measure of consistency into positive consistency (saying “yes” to a positive word and “no” to its paired antonym) and negative consistency (saying “yes” to a negative word and “no” to its paired antonym) and found that high socially anxious participants offered significantly fewer positively consistent responses and significantly more negatively consistent responses than low socially anxious participants, which, in line with cognitive models of SAD, suggests that individuals high in social anxiety possess a relatively stable negative perception of self and a relatively less stable positive perception of self. However, as previously noted, Wilson and Rapee (2006) found that that individuals diagnosed with SAD reported less confidence in their standing on *both* positive and negative self-attributes. Together, these findings suggest that although individuals high in social anxiety may be more negatively consistent when reporting their-self-related attributes (i.e., saying yes to the word introverted as a self-descriptor and no to the word extroverted), this consistency may not translate into greater confidence in their standing on such attributes. Indeed, on a global measure of self-concept clarity asking individuals to report their certainty in their beliefs, opinions, and personality more generally (*Self-Concept Clarity Scale*; SCCS; Campbell et al., 1996), Stopa et al. (2010) found that that those with higher levels of social anxiety endorsed significantly lower levels of self-concept clarity relative to those with low levels of social anxiety, and that variance in self-reported social interaction anxiety was

significantly and uniquely explained by participants' levels of self-concept clarity above and beyond the effects of depression and self-esteem.

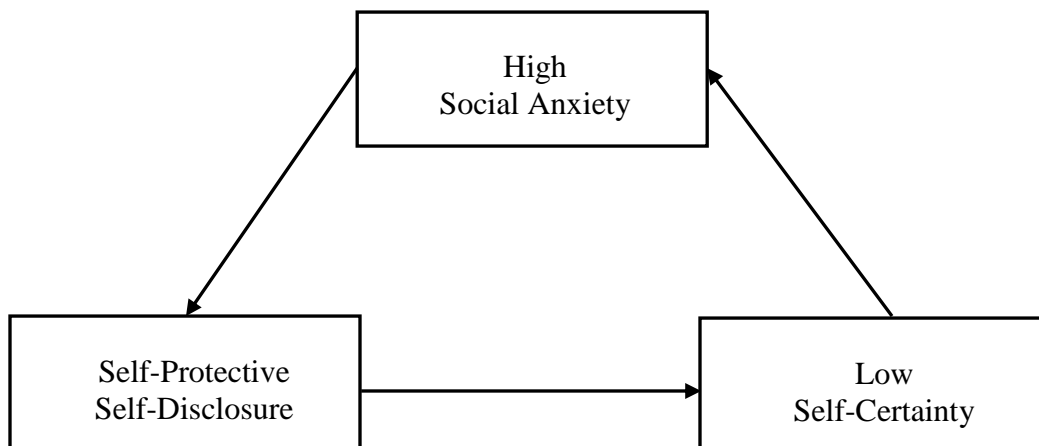
Research Questions

Based on the cumulative research on social anxiety and self-certainty presented above, it is evident that high social anxiety is associated both with low certainty about one's self-views and with low stability and internal inconsistency of one's self-concept. Following from this research, the questions of interest in the current dissertation are: *What mechanisms might underlie the link between social anxiety and self-uncertainty?* That is, how and why might social anxiety elevate one's doubt about one's self-concept? *Moreover, is the link between high social anxiety and low self-certainty bi-directional?* In other words, might higher levels of social anxiety both generate and become generated by lower levels of self-certainty?

Current Research Focus

As shown below in Figure 1, I propose a cyclical model in which high social anxiety and low self-certainty are linked in a bidirectional manner. In addition, I propose that the link between high social anxiety and low self-certainty is mediated by *self-protective disclosure strategies* that are adopted when social anxiety is elevated.

Figure 1. Hypothesized feedback loop: social anxiety, self-disclosure, and self-certainty.



In the sections that follow, I outline my rationale for the hypothesized cyclical links between high social anxiety and self-protective self-disclosure; self-protective self-disclosure and low self-certainty; and low self-certainty and high social anxiety.

Social Anxiety and Self-Disclosure

Self-disclosure is a multidimensional construct that is broadly defined as the process of communicating messages about oneself to others (Cozby, 1973; Wheelless & Grotz, 1976). Several dimensions of self-disclosure have been described and measured in previous research, including the *amount* of self-related information disclosed, the *depth or intimacy* of the information, the *valence* of the information (positive vs. negative), and the level of *honesty* of the information (Gilbert & Horenstein, 1975; Wheelless & Grotz, 1976; Wheelless, 1978). At the extreme ends of each of these dimensions, individuals may disclose aspects of themselves to others that are short or lengthy, superficial or deep, positive or negative, and honest/authentic or dishonest/inauthentic. Research on the amount, valence, depth, and honesty of socially anxious individuals' self-disclosure patterns has demonstrated, for the most part, that those with higher levels of social anxiety self-disclose to the same degree (i.e., the same amount) as individuals with lower levels of social anxiety but differ from low anxious participants in the valence, depth, and honesty of their disclosures. For example, Alden and Bieling (1998) found no difference between the overall duration (in seconds) of socially anxious and non-socially anxious participants' self-disclosures during a "getting to know you" paradigm in which participants conversed briefly with a trained confederate in the laboratory. Leary, Knight, and Johnson (1987) similarly demonstrated that socially anxious participants were no different from non-socially anxious individuals in their proportion of self-disclosure utterances during a 5-min "getting acquainted" conversation. Interestingly, Heerey and Kring

(2007) found that socially anxious participants actually exhibited *more* self-talk (coded as the number of self-relevant responses per second) than non-socially anxious individuals during a dyadic “getting to know you” interaction. These authors concluded that socially anxious individuals may talk more about themselves during an interaction because their hesitation to direct conversation means that they end up answering more personal questions posed by their interaction partners.

With regard to the depth of their disclosures, however, individuals high in social anxiety have been shown to disclose significantly *less intimate* aspects of themselves relative to non-socially anxious individuals (Alden & Bieling, 1998; DePaulo, Epstein & Steele LeMay, 1990). DePaulo, Epstein, and Steele LeMay (1990), for example, found that socially anxious individuals provided more superficial and less revealing self-descriptive information while telling stories about themselves to an interviewer than non-socially anxious individuals. Similarly, in the same study described above, Alden and Bieling (1998) found that socially anxious participants were less intimate (as rated by objective observers on a 7-pt Likert scale) in their disclosures than non-socially anxious participants when led to believe that they were unlikely to make a good impression on their interaction partner. Interestingly, they showed no differences in intimacy of disclosure relative to those with lower levels of social anxiety when led to appraise their chances of success more positively, suggesting that low intimacy in self-disclosures stems from perceived doubt about the ability to convey desired impressions rather than from actual deficits in conversational skill or ability.

Further differences between individuals with higher and lower levels of social anxiety have also been shown with respect to the *valence of their self-disclosures*. Leary et al. (1987) demonstrated that socially anxious individuals in a “getting acquainted” paradigm exhibited a

significantly higher proportion of negative self-disclosures and a significantly lower proportion of positive self-disclosures than non-socially anxious individuals. Positive disclosures were defined and rated by objective coders as “disclosures that would be expected to convey a favourable impression” and negative disclosures were “disclosures that were expected to convey an unfavourable impression.” The authors concluded that the tendency to talk in more depth about negative aspects of themselves may reflect socially anxious individuals’ underlying beliefs that they possess a greater number of negative self-attributes.

Finally, with respect to the *honesty* or *authentic quality* of socially anxious individuals’ self-disclosures, research using diary methods has shown that individuals with higher levels of social anxiety tend to suppress rather than express their negative thoughts and emotions to others (Kashdan & Steger, 2006). Kashdan and Steger (2006) administered questionnaires on trait social anxiety and daily emotion regulation strategies to a community sample of over 100 individuals and found that those with higher levels of social anxiety were more likely to report efforts to withhold their genuine thoughts and emotions from others. Further, research has shown that individuals with higher levels of social anxiety are more likely to conform to others’ behaviours and expectations in social situations rather than adhere to their own individualistic motivations and preferences. For example, Santee and Maslach (1982) found that individuals with higher levels of social anxiety were more likely than non-socially anxious individuals to conform in a laboratory setting to others’ opinions about how to solve relationship problems rather than express their own opinions and solutions. The results from these studies suggest that social anxiety may be associated with attempts not only to limit the depth of self-disclosures but also to generate inauthentic or false disclosures in order to meet the perceived expectations of others and gain their approval.

Research has indicated that there are significant interpersonal costs associated with the guarded self-disclosure style that is typically adopted of socially anxious individuals (Alden & Bieling, 1998; Cuming & Rapee, 2010; Heerey & Kring, 2007; Papsdorf & Alden, 1999; Taylor & Alden, 2011). For example, Alden and Bieling (1998) found that socially anxious participants who were primed to appraise a social interaction negatively and were, thus, less intimate in their disclosures to an interaction partner, were subsequently rated by their interaction partner as significantly less likeable and appropriate than socially anxious participants who were primed to appraise the situation positively and were more intimate in their disclosures. Further, Meleshko and Alden (1993) found that individuals high in social anxiety who failed to reciprocate the high level of depth utilized by a conversation partner in a “getting to know you” paradigm were consequently rated by their conversation partner as being less likable and as having caused more discomfort during the social interaction than individuals low in social anxiety who reciprocated relatively higher levels of depth in their self-disclosures. Taylor and Alden (2011) recently demonstrated that avoidance-related self-disclosure (e.g. minimizing talking and low self-disclosure) are particularly problematic in interpersonal interactions relative to impression-management strategies (e.g. inauthentic nodding and smiling). They found that participants with generalized social anxiety disorder who used avoidance in self-disclosure were rated by their interaction partners as being less desirable candidates for future interactions than participants with generalized social anxiety disorder who used impression management strategies. Finally, in a study examining the association between self-disclosure styles and interpersonal solidarity, Wheelless (1978) found that greater self-reported amount, depth, and honesty in self-disclosures were each significantly and positively associated with higher levels of interpersonal solidarity (i.e. “a feeling of

closeness between people that develops as a result of shared sentiments, similarities, and intimate behaviours”).

Why might socially anxious individuals employ self-disclosure patterns that inevitably facilitate negative interpersonal outcomes? Leary and Kowalski (1998) suggested that the self-disclosures of individuals with higher levels of social anxiety are affected by self-protective motivations and strategies. Fearing that perceived flawed aspects of themselves might become exposed to others in social situations, socially anxious individuals employ various self-concealment strategies (Moscovitch, 2009) which may include limiting the depth of their disclosures or modifying their disclosures to match others’ expectations (Alden & Bieling, 1998; Arkin, 1981; DePaulo et al., 1990). Furthermore, Gaucher, Wood, Stinson, Forest, Holmes and Logel (2012) proposed that individuals low in self-esteem employ self-protective strategies such as limited self-disclosure because they believe that others do not value or accept them. That is, the authors suggested that individuals low in self-esteem are more likely than individuals high in self-esteem to perceive that they are undervalued by an interaction partner, which in turn, leads them to feel less safe and secure about disclosing self-related information. Indeed, results from Gaucher et al. (2012) demonstrated that, in comparison to individuals high in self-esteem, individuals low in self-esteem reported less expressivity in their interactions with both a friend and a romantic partner, and that this link between self-esteem and expressivity was mediated by the extent to which individuals believed they were valued and accepted.

Therefore, socially anxious individuals may similarly find themselves in social situations in which the option of concealing potentially negative self-attributes becomes a higher priority over the option of revealing their personal thoughts and feelings, which they

view as being potentially costly. Paradoxically, however, the negative interpersonal outcomes that follow from their limited self-disclosures may ultimately serve to confirm their fears of rejection. This self-confirmatory pattern or self-fulfilling prophecy may be conceptualized within the framework of *Interpersonal Theory* (e.g. Andrews, 1989; Carson, 1969; Kiesler, 1983), which states that individuals typically behave in a manner that invites predictable, complementary responses from others (Andrews, 1989; Carson, 1969; Kiesler, 1983; Sadler & Woody, 2003). For example, research has shown that individuals who behave in an affiliative and friendly manner invite correspondently high levels of affiliation and friendliness from others, while individuals who are highly dominant in their behaviour invite reciprocally high levels of submissive behaviour from others (e.g. Sadler & Woody, 2003). Based on this theory and research, it is possible that when socially anxious individuals self-disclose with limited depth, positivity, and/or authenticity, they ultimately come across as unfriendly and unaffiliative; this pattern of behaviour may then serve as a self-fulfilling prophecy in which their fears of rejection are confirmed by actually inviting reciprocally hostile responses from others. With respect to this process, a study by Stinson, Cameron, Wood, Gaucher and Holmes (2009) in the self-esteem literature examined how individuals' expectations concerning acceptance during a social interaction were linked to the actual level of acceptance they received. Participants high and low in self-esteem were led to believe that they were being invited to join a market research focus group. They were asked to rate how liked and accepted they believed they would be by the other members of the group and were subsequently asked to give a speech that would be delivered to the group. Five observers watched the speech and rated the level of interpersonal warmth that each participant showed during their speech as well as the extent to which they personally liked each participant. Results showed that, regardless of

self-esteem level, participants who believed that they would be less liked and accepted by the group members showed less interpersonal warmth during their speech and were also rated as less likable by objective observers.

Based on this research, it is evident that one's expectation about acceptance vs. rejection is linked to the behaviours that one chooses to display in social interactions as well as to one's actual level of acceptance and rejection. Ultimately, it appears that fears about rejection may lead individuals high in social anxiety to self-disclose in a self-protective manner, which may then lead others to react in a manner that is likely to confirm their negative self-views. Interestingly, Taylor and Alden (2010) showed that negative self-views can be modified by reducing the amount of self-protective safety behaviours that one uses in social interactions. They found that participants with generalized social anxiety disorder who were instructed to reduce their safety behaviours during a social interaction showed less negative and more accurate self-views after doing so than participants who continued to use their safety behaviours, as per usual. Moreover, participants who dropped their safety behaviours were less likely to expect negative outcomes in future social events than participants who continued to use their safety behaviours. Therefore, it appears that altering one's behaviour during social interactions may interrupt the self-fulfilling process in which negative self-views are confirmed by others' reactions to one's behaviours.

Self-Disclosure and Low Self-Certainty

In addition to eliciting interpersonal reactions from others that are likely to confirm their negative self-views, socially anxious individuals' use of self-protective self-disclosure behaviours might also *impede* self-awareness and self-certainty. Below, I present each of the dimensions of self-disclosure which, according to prior research, might distinguish socially

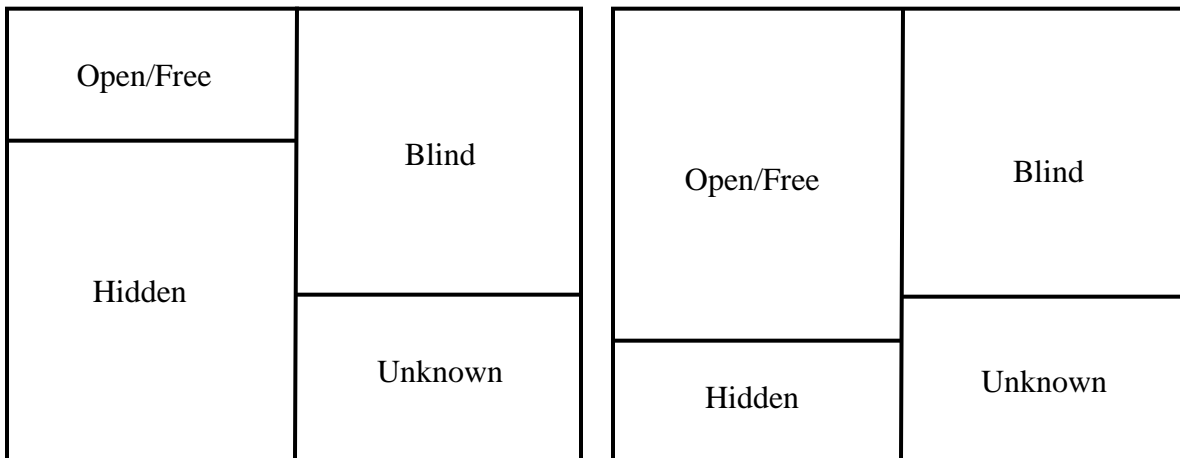
anxious from non-anxious individuals, and examine how each dimension may also influence self-certainty.

Depth of disclosure: Daryl Bem's (1972) self-perception theory (SPT) stipulates that depth of self-disclosures may be integral to the development of the self. According to SPT, individuals infer their own attitudes and emotions by observing their behaviour from an objective standpoint; disclosures that are limited in depth may prevent individuals from being able to reflect on their options, ideas, and values in an elaborative, contemplative manner beyond their own internal cognitions. Consequently, those high in social anxiety who fail to self-disclose on a deeper level may be at a disadvantage in terms of developing a sense of self-certainty. Luft and Ingham's (1955) model of self-awareness also provides a framework for examining self-disclosure and self-certainty. As shown in Figure 2 below, Luft and Ingham (1955) divided self-awareness into four quadrants of self which they called the Johari Window. Quadrant 1 of the Johari Window is the *open* or *free* area of self which represents the information about oneself that is known to both self and others, Quadrant 2 is a *blind* area representing information about oneself that is unknown to self but known to others, Quadrant 3 is a *hidden* area representing information about oneself that is known to self but hidden from others, and Quadrant 4 is an *unknown* area representing information about oneself that is unknown by both self and others. The size of each area varies by person depending on the extent to which one discloses self-related information to others. As Luft (1969) noted, self-disclosure allows individuals to increase their open/free area and decrease their hidden area, the process of which invites feedback and reflection from others; incorporating such feedback into one's understanding of oneself may then increase self-awareness and self-certainty. Therefore, with limited depth and also honesty of self-disclosure, individuals high in social

anxiety may compromise their ability to expand their “open” area and minimize their “hidden” area, thereby limiting the opportunity for increased self-awareness and self-certainty.

Figure 2. The Johari Window of Self-Awareness (Luft & Ingham, 1955).

The window on the left represents a person with a relatively small open/free area and a large hidden area while the window on the right represents a person who has increased his/her open area and decreased his/her hidden area through self-disclosure.



Valence of self-disclosures: Research on the self-enhancement bias (Arkin, Cooper & Kolditz, 1980; Sedikides & Strube, 1997) demonstrated that individuals are generally motivated to promote and enhance the positivity of their self-conceptions. That is, across self-related dimensions such as social skills, work productivity, and general happiness, individuals tend to view themselves more positively than they view the average person (Cross, 1977; Freedman, 1978). In contrast, socially anxious individuals fail to show this self-enhancement bias (e.g., Moscovitch et al., 2009) and also tend to *disclose* more negative and less positive aspects about themselves to others (Leary et al., 1987). By emphasizing their negative attributes during self-disclosure in favour of positive ones, socially anxious individuals may serve to intensify their perception that a discrepancy exists between the way they *are* and the

way they *ought to be* (e.g., Higgins, Klein & Strauman, 1985), which may, in turn, help to erode self-certainty.

Honesty of self-disclosures: Perhaps most intuitively of all the self-disclosure dimensions, the tendency of socially anxious individuals to conform to and agree with others' disclosures rather than adhere to their own preferences and opinions may lead to low self-certainty due to inconsistencies in self-disclosure behaviour across social situations; as such, it may be difficult for socially anxious individuals to integrate and make sense of their situational differences in self-disclosure behaviour, which may serve to mitigate self-certainty. In addition, inauthentic self-disclosures across social interactions may lead to inconsistent reactions from conversation partners, which may, in turn, feed back into lower levels of self-certainty.

Amount of Self-Disclosure: As mentioned above, research demonstrates that socially anxious individuals self-disclose to the same degree as non-socially anxious individuals. Therefore, it is unlikely that the amount that those high in social anxiety self-disclose affects their self-certainty. Nonetheless, the amount of self-disclosure was measured in Study 1 for exploratory purposes.

