

What Does Your Anxiety Mean About You?
Evaluation of Anxious and Confident Partners in Social Anxiety Disorder

by
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AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Individuals with social anxiety engage in maladaptive interpersonal transactional cycles. They expect others to respond negatively to them, and engage in socially undesirable behaviours that lead to their predictions being realized (Alden & Taylor, 2004). In exploring mechanisms underlying these expectancies, we previously found that participants high in social anxiety overvalue confidence as an indicator of interpersonal desirability. We hypothesized that this perception may exaggerate the perceived inferiority of the self as compared to confident others, thereby fuelling socially avoidant behaviour. The present study extended those findings by manipulating and studying social comparisons as a possible mechanism fuelling negative interpersonal expectancies. Participants with social anxiety disorder (SAD) and healthy controls (HCs) were randomized to watch a confederate (who was believed to be a fellow participant) deliver a speech in either a visibly anxious or confident manner. Participants then rated their perceptions of the presenter's desirability (i.e., the extent to which he possesses various desirable attributes) and their desire for future interaction with him. Subsequently, they were asked to compare themselves to the presenter before they delivered their own speeches. Participant speeches were subsequently rated by coders. We hypothesized that observable signs of anxiety and confidence displayed by potential social partners represent important indicators of social desirability and would moderate desire for future interaction amongst participants with SAD. Results suggest that all participants irrespective of social anxiety status judged the visibly anxious presenter as being less desirable and less interested in interacting overall. The more favourably participants rated the presenter's desirability relative to their own, the more they wished to interact with him in the future. Coders also rated participants with SAD as less desirable, and as less interpersonally warm than HCs. Thus, visibly anxious individuals may be judged by others as being less desirable in general (i.e., having less positive qualities or social currency), as less warm, and as less interested in interacting socially. On the other hand, confident individuals were seen consistently as more desirable, warm, pleasant, and appealing to interact with. As a result of this

favourable social standing and increased interpersonal options resulting from it, these individuals may therefore be viewed as being unattainable as social partners for individuals who are themselves visibly anxious. One implication of these findings is that socially anxious individuals may need help conveying interpersonal warmth and interest to potential social partners in order to allow such partners to see past the social anxiety and discover the positive qualities of the anxious individual. Theoretical and treatment implications of these findings to cognitive and interpersonal models of SAD are considered.

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Dedication

I would like to dedicate this work to four extraordinarily strong and courageous women who have been a source of inspiration in my life: Lilya, Sura, Zinaida, and Cynthia.

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Introduction

Social Anxiety Disorder

Social Anxiety Disorder (SAD) is one of the most prevalent psychological disorders, with a lifetime prevalence rate of approximately 12% (Kessler et al., 2005). It is characterized by persistent fear of one or more social situations that are avoided entirely or endured with high levels of distress (American Psychiatric Association, 2000). Individuals with SAD have been shown to experience significant difficulties related to their anxiety symptoms across several life domains, including school and work, social and romantic relationships, and overall quality of life (Stein & Kean, 2000). Given both the high prevalence and detrimental, impairing nature of SAD, significant research efforts have focused on understanding the cognitive and interpersonal factors contributing to the maintenance of SAD symptoms.

It is noteworthy that empirical studies examining cognitive and interpersonal processes in social anxiety have recruited both clinical samples of individuals with symptoms meeting diagnostic criteria for SAD, as well as analogue (typically, student) samples of individuals whose scores on self-reported measures of social anxiety (e.g., the *Social Phobia Inventory*, SPIN; Connor et al, 2000), resemble the scores obtained by clinical participants with SAD. While results of studies on clinical participants are more likely to be generalizable to individuals with SAD, these can be difficult to recruit. Thus, both recruitment approaches are common, and the data from both types of studies will be reviewed together. When discussing specific studies and their findings, the type of participants (clinical or analogue sample) will be specified.

Cognitive Models of Social Anxiety: Flawed Self and Inflated Social Threat

Clark and Wells' (1995) cognitive model was one of the earliest, seminal attempts to provide a complete cognitive account of the processes underlying and maintaining SAD.

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The model centered on the premise that individuals with SAD are motivated to make positive impressions on others, but due to a series of unhelpful beliefs about the self and others, feel unable to secure such impressions. As a result, a heightened sense of threat in social situations is activated. The threat is maintained by an increased perception of the probability and cost associated with being evaluated negatively by others (loss of status or worth, criticism, ridicule, or rejection), resulting in a constellation of cognitive, somatic, affective, and behavioural responses that maintain and exacerbate the perception of social threat, and make the individual appear less warm and friendly, thereby eliciting negative responses from others.

Clark and Wells (1995) emphasized the role of maladaptive assumptions and self-schemata in SAD, which serve to maintain the perception of social danger and strengthen the underlying beliefs that negative social outcomes are both probable and costly. They identified a number of classes of common beliefs reported by individuals with SAD, including excessively high self-standards for social performance (e.g., I must appear intelligent or witty), unconditional negative beliefs about the self (e.g., I am strange, odd, or peculiar), and conditional beliefs about social evaluation (e.g., if I show feelings or make mistakes, others will reject me).

The authors also emphasized the detrimental downstream effects of the heightened sense of social threat, including increased physiological arousal, attentional shift toward internal threat and environmental threat, and in-situation safety behaviours. All of these, according to the authors, negatively impact the ability of individuals with SAD to be successful in social tasks and drive them to avoid the negative interpersonal consequences that they fear. Safety behaviours are a broad class of behaviours that are used by anxious individuals to cope with the perception of imminent danger and minimize the perceived likelihood of feared outcomes (Salkovskis, 1991). In social anxiety, safety behaviours (e.g., attempting to conceal one's

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anxiety, limiting self-disclosure) have been implicated in maintaining symptoms (see Moscovitch et al., 2013). Clark and Wells (1995) identified two important reasons why safety behaviours might be problematic. First, they prevent the disconfirmation of the unrealistic beliefs about the feared behaviours and their consequences (e.g., someone who wears excessive makeup to hide her blushing due to the belief that blushing will lead to ridicule would not be able to disconfirm this belief without eliminating the makeup and determining whether ridicule ensues). As well, in some cases, safety behaviours actually lead to an exaggeration of the feared behaviour (e.g., grasping an object to hide shaking of one's hands may actually exaggerate the shaking). More recent research has also found that safety behaviours may have the additional impact of making socially anxious individuals feel more anxious and inauthentic during interactions, and as a result, come across as more distant, aloof, and cold (e.g., Plasencia, Alden, & Taylor, 2011).

In summary, Clark and Wells' model emphasized the role of maladaptive beliefs about the self and others, and one's perceived inability to achieve a positive impression on others, as the central maintenance processes in SAD, which have important downstream effects on affective responses and social and interpersonal behaviour. Following Clark and Wells (1995), Rapee and Heimberg (1997) further refined the cognitive understanding of SAD with their cognitive model. They emphasized the notion that socially anxious individuals, in their attempt to secure a positive appraisal from others, tend to form and maintain moment-by-moment mental representations of themselves as seen from the vantage point of their imagined evaluators in which they compare their in-vivo social performance with perceived audience standards. In theory, this heightened sense of self-awareness and appraisal of own performance may seem like a helpful way of monitoring one's social behaviour. Unfortunately, the perceptions of

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performance of individuals with SAD tend to be imbued with the individual's own negative, critical self-views and beliefs, and tend to reinforce the notion that one's performance is not measuring up to audience standards. In this way, these increase the perceived probability and catastrophic consequences of not measuring up to social standards, heighten the sense of social danger, and lead to behavioural, cognitive, and physical expressions of anxiety. One of the key additions of Rapee and Heimberg's (1997) model to the model proposed by Clark and Wells (1995) is the emphasis on the imagined audience and unattainable standards for social performance as two important factors that maintain high levels of social anxiety. The authors argued that in social situations, socially anxious individuals perceive themselves to be under constant scrutiny by a harsh and critical audience that possesses social standards that are utterly unattainable for the self. Rapee and Heimberg (1997) further argued that this audience, rather than being a true reflection of any real interaction partners or external standard, actually represents the projection of the socially anxious individual's own sense of inadequacy and inferiority. Nonetheless, this imagined sense of being scrutinized and judged negatively by an evaluative audience with unattainable standards is thought to propagate the experience of social anxiety.