Closing the Loop: Does Low Self-Certainty Lead Back to High Social Anxiety?

Why might we expect a bidirectional relationship between high social anxiety and low self-certainty such that higher social anxiety not only generates lower self-certainty but is also generated by it? Notably, past research demonstrates that low self-certainty causes a reduction in positive affect about the self. Baumgardner (1990) manipulated self-certainty by giving participants bogus personality profiles ostensibly written by a Ph.D.-level psychologist that were worded in either a more "certain" (e.g. "My assessment of her various personality

attributes is very confident”), or “uncertain” manner (e.g. “My assessment of his various personality attributes is not very confident”). Participants were led to believe that the profiles were based on a personality questionnaire that they completed earlier in the study. Participants who received “certain” personality profiles reported a greater increase in positive affect following the manipulation than those who received an “uncertain” profile. Baumgardner (1990) postulated that confidence or certainty in one’s self-concept may promote a sense of *control* over future outcomes by enabling one to maximize strengths while minimizing weaknesses. For example, individuals who are certain that they are both outgoing and disorganized may choose to engage in situations that promote and showcase their outgoing nature while avoiding situations that require strong organizational skills. Less certain individuals, however, may be less able to act decisively in similar situations. Baumgardner (1990) concluded that the sense of control that comes from being able to choose situations that promote one’s sense of self may lead to both positive affect and high self-esteem.

With respect to social anxiety, it can be argued that decreased certainty about the nature of one’s strengths and weaknesses also impacts social outcomes, as individuals who are unsure about their attributes may find it difficult to know whether and how to showcase particular attributes to others in social situations in order to help them make their desired social impression. Consequently, the perceived discrepancy between the type of social impression individuals wish to make and their perceived ability to do so may become greater, thereby increasing social anxiety (Schlenker & Leary, 1982).

Overview of the Current Studies

In three interconnected studies, I examined the hypothesis that social anxiety, self-protective self-disclosure patterns and self-uncertainty operate in a maladaptive cyclical loop.

Study 1 provided a correlational test of the hypothesized feedback model in its entirety; interestingly, results from this study demonstrated that *honesty of self-disclosure* was the most influential variable underlying the relation between high social anxiety and low self-certainty. Study 2 then provided an experimental test of the effect of honesty of self-disclosure on self-certainty. Study 3 provided an experimental test of the effect of self-certainty on state social anxiety.

Study 1: Correlations between Social Anxiety, Self-Disclosure, and Self-Certainty

In Study 1, a sample of 214 students was recruited from the undergraduate psychology research pool at the University of Waterloo. All participants completed online trait questionnaires pertaining to their level of social anxiety, their self-protective disclosure patterns (across the four dimensions of amount, depth, valence, and honesty), and their self-certainty. Other questionnaires were also included that were not analyzed as part of the current study. Based on the research reviewed above, I proposed that higher levels of social anxiety would predict lower depth, greater negativity, and less honesty in self-disclosure, each of which would then predict lower levels of self-certainty. Further, I proposed that lower self-certainty would feed back into higher levels of social anxiety. As mentioned above, items measuring “amount of disclosure” were included for exploratory purposes only, given that socially anxious and non-socially anxious individuals have not been shown to differ on this self-disclosure dimension in past studies.

Study 1 Method

Participants

Two hundred and fourteen undergraduate students were recruited for the study from the University of Waterloo research pool. All participants indicated during pre-screening that they were able to speak, read, and write English fluently. There were no other selection or exclusion criteria. Once they signed up for the study, participants were directed to an online website through the server, "PsychSurveys.Org" – a free, user-friendly, online system that secures the privacy and confidentiality of survey data and other identifying information. Participants were between the ages of 18 and 49 years of age with an average age of 21.54 ($SD = 4.30$). Of the total sample, 71.5% was female. Forty-nine percent of the total sample was White ($n = 104$), 32.7% was Asian ($n = 70$) and 19% ($n = 19$) of participants were classified as "Other" (Black, East Indian, and Middle Eastern).

Procedure

Eligible participants completed the questionnaires online through "PsychSurveys.Org." Seven other questionnaires were also administered that were not relevant to the current study. Two self-certainty questionnaires were presented at the beginning of the study to ensure that participants' perceptions of certainty were not influenced by later questions. The order of the two self-certainty questionnaires was counterbalanced across participants. The other questionnaires in the study followed the measure of self-certainty and were presented in random order. At the end of the online study, participants were debriefed through an online information letter and received a research participation credit.

Measure of Trait Social Anxiety

Social Phobia Inventory (SPIN; Connor et al., 2000). The *SPIN* is a 17-item scale that assesses fear, avoidance, and physiological arousal associated with social anxiety. Each item is rated on a 0 (“not at all”) to 4 (“extremely”) Likert-type scale, with higher scores associated with greater levels of distress (e.g., “I am bothered by blushing in front of people”). The scale shows excellent internal consistency (ranges from .87 to .94), good test-retest reliability (.89) and good convergent validity (Antony et al., 2006; Connor et al., 2000). In the current study, the *SPIN* was reliable at $\alpha = .92$. A copy of the *SPIN* is presented in Appendix A.

Measure of Self-Disclosure

The *General Disclosiveness Scale (GDS; Wheelless, 1978)* is a 31-item measure that assesses communication with others in general along five disclosure dimensions: *intent* (e.g. “When I reveal my feelings about myself, I consciously intend to do so”), *amount* (e.g. “I usually talk about myself for fairly long periods of time”), *depth* (e.g. “I often disclosure intimate, personal things about myself without hesitation”), *positivity* (e.g. “I normally express my good feelings about myself”), and *honesty* (e.g. “My self-disclosures are completely accurate reflections of who I really am”), each of which represent its own separate factor. In the current study, participants were asked to rate the extent to which they agreed with each item from 0 (“strongly disagree”) to 6 (“strongly agree”). Following administration, data from the latter four subscales were subjected to analyses, as per the study hypotheses. In previous research, the *GDS* has been used to examine associations between self-disclosure and relationship outcomes (Wheelless & Grotz, 1976), attachment styles (Adams, 2004), and communication apprehension (Wheelless, Nesser & McCroskey, 1982), with internal consistencies for each of the subscales ranging from .65 to .91. I chose the *GDS* as a measure

of self-disclosure for the current study because it adequately addressed the self-protective self-disclosure dimensions common amongst individuals high in social anxiety and could, therefore, be used quite readily to examine my primary research questions. In the current study, Cronbach's alphas for each of the subscales were: amount = .60, depth = .83, positivity = .86 and honesty¹ = .85. Exploratory analyses involving the “amount” subscale of the *GDS* were interpreted with caution given the subscale’s low reliability. See Appendix B.

Measures of Self-Certainty

Self-certainty was measured in the current study by both the *Self-Concept Clarity Scale* (*SCCS*; Campbell et al., 1996) and the *Self-Attributes Scale* (*SAS*; Church et al., 2008). The *SCCS* provides a general, global measure of the stability and internal consistency of one’s self-concept while the *SAS* measures participants’ certainty on individual self-ratings (e.g. talkative; organized; shy) across the Big 5 dimensions of personality. Together, the measures provide a comprehensive rating of participants’ self-certainty across multiple self-relevant personality domains. As mentioned above, the terms self-certainty and self-concept clarity are used interchangeably in the current research to refer to the extent to which an individual’s self-concept is clearly defined, stable, and internally consistent. The decision to examine participants’ self-views across the Big 5 dimensions of personality was based on research, reviewed above, which has shown that social anxiety symptoms may be associated with generalized negative beliefs across personality dimensions rather than with negative beliefs specific to the domains of social skills and behavioural performance.

¹ The first two items of the “Honesty” subscale of the *GDS* were removed from the scale analyses because they pertained more to the construct of self-certainty than honesty of self-disclosure (i.e.: “*I cannot reveal myself when I want to because I do not know myself thoroughly enough*” and “*I am often not confident that my expressions of my own feelings, emotions and experiences are true reflections of myself.*”) The reported alpha value of .85 reflects this removal. See Appendix B for the full scale.

The *Self-Concept Clarity Scale (SCCS; Campbell et al., 1996)* is a single factor scale which provides a general, global measure of the stability and internal consistency of one's self-concept. Participants are asked to rate the extent to which they agree with statements such as, "My beliefs about myself often conflict with one another" and "I spend a lot of time wondering about what kind of person I really am" from 1 (strongly disagree) to 5 (strongly agree). In previous research, the *SCCS* has been used to examine the link between self-certainty and personality traits such as narcissism (Campbell et al., 1996; Edwards & Bond, 2012), self-esteem (Campbell et. al., 1996) and social anxiety (e.g. Stopa et al., 2010; Stopa, Brown, & Hirsch, 2012), with internal consistencies ranging from .84 to .90. In the current study, the *SCCS* was highly reliable at .89. See Appendix C.

The *Self-Attribute Scale (SAS)*, which was named for the current study, was based on the *Trait-Role Questionnaire* developed by Church et al. (2008). In a study examining how personality attributes vary across different social roles, Church et al. (2008) introduced the *Trait-Role Questionnaire* consisting of 40 attribute items across the Big Five dimensions of Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience (8 items per dimension). Church et al.'s (2008) scale was based on previously published measures of trait-role consistency (e.g. Baird et al., 2006; Donahue et al., 1993; Suh, 2002) in which participants rate the extent to which attributes such as "talkative" and "organized" were descriptive of them in general and across five different social roles on a scale from 0 (does not describe me at all) to 4 (describes me extremely well). In Church et al. (2008), items *within* each Big 5 scale were summed to create composite scores with Cronbach's alphas for each scale ranging from .62 to .85. For the purposes of the current study, I added a "certainty" question for each self-attribute in which participants rated how certain they were of their

standing on each attribute from 0 (not at all certain) to 4 (extremely certain). Certainty items for each participant were summed *across* the Big 5 dimensions and served as one of the two dependent measures of self-certainty (in conjunction with the *SCCS* above), with higher scores on this measure indicating greater overall self-certainty. Because I was interested in self-certainty across multiple self-relevant domains and did not propose specific hypotheses about variations in self-certainty within the Big 5 dimensions, I did not analyze the data separately from each of the Big 5 personality subscales. The Cronbach's alpha for the overall certainty scale was excellent at .94. See Appendix J.

Study 1 Results

Two path analyses (one for each dependent measure of self-certainty) were conducted using Analysis of Moment Structures (SPSS AMOS, version 20) in which social anxiety (as measured by the *SPIN*), the four self-disclosure dimensions (as measured by the *GDS*), and self-certainty (as measured by the *SCCS* and *SAS*) operated in a cyclical feedback loop. Such non-recursive models, with a feedback chain involving three variables, are discussed in Andrews (1989) and Kline (2010). Within each model, social anxiety, self-disclosure patterns, and self-certainty were observed variables and the error term paths pertaining to each variable were set to 1. Results based on the *SAS* as a measure of self-certainty replicated the results using the *SCCS*, with one exception pertaining to the relationship between depth of disclosure and self-certainty. Therefore, only the model pertaining to the *SCCS* as a measure of self-certainty is presented in Figure 3, below, with the exception pertaining to “depth of disclosure” as noted in the text, below. All estimates are in standardized form. See Table 1 for the means and standard deviations of the variables, and Table 2 for the correlations between variables. All variables were normally distributed, as demonstrated by skewness values within the range of -2 and +2 and kurtosis values within the range of -7 and +7 (West, Finch, & Curran, 1995).

Figure 3. Path analysis: Social anxiety, self-disclosure and self-certainty.

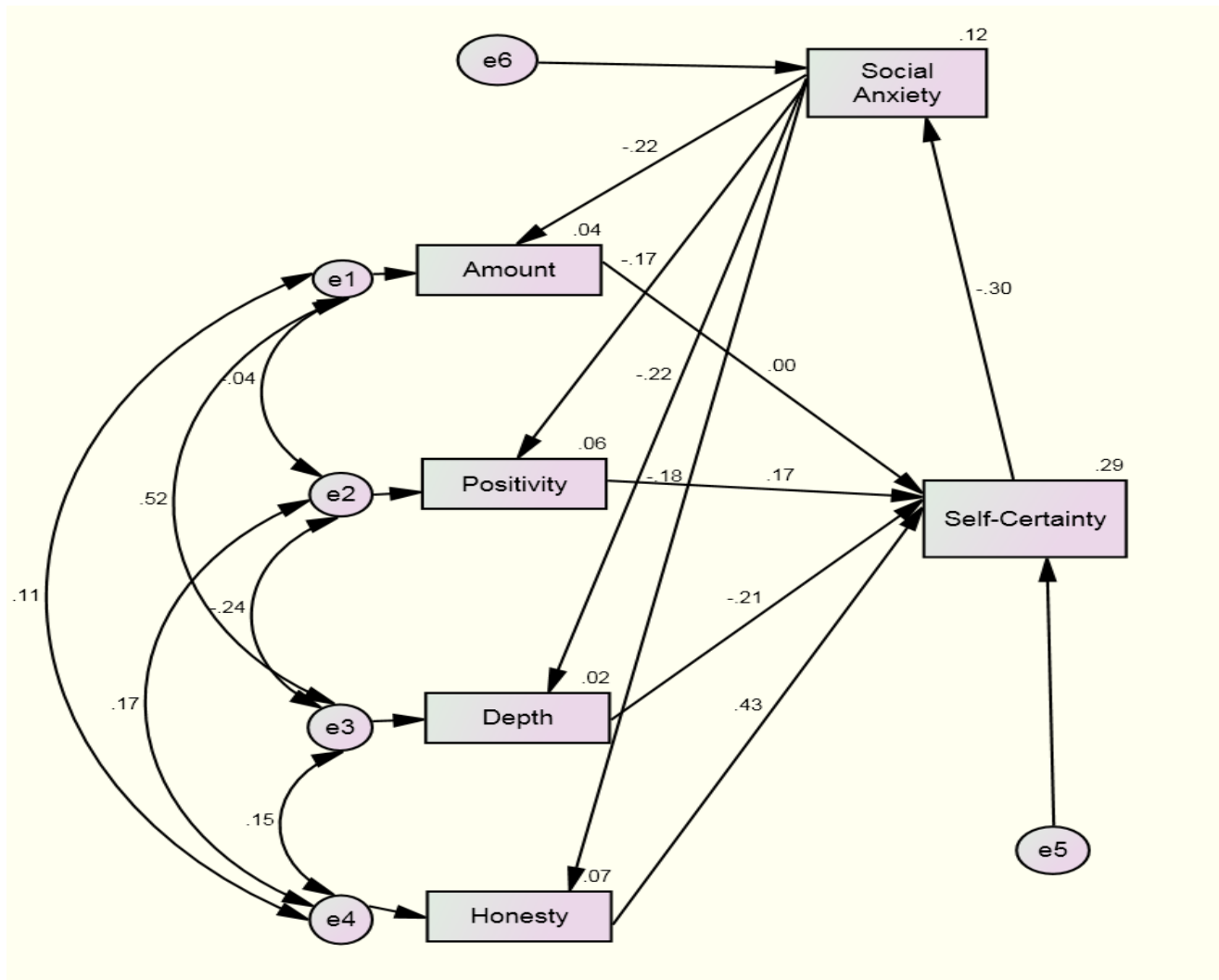


Table 1. Means and standard deviations (in brackets) of Study 1 variables

Variable	Value	Scale Range
Social Phobia Inventory (<i>SPIN</i>)	20.71 (12.28)	0-61
Self-Concept Clarity Scale (<i>SCCS</i>)	38.00 (08.86)	13-60
Self-Attributes Scale (<i>SAS</i>)	103.48 (21.07)	0-160
General Disclosiveness Scale (<i>GDS</i>): Amount	18.78 (05.57)	0-42
General Disclosiveness Scale: (<i>GDS</i>) Positivity	22.30 (05.84)	0-42
General Disclosiveness Scale: (<i>GDS</i>) Depth	11.23 (05.81)	0-30
General Disclosiveness Scale: (<i>GDS</i>) Honesty	28.53 (07.76)	0-36

Table 2. Correlations amongst Study 1 variables

	B	C	D	E	F	G
A) Social Phobia Inventory (<i>SPIN</i>)	-.35**	-.30**	-.20**	-.25**	-.17	-.30**
B) Self-Concept Clarity Scale (<i>SCCS</i>)		.34**	.01	.34**	-.11	.46**
C) Self-Attributes Scale (<i>SAS</i>)			-.03	.31**	-.01	.31**
D) General Disclosiveness Scale: (<i>GDS</i>) Amount				.01	.54**	.17*
E) General Disclosiveness Scale: (<i>GDS</i>) Positivity					-.18**	.22**
F) General Disclosiveness Scale: (<i>GDS</i>) Depth						.19**
G) General Disclosiveness Scale: (<i>GDS</i>) Honesty						

* $p < .05$, ** $p < .01$.

Social Anxiety → *Amount of Disclosure* → *Self-Certainty*

Interestingly, results demonstrated that there was a significant negative relationship between social anxiety and amount of disclosure such that participants who were high in social anxiety reported more limited self-disclosures ($\beta = -.22, p = .002$). There was not, however, a significant relationship between amount of self-disclosure and self-certainty ($\beta = .00, p = .97$). Social anxiety accounted for 4% of the variance in amount of disclosure ($R^2 = .040$). When isolating the effect of amount of self-disclosure on self-certainty, amount of self-disclosure accounted for zero percent of the variance in self-certainty ($R^2 = 0.00$).

Social Anxiety → Positivity of Disclosure → Self-Certainty

As predicted, there was a significant negative relationship between social anxiety and positivity of disclosure such that participants who were high in social anxiety reported less positivity in their self-disclosures ($\beta = -.17, p = .019$). Also as predicted, there was a significant positive relationship between the positivity of self-disclosures and self-certainty ($\beta = .17, p = .01$), indicating that those who tended to disclose positive aspects about themselves were higher in self-certainty. Social anxiety accounted for 5.7% of the variance in positivity of self-disclosure ($R^2 = .057$), while positivity of self-disclosure accounted for only 4% ($R^2 = .04$) of the variance in self-certainty (when isolating the effect of positivity of self-disclosure on self-certainty).

Social Anxiety → Depth of Disclosure → Self-Certainty

As predicted, there was a significant negative relationship between social anxiety and depth of disclosure such that participants who were higher in social anxiety reported less depth in their self-disclosures, $\beta = -.22, p = .002$. Contrary to my prediction, however, there was a significant, negative relationship between depth of self-disclosure and self-certainty $\beta = -.21, p = .006$, such that less depth was related to greater self-certainty. With respect to the squared multiple correlations, social anxiety accounted for only 2.5% of the variance in depth of self-disclosure, ($R^2 = 0.025$), while depth of self-disclosure accounted for only 2.0 % ($R^2 = .02$) of the variance in self-certainty (when isolating the effect of depth of disclosure on self-certainty). Interestingly, however, when utilizing the SAS as a measure of self-certainty, the relationship between depth of self-disclosure and self-certainty was non-significant, $\beta = .021, p = .80$, with depth of self-disclosure accounting for 0% ($R^2 = .00$) of the variance in self-certainty.

Social Anxiety → Honesty of Disclosure → Self-Certainty

In line with my prediction, there was a significant negative relationship between social anxiety and honesty of disclosure such that participants who were high in social anxiety reported less honesty in their self-disclosures ($\beta = -.18, p = .018$). Also as predicted, there was a significant positive relationship between the honesty of self-disclosures and self-certainty ($\beta = .43, p < .001$), indicating that those who reported more honesty in their self-disclosures were higher in self-certainty. Social anxiety accounted for 7.4% of the variance in honesty of self-disclosure ($R^2 = .074$), and when isolating the effect of honesty of disclosure on self-certainty, honesty of disclosure accounted for 18% of the variance in self-certainty ($R^2 = .18$).