These seminal models of SAD by Clark and Wells (1995) and Rapee and Heimberg (1997) have inspired a large number of studies and have generally garnered strong empirical support (for a review, see Morrison & Heimberg, 2013). They continue to serve as an important foundation for the current understanding of SAD. A more recent model by Hofmann (2007) further refined the cognitive conceptualization of SAD. One of the unique contributions of this model that is relevant to the current study is the notion that individuals with SAD perceive themselves to have little control over their own negative emotional response, and believe that

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their negative emotions are highly visible to others. The belief that one's negative, anxious feelings are highly visible to partners, as well as potential beliefs about the implications of displaying visible anxiety, may add to the perceived threat and sense of imminent social failure

Finally, in a recent model, Moscovitch (2009) reframed the notion of social threat in SAD from feared social situations to feared self-attributes that might become exposed and lead to ridicule, criticism, or social rejection. Moscovitch identified three domains of feared self-relevant attributes that individuals with SAD fear would come under scrutiny and lead to social mishaps. These are (1) perceived flaws in social skills and competence, (2) displaying visible anxiety, and (3) perceived flaws in physical appearance. The notion that participants with SAD hold negative beliefs about themselves was a premise shared among the cognitive models, but this model was unique in that it categorized the negative beliefs into the most common themes and proposed these self-attributes and associated beliefs as important, individualized ways to customize therapy according to each client's self-perceived flaws. Consistent with Hofmann (2007), Moscovitch argued that a substantial proportion of individuals with SAD are highly preoccupied with their perceived signs of social anxiety, and hold catastrophic beliefs about the likelihood and cost of their anxiety becoming visible to others.

To summarize, Clark and Wells (1995) introduced the notion that maladaptive beliefs about the self and others fuel the perception of threat in social anxiety. Rapee and Heimberg (1997) expanded on the earlier model by emphasizing socially anxious individuals' perceptions of an imagined critical audience and high, rigid perceived standards for social performance, which are thought to be projections of their own sense of inadequacy and inferiority, combined with a heightened sense of scrutiny, judgment, and unattainably high social standards. Hofmann (2007) contributed the notion of social transparency, suggesting that when individuals with SAD

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experience social anxiety, they believe this anxiety is out of their control, is readily observable to social partners, and is highly undesirable to others and likely to lead to feared negative outcomes (e.g., rejection). Finally, Moscovitch (2009) identified three classes of negative self-relevant flaws that individuals with SAD worry about revealing to others, including concerns about being socially incompetent, physically unattractive, and visibly anxious.

Informed by these seminal models of SAD, the current study was aimed at investigating the ways self-relevant beliefs and information about social partners interact to shape predictions and interpersonal behaviour. What about the self is seen as likely to elicit negative reactions in social partners, and is this equally true in all contexts? Displaying visible social anxiety has been a recurring theme across the cognitive models outlined earlier, and has been shown to be perceived by a large subset of individuals with SAD as being highly socially costly (e.g. Moscovitch & Huyder, 2011). Conversely, concealing anxiety is presumably seen by individuals with SAD as both important and productive, which motivates a class of safety-behaviours with this as the central aim. We sought to understand the impact of these beliefs about displaying visible anxiety and social confidence on interpersonal predictions and behaviour.

Specifically, we examined whether individuals with SAD uniquely appraise visible anxiety as being catastrophic, and confidence as being highly desirable. Perhaps confident social partners, by virtue of possessing the confidence that anxious individuals desire but lack, elicit a heightened sense of inferiority in individuals with SAD and heighten the sense of social threat and unattainable standards. Conversely, anxious partners may be appraised as more alike or on par with the self, less desirable, less threatening, and as having more attainable social standards. It seems worthwhile to compare these perceptions of standards to the actual standards held by nonanxious individuals (i.e., the typical “audience” likely to be encountered by those with SAD)

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and to examine how visible anxiety and confidence impacts actual liking or social rejection. It is noteworthy that because of the emphasis on interpersonal evaluations in this study, the focus of the present study was deliberately chosen to be signs of anxiety and social confidence that are visible to others, rather than the internal, subjective experience of anxiety and confidence. The specific methodology used in this study is described below.

Negative Self-Relevant Beliefs

Negative self-perception is identified as an important causal and maintaining factor for SAD across the cognitive models outlined (Clark & Wells, 1995; Hofmann, 2007; Leary & Kowalski, 1995; Moscovitch, 2009; Rapee & Heimberg, 1997). The notion that individuals with SAD see themselves as fundamentally flawed or deficient has received considerable research attention. Studies on this topic have consistently found that socially anxious individuals rate themselves less positively and more negatively as compared to individuals without social anxiety. For example, individuals with high levels of social anxiety or a clinical diagnosis of SAD have been shown to be negatively biased when rating their interpersonal performance on social tasks such as first encounters with unfamiliar others, overestimating the negative aspects of their performance as compared to the ratings of observers (e.g., Alden & Wallace, 1995; Stopa & Clark, 1993). Similar tendencies to rate the self negatively have emerged when individuals high in social anxiety have been asked to rate their more stable personality characteristics, such as physical attractiveness, quality of life and relationships, intelligence, and achievements (e.g., Moscovitch, Orr, Rowa, Gehring Reimer, & Antony, 2009; Wilson & Rapee, 2006).