Self-Certainty → Social Anxiety

As predicted, self-certainty was significantly and negatively associated with social anxiety such that low levels of self-certainty were associated with higher levels of social anxiety ($B = -.30, p < .001$). In addition, self-certainty accounted for 12% of the variance in social anxiety ($R^2 = .12$).

Summary of Study 1 Results

Results demonstrated that a) high levels of social anxiety were associated with self-disclosures that were limited in amount, depth, honesty and positivity, and b) less honest and positive self-disclosures were associated with significantly lower levels of self-certainty on the *SCCS*. Low depth of self-disclosure was associated with higher levels of self-certainty on the *SCCS* while amount of self-disclosure was unrelated to self-certainty. Results based on the *SAS* as a measure of self-certainty replicated the results using the *SCCS* with the exception of the relationship between depth of disclosure and self-certainty, in which depth of disclosure was found to be unrelated to self-certainty on the *SAS*. When isolating the effects of each dimension

of disclosure on self-certainty, honesty of self-disclosure accounted for the highest level of variance in self-certainty (18%) on the *SCCS*, while positivity of self-disclosure and depth of self-disclosure each accounted for minimal variance (4% and 2%, respectively). Amount of self-disclosure accounted for none of the variance in self-certainty on the *SCCS*. Finally, as expected, low self-certainty on the *SCCS* was associated with high levels of social anxiety, thereby completing the feedback loop. Again, the above relationships utilizing the *SCCS* as a measure of self-certainty were replicated using the *SAS*.

Study 1 Discussion

Study 1 provided a correlational test of the proposed cyclical feedback loop between social anxiety, self-protective self-disclosure, and self-certainty. The results partially supported the hypothesized model. As predicted, high social anxiety was associated with low self-certainty. However, the nature of the indirect relationships between social anxiety and self-certainty varied by self-disclosure dimension. As expected, individuals high in social anxiety reported less depth in self-disclosures but low depth of disclosure was not associated with lower self-certainty, contrary to what was expected. Rather, low depth of disclosure predicted high (as opposed to low) self-certainty on the *SCCS* and was unrelated to self-certainty on the *SAS*. When isolating the effect of depth of self-disclosure on self-certainty, the variance accounted for by depth of disclosure was minimal for both the *SCCS* ($R^2 = .02$) and the *SAS* ($R^2 = .00$). These results suggest that changes in depth of disclosure do not account for changes in self-certainty and that there are likely other factors accounting for the significant negative relationship between social anxiety and self-certainty.

With respect to other such factors, the results demonstrated that honesty of self-disclosure mediated the relationship between social anxiety and self-certainty according to the joint significance model of mediation (MacKinnon et al., 2002)². That is, higher levels of social anxiety were associated with significantly less honesty in self-disclosures, and the honesty of disclosure significantly predicted self-certainty. Further, honesty of self-disclosure accounted for 18% of the variance in self-certainty. These findings can be interpreted by noting that self-protective goals may lead socially anxious individuals to adopt social roles that are

² A review of methods of testing mediation by Fritz and MacKinnon (2007) which included the Baron and Kenny (1986) causal-steps approach to mediation, the Sobel (1982) test of mediation and the joint significance test of mediation (MacKinnon et al., 2002) demonstrated that the joint significance test consistently outperforms, and is more powerful at detecting mediation than these other, more commonly used approaches.

inauthentic in social situations or to agree with others' disclosures regardless of their own preferences and opinions; doing so may lead to inconsistencies in their behaviour and internal confusion about their sense of selves. In turn, they may experience lower self-certainty than individuals who are more authentic in their disclosures with others. Inauthentic self-disclosures may also facilitate inconsistent reactions and feedback from conversation partners, which, in turn, may feed back into lower levels of self-certainty.

Furthermore, higher levels of social anxiety were significantly associated with less positive self-disclosures, and less positive self-disclosures were significantly associated with lower self-certainty. These results may be interpreted in terms of self-discrepancy theory (Higgins, Klein & Strauman, 1985), such that the tendency of socially anxious individuals to disclose negative as opposed to positive aspects of self may exaggerate the discrepancy between the impression they believe they are actually making in social situations and the (more positive) one they think they ought to be making, which may, in turn, function to erode a sense of self-certainty. Positivity of self-disclosure, however, accounted for only 4% of the variance in self-certainty, indicating that it plays a secondary role to honesty of self-disclosure in this regard.

Finally, results demonstrated that the amount of self-disclosure was unrelated to self-certainty, suggesting that the quantity of individuals' self-disclosures neither increased nor decreased their sense of self-certainty. Interestingly, however, less self-disclosure was significantly associated with higher levels of social anxiety. This finding stands in contrast to previous studies that have either failed to find a relation between social anxiety and amount of self-disclosure, or have found that socially anxious individuals self-disclose more than non-anxious controls. It is important to highlight that the results from the current study were

questionnaire-based, whereas previous findings pertained to lab-based observations of participants' self-disclosure behaviours provided by objective coders; as such, participants in the present study may have had an inaccurate perception of the extent to which they actually self-disclose. Also important to note is that the reliability of the "amount" self-disclosure subscale was relatively low (.62) and the results pertaining to the scale must therefore be interpreted with caution.

Thus, among the observed variables in Study 1, honesty of self-disclosure emerged as the most promising mediator of the relationship between social anxiety and self-certainty. The goal of Study 2, therefore, was to causally test the effect of honesty of self-disclosure on self-certainty within a laboratory setting.³

³ Limitations of Studies 1, 2, and 3 will follow in the "General Discussion" section.

Study 2: Causal Effect of Honesty of Self-Disclosure on Self-Certainty

In everyday interactions involving self-disclosure, individuals high in social anxiety may be motivated to present dishonest or inaccurate impressions when they suspect that their own opinions and values deviate from the opinions and values of others. That is, concerns about rejection or criticism from conversation partners, should they disagree with others' views, may lead individuals high in social anxiety to put forward an inauthentic façade of agreeable behaviour and to “go along” with others' opinions even if their true desires or views stand in contrast to those with which they feel compelled to conform. The failure to reveal their own authentic values and opinions in self-disclosures may consequently impede self-certainty.

In Study 2, I experimentally manipulated the extent to which participants disclosed their authentic opinions on a controversial topic in the face of another participant's disagreeing views, and examined the resulting effects on self-certainty. To this end, participants were recruited from the undergraduate psychology research pool at the University of Waterloo and were randomly assigned to either an honesty or dishonesty condition. Participants in the honesty condition were led to believe that it was in their best interest (in terms of avoiding a bad social impression⁴) to give a speech to another participant in which they stood up for their own view on a controversial topic (e.g. abortion) in the face of the participant's opposing view; conversely, participants in the dishonesty condition were led to believe that it was in their best interest to give a talk to another participant in which they went along with the participant's view on a controversial topic rather than standing up for their own view. After standing up for their own view or going along with another's view, participants were then administered the 12-item *Self-Concept Clarity Scale (SCCS)*; Campbell, 1996) and the 40-item *Self Attributes Scale*

⁴ The focus on “avoiding a bad impression” was utilized to match the typical self-protective goal of individuals high in social anxiety during social situations (Leary & Kowalski, 1998).

(SAS; Church et al., 2008) as measures of self-certainty (the order of which was counterbalanced across participants). As mentioned in Study 1, the *SCCS* provides a general, global measure of the stability and internal consistency of one's self-concept while the *SAS* measures self-certainty of one's individual self-attributes across the Big 5 dimensions of personality. It was an empirical question whether dishonesty in self-disclosure would lead participants to feel less certain relative to participants in the honesty condition about not only their self-concept more generally but also about their individual personality attributes. Including both measures of self-certainty allowed me to examine the extent to which dishonesty in self-disclosure affected self-certainty across both types of self-related constructs.

Also of interest in the current study was the potential emotional cost of being dishonest vs. honest about one's views. Although not originally proposed in Study 1, it is possible that there is a direct link between dishonesty of self-disclosure and high state social anxiety such that being dishonest during self-disclosures leads to higher state anxiety than being honest. In line with this hypothesis, research on Festinger's (1957) theory of cognitive dissonance demonstrates that behaving in a manner that is discordant with one's true cognitions results in physiological discomfort and tension (Zanna & Cooper, 1974). Given that participants in the dishonesty condition likely experienced a certain level of cognitive dissonance upon presenting inauthentic self-views, it is probable that they would also report higher levels of state anxiety upon doing so than participants in the honesty condition, particularly when asked to express these views to another individual. The effect of condition (honest vs. dishonest self-disclosure) on state social anxiety was therefore tested as a secondary aim of the study. State anxiety was measured in the current study via the *Subjective Units of Distress Scale (SUDS)* as well as the *Self-Assessment Manikin (SAM)*; Bradley & Lang, 1994). The *SUDS* is a single-item measure in

which participants provide a number from 0-100 to represent their level of state anxiety while the *SAM* is a nonverbal pictorial measure which asks participants to select a visual image from a set of images to depict their level of physiological arousal.

Additionally, of interest in the current study was the extent to which being honest vs. dishonest in one's views on one occasion would affect participants' expectations about displaying honest self-disclosure on future interactions. With respect to this question, I hypothesized that participants who were instructed to conform with another's view would rate themselves as less likely to display honest self-disclosure in a subsequent interaction with the same individual. That is, individuals who go along with others' views rather than share their authentic views may feel a certain level of pressure to maintain their inauthentic facade during future interactions.

Finally, of interest was the extent to which the hypothesized effects would be moderated by trait social anxiety. It was possible that being dishonest about one's views would lower self-certainty and higher state social anxiety relative to being honest in particular amongst individuals high in trait social anxiety, whose fears about negative evaluation and strong desire to fit in and make a positive social impression might especially promote conformity and, in turn, erode self-certainty and increase social anxiety. Thus, trait social anxiety was included as a dimensional moderator variable in the analyses below.

Study 2 Method

Participants

One hundred participants from the University of Waterloo undergraduate research pool were recruited for the current study based on pre-screen criteria that a) they were able to speak, read, and write English fluently and b) that they had lived in Canada for five or more years. The latter criterion was used because previous studies have shown that the interpretation of *self-certainty* can vary by culture (e.g. Heine & Lehman, 1997; Peng, Ames, & Knowles, 2001), with individuals from collectivist cultures more likely than those from individualistic cultures to simultaneously hold self-related beliefs that are inconsistent or contradictory with one another (e.g., believing oneself to be both shy and extroverted; Choi & Choi, 2002) and less likely to associate negative consequences (e.g., increased negative affect and decreased life satisfaction) with self-related inconsistencies (Suh, 2002). Although I did not explicitly measure participants' individualistic vs. collectivist cultural orientations per se, the exclusion of participants who lived in Canada for less than 5 years was applied in order to help minimize potential variability in culturally-based interpretations of self-certainty.

Of the 100 participants recruited, five were excluded after participation due to a) procedural errors ($n = 1$), b) comprehension difficulties ($n = 1$), and c) disruptive behaviour during the experiment ($n = 3$). Two participants were also excluded after participation due to the fact that their ages (each 38 years-old) were 8 standard deviations above the overall mean of 20 years old. Finally, 15 participants were excluded due to missing self-certainty pre-score data which were completed at the start of the semester and were necessary for computation of the main analyses below. There were no other exclusion criteria, leaving 78 total participants.

Upon arrival in the lab, participants were randomly assigned to either the honesty ($n = 43$) or dishonesty ($n = 35$) conditions.

Procedure

Participants who signed up for the study in a communal student area were met by the experimenter (E. Orr) and walked to the lab. While approaching the lab, the experimenter told participants that the study would involve another participant who would be situated in a separate lab room performing similar tasks; however, in reality, there was no other participant. To enhance this deception, the experimenter asked the participant to wait in the hallway while the experimenter peeked into a room with a door that was slightly ajar (so that only the experimenter could see inside) and said, "I'll just be a minute." The room was empty but participants were unable to tell that this was the case from their position in the hallway.

Upon arriving at the lab, participants were told that the study was about "how to avoid making a bad impression on someone else." They were told that they would draw a slip of paper from a choice of two slips of paper to determine their role in the study and that the other participant who was (ostensibly) down the hall would take the remaining slip of paper. Participants were told that choosing one of the slips of paper would require them to make a three minute video for the other person with the goal of trying to avoid making a bad impression; choosing the other slip of paper would require them to be the person who watched the video and rated the impression the other person made. Given that there was in fact no other participant, both slips of paper said "make a video." In addition to being told about the video task, participants were given the false information that *after* making their video, they would be asked to get together with the other participant for a five minute conversation, and that following this conversation, the person who watched the video would rate how their

impression from the video matched their impression from the conversation. Participants were given this false information to motivate them to take the task seriously given that they would have to meet the person later, as well as to more deeply instill within them the motivation to avoid making a bad impression.

Once participants learned that they would have to make a video, they were asked to choose a topic from a list of five topics (abortion, capital punishment, same sex marriage, gun control, and internet censorship) that they perceived as being most related to their core beliefs and values. This criterion about core beliefs and values was utilized to ensure that participants cared about and took seriously the views about which they would be speaking in their video. After choosing a topic, they were asked to state whether they were supportive (“for”) or disapproving (“against”) of their topic (e.g. whether they were for or against capital punishment).

The participant was then told that the experimenter was going to leave the room to explain the study to the other participant down the hall. The experimenter also said that she was going to “ask the other participant what their⁵ view was on the topic at hand (e.g. on capital punishment) so that you (the actual participant) can have this information in advance of making your video.” The experimenter then left the room for three minutes. Upon returning to the lab room, the experimenter told the participant that the other participant had the view that was opposite to their own. For example, if the participant had previously stated that he/she was *against* capital punishment, the experimenter said, “The other participant has the view opposite to your own: they are *for* capital punishment.”

⁵ Throughout the study, the fake participant’s gender was kept ambiguous through the use of the pronoun “their” so as to avoid any confounding effects of gender on participants’ reactions throughout the study.

Following this information, participants who were randomly assigned to the Dishonesty condition were given the following oral instructions:

“In this case, rather than stand up for your own view, I would like you to go along with the other participant's viewpoint on this issue, and I'll tell you why. Research shows that a “bad impression” can be avoided if individuals express opinions that match, regardless of whether they are genuine. Basically, individuals who present the same opinions are least likely to make a bad impression. So, I would like you to present the viewpoint held by the other participant on this issue so that you can try to avoid making a bad impression. Please know that I do not want to bias the other participant’s ratings of you, so I will not be letting them know that I have given you these instructions ahead of time. That is, when they watch the video, they will assume that the choice of which side to present was your own, and that you believe the viewpoint you are expressing.”

Participants who were randomly assigned to the Honesty condition were given the following oral instructions:

“In this case, rather than go along with the other participant's viewpoint on this issue, I would like you to stand up for your own view, and I'll tell you why. Research shows that a “bad impression” can be avoided if individuals express opinions that are genuine, regardless of whether they match. Basically, individuals who present their own true opinions are least likely to make a bad impression. So, I would like you to present your own viewpoint on this issue so that you can try to avoid making a bad impression. Please know that I do not want to bias the other participant’s ratings of you, so I will not be letting them know that I have given you these instructions ahead of time. That is, when they watch the video, they will assume that the choice of which side to present was your own, and that you believe the viewpoint you are expressing.”

Therefore, in each condition, participants were motivated by the desire to avoid making a bad impression; however, they were led to believe that the best way to do so was either a) to be dishonest or b) honest in their opinion. All participants were then given three minutes to prepare their talk by writing notes about their chosen side. Participants were then asked to talk on video for three minutes about their chosen topic while the experimenter stood in an adjacent room (to ensure that participants were not influenced by changes in the experimenter's demeanour). Participants were then told via intercom when three minutes had elapsed. Immediately after their talk, participants were asked to report on their level of state anxiety that they experienced during their talk using the *Self-Assessment Manikin* and the *Subjective Units of Distress Scale*. They were then asked to complete the outcome measures of self-certainty (the *Self-Concept Clarity Scale* and the *Self-Attributes Scale*), the order of which was counterbalanced across participants. Following these ratings, participants were asked to anticipate the extent to which they would be anxious about meeting the other participant at the end of the study via the *Self-Assessment Manikin* and *Subjective Units of Distress Scale* and to rate from 0-4 the extent to which they believed that they would be honest in their future interaction with the other participant at the end of the study. Following these ratings, participants filled out a trait measure of social performance anxiety (the *Social Phobia Scale*; *SPS*; Mattick & Clarke, 1998) to enable an analysis of the moderating effect of performance anxiety on self-certainty. Participants were then fully debriefed about the purpose of the study and the deception that was involved. They received a research participation credit for their participation. The entire experiment lasted approximately one hour.

Measures of Self-Certainty

Self-Concept Clarity Scale (SCCS; Campbell et al., 1996). As mentioned in Study 1, the *SCCS* provides a general, global measure of the stability and internal consistency of one's self-concept and was administered during the laboratory study following the honesty/dishonesty manipulation (providing a dependent measure of self-concept clarity) as well as approximately 1-3 months prior to the laboratory study at the time of mass testing (providing a pre-measure of participants' self-concept clarity; hereafter referred to as "pre-scores"). Respondents were instructed to rate the extent to which they agree with statements such as, "My beliefs about myself often conflict with one another" and "I spend a lot of time wondering about what kind of person I really am" from 1 (strongly disagree) to 5 (strongly agree). In past studies (e.g. Stopa et al., 2010), the scale has shown excellent internal consistency ($\alpha = .90$) and in the current study, the *SCCS* was reliable at .89 (in mass testing) and .88 (during the study). See Appendix C for a copy of the *SCCS*.

Self-Attribute Scale (SAS; adapted from the Trait-Role Questionnaire developed by Church et al., 2008). As reported in Study 1, the *SAS* provides a measure of the level of certainty with which 40 self-attributes across the Big Five dimensions of Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience are held (8 attributes per dimension). Participants rated the extent to which each attribute was descriptive of them in general from 0 (does not describe me at all) to 4 (describes me extremely well). As in Study 1, I added a "certainty" question for each self-attribute item in which participants rated how certain they were of their standing on each attribute from 0 (not at all certain) to 4 (extremely certain). Certainty items for each participant were then summed across the Big 5 dimensions and served as a dependent measure of self-certainty, with higher scores on this

measure indicating greater overall self-certainty of one's self-attributes. No pre-scores were collected in mass testing due to the greater length of this measure (self-descriptive + certainty responses for each self-attribute = 80 items). Given that I was interested in self-certainty across multiple self-relevant domains and did not have specific hypotheses about variations in self-certainty within the Big 5 dimensions, I examined only overall self-certainty, for which Cronbach's Alpha was excellent at .95. See Appendix J.

Certainty about Controversial Opinions. Prior to and after participants' talks, participants were asked to rate from 0-100 how certain they felt about their actual viewpoint on the topic of their choosing, with 0 equalling not at all certain and 100 equalling extremely certain. For example, participants who stated that they were pro-capital punishment were asked to rate how certain from 0-100 they were of this opinion prior to and after their talk. Ten participants were excluded from the analysis pertaining to participants' opinion certainty due to a change in the wording of the measure after commencing the study, leaving 68 eligible participants.⁶

Measures of State Anxiety and Perceived Arousal

Self-Assessment Manikin (SAM; Bradley & Lang, 1994). The SAM is a non-verbal pictorial self-assessment technique that measures self-reported physiological arousal, pleasure, and dominance. Only the arousal scale was used for the current study. Participants were asked to place an X on or between any of the five images depicting differing levels of perceived physiological arousal, which, in turn, correspond with a 9-point scale. Participants' perceived

⁶ That is, the first ten participants were asked to rate from 0-100 how certain they were of their opinion on their topic of choice both prior to and after their talk. It then became evident in the debriefing phase that some of these initial ten participants were unsure whether the ratings they made after their talks pertained to how certain they now were of their *original* viewpoint on the topic (which was the intention of the question) or how certain they were of the viewpoint that they had just discussed during their talk. To remedy this confusion for the remaining participants, the wording of the measure was changed such that participants were asked to rate how certain they were (from 0-100) of their *original* opinions on the topic that they chose both prior to and after their talks.

arousal was measured in anticipation of and during their talk as well as in relation to how they would feel about meeting the other participant at the end of the study. In past research, the *SAM* arousal scale has demonstrated strong convergent validity, as the dimensions of the measure have been shown to co-vary reliably with physiological measures of anxiety such as skin conductance and heart rate (e.g., Bradley et al., 1992; Lang et al., 1993; Sloan & Kring, 2007). See Appendix D for a copy of the *SAM* arousal scale.