Interestingly, negative self-relevant perceptions have been shown to persist regardless of whether a given interaction was objectively successful or unsuccessful (e.g., Alden & Wallace, 1995). However, when social interactions are experimentally designed to go particularly poorly,

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individuals with high levels of social anxiety have been shown to display additional biases, including biases in their interpretation of both the reasons for, and consequences of, these negative interactions. For example, Wilson and Rapee (2005) demonstrated that individuals high in social anxiety and those with a clinical diagnosis of SAD were more likely to attribute negative social events to negative, stable personality attributes in themselves, and were also more likely to believe that these events would have costly consequences and would result in negative evaluation by others. Surprisingly, even when interactions were ostensibly successful, individuals with high social anxiety were shown to attach more negative, anxious implications to these events, such as tending to doubt the veracity of the seemingly positive behaviours their partners displayed towards them (e.g., believing partners were only pretending to be interested in them to be polite), believing that others would expect more of them in future interactions as a result of the current performance, and believing that their social successes would be short-lived and inevitably followed by more negative events (e.g., Alden, Taylor, Mellings, & Laposa, 2008; Wallace & Alden, 1991; Wallace & Alden, 1997). In summary, negative biases in socially anxious individuals seem to extend beyond seeing the self in an exceedingly negative way and to encompass a series of interactive biases that negatively colour both their predictions and interpretations related to social encounters.

Interpersonal Perspectives on Social Anxiety: Inflated Standards

In addition to holding negative, exaggerated beliefs about the self, individuals with high levels of social anxiety have also been shown to have a number of other important biases relating to their beliefs and predictions about other people. For example, individuals with high levels of social anxiety have been shown to believe that others hold unreachable or overly rigid social expectations, standards that the self is seen as being unable to fulfill (Clark & Wells, 1995;

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Hofmann, 2007; Schlenker & Leary, 1982). Interpersonal writers have written extensively on the central tension in social anxiety between the desire to make positive social impressions and be evaluated positively by others, and the lack of efficacy or perceived ability of the self to fulfill this goal. This tension is thought to lead socially anxious individuals to enter social encounters expecting negative social outcomes and behave in self-protective ways aimed at reducing negative interpersonal outcomes. Alden & Taylor (2004), for example, have identified *maladaptive interpersonal transactional cycles* in SAD, wherein individuals with SAD enter social situations predicting and expecting negative outcomes (e.g., “I will come across as socially incompetent and be rejected”). According to these authors, such negative beliefs paradoxically make socially anxious individuals behave in ways that increase the likelihood of negative interpersonal evaluations (e.g., “trying too hard” to portray a desirable but inauthentic self to social partners in an effort to gain approval, or concealing aspects of the self by behaving distant or limiting disclosure). A substantial body of work supporting these ideas has emerged. For example, two earlier studies by Alden and Wallace (Alden & Wallace, 1991; Wallace & Alden, 1991) showed that individuals high in social anxiety experienced higher levels of discrepancy between the perceived social standards they were aiming to meet, on the one hand, and their perceived ability or efficacy in meeting those standards, on the other. This discrepancy, in turn, led to a higher perception of social threat and higher levels of subsequent withdrawal from the interaction. Other studies have also provided support for the idea that social threat motivates unhelpful behaviours (e.g., safety behaviours), and that these behaviours contaminate social interactions by maintaining or increasing anxiety over the long term, eroding the felt sense of authenticity and reducing self-concept clarity (e.g., Orr & Moscovitch, 2015). Safety behaviours have also been shown to elicit negative evaluation by social partners, who rate individuals using

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them as being less warm and less similar to the self; moreover, these partners also report more negative emotions during interactions with socially anxious individuals who use safety behaviours, ultimately reducing overall connectedness and resulting in less liking and higher rates of rejection of such individuals (e.g., McManus, Sacadura, & Clark, 2008; Placencia et al., 2011; Rowa et al., 2015; Voncken, Alden, Bögels, & Roelofs, 2008).