Subjective Units of Distress Scale (SUDS). The *SUDS* is a brief, face valid measure of state anxiety in which participants are asked to rate how anxious they feel from 0-100, where 0 = not at all anxious and 100 = extremely anxious. In the current study, participants were asked to report how much anxiety they experienced in anticipation of and during their talk, and to anticipate how much anxiety they would feel upon meeting the other participant. Recent research has shown that the *SUDS* has strong convergent validity with other measures of anxiety (Alpers et al., 2005; Sloan & Kring, 2007). For example, Alpers et al. (2005) demonstrated that *SUDS* ratings reliably co-varied with ratings of heart-rate during an in-vivo exposure for driving phobia.

Measure of Trait Social Performance Anxiety

Social Phobia Scale (SPS; Mattick & Clarke, 1998). The *SPS* was used in the current study to explore the extent to which participants' fears of being scrutinized by others during performance situations moderated the effect of condition (honesty vs. dishonesty) on self-certainty. Given that the speech task in the current study was performance-based as opposed to interaction-based, the *SPS*, rather than a measure of social interaction anxiety, was used. On the *SPS*, participants rated the extent to which statements such as "I can suddenly become aware of my own voice and of others listening to me" and "I worry about shaking or trembling

when I'm watched by other people" was characteristic of them from 0 (not at all) to 4 (extremely). In past studies (e.g. Mattick & Clarke, 1998), the scale has shown excellent internal consistency ($\alpha = .89$) and in the current study, the scale was highly reliable at .94. See Appendix E for a copy of the *SPS*.

Measure of Expected Level of Honesty in Future Interaction

Finally, following the speech task, participants were asked to indicate from 0-4 the extent to which they believed that they would be honest in their future interaction with the other participant.

Study 2 Results

Preliminary Results

Participants did not differ across conditions (honesty vs. dishonesty) in age, $F(1, 75) = .88, p = .35$, gender, $\chi^2(1) = .002, p = .96$, or race, $\chi^2(2) = .51, p = .77$, nor did they differ on trait performance anxiety scores on the SPS, $F(1, 75) = .11, p = .74$, partial $\eta^2 = .001$, ($M_{\text{dishonesty}} = 18.91, SD = 12.80$; $M_{\text{honesty}} = 17.81, SD = 15.94$). However, participants randomly assigned to the dishonesty condition demonstrated significantly lower pre-scores on the SCCS ($M_{\text{dishonesty}} = 34.26, SD = 8.88$) than participants in the honesty condition ($M_{\text{honesty}} = 38.44, SD = 9.53$), $F(1, 76) = 3.95, p = .050$, partial $\eta^2 = .049$. Therefore, all subsequent analyses included self-certainty pre-scores as a control variable.

Manipulation Check

To confirm that participants in the dishonesty condition were in fact less honest in the views they expressed during their controversial topic than participants in the honesty condition, they were asked at the end of the study to rate from 0–4 how honest or genuine they felt while expressing their views, where 0 = not at all honest or genuine and 4 = extremely honest or genuine. After controlling for self-certainty pre-scores, results showed that participants in the dishonesty condition ($M = .49, SD = .55$) reported being significantly less honest or genuine in their views than participants in the honesty condition ($M = 1.46, SD = 1.36$), $F(1, 73) = 71.71, p < .001$, partial $\eta^2 = .50$.

Participants were also asked to rate from 0-4 the extent to which the views they expressed during their talk were reflective of their true beliefs and values where 0 = “The views I expressed did not at all reflect my true beliefs” and 4 = “The views I expressed reflected my true beliefs extremely well.” As expected, results showed that participants in the

dishonesty condition were less likely to express views that were in line with their true beliefs ($M = .69$, $SD = 1.05$) relative to participants in the honesty condition ($M = 3.41$, $SD = .71$), $F(1, 73) = 174.68$, $p < .001$, partial $\eta^2 = .71$. Finally, participants were asked to rate from 0-4 the extent to which they felt the choice of which side of the argument to present in their talk was their own free will where 0 = “My choice was not at all of my own free will” and 4 = “My choice was entirely of my own free will.”

As expected, participants in the honesty condition were significantly more likely to rate their choice of argument as representative of their own free will ($M = 3.71$, $SD = .51$), relative to participants in the dishonesty condition, ($M = .71$, $SD = 1.13$), $F(1, 73) = 217.78$, $p < .001$, partial $\eta^2 = .75$.⁷

Primary Analyses

Multiple Regressions: Effect of Condition (Honesty vs. Dishonesty) on DV's of interest.

A series of multiple regressions were conducted to examine the effect of condition (honesty vs. dishonesty), trait performance anxiety (the proposed moderator measured by the SPS), and the interaction between condition and trait performance anxiety on the following dependent variables: Self-certainty (on the *SCCS* and *SAS*); certainty of opinions; state anxiety during the talk and about meeting the other participant (on the *SUDS* and *SAM*); and level of expected honesty in future interactions. Variables entered in Step 1 included condition (dummy coded predictor variable with the dishonesty condition as the reference point), trait performance anxiety as the moderator variable, and self-certainty pre-scores. The interaction term of condition X trait performance anxiety was entered in Step 2. The means and standard deviations of the variables are presented in Table 3 and the correlations between the variables

⁷ Trait performance anxiety did not significantly predict perceived free will ($B = -.01$, $p = .34$), nor did it moderate the effect of condition on perceived free will ($B = .007$, $p = .63$).

are presented in Table 4. All variables were normally distributed, as demonstrated by skewness values within the range of -2 and +2 and kurtosis values within the range of -7 and +7 (West et al., 1995). All continuous predictor variables were centred to reduce multicollinearity.

Table 3. Means and standard deviations (in brackets) of study 2 variables.

	Honesty	Dishonesty	Scale Range
Trait Performance Anxiety (SPS)	17.81 (15.94)	18.91 (12.80)	0-80
Self-Certainty Pre-Scores (SCCS)	38.44 (09.53)	34.26 (08.88)	12-60
Self-Certainty Post Scores (SCCS)	42.51 (08.49)	39.77 (09.84)	12-60
Self-Certainty on SAS	125.63 (20.50)	124.74 (17.51)	0-160
State Anxiety during Speech (SAM)	4.44 (02.44)	5.91 (01.98)	1-9
State Anxiety during Speech (SUDS)	44.77 (29.08)	58.09 (25.79)	0-100
State Anxiety re: Meeting Participant (SAM)	3.43 (01.92)	4.71 (02.19)	1-9
State Anxiety re: Meeting Participant (SUDS)	32.37 (25.43)	45.54 (28.19)	0-100
Expected Honesty in Future Interactions	3.17 (00.76)	2.63 (00.77)	0-4

Table 4. Correlations amongst Study 2 variables.

	B	C	D	E	F	G	H	I	J
A) Condition	-.04	.22*	.15	.02	-.31**	-.24*	-.30**	-.26*	.33**
B) Trait Performance Anxiety		-.40**	-.57**	-.17	.47**	.57**	.33**	.35**	-.13
C) Self-Certainty Pre-Scores (SCCS)			.70**	.20	-.40**	-.44**	-.39**	-.43**	.12
D) Self-Certainty Post Scores (SCCS)				.36**	-.41**	-.52**	-.36**	-.40**	.13
E) Self-Certainty on SAS					-.28*	-.28*	-.09	-.12	.36**
F) State Anxiety during Speech (SAM)						.86**	.50**	.57**	-.16
G) State Anxiety during Speech (SUDS)							.50**	.65**	-.20
H) State Anxiety re: Meeting Participant (SAM)								.87**	-.28*
I) State Anxiety re: Meeting Participant (SUDS)									-.22*
J) Expected Honesty in Future Interactions									

* $p < .05$, ** $p < .01$.

1) Effect of condition on self-certainty as measured by the Self-Concept Clarity Scale.

See Table 5 for a summary of the hierarchical regression results. Results revealed that the omnibus ANOVA was significant, $F(4, 72) = 28.34, p < .001, R^2 = .59$, with a main effect of trait performance anxiety such that participants with high levels of trait performance anxiety

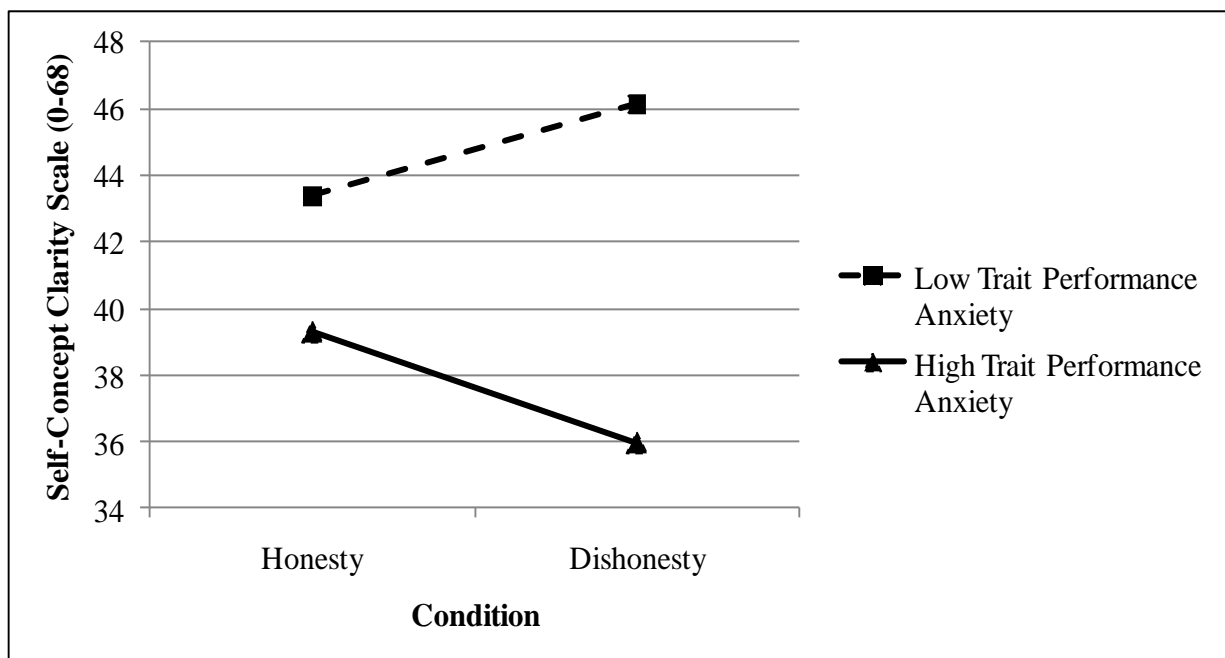
were significantly less certain about themselves than those low in trait performance anxiety, $B = -.35, p < .001, R^2 = .10$. There was also a main effect of self-certainty pre-scores such that participants with higher self-certainty pre-scores were significantly more likely to report higher self-certainty scores following their talk, $B = .54, p < .001, R^2 = .25$. Contrary to expectations, there was no main effect of condition, $B = .29, p = .83, R^2 = .00$. However, as shown in Figure 4, below, there was a significant interaction between condition and trait performance anxiety, $B = .21, p = .037, R^2 = .024$. Probing the interaction demonstrated that *within* each manipulation condition (honesty vs. dishonesty), participants high in trait performance anxiety reported significantly lower self-certainty scores than low anxious participants; however, the magnitude of the difference in self-certainty between low and high anxious participants was greater in the dishonesty condition, $B = -.35, p < .001, R^2 = .10$, than in the honesty condition, $B = -.15, p = .020, R^2 = .030$. Probing the interaction term *across* manipulation conditions showed that participants with high performance anxiety reported marginally lower self-certainty after having been dishonest than after being honest about their views, $B = 3.32, p = .098, R^2 = .015$. Interestingly, as shown in Figure 4, participants low in performance anxiety showed the opposite trend. That is, they reported higher levels of self-certainty after having been dishonest; however, this effect was not statistically significant, $B = -2.73, p = .18, R^2 = .010$.

Table 5. Hierarchical regression analysis predicting self-certainty on SCCS.

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>	ΔR^2	R^2
<u>Step 1</u>						
Self-Certainty Pre-Scores (<i>SCCS</i>)	.54	.080	.56**	< .001		
Condition (honesty vs. dishonesty)	.29	1.39	.016	.83		
Trait Performance Anxiety (<i>SPS</i>)	-.35	.081	-.56**	< .001	.57	.57
<u>Step 2</u>						
Condition X Performance Anxiety	.21	.098	.27*	.037	.024	.59

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

Figure 4. The moderating effect of trait performance anxiety on (*SCCS*) self-certainty ratings



2) Effect of condition on self-certainty as measured by the Self-Attributes Scale.

Results revealed that the omnibus ANOVA was non-significant, $F(4, 72) = 1.48, p = .22, R^2 = .024$, with no main effects of either trait performance anxiety, $B = .14, p = .60, R^2 =$

.004 or condition, $B = -1.30$, $p = .77$, $R^2 = .001$. The interaction between condition and trait performance anxiety was also non-significant, $B = -.42$, $p = .18$, $R^2 = .024$.

3) *Effect of condition on certainty of opinions.*

Results revealed that the omnibus ANOVA was significant, $F(4, 62) = 59.67$, $p < .001$, $R^2 = .78$. However, this effect was largely accounted for by participants' certainty ratings prior to their talk, $B = .98$, $p < .001$, $R^2 = .70$, such that participants who displayed higher certainty scores prior to their talk were significantly more likely to report higher certainty scores after their talk. There was no main effect of condition, $B = 1.61$, $p = .55$, $R^2 = .001$, no effect of trait performance anxiety, $B = .056$, $p = .71$, $R^2 = .000$, and no significant interaction between condition and trait performance anxiety, $B = -.10$, $p = .62$, $R^2 = .001$.

4) *Effect of condition on perceived arousal during speech as measured by SAM.*

Results revealed that the omnibus ANOVA was significant, $F(5, 71) = 11.23$, $p < .001$, $R^2 = .40$, with a significant main effect of condition, $B = -1.07$, $p = .015$, $R^2 = .049$, such that participants in the dishonesty condition reported feeling significantly more aroused during their speech ($M = 5.91$, $SD = 1.98$) than participants in the honesty condition ($M = 4.44$, $SD = 2.44$). There was also a main effect of baseline scores on the SAM, $B = .47$, $p = .001$, $R^2 = .10$, such that participants who displayed higher scores on the SAM at the beginning of the study were significantly more likely to report higher scores on the SAM during their speech. There were no main effects of self-certainty pre-scores, $B = -.031$, $p = .23$, $R^2 = .012$, or trait performance anxiety, $B = .021$, $p = .41$, $R^2 = .005$, nor was the interaction between trait performance anxiety and condition significant, $B = .025$, $p = .40$, $R^2 = .006$.

5) *Effect of condition on state anxiety during speech as measured by SUDS.*

Results revealed that the omnibus ANOVA was significant, $F(5, 70) = 23.80, p < .001, R^2 = .60$, with a significant main effect of condition, $B = -8.25, p = .054, R^2 = .020$. Participants in the dishonesty condition reported being significantly more anxious on the *SUDS* during their speech ($M = 58.09, SD = 25.79$) than participants in the honesty condition ($M = 44.77, SD = 29.08$). There was also a main effect of baseline scores on the *SUDS*, $B = .66, p < .001, R^2 = .23$, with participants who displayed higher scores on the *SUDS* at the beginning of the study significantly more likely to report higher scores on the *SUDS* during their speech. Further, there was a main effect of trait performance anxiety, $B = .58, p = .032, R^2 = .025$, revealing that participants with higher levels of trait performance anxiety reported significantly higher state anxiety on the *SUDS* during their speech than participants with lower levels of trait performance anxiety. There was no main effect of self-certainty pre-scores, $B = -.30, p = .23, R^2 = .008$, nor was there a significant interaction between trait performance anxiety and condition, $B = -.32, p = .28, R^2 = .006$.

6) *Effect of condition on perceived arousal about meeting other participant as measured by the SAM.*

The omnibus ANOVA was significant, $F(5, 71) = 8.71, p < .001, R^2 = .34$ with a significant main effect of condition, $B = -.92, p = .028, R^2 = .044$. Participants in the dishonesty condition reported higher arousal about meeting the other participant ($M = 4.71, SD = 2.19$) than participants in the honesty condition ($M = 3.43, SD = 1.92$). There was also a main effect of baseline scores on the *SAM*, $B = .50, p < .001, R^2 = .14$, with participants who displayed higher scores on the *SAM* at the beginning of the study significantly more likely to report higher scores on the *SAM* about meeting the other participant. There was not a main effect of

self-certainty pre-scores, $B = -.036$, $p = .14$, $R^2 = .020$, or trait performance anxiety, $B = .006$, $p = .82$, $R^2 = .000$, nor was there an interaction between trait performance anxiety and condition, $B = .004$, $p = .90$, $R^2 = .000$.

7) *Effect of condition on state anxiety about meeting participant as measured by SUDS.*

The omnibus ANOVA was significant, $F(5, 70) = 14.66$, $p < .001$, $R^2 = .48$ with a significant main effect of condition, $B = -9.69$, $p = .044$, $R^2 = .029$. Participants in the dishonesty condition reported being significantly more anxious on the *SUDS* about meeting the other participant ($M = 46.54$, $SD = 28.19$) than participants in the honesty condition ($M = 32.37$, $SD = 25.43$). There was also a main effect of baseline scores on the *SUDS*, $B = .70$, $p < .001$, $R^2 = .26$, with participants who displayed higher scores on the *SUDS* at the beginning of the study significantly more likely to report higher scores on the *SUDS* about meeting the other participant. The main effect of self-certainty pre-scores trended toward significance, $B = -.48$, $p = .087$, $R^2 = .021$, but the effect of trait performance anxiety, $B = -.027$, $p = .93$, $R^2 = .000$, and the interaction between trait performance anxiety and condition, $B = -.22$, $p = .51$, $R^2 = .003$, were not significant.

8) *Effect of condition on expected level of honesty when meeting participant.*

The omnibus ANOVA was significant, $F(4, 72) = 2.62$, $p = .042$, $R^2 = .079$, with a significant main effect of condition, $B = .53$, $p = .005$, $R^2 = .10$. Participants in the dishonesty condition reported that they would be less honest in their future interaction with the other participant ($M = 2.63$, $SD = .77$) than participants in the honesty condition ($M = 3.17$, $SD = .76$). There were no main effects of self-certainty pre-scores, $B = .000$, $p = .98$, $R^2 = .000$, or

trait performance anxiety, $B = -.003$, $p = .74$, $R^2 = .001$, nor was there a significant interaction between trait performance anxiety and condition, $B = -.005$, $p = .71$, $R^2 = .002$.

Study 2 Discussion

Contrary to expectations, the results from Study 2 demonstrated that honesty of self-disclosure did not significantly affect participants' self-certainty on either the *Self-Concept Clarity Scale* or the *Self-Attributes Scale*, nor did it significantly affect participants' certainty about their opinions on controversial topics. However, the effect of honesty of self-disclosure on self-certainty (as measured by the *Self-Concept Clarity Scale*) was significantly moderated by trait performance anxiety. Participants who were high in trait performance anxiety trended toward being *less* self-certain after they were dishonest in their views (relative to when they were honest), while those who were low in performance anxiety trended toward being *more* self-certain after being dishonest. This finding suggests that individuals with high performance or social anxiety might experience particularly costly effects of being inauthentic or dishonest during social encounters. That is, when faced with a person who has a disagreeing view, it is possible that fears about negative evaluation, concerns about pleasing the other participant and/or a desire to "fit in" drives such individuals to prioritize the other person's beliefs relative to their own if they believe that doing so would help them avoid a bad impression. Taking on the other person's view (while perhaps devaluing their own view) may then have the costly result of hampering their own global sense of self-certainty.

For individuals with low trait performance anxiety, it is possible that being asked to support the opposite view resulted in a "rebound" effect, in which their attempts to come up with talking points to support the side opposite to their own served to demonstrate to themselves how much they actually believed in their original viewpoint. In support of this hypothesis, McGregor et al.'s research on defensive conviction (e.g. McGregor et al., 2005; McGregor & Marigold, 2003) shows that individuals high in self-esteem tend to respond to

threats to self-certainty with compensatory conviction in their own personal ideals, values, and opinions, while individuals low in self-esteem fail to show such a response. That is, McGregor and Marigold (2003) found that participants who were led to feel uncertain about their self-concepts through recounting an unresolved personal dilemma showed more subsequent conviction in their opinions on social issues than participants in a control condition who were not primed with uncertainty – but; only when self-esteem was high. When self-esteem was low, there were no differences between participants who received the uncertainty vs. control manipulation in the subsequent conviction with which their views were held. The authors interpreted these results by suggesting that individuals high in self-esteem may be better equipped to employ self-enhancing strategies such as compensatory conviction in the face of an uncertainty threat because they are more focused on promoting their self-concepts and pursuing self-success (McGregor, Gailliot & Vasquez, 2007). In applying the framework of compensatory conviction to the current study's results, it is possible that participants who were low in social performance anxiety were also better equipped than participants high in social performance anxiety to promote their self-concept through compensatory conviction; hence, the (non-significant) trend of participants low in trait performance anxiety to show increased self-certainty following dishonest self-disclosure.

Of additional importance in relation to Study 2 is that the experiment did not give participants the option to choose which side of the argument to present. Instead, participants were told to argue either for or against a topic, and were then provided with a rationale for doing so. It is therefore possible that participants in the dishonesty condition, who were forced to argue for a topic against their “free will,” felt less ownership over their behaviour than participants in the honesty condition, who were given the opportunity to stand up for their own

beliefs. Past research on counter-attitudinal arguments demonstrates that participants who behave in a manner that stands in contradiction to their attitudes experience a change in their attitudes *if* they believe that their choice of behaviour was of their own free will (e.g. Holmes & Strickland, 1970; Zanna & Cooper, 1974). Based on this research, it is possible that participants who were in the dishonesty condition may have felt less responsibility and ownership over their behaviour, which may have made it less likely that they would experience changes in self-certainty. Interestingly, however, the finding that participants high in trait performance anxiety in the dishonesty condition did, in fact, show reductions in self-certainty suggests, once again, that such individuals are especially vulnerable to the effects of conforming to another's views. Although they may have felt pressure to conform for the sake of the study, this pressure may have been a secondary driving force in their behaviour relative to their own internal motivation to conform (e.g. Santee & Maslach, 1982).

As noted above, trait performance anxiety did not significantly moderate the effect of honesty of self-disclosure on self-certainty as measured by the *Self-Attributes Scale* nor did it significantly moderate the effect of honesty of self-disclosure on the level of certainty with which participants' opinions were held. These results suggest that, for all individuals (regardless of one's level of trait performance anxiety), being dishonest about an opinion does not necessarily lead to less certainty about the opinion itself nor does it lead to less certainty about one's own individual self-attributes. In other words, it appears that dishonest self-disclosure (at least in the manner operationalized in the present study) does not erode one's confidence in one's own *specific* personality attributes or opinions. Rather, it appears to reduce self-certainty more globally (as measured by the *Self-Concept Clarity Scale*) amongst those high, but not low, in trait performance anxiety.

The current study also examined the secondary hypothesis that dishonesty of self-disclosure would lead to high state social anxiety. Although not originally proposed in Study 1, it was hypothesized in the current study that behaving in a manner that is discordant with one's true cognitions may result in physiological discomfort and tension (Festinger, 1957), especially when faced with expressing such cognitions to others. Results showed that participants assigned to the dishonesty condition did, in fact, feel significantly more physiologically aroused (on the *SAM*) and anxious (on the *SUDS*) while completing their speech, as well as in anticipation of meeting the other participant at the end of the study, than participants assigned to the honesty condition, irrespective of their levels of trait performance anxiety. To the extent that the results from Study 2 may generalize to more naturalistic social interactions in which high anxious individuals might intentionally be untruthful for the sake of conformity, it is of interest to ask why they might opt to use such strategies if being dishonest elicits increased perceived arousal and anxiety symptoms? It is possible that individuals high in social/performance anxiety are willing to conform to another's views in spite of the emotional discomfort it elicits because they believe that "similarity breeds liking." The *law of attraction* (Byrne & Nelson, 1965) states that there is a positive linear relationship between similarity and liking, such that individuals who share similar attitudes tend to like one another to a higher degree than individuals with dissimilar attitudes. Interestingly, a recent meta-analysis of 313 studies on attitude similarity and liking demonstrated that perceived similarity (the degree to which individuals *perceive* themselves to share attributes with another) significantly and positively predicts liking in existing relationships, whereas *actual* similarity (the degree to which individuals *actually* share the same attributes) does not (Montoya, Horton & Kirchner, 2008). Therefore, it appears that believing that one shares qualities with another person is more

important in terms of liking than actually sharing such qualities in the first place. In this sense, it is possible that individuals high in social anxiety who go along with others' views for the sake of avoiding bad impressions are, in fact, liked more by those interaction partners who perceive themselves to be similar to them. Thus, feeling liked in these interactions might motivate individuals high in social anxiety to conform to others' views in future interactions irrespective of emotional discomfort. Indeed, results from the current study showed that participants in the dishonesty condition who went along with another's views believed that they would be less likely to be honest in future interactions with the same individual than participants in the honesty condition who stood up for their views. Therefore, it seems that being dishonest once may set a precedent for being dishonest again in order to maintain the inauthentic façade and stave off undesired impressions. In essence, individuals high in social anxiety might be willing to continually sacrifice their emotional comfort and their self-integrity (in terms of their opinions and attitudes) for the outcome – perceived or real - of feeling liked and valued by other individuals.

While research shows that perceived similarity amongst individuals leads to more liking, it also demonstrates that perceived dishonesty in self-disclosure leads to less liking. For example, in a study by Robinson, Johnson and Shields (1995), participants read vignettes of individuals who made self-enhancing statements, self-deprecating statements, and self-balanced statements (revealing both positive and negative attributes) and then rated how honest and likable they believed the individuals in the vignettes to be. Results showed that the individual in the vignette who made self-enhancing statements was rated by participants as being significantly less likable than the individual who made balanced statements; moreover, this association between types of self-statements and likeability was significantly mediated by

perceived honesty. That is, individuals who made self-enhancing comments were rated as less likeable primarily because they were perceived to be less honest in their self-disclosures.

In contrast to these results, research by Plasencia, Alden and Taylor (2011) demonstrated that while participants with social anxiety disorder who used avoidance-related safety behaviours (e.g. reduced eye contact) during a social interaction were rated as less likeable by an interaction partner, the use of impression management strategies (e.g., rigidly observing and mentally censoring one's speech) was unrelated to negative interpersonal outcomes. The authors explained this finding by noting that such impression management strategies may allow individuals to feign friendliness to a greater degree than other self-protective strategies such as avoidance, which may then result in greater liking on the part of the interaction partner.

Ultimately, liking on the part of the interaction partner – at least within the context of an initial meeting or conversation with that person - may depend on how successfully individuals high in social anxiety are able to take on another's views and opinions in social interactions. It is perhaps the case that among individuals who opt to conform by pretending that their opinions and values are in line with someone else's, those who are able to do so convincingly may be more likable, whereas those who are less convincing may come across as dishonest or deceptive and may, therefore, be liked to a lesser degree by interaction partners. Certainly, the effectiveness of this conformity strategy, no matter how skilled it may be, would be expected to break down within the context of frequent meetings with the same person; indeed, it would seem quite maladaptive to cling to such a strategy within the context of longer-term relationships. Regardless of whether individuals are able to convincingly conform to others' opinions, they are nonetheless denying themselves the opportunity to learn that they

may also be liked by others for their authentic opinions, values, and attributes, even if they do not match those of their interaction partners. Further, as demonstrated by the results of Study 2, they may be “blending in” during social interactions at the potential cost of losing a portion of their self-certainty along the way.

Study 3: Causal Effect of Self-Certainty on Social Anxiety

In Study 2, I found that being dishonest in self-disclosure led to low levels of self-certainty on the *SCCS* particularly for those high in trait performance anxiety. In Study 3, I aimed to test whether low levels of self-certainty would feed back into and cause state anxiety in subsequent social interactions. As mentioned in the introduction, I expected that individuals who are uncertain about their self-concept might find it difficult to know how to showcase particular attributes to others in social situations in order to make desired social impressions. As noted by Schlenker and Leary (1982), a desire to make a good impression combined with a perceived inability to do so tends to result in greater levels of anxiety in social situations. In the current study, I therefore manipulated self-certainty in the laboratory and tested the causal effect of self-certainty on state social anxiety during a public speaking task.

To this end, 95 participants were recruited from the undergraduate psychology research pool at the University of Waterloo and were randomly assigned to either a certainty or an uncertainty condition. Participants in the certainty condition were given false information that the results from their mass testing questionnaires indicated that they were quite certain about their personality. They were then encouraged to internalize this information by a) writing about a time within the last year in which they were certain about their personality, and b) re-experiencing the event through a visualization exercise. Conversely, participants in the uncertainty condition were given the false information that the results from mass testing questionnaires indicated that they were quite uncertain about their personality, and they were then asked to write about and visualize a time within the last year when they were uncertain about their personality. Following the certainty vs. uncertainty induction, participants were asked to speak on video for three minutes about their university lives. Ratings of participants'

state anxiety were collected via the *SAM* and the *SUDS* in anticipation of giving their speech as well as during their talk. Following their speech, participants reported on the self-disclosure behaviours that they believed they displayed during their speech across the dimensions of amount, depth, positivity, and honesty via a self-report self-disclosure scale (see Measures section for a detailed description of the scale). At a later point in time, four objective observers rated the self-disclosure behaviours that participants exhibited in their videotaped speeches).

I hypothesized that the participants who were led to feel uncertain about their personalities would report significantly higher levels of state social anxiety on the *SAM* and *SUDS* in anticipation of and during their video task than participants who were led to feel certain. Further, I conducted an exploratory test of the direct relationship between self-disclosure and self-certainty to examine whether decreased self-certainty would lead to maladaptive patterns of self-disclosure, including decreased amount, depth, positivity, and honesty. This direct relationship between self-certainty and self-disclosure was not initially proposed in Study 1; however, it is possible that inducing participants to feel uncertain about their self-concepts may lead to direct changes in self-disclosure. That is, participants who feel uncertain about the nature of their traits, values, beliefs, or ideas may simply be unable to come up with things to say about themselves during social interactions regardless of the level of social anxiety that they are feeling. If one is feeling confused or uncertain about one's sense of self, it may be difficult if not impossible to express self-related information to others in a clear, elaborate and authentic manner. In this sense, high social anxiety may not be necessary to induce changes in self-disclosure behaviours following low self-certainty. Because no studies have yet manipulated self-certainty to examine the corresponding direct effect on self-disclosure, the test of this effect is presented in exploratory form.

Finally, to remain consistent with Study 2, I examined whether trait performance anxiety moderated the effects of self-certainty on both state social anxiety and self-disclosure.

Study 3 Method

Participants

Ninety-five participants from the University of Waterloo SONA undergraduate Psychology research pool were recruited for the current study based on pre-screen criteria that a) they were able to speak, read, and write English fluently, and b) they had lived in Canada for five or more years. There were no other exclusion criteria. Upon arrival in the lab, participants were randomly assigned to either the certainty ($n = 47$) or the uncertainty ($n = 48$) condition.

Procedure

The experimenter (E. Orr) met participants individually in a communal student area and brought them to the lab. Upon arriving in the lab, participants were informed that the experimenter was a clinical psychology graduate student researching “personality variables in the context of university life” and that their personality would be assessed via both questionnaires and a short videotaped speech task that they would be asked to perform. The experimenter then administered the certainty/uncertainty manipulation which involved a) giving participants false information about the certainty of their personalities, and b) helping them to internalize the false information through a two-part exercise in which they wrote, in detail, about a time within the last year in which they were certain or uncertain about their personalities, and attempted to re-experience the event about which they wrote through a visualization exercise.

Participants were instructed to think back to the time when they completed their mass testing questionnaires at the beginning of the term, as follows, “*Some of the questionnaires in mass testing were about self-certainty, meaning how well you know yourself and how sure you are of your traits and attributes. In our experience, students tend to score anywhere within the*

broad range of being very uncertain to very certain of their personalities. Falling anywhere on this range of certainty is normal and expected.” In order to attenuate the potential negative emotional impact of receiving information that one is uncertain about one’s personality, explicit efforts were made by the experimenter (as indicated in the script, above) to normalize the full range of certainty outcomes.

Certainty Induction

After being asked to think back to their mass testing questionnaires, participants in the *certainty* condition were informed: *“Based on the results from the mass testing questionnaires, it seems that you are generally quite certain about your personality.”* In order to allow participants time to internalize this information, they were asked to write about a time within the last year that they were certain about their personalities. Specifically, they were told: *“In the next 10 minutes, I would like you to think of a time within the last year when you were certain about your personality – a time when you felt that you knew yourself well and you felt confident in your traits or attributes. For example, you may have felt especially certain about your traits or attributes after handling a challenging task or when or going through a life transition. When you have arrived at an example of a time in which you were certain of your personality, please write about it in the space below.”* After completing the 10-minute writing task, participants were asked to close their eyes for 1-minute and imagine that they were once again experiencing the situation about which they just wrote. They were told, *“Imagine, and try to re-experience, the thoughts that were going through your head at the time and the feelings you had.”*

Uncertainty Induction

On the other hand, participants in the *uncertainty* condition were informed: “*Based on the results from the mass testing questionnaires, it seems that you are generally quite uncertain about your personality.*” They were then asked to write about a time in which they were uncertain about their personalities through the following script: “*In the next 10 minutes, I would like you to think of a time within the last year when you were uncertain about your personality – a time when you felt that you did not know yourself well and you felt unconfident in your traits or attributes. For example, you may have felt especially uncertain about your traits or attributes after handling a challenging task or when or going through a life transition. When you have arrived at an example of a time in which you were uncertain of your personality, please write about it in the space below.*” After completing the writing task, participants were then asked to close their eyes and imagine that they were once again experiencing the situation about which they just wrote. The experimenter read each set of instructions in a neutral tone.

Video Task

Participants were then asked by the experimenter to speak on video for three minutes about their university lives. They were told: “*Now, I am going to ask you to talk for about three minutes about yourself, specifically about your university life. You can talk about any aspects of your personal experiences at university so far. While you speak, I’ll be in the adjacent room and will let you know through an intercom when you can start and when three minutes are up. If you run out of things to say, it’s OK to pause, but try to keep going for the whole three minutes.*”

Participants' state anxiety was measured in anticipation of giving their talk on the arousal scale of the *Self-Assessment Manikin (SAM)* (Bradley & Lang, 1994) as well as on the *Subjective Units of Distress Scale (SUDS)*. Following their talk, participants were asked to retrospectively report on the level of arousal and anxiety they experienced while making their video on the same measures. Subsequently, participants completed a *Self-Disclosure Questionnaire* developed for the current study (see Measures section). Then, they completed the *Social Phobia Scale (SPS)* (Mattick & Clarke, 1998) as a measure of trait performance anxiety. Participants were then fully debriefed about the purpose of the study and the deception that was involved. They received a research participation credit for their participation. The entire experiment lasted approximately 45 minutes. Following the conclusion of the study, four trained observers who were blind to the purpose of the study rated participants' self-disclosure behaviours in the videotaped speeches.

Measures of State Anxiety

Subjective Units of Distress Scale (SUDS). As described in Study 2, the *SUDS* is a brief, face valid measure of state anxiety in which participants are asked to rate how anxious they feel from 0-100, where 0 = not at all anxious and 100 = extremely anxious. In the current study, participants were asked to rate from 0 -100 how much anxiety they experienced in anticipation of and during their talk.

Self-Assessment Manikin (SAM) (Bradley & Lang, 1994). As described in Study 2, the *SAM* is a non-verbal pictorial self-assessment technique that measures self-reported physiological arousal, pleasure, and dominance. The arousal scale was used as a measure of participants' self-reported physiological arousal in anticipation of and during their talk (see Appendix D), while the pleasure scale was used to check that the effect of the manipulation

was specific to changes in self-certainty rather than changes in affect more generally (see Appendix G). With respect to the pleasure scale used in the manipulation check, participants were asked to place an X on or between any of the five images depicting differing levels of happiness. Ratings placed on or between the images then translated onto a 9-point scale with 1 equalling very unhappy and 10 equalling extremely happy. In past research, the *SAM* pleasure scale has demonstrated strong convergent validity, as differences in affect have been shown to systematically co-vary with facial displays of emotion (Bradley & Lang, 1994).

Measure of Trait Performance Anxiety

Social Phobia Scale (SPS; Mattick & Clarke, 1998). The *SPS* was used in the current study to explore the extent to which participants' fears of being scrutinized by others during performance situations moderated the effect of condition (certainty vs. uncertainty) on state social anxiety and self-disclosure behaviours. In the current study, the scale was highly reliable with an alpha of .90. See Appendix E for the *SPS*.

Measure of Self-Disclosure Behaviours

Self-Disclosure Scale: Participant Version- modified from Gaucher et al. (2012).

Participants rated the perceived amount, positivity, depth, and honesty of self-disclosures they displayed in their speech on a scale from 0–4 (where 0 = not at all and 4 = extremely). Items pertaining to amount, positivity, and depth were based upon the items created by Gaucher et al. (2012) in their manuscript on self-esteem differences in expressivity, while the *honesty* items were developed for the current study. Specifically, two scale items measured *amount* of self-disclosure: “How much did you talk about yourself (i.e., your own experiences rather than facts and observations about university in general)?” and “When you talked about yourself, how detailed were your descriptions?” These two items were combined

into a composite measure ($\alpha = .69$). Two items measured the *positivity* of participants' self-disclosures: "When you talked about yourself, how positive were your descriptions?" and "When you talked about yourself, how much positive emotion did you express?" which were combined to represent the positivity dimension ($\alpha = .71$). Two items measured the *negativity* of participants' self-disclosures: "When you talked about yourself, how negative were your descriptions?" and "When you talked about yourself, how much negative emotion did you express?" which were combined to represent the negativity dimension ($\alpha = .80$). In addition, one item measured the *depth* of participants' self-disclosures: "When you talked about yourself, how deep or intimate were your descriptions?" while two items measured the *honesty* of participants' self-disclosures: "When you talked about yourself, how authentic (i.e. "real" or "genuine") were you?" and "How much did you censor information about yourself (i.e. how much did you stop yourself from saying things about yourself that came into your mind)?" These last two items were combined to represent the honesty dimension ($\alpha = .58$).

In addition to the nine behavioural items of self-disclosure scale mentioned above, a non-behavioural self-disclosure item was also included. That is, the item: "How hesitant were you to share your personal experiences?" was created to capture participants' *felt sense* of reticence to divulge personal information. Including this item alongside the behavioural items of self-disclosure allowed an examination of the extent to which participants were aware and cognizant of a desire to withhold personal information. The items from each subscale were not combined into one overarching scale because each of the subscales tapped into different types of self-disclosure behaviours. Indeed, the reliability of combining all items into a single self-disclosure scale was low at .44.