Given the central role in social anxiety of the perceived discrepancy between the demanding standards of the social world and one's ability to meet these standards, experimental studies have been designed to further clarify this standards-ability discrepancy. To this end, a small number of studies have suggested that individuals with higher levels of social anxiety perceive others to hold unreachable (high or overly rigid) standards for interpersonal performance both for themselves and for others (e.g., Moscovitch & Hofmann, 2007; Moscovitch, Rodebaugh, & Hesch, 2012). For example, in one study in which participants imagined themselves and others committing common social blunders, researchers found that individuals with high social anxiety rated the interpersonal costs of fairly common blunders as considerably higher than those without social anxiety, regardless of whether it was the self or another person committing the blunder. These findings suggest that imagined costs were primarily driven by the perceived consequences of violating social standards or norms, seemingly irrespective of whether the person violating such standards is believed to have high or low levels of "social currency." Conversely, several studies have shown that individuals with high social anxiety believe that they will fall short of standards not because standards are viewed as unreasonably high but because certain qualities inherent to *themselves* make failing to reach others' standards particularly likely, including lacking the skills or personality attributes that are desired by their partners. As a result of these stable, global shortcomings, individuals with high

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levels of social anxiety perceive themselves as particularly likely to fall short and to elicit negative responses from partners (e.g., Alden, Bieling, & Wallace, 1994; Moscovitch, Waechter, Bielak, Rowa, & McCabe, 2015; see also Moscovitch, 2009; Wallace & Alden, 1991).

Social Skills Deficits

One important question that follows from this research is whether this perception of inferiority that is held by individuals with high social anxiety reflects some realistic shortcoming in social skills or personality, or whether it is more indicative of a negative bias in self-perception that is not truly reflective of reality. Some studies have suggested that individuals with high social anxiety do tend to come across as less socially skilled as compared to those without social anxiety (e.g., Baker & Edelman, 2002; Stopa & Clark, 1993; Thompson & Rapee, 2002; Voncken, Alden, & Bögels, 2006; Voncken et al., 2008, Voncken, Dijk, de Jong, & Roelofs, 2010). However, cognitive behavioural theorists have suggested that individuals with high social anxiety generally possess the abilities needed to perform successfully in social interactions, but that their use of these skills is hindered or inhibited by their preoccupation with perceived expectations (or standards) of others, shortcomings of the self, and the perceived costs of falling short of perceived standards (see Hofmann, 2007; Rapee & Heimberg, 1997). Supporting these claims, a prominent study by Rapee and Lim (1992) examined the differences between self and audience ratings of a short speech task by individuals with SAD and controls. Rapee and Lim (1992) found that, while there were no differences in the observer rating of the performance on the task by individuals with SAD and controls, individuals with SAD rated themselves as having performed significantly worse than controls. More recent studies on the topic (e.g., Inderbitzen-Nolan, Anderson, & Johnson, 2007; Norton & Hope, 2001) have suggested that individuals with SAD do not, in fact, perform as well as controls on social tasks,

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but that they also display additional negative biases in their self-evaluations, underestimating their own performance on these tasks to a degree that exceeds actual performance deficits. These studies suggest that both objective social deficits and negative biases in self-evaluation impact the cognitions, performance, and social outcomes of individuals with SA, and raise additional questions regarding the ways in which these two processes interact.

Safety Behaviours and their Consequences

Related to the mixed literature on social skills deficits in social anxiety, there is now a considerable, fairly consistent body of empirical support for the notion that beliefs about the likelihood of interpersonal failure or rejection motivate the use of subtle avoidance or self-concealment behaviours in social situations (e.g., failing to show adequate warmth, limiting self-disclosure), which in turn make socially anxious individuals seem less warm, interested, and approachable and therefore less desirable to others as social and relational partners (Rowa et al., 2015; see review by Alden & Taylor, 2004). To further understand these behaviours, a recent study by Plasencia, Alden, and Taylor (2011) examined the various types of safety behaviours that individuals with SAD display while engaging in a social interaction. These researchers demonstrated that socially anxious participants' use of safety behaviours that functioned as avoidance strategies (e.g., avoiding eye contact, deliberately appearing distant) were associated with higher levels of rejection by social partners (i.e., lower ratings of desire for future interaction) than safety behaviours aimed at impression management (i.e., acting overly agreeable). These findings provide support for the notion that self-protective strategies presumably aimed at distancing and protecting the self from negative partner responses may actually facilitate the occurrence of these feared partner responses, and add to a growing literature on the negative affective, cognitive, and interpersonal consequences of self-

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concealment in social anxiety (see also Moscovitch et al., 2013; Orr & Moscovitch, 2015). It is noteworthy that in the study by Plasencia et al. (2011), safety behaviours that were aimed at impression management did not result in negative interpersonal consequences. Clearly, appearing distant or attempting to conceal aspects of the self is significantly more interpersonally costly than attempting (albeit not in a completely genuine way) to be interested, engaged, or agreeable.