Self-disclosure scale used by objective observers (developed for the current study).

Participants' self-disclosure behaviours were also rated by four research assistants who were blind to the purpose and conditions of the study. The observers used the same rating scale as participants except that the items in the honesty dimension (pertaining to authenticity and level of censorship) as well as the question measuring hesitancy to reveal personal information were removed because I reasoned that it would be difficult for coders to rate these dimensions without having access to the actual motivations and intentions of the participants. Prior to rating the videos, the experimenter met with the four observers for training sessions in which they learned how to interpret the scale items and apply them to participants' performances. As shown in Appendix I, the coding scheme included detailed descriptions for each item to increase the reliability between observers. However, to ensure that the observers were preserving the context and meaning of participants' talks, they were asked not to count individual sentences to arrive at their ratings but rather to make approximations based on the criteria for each item. Pilot participants were used as training examples to help the observers calibrate their ratings.

The inter-rater reliabilities across the four coders (two-way, mixed intraclass correlation coefficients for the consistency of the average measures; *ICC*) are presented in Table 6, below. With respect to *ICC* cut-offs for reliability, Portney and Watkins (2009) suggested that *ICC*'s greater than .75 represent good reliability while *ICC*'s less than .75 reflect moderate to poor reliability; Rosner (2000), on the other hand, indicated that an *ICC* of less than 0.4 is considered poor, an *ICC* between 0.4 and 0.75 is considered fair, and an *ICC* greater than 0.75 is excellent. All *ICC* values in the present study were greater than .64.

Table 6. *Reliability of observers' ratings on self-disclosure scale*⁸

Observer Self-Disclosure Scale Item	<i>ICC</i>
Amount of Self-Disclosure	.80
Positivity of Self-Disclosure	.82
Negativity of Self-Disclosure	.83
Depth of Self-Disclosure	.64

⁸ ICC ratings are equivalent to Cronbach's Alpha reliability ratings.

Study 3 Results

Preliminary Results

Participants did not differ across conditions (certainty vs. uncertainty) in age, $F(1, 93) = .001, p = .98$, gender, $\chi^2(1) = 1.82, p = .18$, or race, $\chi^2(2) = 1.70, p = .43$, nor did they differ on pre-scores on the SCCS, $F(1, 85) = .22, p = .64$, partial $\eta^2 = .003$. However, despite random assignment to the two conditions, participants in the certainty condition reported significantly lower scores in trait performance anxiety on the SPS ($M = 12.57, SD = 10.85$) than participants in the uncertainty condition ($M = 17.48, SD = 11.81$), $F(1, 93) = 4.44, p = .038$, partial $\eta^2 = .046$. This difference between conditions was controlled in all regression analyses given that trait performance anxiety was entered as a moderator variable.

Manipulation Check

To confirm that participants in the certainty condition were, in fact, more certain than participants in the uncertainty condition, all participants completed the SCCS (Campbell et al., 1996; See Appendix C) and a 3-item questionnaire developed for the study (see Appendix F), the order of which were counterbalanced across participants. Results showed that on the SCCS, participants in the certainty condition reported significantly higher self-certainty ($M = 45.51, SD = 6.54$) following the manipulation than participants in the uncertainty condition ($M = 38.67, SD = 8.60$), $F(1, 92) = 14.09, p < .001$, partial $\eta^2 = .13$. On the 3-item questionnaire developed for the study, participants in the certainty condition were also significantly more certain ($M = 84.38, SD = 8.11$) than participants in the uncertainty condition ($M = 71.80, SD = 13.70$), $F(1, 92) = 24.29, p < .001$, partial $\eta^2 = .21$.

To confirm that the effect of the manipulation was specific to self-certainty and did not impact participants' affect more generally, participants were asked to report how happy vs.

unhappy they felt following the manipulation on the pleasure scale of the *SAM* (Bradley & Lang, 1994). Results revealed that there were no differences between the two conditions in affect following the manipulation ($M_{certain} = 7.19, SD = 1.26; M_{uncertain} = 6.85, SD = 1.27$; scale range = 1-9, with higher scores equalling more happiness), $F(1, 92) = .14, p = .71$, partial $\eta^2 = .001$.

Primary Analyses

Multiple Regression Analyses

A series of hierarchical multiple regression analyses were conducted to examine the effect of condition (certainty vs. uncertainty), trait performance anxiety, and the interaction between condition and trait performance anxiety on the following dependent variables: state anxiety before and during the talk (on the *SUDS* and *SAM*); amount of self-disclosure; positivity of self-disclosure; negativity of self-disclosure; depth of self-disclosure; honesty of self-disclosure; and hesitancy to reveal personal information. The amount, positivity, negativity, and depth dimensions were rated by both participants and observers while the dimensions of honesty and hesitancy to reveal personal information were rated by participants alone. Variables entered in Step 1 were: condition and trait performance anxiety (as a moderator). The interaction term of condition X trait performance anxiety was entered in Step 2. The means and standard deviations of each variable are presented in Table 7 and the correlations between the variables are presented in Table 8. All continuous predictor variables were centred to reduce multicollinearity.

Table 7. Means and standard deviations (in brackets) of study 3 variables.

	Low Self-Certainty	High Self-Certainty	Scale Range
Trait Performance Anxiety (<i>SPS</i>)	17.48 (11.81)	12.57 (10.85)	0-80
Amount of Self-Disclosure (participant)	2.45 (00.89)	2.35 (00.77)	0-4
Positivity of Self-Disclosure (participant)	2.34 (00.81)	2.62 (00.65)	0-4
Negativity of Self-Disclosure (participant)	1.46 (00.82)	1.05 (00.84)	0-4
Depth of Self-Disclosure (participant)	1.73 (01.09)	2.09 (01.12)	0-4
Honesty of Self-Disclosure (participant)	3.04 (00.82)	3.20 (00.74)	0-4
Hesitancy to Disclose (participant)	2.04 (01.24)	1.40 (01.16)	0-4
Amount of Self-Disclosure (observer)	2.89 (00.55)	2.97 (00.51)	0-4
Positivity of Self-Disclosure (observer)	2.71 (00.55)	2.80 (00.62)	0-4
Negativity of Self-Disclosure (observer)	1.09 (00.56)	1.04 (00.68)	0-4
Depth of Self-Disclosure (observer)	1.91 (00.62)	2.00 (00.63)	0-4
State Anxiety before Talk (<i>SAM</i>)	3.96 (02.01)	3.15 (01.68)	1-9
State Anxiety before Talk (<i>SUDS</i>)	44.29 (29.94)	28.30 (23.05)	0-100
State Anxiety during Talk (<i>SAM</i>)	4.04 (02.42)	3.60 (02.09)	1-9
State Anxiety during Talk (<i>SUDS</i>)	41.94 (30.84)	33.46 (26.92)	0-100

Table 8. Correlations amongst Study 3 variables.

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
A) Condition	-.21*	-.06	.18	-.24*	.16	.10	-.26*	.07	.07	-.04	.08	-.21*	-.31**	-.10	-.17
B) Trait Performance Anx.	-.05	-.14	.31**	.01	-.24*	.41**	.11	-.21	.26*	.18	.56**	.55**	.46**	.44**	
C) Amount of SD (P)			.20	.02	.41**	.06	-.11	.41**	.02	.09	.40**	-.03	-.01	-.22*	-.13
D) Positivity of SD (P)				-.51**	.13	.15	-.20	.22*	.41**	-.33**	.22	-.20	-.24*	-.23*	-.27**
E) Negativity of SD (P)					.12	-.18	.26*	-.09	-.47**	.48**	-.01	.17	.27**	.27**	.25*
F) Depth of SD (P)						.22*	-.07	.07	-.15	.24*	.31*	-.09	-.20	-.09	-.14
G) Honesty of SD (P)							-.51**	.13	.05	.01	.31*	.34**	-.28**	-.24*	-.25*
H) Hesitancy to Disclose (P)								-.29**	-.22*	.18	-.18	.54**	.53**	.53**	.54**
I) Amount of SD (O)									.23*	-.06	.62**	.01	-.01	-.10	-.12
J) Positivity of SD (O)										-.92**	-.05	-.17	-.19	-.19	-.16
K) Negativity of SD (O)											.22*	.20	.21*	.18	.15
L) Depth of SD (O)												.09	.09	-.05	-.08
M) State Anxiety before Talk (SAM)													.85**	.67**	.67**
N) State Anxiety before Talk (SUDS)														.67**	.75**
O) State Anxiety during Talk (SAM)															.91**
P) State Anxiety during Talk (SUDS)															

* $p < .05$, ** $p < .01$.

SD = self-disclosure

P = Participant

O = Observer

1) *Effect of condition on anticipatory state anxiety on the Subjective Units of Distress Scale.*

Results revealed that the omnibus ANOVA was significant, $F(3, 90) = 15.69, p < .001, R^2 = .32$, with a main effect of trait performance anxiety. Participants with high levels of trait performance anxiety reported significantly more anticipatory social anxiety than participants low in trait performance anxiety, $B = 1.02, p < .001, R^2 = .11$. As hypothesized, there was also a main effect of condition. After controlling for trait performance anxiety, participants in the uncertainty condition reported significantly more anticipatory state anxiety on the *SUDS* than participants in the certainty condition, $B = -9.82, p = .036, R^2 = .033$. There was no interaction between condition and trait performance anxiety, $B = .33, p = .43, R^2 = .005$. See Table 9 below for a summary of the hierarchical regression results.

Table 9. *Hierarchical regression analysis predicting anticipatory (SUDS) state social anxiety.*

Variable	<i>B</i>	<i>SE B</i>	β	<i>p</i>	ΔR^2	R^2
<u>Step 1</u>						
Trait Performance Anxiety (<i>SPS</i>)	1.02	.27	.44**	<.001		
Condition (honesty vs. dishonesty)	-9.82	4.61	-.19*	.036		.32
<u>Step 2</u>						
Condition X Performance Anxiety	.32	.41	.092	.43	.00	.32

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

2) *Effect of condition on perceived arousal in anticipation of the talk on the SAM*

Results again revealed a significant omnibus ANOVA, $F(3, 90) = 14.35, p < .001, R^2 = .30$, with a main effect of trait performance anxiety such that participants with high levels of trait performance anxiety reported significantly higher scores on the SAM than participants

low in trait performance anxiety, $B = .082$, $p < .001$, $R^2 = .13$. However, results showed no main effect of condition on anticipatory perceived arousal as measured by the SAM, $B = -.32$, $p = .35$, $R^2 = .007$, nor was there a significant interaction between trait performance anxiety and condition, $B = .018$, $p = .55$, $R^2 = .003$.

3) *Effect of condition on perceived arousal during the talk as measured by the SUDS.*

Results revealed a significant omnibus ANOVA, $F(3, 91) = 7.66$, $p < .001$, $R^2 = .18$, with a main effect of trait performance anxiety; participants with high levels of trait performance anxiety reported significantly higher levels of state social anxiety during their talk than participants with low levels of trait performance anxiety ($B = .96$, $p = .004$, $R^2 = .077$). However, results showed no main effect of condition on either state social anxiety during participants' talks ($B = -4.19$, $p = .45$, $R^2 = .005$), nor was there a significant interaction between trait performance anxiety and condition ($B = .23$, $p = .63$, $R^2 = .002$).

4) *Effect of condition on state anxiety during the talk as measured by the SAM*

Results once again revealed a significant omnibus ANOVA, $F(3, 91) = 8.07$, $p < .001$, $R^2 = .18$, with a main effect of trait performance anxiety, such that participants with high levels of trait performance anxiety reported significantly higher levels of social anxiety and physiological arousal during their talk ($B = .097$, $p < .001$, $R^2 = .13$). As reported above, results once again showed no main effect of condition on state social anxiety on the SAM during participants' talks ($B = -.032$, $p = .94$, $R^2 = .00$), nor was there a significant interaction between trait performance anxiety and condition ($B = -.016$, $p = .67$, $R^2 = .002$).

5) *Effect of condition on participants' reports of their own self-disclosure behaviours*

Results revealed that condition did not significantly predict participants' reports of the amount of their self-disclosures, $F(3, 90) = .53$, $p = .66$, $R^2 = .02$, the positivity of their self-

disclosures, $F(3, 91) = 1.70$, $p = .17$, $R^2 = .05$, the *depth* of their self-disclosures, $F(3, 91) = .91$, $p = .44$, $R^2 = .029$, or the *honesty* of their self-disclosures, $F(3, 91) = 2.00$, $p = .12$, $R^2 = .062$. However, condition was a significant predictor of the *negativity* of participants' self-disclosures, $F(3, 91) = 5.09$, $p = .003$, $R^2 = .14$, with; participants in the uncertainty condition reporting significantly more negativity in their self-disclosures than participants in the certainty condition, $B = -.37$, $p = .035$, $R^2 = .043$. There was no main effect of trait performance anxiety ($B = .011$, $p = .29$, $R^2 = .011$), nor was there a significant interaction between trait performance anxiety and condition ($B = .020$, $p = .17$, $R^2 = .018$).

6) *Effect of condition on observers' reports of participants' self-disclosure behaviours*

Condition did not significantly predict observers' reports of the *amount* of participants' self-disclosures, $F(3, 85) = 1.15$, $p = .34$, $R^2 = .04$, the *positivity* of their self-disclosures, $F(3, 86) = 1.35$, $p = .26$, $R^2 = .045$, the *negativity* of their self-disclosures, $F(3, 86) = 2.18$, $p = .096$, $R^2 = .071$, or the *depth* of their self-disclosures, $F(3, 86) = 2.29$, $p = .084$, $R^2 = .074$.

7) *Correlations between participant and observer reports of self-disclosure behaviours*

As shown in Table 7, above, participants' and observers' reports of participants' self-disclosure behaviours were significantly and positively correlated for all dimensions: *amount*: $r = .41$, $p < .001$; *positivity*: $r = .41$, $p < .001$; *negativity*: $r = .48$, $p < .001$; and *depth*: $r = .31$, $p = .003$.

8) *Hesitancy to disclose personal information*

As mentioned above, an additional aim of the current study was to examine the extent to which condition affected participants' felt sense of reticence about disclosing personal information. Results revealed a significant omnibus ANOVA, $F(3, 91) = 7.70$, $p < .001$, $R^2 =$

.18, with a marginally significant main effect of condition, such that participants in the uncertainty condition reported more hesitancy to reveal personal information about themselves than participants in the certainty condition, $B = -.45$, $p = .061$, $R^2 = .031$. There was also a main effect of trait performance anxiety ($B = .045$, $p = .002$, $R^2 = .092$), such that participants who were high in trait performance anxiety reported more hesitancy to reveal personal information than participants low in trait performance anxiety. There was not a significant interaction between trait performance anxiety and condition ($B = -.011$, $p = .60$, $R^2 = .002$).

Study 3 Discussion

Results from Study 3 showed that participants' levels of self-certainty had a significant impact on anticipatory state social anxiety. As predicted, participants who were led to feel uncertain about their personalities reported significantly more anxiety on the *Subjective Units of Distress Scale (SUDS)* in anticipation of their talk about their university lives than participants who were led to feel certain about their personalities. Results showed that the self-certainty induction had no effect on participants' ratings of anticipatory state anxiety on the *Self-Assessment Manikin (SAM)*, nor did the induction affect participants' state social anxiety during the speech on either the *SUDS* or *SAM*. Moreover, results pertaining to the exploratory test of the direct effect of self-certainty on self-disclosure behaviours demonstrated that participants who were led to feel uncertain about their personalities reported significantly more negativity in their self-disclosures than participants in the certainty condition as well as more hesitancy to reveal personal information about themselves (although this finding was marginally significant). The self-certainty induction did not significantly affect participants' perceptions of their self-disclosure behaviours in the categories of amount, depth, honesty, or positivity. Finally, the induction did not significantly affect observers' ratings of participants' self-disclosure behaviours.

The finding that participants who were led to feel uncertain about their personalities reported significantly more anticipatory anxiety on the *SUDS* suggests that the experience of low self-certainty is a subjectively aversive experience, particularly when one is faced with the task of disclosing self-related information. Why might this be the case? Identity Consolidation (IC) Theory proposes that personal uncertainty is a particularly aversive, anxiety-provoking experience because it blocks the ability to make and act upon decisions (McGregor, 2003).

That is, decreased conviction about one's own personal strengths and weaknesses within the context of social situations may lead to considerable doubt about how to best use one's own skills, personality, and/or attributes to one's advantage to make desired impressions with interaction partners. Participants in the current study who were led to feel uncertain about their personalities may have entertained such questions as: "What are my opinions and values?" "What should I say about myself to make a good impression?" "What parts of myself should I reveal?" and "What parts of myself should I hide?" It is likely and perhaps inevitable that such questions lead to significant levels of anxiety in anticipation of social events when one doubts one's ability to utilize one's skills to make a desired impression (Schlenker & Leary, 1982).

As reported above, the self-certainty induction did not lead to significant differences in anticipatory state social anxiety on the *Self-Assessment Manikin* nor did it lead to significant differences in state anxiety during the talk on either the *Self-Assessment Manikin* or the *Subjective Units of Distress Scale*. An inspection of the means of participants' state anxiety scores on such measures (see Table 7) shows that participants in the uncertainty condition did, on average, demonstrate lower state anxiety across the board than participants in the certainty condition. However, these lower state anxiety scores in the uncertainty condition were likely due to the fact that participants in the uncertainty condition showed significantly lower trait performance scores on the *Social Performance Scale (SPS)* and were therefore likely more prone to anxiety during social situations than participants in the certainty condition. As shown above, only anticipatory state anxiety on the *SUDS* was significantly predicted by self-certainty after controlling for *SPS* scores. The finding that self-certainty did not significantly predict anticipatory changes in state arousal on the *SAM* suggests that, although participants in the uncertainty condition were reportedly anxious about the idea of talking about themselves, they

were not actually feeling as aroused or “worked up” in the moment. It is possible that participants were foreshadowing that they would feel anxious while performing their talk despite the fact that they were not feeling particularly aroused while making such contemplations.

Further, the finding that self-certainty did not significantly predict state social anxiety *during* participants’ speeches on the *SUDS* and *SAM* may be a result of a ceiling effect in which all participants, regardless of condition were feeling anxious during the disclosure task. Indeed, an inspection of the means on Table 7 shows that state anxiety *SUDS* and *SAM* scores of participants in the high certainty condition increased during the self-disclosure task to more closely resemble the scores of participants in the low certainty condition. The self-certainty induction may not have been strong enough to elicit changes in state anxiety during participants’ talks in light of this potential ceiling effect. Changing the self-disclosure experimental protocol from a public speech to a casual conversation may be a method in which to reduce the threat associated with the task and therefore decrease the likelihood of a potential ceiling effect of state social anxiety. Alternatively, enhancing the strength of the certainty induction by helping participants to more strongly internalize low or high self-certainty may lead to corresponding changes in state social anxiety during the disclosure task. Enhancing the strength of the induction may be accomplished by asking participants to arrive at *more* examples of times at which they have felt low or high certainty, or by presenting them with more convincing oral or visual feedback about their low vs. high self-certainty. For example, graphs that illustrate to participants that their level of self-certainty falls much below or above the average, or that their personality traits have either changed or remained stable across time may be effective in inducing low vs. high self-certainty to a greater degree. Testing the effect

of such modifications on state social anxiety before and during a self-disclosure task would elucidate whether the effect of self-certainty is, in fact, limited to anticipatory state social anxiety or whether it extends to anxiety during the disclosure task as well.

In addition to testing the primary hypothesis that low self-certainty leads to high state social anxiety, the current study also tested the exploratory hypothesis that low self-certainty leads to self-protective self-disclosure. As mentioned above, this direct pathway was not originally proposed in Study 1; however, it was reasonable to suspect that uncertainty and confusion about oneself might impede one's ability to disclose self-related information. Interestingly, results from the current study showed that feeling uncertain about one's personality led to more reticence to self-disclose. That is, participants who were led to feel uncertain about their personalities reported that they were more hesitant to reveal personal information than participants who were led to feel certain (this finding was marginally significant). These findings are consistent with previous studies which have found that individuals who are low in self-certainty are more hesitant to self-disclose than individuals who are high in self-certainty. For example, Knobloch (2008) found that participants low in self-relational certainty (the confidence one has about one's involvement within interpersonal relationships) created date request messages (messages requesting a date with an unknown individual) that were less fluent, affiliative, relationally focused, explicit, and effective than participants high in relational certainty. Further, Checton (2010) found that individuals who were uncertain about the nature of their health-related problems were less likely to talk to their partners about their condition than individuals who were more certain about their symptoms.

Results also showed that participants in the uncertainty condition perceived that they displayed significantly more negativity in self-disclosure during their talk than participants in

the certainty condition. However, the certainty manipulation did not significantly affect participants' perceptions of their own self-disclosure behaviours across any of the other self-disclosure dimensions. Notably, the finding that the self-certainty manipulation did not affect honesty of self-disclosure suggests that, while dishonesty of self-disclosure leads to low self-certainty (as shown in Study 2), low self-certainty does not necessarily contribute back to more dishonesty in self-disclosure. It is perhaps the case that dishonesty of self-disclosure is only activated by social contexts in which individuals are motivated to conform to another's view in order to feel accepted or avoid a bad impression. In Study 3, participants were not speaking with an interaction partner with differing self-views and may therefore have felt little to no need to be dishonest in their disclosures. In a subsequent study, it would be informative to examine the effect of self-certainty not only on self-disclosure generally but also the extent to which participants dishonestly self-disclose when faced with interaction partner with disagreeing views.

Further, the results showed that participants' perceptions of their self-disclosure behaviours were significantly correlated with observer ratings (see Table 8), indicating that participants and observers were in relative agreement about the directionality of participants' self-disclosure behaviours. Notably, the self-certainty induction did not affect self-disclosure behaviours on any of the observers' self-disclosure ratings. Therefore, the proposed exploratory effect of self-certainty on self-disclosure was supported in part such that low self-certainty affected participants' perceptions of their self-disclosure behaviours in the domains of hesitancy and negativity, but did not affect their observable self-disclosure behaviours in any of the self-disclosure domains. Based on this finding, it is possible that participants' perceptions of their self-disclosure behaviours were underestimations or distortions of their

actual self-disclosure behaviours. Previous research has shown that individuals high in social anxiety tend to rate their social performances more negatively than do individuals low in social anxiety despite being comparable on actual social abilities as rated by objective observers (Rapee & Lim, 1993; Segrin & Kinney, 1995). It is therefore conceivable that participants in the uncertainty condition who experienced higher levels of state anxiety than participants in the certainty condition were also rating their self-disclosures in a biased or distorted manner.

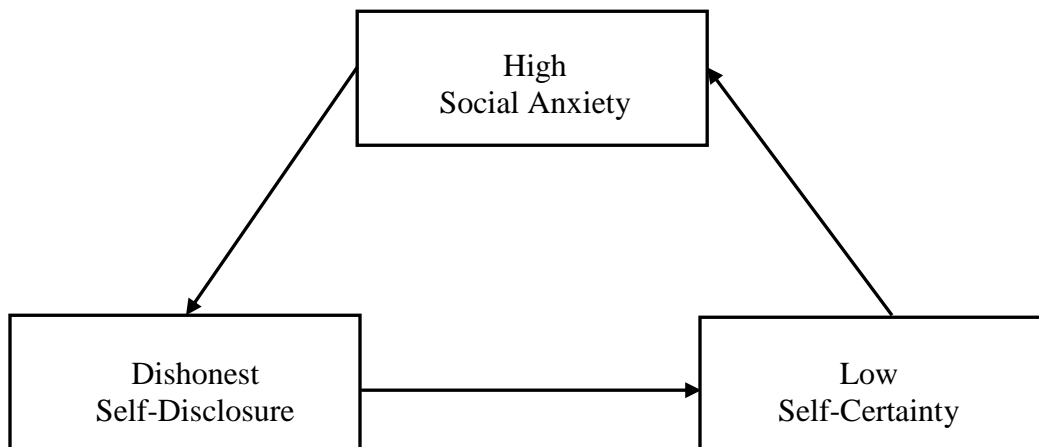
General Discussion

In the Introduction, I presented research which demonstrated that high social anxiety is associated with low certainty about one's self-views (Moscovitch et al., 2009; Stopa et al., 2010; Wilson & Rapee, 2006) and posed the question: What are the mechanisms underlying the link between high social anxiety and low self-certainty? In Study 1, I hypothesized that self-protective self-disclosure would underlie the relationship between high trait social anxiety and low self-certainty. I also hypothesized that the relationship between high social anxiety, self-protective self-disclosure, and low self-certainty operated in a feedback loop in which low self-certainty as a result of self-protective self-disclosure would lead back to and significantly predict high levels of social anxiety. To test these hypotheses, I conducted a path analysis examining the cyclical relationship between participants' self-reported trait social anxiety, self-protective self-disclosure patterns and self-certainty. In line with past research, results from Study 1 showed that individuals high in trait performance anxiety were more likely to report self-protective self-disclosure patterns characterized by limited depth (Alden & Bieling, 1998; DePaulo, Epstein & Steele LeMay, 1990), positivity (Leary et al., 1987) and honesty (Kashdan & Steger, 2006; Santee & Maslach, 1982) relative to individuals low in trait performance anxiety. However, in contrast to past studies which found either no association between trait social anxiety and amount of self-disclosure (Alden & Bieling, 1998; Leary et al., 1987) or a positive relationship between social anxiety and amount of self-disclosure (Heerey & Kring, 2007), Study 1 showed that individuals high in trait performance anxiety reported lower amounts of self-disclosure than individuals low in social anxiety. The discrepancy between the current and past studies may be due to the fact that the measure of self-disclosure in the current study was based on participants' perceptions of how much they typically self-disclose while

previous studies used lab-based objective observations of participants' self-disclosure behaviours. It is therefore possible that participants in Study 1 who were high in social anxiety were underestimating the extent to which they actually self-disclose.

Of the results from Study 1, perhaps the most notable finding was that *honesty of self-disclosure* was a significant mechanism underlying the link between high social anxiety and low self-certainty. Higher social anxiety was significantly associated with lower honesty in self-disclosures; lower honesty was significantly associated with lower self-certainty; and lower self-certainty was significantly associated with higher social anxiety. See Figure 5, below, for a visual depiction of the results from Study 1 pertaining to the relationships between high social anxiety, low honesty of self-disclosure, and low self-certainty.

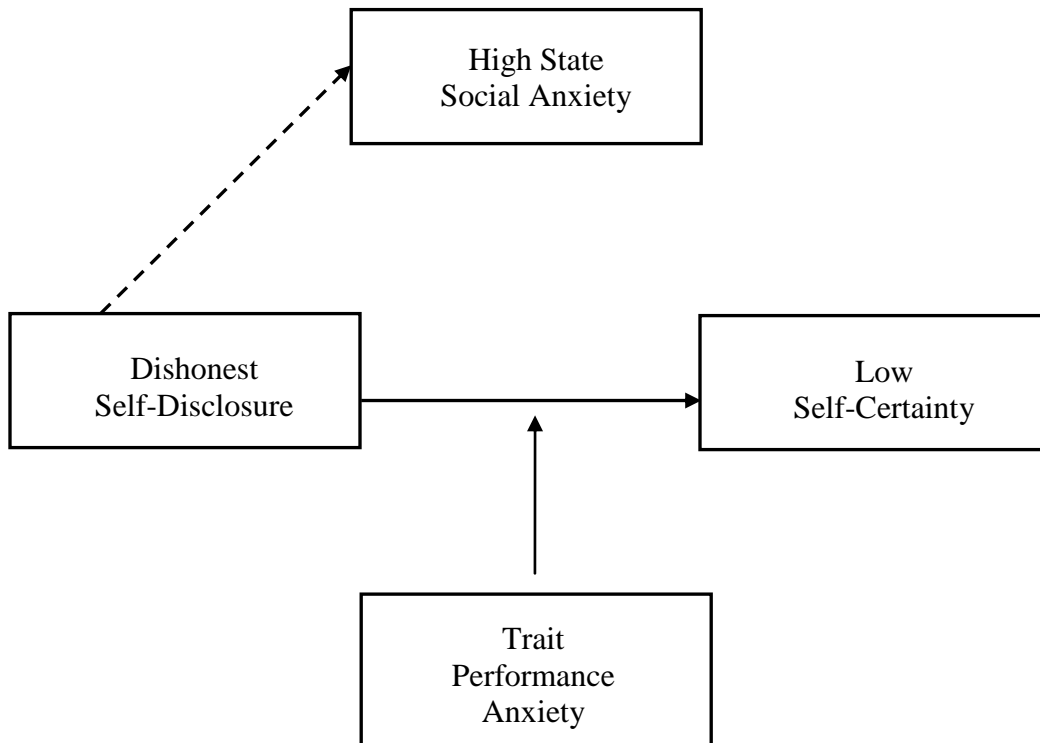
Figure 5. Correlational pathways tested in Study 1 between social anxiety, honesty of self-disclosure and self-certainty.



The main limitations for Study 1 were a) that the mediational model was correlational rather than causal, and, b) that temporal precedence could not be achieved because the variables were measured at the same time. The aim of Studies 2 and 3 was therefore to provide a causal test of this feedback loop by testing the primary hypotheses that a) dishonesty of self-

disclosure would lead to low self-certainty and b) low self-certainty would lead to high state social anxiety. See Figure 6, below, for a visual depiction of the results from Study 2.

Figure 6. Causal pathways tested in Study 2 between social anxiety, self-disclosure and self-certainty.⁹



As shown in Figure 6, participants who were dishonest in their views as a result of conforming to another individual’s opinions experienced lower levels of self-certainty on the *SCCS* than participants who were honest and stood up for their own views, but only when trait performance anxiety was high. Further, participants who were dishonest in their views reported significantly higher levels of state social anxiety both during and after their self-disclosure task. Based on these results, it appears that dishonest self-disclosure may play a *maintaining* role in the development of social anxiety. That is, conforming to others’ views leads

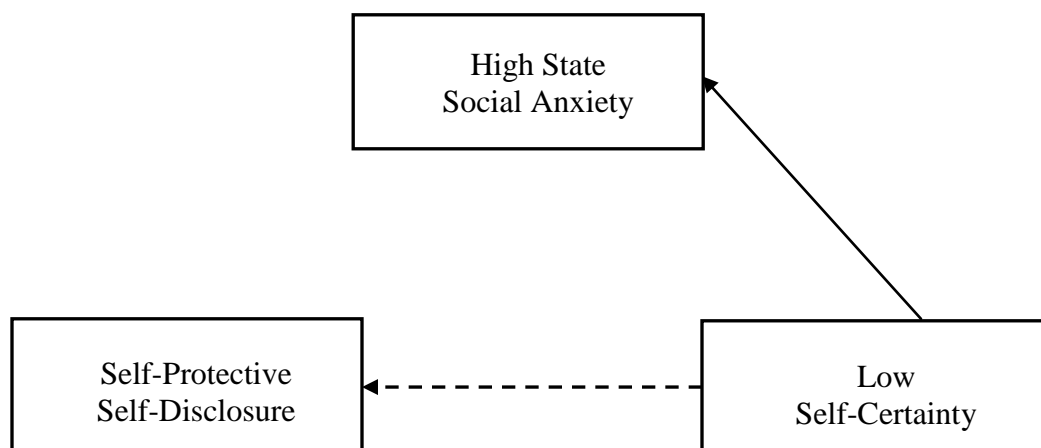
⁹ The solid arrows show that the relationship between dishonest self-disclosure and low self-certainty was moderated by trait performance anxiety. The dotted arrow shows the exploratory finding that dishonest self-disclosure leads to high state social anxiety.

individuals who are *already* high in trait performance anxiety to become less self-certain. Then, Study 3 (see Figure 7, below) showed that feeling less certain about one's personality in the moment leads to significantly higher levels of state social anxiety in anticipation of disclosing self-related information than feeling certain in the moment. For individuals who are already high in trait social anxiety, this moment-to-moment uncertainty may serve to maintain or increase their social anxiety symptoms. For individuals who are not high in trait social anxiety, low self-certainty may contribute to higher levels of state anxiety over time. Future prospective laboratory research is needed to understand how self-certainty and symptoms of social anxiety may develop and interact during a social event over time amongst both socially anxious and non-socially anxious individuals.

Study 3 additionally demonstrated that feeling uncertain about one's personality not only leads to higher levels of anticipatory anxiety but also to more reticence to self-disclose. That is, participants who were led to feel uncertain about their personalities reported that they were more hesitant to reveal personal information than participants who were led to feel certain (this finding was marginally significant). Further, participants in the uncertainty condition perceived that they displayed significantly more negativity during their talk than participants in the certainty condition. However, self-certainty did not significantly affect participants' perceptions of their own self-disclosure behaviours across any of the other self-disclosure dimensions, nor did self-certainty affect observers' reports of participants' self-disclosure behaviours. Therefore, the exploratory link between low self-certainty and self-protective self-disclosure was supported in part, such that low self-certainty seemed to affect participants' perceptions of their self-disclosure behaviours in the domains of hesitancy and negativity, but not their observable self-disclosure behaviours, according to objective reports. It is unclear

whether participants' perceptions of their self-disclosure behaviours were underestimations or distortions of their actual self-disclosure behaviours, or whether the observers failed to identify subtle, actually occurring changes in participants' self-disclosure behaviours. To gain a better understanding of participants' self-disclosure behaviours following the self-disclosure task, it may be helpful to ask participants to identify and explain the self-disclosure behaviours that they performed throughout the task while watching a video playback of their performance. Such a process may help the experimenter to determine whether participants were detecting *actual* changes in their own self-disclosure behaviours, or, whether they were viewing their performance in an overly negative, inaccurate manner.

Figure 7. Causal pathways tested in Study 3 between self-certainty, social anxiety, and self-disclosure.¹⁰



Finally, of note with respect to the pathways between social anxiety, self-disclosure, and self-certainty is that state social anxiety was not experimentally manipulated in the current research. Therefore, the direct link between state social anxiety and self-disclosure can only be assumed to be correlational (as shown in Study 1) rather than causal, at this point. Future

¹⁰ The solid arrow from low self-certainty to high state social anxiety shows the primary finding that low self-certainty causes high state social anxiety. The dotted arrow shows the exploratory pathway between low self-certainty and self-protective disclosure. This pathway was partially supported by the data.

research that directly manipulates state social anxiety to determine the effect on self-protective self-disclosure would help to clarify the specific nature of the relationship between these two variables.

To the extent that the current studies' results may be generalizable to individuals with SAD, they suggest that socially anxious individuals could benefit from therapeutic assistance in identifying whether self-protective self-disclosure is one of safety behaviours that they utilize in social situations. If so, they may then be helped to examine and challenging the cognitions that might be underlying a need to limit or modify their self-disclosures, as well as designing and implementing exposures or behavioural experiments that encourage the disclosure of authentic opinions in the face of others' disagreeing views. Individuals could also be encouraged to drop any safety behaviours that may be preventing them from engaging in self-disclosure (e.g., McManus, Sacadura & Clark, 2008; Taylor & Alden, 2010). For example, some individuals may routinely check in with their interaction partners about their partners' beliefs before disclosing their own. Other individuals may remain silent for the initial portion of the interaction to determine the manner in which they can match their own views to those of their interaction partners. Encouraging individuals to drop such safety behaviours would not only help them engage more fully in the exposure and benefit from the behavioural experiment but also prevent them from attributing a successful social interaction to their use of these behaviours. It would also be helpful to provide individuals high in social anxiety with psychoeducation about the effect of dishonest self-disclosure on self-certainty not only to increase their understanding of the links between the two processes but also to increase their motivation to engage in therapy.

Further, although the causal link between self-certainty and state anxiety may not be unique to individuals with high trait social anxiety, it may nonetheless be helpful to focus on self-certainty as a variable of change in cognitive behavioural treatment for SAD. That is, the results from Study 3 suggest that helping individuals to increase their self-certainty through discussions of their values, beliefs, and unique characteristics may then lead to reduced anxiety when entering social situations as well a greater willingness to self-disclose should the opportunity arise.

Limitations and Future Research

Several limitations and areas of future research are worthy of mention. First, I examined my research questions in samples of North American undergraduate students who have lived in Canada for at least 5 years. Within this cultural context, the construct of self-certainty tends to be viewed as an important component of healthy identity development (e.g., Baumgardner, 1990; Donahue, Robins, Roberts & John, 1993; Erikson, 1950; McAdams, 2001). However, there is reason to suspect that self-certainty carries a different connotation in collectivist cultures in which contradictions within one's self-concept are both tolerated and encouraged (Peng, Ames & Knowles, 2001). For example, research has shown that individuals from East Asian cultures are less troubled by contradiction in their thoughts, behaviours, and personalities than individuals from North American cultures (Heine & Lehman, 1997) and also value the ability to flexibly adapt one's self to situational or role requirements (Suh, 2002). Within such cultures, duality is expected and accepted within all things, such that qualities such as strength and weakness, and good and bad are believed to exist simultaneously within the same object or event (Spencer-Rodgers, Peng, Wang & Hou, 2004). Based on this research, it is possible that the results from the present study would not generalize to participants from

collectivist cultures, for whom conformity to others' opposing views may not have the same deleterious effects on self-certainty and perceived arousal. In addition, manipulating self-certainty within the lab with participants from East Asian cultures may not have the same negative consequences on state social anxiety.

At present, it is unclear whether the results of the present study would generalize to individuals with a clinical diagnosis of SAD. It is also unknown how the results would apply to SAD with comorbid depression. As mentioned in the Introduction, individuals with both social anxiety and depressive symptomatology report significantly more negative self-related cognitions than individuals high in symptoms of social anxiety only (Ingram, 1989) and depression only (Bruch, Mattia, Heimberg & Holt, 1993). It is therefore possible that such individuals would be especially likely to engage in inauthentic self-disclosure as a means to hide or conceal aspects of themselves that they believe to be deficient or flawed. More research is needed on the way in which comorbid depression may interact with social anxiety symptoms to affect self-disclosure behaviours and self-certainty.

With respect to the designs of the three studies, my research utilized manipulations and measures that were psychometrically sound and based on past research. However, some of my measures were novel and, therefore, require replication. In Study 2, the design and script were created with the intent to enhance external validity by enhancing participants' desire to avoid making a bad social impression, much like in real world social encounters. At the same time, although requiring participants in the dishonesty condition to argue against their view rather than giving them a choice of which view to present enabled a clear and direct manipulation of their self-disclosure behaviour, doing so also prevented an examination of the self-disclosure behaviour that socially anxious individuals may spontaneously employ when interacting with

others who have disagreeing views. It is, therefore, an empirical question whether individuals high in social anxiety would, in fact, naturally conform to others' view by spontaneously taking on and speaking about others' views as if they are their own, or whether they would employ more subtle conformity tactics such as agreeing with others, nodding their heads, and/or remaining silent. Future studies may wish to alter the current manipulation in a manner that allows participants more choice in deciding *which* self-disclosure behaviours to employ when faced with a person who holds an opposing view.

With respect to measuring anxiety and perceived physiological arousal, my dissertation was also limited by its reliance on single-item outcome measures (the *SUDS* and *SAM*). I used the *SUDS* and *SAM* as measures of self-reported anxiety and arousal, respectively, due to their face validity, the ease with which they could be administered, and their convergent validity with other physiological and anxiety measures (e.g., Sloan & Kring, 2007); however, their reliability as single-item measures may not be as strong as other measures of affective experience such as the multi-item *Positive and Negative Affect Scale (PANAS)* (Watson, Clark, & Tellegen, 1988).