A study by Voncken et al. (2008) provides further insight into why self-protective safety behaviours may have detrimental consequences on partner perceptions and responses. Voncken and her colleagues asked confederates to rate the social performance of individuals with and without SAD, the emotions that interacting with the participant evoked in them, the perceived similarity between themselves and the participant, and the level of desire for future interaction with the participant. Findings indicated that, when collapsing across the entire sample of individuals with SAD and HCs, higher levels of self-reported social anxiety symptoms were associated with poorer performance in the interaction task, elicited more negative emotions in the confederate, led to the participant being perceived as more dissimilar to the self, and ultimately led to lower ratings of desire amongst confederates for future interaction with the participant (i.e., social rejection). It seems possible that when individuals with SAD engage in self-protective strategies, especially those oriented at concealing the self or certain perceived shortcomings, social partners may be able to detect that their social partner is not being totally present in the interaction. This appears to make the interaction less rewarding and positive for partners, leading them ultimately not to desire continued interaction with the socially anxious individual.

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In sum, while the extant research suggests that there may indeed be underlying social skills deficits in some socially anxious individuals contributing to these individuals doing more poorly on both performance (e.g., Rowa et al., 2015) and interaction social tasks in the lab, and having less satisfaction with their own friendships (Rodebaugh, 2009; Rodebaugh et al., 2012), a more consistent feature among individuals with SAD is a general class of beliefs about unattainable social standards and one's own inability to measure up, which result in the use of social avoidance and self-protective behaviours. Ironically, these behaviours are, at least in part, responsible for increasing the likelihood of these same feared outcomes (e.g., interpersonal rejection) -- a pattern of results that has been demonstrated across a large number of studies (Alden & Bieling, 1998; Heerey & Kring, 2007; Meleshko & Alden, 1993; Moscovitch et al., 2013; Papsdorf & Alden, 1998; Plasencia et al., 2011; Wenzel, Graff-Dolezal, Macho, & Brendle, 2005). It is crucial to understand whether there are partner characteristics that make individuals with SAD particularly likely to employ these self-jeopardizing self-concealment strategies, and to help clients identify partner characteristics and social behaviours that are likely to facilitate a positive interpersonal experience.

Psychoevolutionary Models of Social Anxiety: Social Rank and Affiliation

There have been significant efforts over the past three decades to understand the psychoevolutionary origin and purpose of social anxiety. The bulk of this research has focused on the two central systems governing social behaviour in both humans and animals which are thought to maintain social order: the *rank system* and the *affiliation system*. The rank, dominance, or power system governs cues related to relative rank, power, and control within interpersonal interactions. Conversely, the affiliation system is sensitive to displays of intimacy, reciprocity, and belonging. These two orthogonal attributes of warmth (or affiliation) and

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dominance comprise the interpersonal circumplex model of personality (Leary, 1957), and can be used to describe individual interpersonal behaviours and global interpersonal tendencies (e.g., Alden, Wiggins, & Pincus, 1990; Trower & Gilbert, 1989). Both the dominance and affiliation system are thought to be implicated in the experience and maintenance of social anxiety.

An early psychoevolutionary model of social anxiety was put forth by Trower and Gilbert (e.g., Trower & Gilbert, 1989). In this model, the experience of socially anxious individuals was described as consistent with the experience of low-ranked members of an animal hierarchy (e.g., primates). They describe social threat as a perception or awareness of oneself as being low in the social hierarchy, and thus being constantly ready to be on the receiving end of hostility or dominant gestures from more dominant members of the group. Individuals with social anxiety, much like low-ranked members of an animal hierarchy, engage in social interactions under a heightened state of threat, and must be ready to engage in submissive behaviours (e.g., acting overly agreeable, avoiding eye contact) or escape in order to avoid harm at the hand of others, who are often perceived as dominant (and potentially hostile). Indeed, the notion that individuals with social anxiety are particularly sensitive to cues related to social rank and dominance, and less attuned to cues related to safety, warmth and affiliation, has gained considerable support (e.g., Gilboa-Schechtman, Foa, & Amir, 1999; Hope, Sigler, Penn, & Meier, 1998; Weeks, Heimberg, & Heuer, 2011). Aderka, Weisman, Shahar, and Gilboa-Schechtman (2009) recently found evidence that perceptions of oneself as having a low social rank lead to increased levels of social anxiety as well as subsequent depression. Weeks, Rodebaugh, Heimberg, Norton, & Jakatdar, (2009) tested the notion that an overarching class of cognitions related to submissive social rank was related to and predictive of both social anxiety and depressive symptoms. Indeed, they found support for a mediation model in which