Finally, my dissertation was limited by the age and demographics of the samples for Studies 1, 2 and 3. All participants were undergraduate students with mean ages of 21.54, 19.70, and 19.76, respectively. Past theory and research (e.g. Adams, Abraham & Markstrom, 1987; Erikson, 1968) on the developmental progression of self-certainty suggests that when individuals reach adolescence they enter stages of identity such as foreclosure (committing to an identity without exploration), diffusion (no pursuit of identity), moratorium (actively exploring different identities), and achievement (actively exploring different identities and committing to one). It is possible that a proportion of the undergraduates in Studies 1, 2 and 3

were engaged in the moratorium stage and were, thus, particularly susceptible to alterations in their self-certainty. It remains unknown, therefore, whether individuals of older ages who perhaps have begun to solidify their unique identities would respond similarly to the studies' manipulations. Future research is needed to determine the influence of age on the causal associations between social anxiety, honesty of self-disclosure, and self-certainty.

Conclusion

The results from the present research have important implications for cognitive-behavioural and interpersonal conceptualizations of social anxiety and, perhaps, for its treatment.. Notably, they outline the difficult cyclical process within which individuals high in social anxiety may become fixated. Specifically, social anxiety may lead one to modify one's self-presentation by conforming in social situations in order to be liked or to avoid making a bad impression. However, this modification, in turn, may only serve to weaken one's own self-certainty while also leading one to feel anxious about being able to maintain one's "veil of conformity" in future interactions. This erosion of self-confidence may then feed back into social anxiety by further elevating symptoms, which, in turn, hampers authentic self-disclosures, perhaps by decreasing perceived clarity about how to use one's own skills, personality, and/or attributes to make a desired impression. When facing social situations, individuals high in social anxiety may try to protect themselves by holding back, hiding, or modifying their public selves; however, the results of the present studies suggest that although this may seem to them like a safe option, doing so may only serve to intensify the problem. In essence, they may be blending in at the cost of losing themselves. Such results help to elucidate the mechanisms by which the use of safety behaviours maintains social anxiety symptoms.

However, there is reason for optimism, as an awareness of this maladaptive cycle, and the mechanisms that perpetuate it, lends itself to possible interventions for treatment-seeking individuals high in social anxiety, such as those with SAD. Such individuals may benefit from a focus in cognitive behavioural therapy on honesty of self-disclosure in which conformity-related safety behaviours are identified and dropped during graduated exposures, and negative cognitions concerning hiding aspects of self are examined and challenged.

Further, a focus on honesty of self-disclosure could be incorporated into interpersonal therapies for SAD in which individuals are encouraged to examine the cyclical, reciprocal dynamic between themselves and their interaction partners. For example, it is possible that inauthentic disclosure across social interactions may result in inconsistent feedback from conversation partners, which may, in turn, lead to lower levels of self-certainty. In addition, research has also shown that individuals who are dishonest in their self-disclosures are rated as less likable by their interaction partners (Robinson, Johnson & Shields, 1995). Helping individuals with SAD understand the effect that their inauthentic self-disclosures have on others may then provide them with the rationale and motivation to try to eliminate these behaviours. Indeed, research has shown that helping participants with SAD to reduce idiosyncratic safety behaviours during a social interaction allows them to realize both the intrapersonal benefits (i.e., decreased anxiety) and interpersonal benefits (i.e., being more liked and positively regarded by partner) of doing so (Kim, 2005; Taylor & Alden, 2011).

For both cognitive behavioural and interpersonal therapies, facilitating an understanding of the benefits of disclosing honest views and opinions in terms of greater self-certainty may ultimately provide such individuals with the rationale and impetus to begin to engage more fully in social interactions.

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Appendices

Appendix A

SPIN

(Connor et al., 2000)

Please indicate from 0-4 how much the following problems have bothered you during the past week. Choose only one number for each problem, and be sure to answer all items.

- 0 = Not at all
- 1 = A little bit
- 2 = Somewhat
- 3 = Very much
- 4 = Extremely

1. I am afraid of people in authority.
2. I am bothered by blushing in front of people.
3. Parties and social events scare me.
4. I avoid talking to people I don't know.
5. Being criticized scares me a lot.
6. Fear of embarrassment causes me to avoid doing things or speaking to people.
7. Sweating in front of people causes me distress.
8. I avoid going to parties.
9. I avoid activities in which I am the centre of attention.
10. Talking to strangers scares me.
11. I avoid having to give speeches.
12. I would do anything to avoid being criticized.
13. Heart palpitations bother me when I am around people.
14. I am afraid of doing things when people might be watching.
15. Being embarrassed or looking stupid are among my worst fears.
16. I avoid speaking to anyone in authority.
17. Trembling or shaking in front of others is distressing to me.

Appendix B

General Disclosiveness Scale (GDS; Wheelless, 1978)

Please mark the following statements to reflect how you communicate with other people in general.

- 0 = Strongly Disagree
- 1 = Disagree
- 2 = Moderately Disagree
- 3 = Undecided
- 4 = Moderately Agree
- 5 = Agree
- 6 = Strongly Agree

Amount Subscale:

- I do not often talk about myself.
- My statements of my feelings are usually brief.
- I usually talk about myself for fairly long periods at a time.
- My conversation lasts the least time when I am discussing myself.
- I often talk about myself.
- I often discuss my feelings about myself.
- Only infrequently do I express my personal beliefs and opinions.

Positivity Subscale:

- I usually disclose positive things about myself.
- On the whole, my disclosures about myself are more negative than positive.
- I normally reveal "bad" feelings about myself.
- I normally express my "good" feelings about myself.
- I often reveal more undesirable things about myself than desirable things.
- I usually disclose negative things about myself.
- On the whole, my disclosures about myself are more positive than negative.

Depth Subscale:

- I intimately disclose who I really am, openly and fully in my conversation.
- Once I get started, my self-disclosures last a long time.
- I often disclose intimate, personal things about myself without hesitation.
- I feel that I sometimes do not control my self-disclosure of personal or intimate things I tell about myself.
- Once I get started, I intimately and fully reveal myself in my self-disclosures.

Honesty Subscale:

- *I cannot reveal myself when I want to because I do not know myself thoroughly enough.
- *I am often not confident that my expressions of my own feelings, emotions and experiences are true reflections of myself.
- I always feel completely sincere when I reveal my own feelings and experiences.
- My self-disclosures are completely accurate reflections of who I really am.

I am not always honest in my self-disclosure.

My statements about my own feelings, emotions, and experiences are always accurate self-perceptions.

I am always honest in my self-disclosures.

I do not always feel completely sincere when I reveal my own feelings, emotions, behaviours, or experiences.

*Items were removed from the honesty scale analyses because they pertained more to the construct of self-certainty than honesty of self-disclosure. Alpha of remaining six items = .85.

Appendix C

Self-Concept Clarity Scale

Please read the statements below and rate the extent to which you agree or disagree with each statement according to the following scale. Please only circle one number (1-5) on each statement.

1. My beliefs about myself often conflict with one another.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

2. On one day I might have one opinion of myself and on another day I might have a different opinion.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

3. I spend a lot of time wondering about what kind of person I really am.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

4. Sometimes I feel that I am not really the person that I appear to be.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

5. When I think about the kind of person that I have been in the past, I'm not sure what I was really like.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

6. I seldom experience conflict between the different aspects of my personality.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

7. Sometimes I think I know other people better than I know myself.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

8. My beliefs about myself seem to change very frequently.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

9. If I were asked to describe my personality, my description might end up being different from one day to another day.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

10. Even if I wanted to, I don't think I could tell someone what I'm really like.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

11. In general, I have a clear sense of who I am and what I am.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

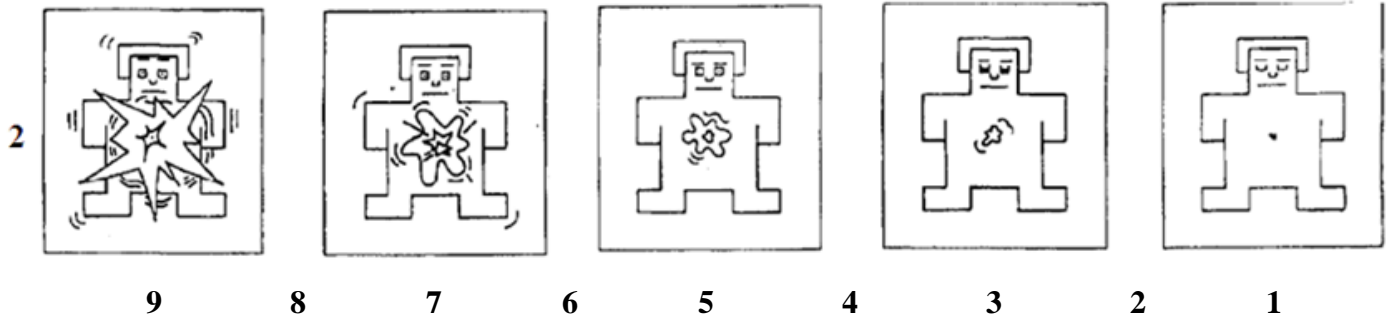
12. It is often hard for me to make up my mind about things because I don't really know what I want.

1-----2-----3-----4-----5
Strongly Disagree Strongly Agree

Appendix D

Self-Assessment Manikin Arousal Scale (SAM; Bradley & Lang, 1994).

Put an "X" *over* the box, or *between* the two boxes that best represents how anxious you currently feel.



Appendix E

SPS

(Mattick & Clarke, 1998)

Indicate the degree to which you feel each statement is characteristic or true of you:

- 0 = Not at all
- 1 = Slightly
- 2 = Moderately
- 3 = Very
- 4 = Extremely

1. I become anxious if I have to write in front of people.
2. I become self-conscious when using public toilets.
3. I can suddenly become aware of my own voice and of others listening to me.
4. I get nervous that people are staring at me as I walk down the street.
5. I fear I may blush when I am with others.
6. I feel self-conscious if I have to enter a room where others are already seated.
7. I worry about shaking or trembling when I'm watched by other people.
8. I would get tense if I had to sit facing other people on a bus or a train.
9. I get panicky that others might see me to be faint, sick or ill.
10. I would find it difficult to drink something if in a group of people.
11. It would make me feel self-conscious to eat in front of a stranger at a restaurant.
12. I am worried people will think my behaviour odd.
13. I would get tense if I had to carry a tray across a crowded cafeteria.
14. I worry I'll lose control of myself in front of other people.
15. I worry I might do something to attract the attention of others.
16. When in an elevator I am tense if people look at me.
17. I can feel conspicuous standing in a queue.
18. I get tense when I speak in front of other people.
19. I worry my head will shake or nod in front of others.
20. I feel awkward and tense if I know people are watching me.

Appendix F

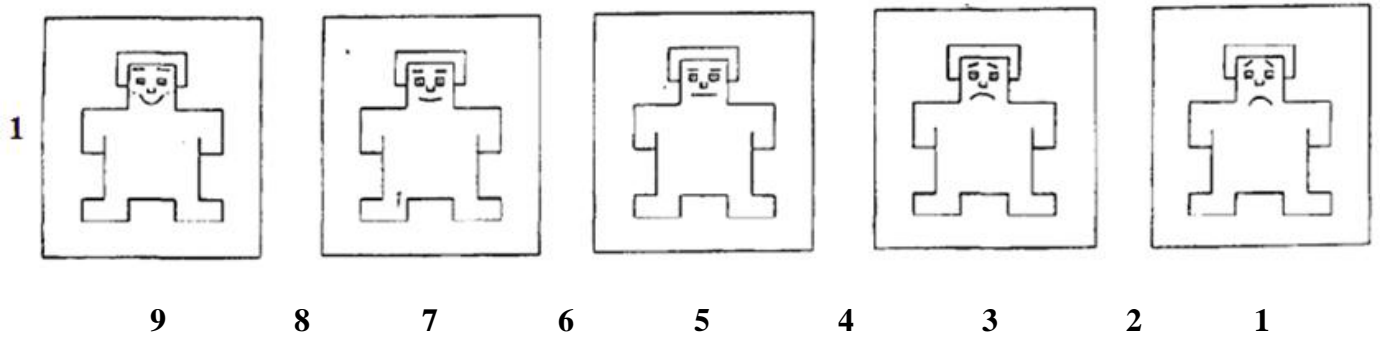
Please read the questions carefully and answer as honestly as you can....

- 1) Please rate how certain you currently feel about yourself and your personality on a scale from 0-100, where 0 = not at all certain, and 100 = extremely certain. _____
- 2) Please rate how sure you are of your own traits and attributes on a scale from 0-100, where 0 = not at all sure, and 100 = extremely sure. _____
- 3) Please rate how much you feel you currently know yourself on a scale from 0-100, where 0 = "I don't know myself at all" and 100 = "I know myself extremely well."

Appendix G

Self-Assessment Manikin Pleasure Scale (SAM; Bradley & Lang, 1994).

Put an "X" *over* the box, or *between* the two boxes that best represents how happy vs. unhappy you currently feel.



Appendix H

Participants' Self-Disclosure Scale (developed for study)

Please answer the following questions about your talk using the rating scale below:

- 0 = Not at all
- 1 = Slightly
- 2 = Moderately
- 3 = Very Much
- 4 = Extremely

- 1) How **much** did you talk about **yourself** (i.e. your own experiences rather than facts and observations about university in general)? _____
- 2) When you talked about yourself, how **detailed** were your descriptions? _____
- 3) When you talked about yourself, how **positive** were your descriptions? _____
- 4) When you talked about yourself, how much **positive emotion** did you express?

- 5) When you talked about yourself, how **negative** were your descriptions? _____
- 6) When you talked about yourself, how much **negative emotion** did you express?

- 7) When you talked about yourself, how **deep or intimate** were you? _____
- 8) How **hesitant** were you to share your **personal** experiences? _____
- 9) When you talked about yourself, how **authentic** (i.e. "real" or "genuine") were you?

- 10) How much did you **censor** information about yourself (i.e. how much did you stop yourself from saying things about yourself that came into your mind)? _____

Appendix I

Observers' Disclosure Scale (developed for study)

1) How **much** did the participant talk about **him/herself** (i.e. own experiences rather than facts and observations about university in general)?

- 0 = Not at all: (approx. little to no statements about self).
- 1 = Slightly: (approx. ¼ of the statements were about self).
- 2 = Moderately: (approx. ½ of the statements were about self).
- 3 = Very much: (approx. ¾ of the statements were about self).
- 4 = Extremely: (approx. all of the statements were about self).

2) When the participant talked about him/herself, how **detailed** were the descriptions?

- 0 = Not at all: (self-topics, on average, include zero or 1 detail).
- 1 = Slightly: (self-topics, on average, include 2-3 details).
- 2 = Moderately: (self-topics, on average, include 4-5 details).
- 3 = Very much: (self-topics, on average, include 5-6 details).
- 4 = Extremely: (self-topics, on average, include 6 + details).

3) When the participant talked about him/herself, how **positive** were the descriptions?

- 0 = Not at all: (approx. little to no positive statements).
- 1 = Slightly: (approx. ¼ of statements positive).
- 2 = Moderately: (approx. ½ of statements positive).
- 3 = Very much: (approx. ¾ of statements positive).
- 4 = Extremely: (approx. all of statements positive).

4) When the participant talked about him/herself, how **positive were his/her expressed emotions**?

- 0 = Not at all: (approx. little to no statements with positive tone).
- 1 = Slightly: (approx. ¼ of statements with positive tone).
- 2 = Moderately: (approx. ½ of statements with positive tone).
- 3 = Very much: (approx. ¾ of statements with positive tone).
- 4 = Extremely: (approx. all of statements had positive tone).

5) When the participant talked about him/herself, how **negative** were the descriptions?

- 0 = Not at all: (approx. little to no negative statements).
- 1 = Slightly: (approx. ¼ of statements negative).
- 2 = Moderately: (approx. ½ of statements negative).
- 3 = Very much: (approx. ¾ of statements negative).
- 4 = Extremely: (approx. all of statements negative).

6) When the participant talked about him/herself, how **negative were his/her expressed emotions?**

- 0 = Not at all: (approx. little to no with negative tone).
- 1 = Slightly: (approx. ¼ of statements with negative tone).
- 2 = Moderately: (approx. ½ of statements with negative tone).
- 3 = Very much: (approx. ¾ of statements with negative tone).
- 4 = Extremely: (approx. all of statements had positive tone).

7) When the participant talked about him/herself, how **deep or intimate** was he/she?
(See examples below for “deep” statements).

Expressions of Emotional Experience

Examples: “It really bugs me ...,” “It makes me sick when...,” “Boredom is one of my big problems.”

Expressions of opinions, preferences, and values

Examples: “I think that...,” “I like when...,” “It’s important to me that...”

Expressions of needs

Examples: “I demand a great deal of attention,” “I don’t feel too motivated to do much of anything.” “All I want is...”

Expressions of fantasies, dreams and/or hopes

Examples: I’ve wanted to be a doctor since I was 5-years old.” “I dream of the day when...”

Expressions of self-awareness

Examples: “I rationalize that by...” “That’s one my handicaps.” “It’s not a natural thing for me...”

- 0 = Not at all: (i.e. approx. little to no self-statements about *emotions, opinions, preferences, values, needs, fantasies, dreams, hopes, or self-awareness*).
- 1 = Slightly: (i.e. approx. ¼ of self-statements about *emotions, opinions, preferences, values, needs, fantasies, dreams, hopes, or self-awareness*).
- 2 = Moderately: (i.e. approx. ½ of self-statements about *emotions, opinions, preferences, values, needs, fantasies, dreams, hopes, or self-awareness*).
- 3 = Very much: (i.e. approx. ¾ of self-statements about *emotions, opinions, preferences, values, needs, fantasies, dreams, hopes, or self-awareness*).
- 4 = Extremely: (i.e. approx. all of self-statements about *emotions, opinions, preferences, values, needs, fantasies, dreams, hopes, or self-awareness*).

Appendix J

Self-Attribute Scale (Church et al., 2008).

For each attribute below, please circle a number indicate the degree to which each attribute describes you **in general**. Please answer honestly and record your first impression.

- 0 = does not describe me at all
- 1 = describes me slightly
- 2 = describes me moderately
- 3 = describes me very much
- 4 = describes me extremely well

Then, please rate how **certain** you are of each rating you made on the scale below.

- 0 = not at all certain
- 1 = slightly uncertain
- 2 = moderately certain
- 3 = very certain
- 4 = extremely certain

1. Talkative

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

2. Sympathetic

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

3. Organized

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

4. Relaxed

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

5. Creative

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

6. Extroverted

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

11. Bold

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

12. Generous

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

13. Hard-working

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

14. Self-confident

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

15. Intelligent

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

16. Energetic

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

17. Helpful

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

18. Thrifty (careful with money / resources)

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

19. Moody

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

20. Wise

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

21. Cheerful

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

22. Respectful

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

23. Sloppy

0-----1-----2-----3-----4
Does not describe Describes me
Me at all extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

24. Jealous

0-----1-----2-----3-----4
Does not describe Describes me
Me at all extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

25. Artistic

0-----1-----2-----3-----4
Does not describe Describes me
Me at all extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

26. Shy

0-----1-----2-----3-----4
Does not describe Describes me
Me at all extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

27. Selfish

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

28. Careless

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

29. Touchy

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

30. Open-minded

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

31. Quiet

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

32. Suspicious

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

33. Wasteful

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

34. Nervous

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

35. Talented

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

36. Reserved

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

37. Boastful

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

38. Lazy

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

39. Irritable

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

40. Shallow

0-----1-----2-----3-----4
Does not describe Me at all Describes me extremely well

0-----1-----2-----3-----4
Not at all Certain Extremely Certain

END