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submissive cognitions mediated the relationship between social comparisons and submissive behaviours. It appears, then, that social comparisons, particularly upward comparisons, might be a crucially important source of social information that triggers a broad schema of beliefs and appraisals of the self as inferior and submissive, which then feed increased submissive behaviours. In sum, there is an emerging body of research support for the notion that socially anxious individuals are particularly attuned to and concerned with cues related to social rank or dominance, perceive themselves as holding an inferior and tenuous social position, and respond consistently in a submissive manner to social partners (e.g., Cain, Pincus, Holforth, 2010; Hope et al., 1998; Weeks et al., 2009).

There is also a growing body of research emerging in support of the notion that in being preoccupied with social rank and power and threats to their already tenuous social standing, individuals with higher levels of social anxiety are both less sensitive to detecting cues of warmth or affiliation in others and less likely to convey warmth in their own actions (e.g., Cain et al., 2010; Rodebaugh et al., 2015; see review by Gilboa-Schechtman & Shahar-Lavie, 2013). Although there is support for the notion that individuals with high levels of social anxiety come across as less warm or more cold than those without social anxiety, it has also been widely established in the interpersonal literature that behaviours conveying warmth are conducive to relationship initiation and maintenance. In fact, the interpersonal quality of extraversion (often conceptualized as a combination of warmth and dominance) primarily relates to the formation of positive early impressions (Borkenau, Brecke, Mötig, & Paelecke, 2009), while the quality of agreeableness (warm submissiveness) is thought to contribute to longer-term liking, the maintenance of relationships and relationship satisfaction (Wortman & Wood, 2011). Thus, the interpersonal style of individuals with social anxiety, which is typically cold and submissive (and

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less frequently, cold and hostile, see Cain et al., 2010), can be perceived as being lower on extraversion and somewhat lower on agreeableness (for a review, see Levinson, Kaplan, & Rodebaugh, 2012), and may place individuals with social anxiety at a considerable disadvantage both in forming positive initial impressions and in their ability to maintain and enhance existing relationships.

Social Comparisons

Given the careful attention paid by individuals with high social anxiety toward social rank information and threats to their social status, potentially at the expense of being aware of or displaying important interpersonal cues related to affiliation (see Gilboa-Schechtman & Shahar-Lavie, 2013), it is worthwhile to consider what information individuals high in social anxiety use to determine their social rank or status. What specific cues do these individuals consider in order to conclude that they are inferior and must therefore act submissively to avoid negative social consequences, and is this conclusion equally likely regardless of social context? The relevant information is likely to be elicited through observing the self and others, and sizing oneself up relative to other members of the social group through the process of social comparisons. Social comparisons are evaluations of the self relative to one or more other people based on a given domain (Festinger, 1954). Psychologists have long argued that people gain important information about themselves and the world through observing others (e.g., Festinger, 1954; Morse & Gergen, 1970). Leary, Tambor, Terdal and Downs (1995) described self-esteem, or an individual's appraisal of the worth of the self, as being intimately related to the perceived evaluation of the worth of the self by others. Some have argued (e.g., Leary & Baumeister, 2000) that self-esteem is seen as an interpersonal gauge or "sociometer" that is sensitive to the degree to which an individual is valued by others. According to this view, under conditions of relational

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devaluation, a sense of threat or distress (expressed as increased feelings of social anxiety) serves as an alarm signal to trigger a change in behaviour that is designed to restore or protect the individual's relational value. Social anxiety and depression are both viewed as possible downstream products of such unfavourable activation of the sociometer (Baumeister & Tice, 1990; Leary & Kowalksi, 1995).

Social comparisons appear to be one important way in which information about the self, others, and others in relation to the self are collected and integrated. Social comparison processes have received considerable theoretical and empirical attention, and are thought to be universal and fundamental processes within human social behaviour (e.g., Gilbert, Price, & Allan, 1995). Researchers have studied social comparisons that occur in individuals' daily lives using a combination of daily diaries (e.g., Wheeler & Miyake, 1992), self-report measures (e.g., *Iowa-Netherlands Comparison Orientation Measure*; Gibbons & Buunk, 1999), and, somewhat more infrequently, experimental tasks in which salient social comparison information (e.g., participants' and others' scores on a test) is offered to participants and their preferences in selecting and using this information are studied (e.g., Gibbons et al., 2002).

In the context of social comparisons in nonclinical samples, one robust finding is that downward comparisons – i.e., ones in which the self is seen as superior to a target - have positive impact on anxiety and mood. It is not surprising, then, that individuals who are feeling threatened or uncertain in some way have been shown to be more motivated to seek and engage in downward comparisons. Importantly, this comparison behaviour has been shown to be helpful in alleviating negative affect (e.g., Gibbons, 1986; for a review of this literature, see Buuk & Gibbons, 2007). Conversely, it has also been shown that the tendency to engage in upward comparisons, or comparisons in which the self is seen as inferior to others, is associated with

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dysphoric mood, low self-esteem, and depression, with its negative effects on self-concept demonstrated to be long-lasting (Ahrens & Alloy, 1997; Butzer & Kuiper, 2006; Giordano, Wood, & Michela, 2000; Gibbons & Gerrard, 1989; Lockwood & Kunda, 1997; Wheeler & Miyake, 1992; Wood, 1989; see Major, Testa, & Bylsma, 1991, for a detailed review).

A consistent difference between individuals with low self-esteem and dysphoria and those with higher self-esteem has been found in their tendency to engage in upward versus downward social comparisons. Many studies have found that individuals with low self-esteem, rather than seeking out and engaging in downward comparisons in order to experience the uplifting impacts on mood of such comparisons, are more likely to engage in upward comparisons that maintain their negative self-esteem and depressive cognitions (e.g., Swallow & Kuiper, 1988; see review by Wood & Lockwood, 1999). In a review, Wood and Lockwood offered a number of potential motivations underlying social comparisons: (a) self-evaluation (attempting to resolve the uncertainty about the position of the self relative to others), (b) self-validation (seeking individuals who are similar to the self to compare to), (c) self-protection (attempting to avoid awareness of one's flaws), and (d) self-deprecation (seeking evidence consistent with negative self-relevant schemata), and (e) self-enhancement (seeking evidence for a favourable evaluation of the self). Based on the pattern of social comparisons observed in high and low self-esteem individuals, the authors reasoned that while healthy individuals are more likely to use social comparisons for self-enhancement motives, individuals with low self-esteem and depression tend to use comparisons for self-evaluation, self-validation, and self-deprecation. These authors highlighted the notion that individuals generally have a wide range of available targets with whom to compare at any given time (e.g., close others, colleagues, people on the street, the media). It is likely, then, that individuals are systematic in (though perhaps not

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completely aware or in control of) the choices they make in terms of whom to compare themselves to, and that these choices have considerable impact on the outcome of comparisons as well as downstream impact on mood and self-concept.

While social comparisons have received considerable attention in the context of self-esteem and depression, the literature on social comparisons in social anxiety has remained surprisingly modest, particularly in light of the theoretical and empirical overlap between the concepts of social anxiety, self-esteem, and depression, as well as the psychoevolutionary motivations for competition and social comparison in social anxiety. One exception was a seminal diary study of social comparisons in SAD that was conducted by Antony, Rowa, Liss, Swallow, and Swinson (2005). These researchers used a diary paradigm based on Wheeler and Miyake's (1992) *Rochester Social Comparison Diary*, a measure that allows participants to track social comparisons occurring in their daily lives. Participants in this study were instructed to write about situations in their daily lives in which they engaged in social comparisons, and to indicate the dimensions across which they were comparing themselves and what their perceived standing was on these dimensions compared to the individuals to whom they were making these comparisons. Consistent with predictions, Antony et al. (2005) found that individuals with SAD engaged in more frequent social comparisons, especially upward comparisons with others across a variety of domains (most commonly including intelligence, appearance, and quality of relationships), and that these comparisons resulted in state increases of anxiety and dysphoric mood. Thus, Antony et al.'s (2005) study supported the notion that individuals with SAD are highly motivated to compare themselves to others, and that their comparisons often result in the self being seen as inferior and in significant negative affective consequences.

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In another relevant study, Aderka, Weisman, Shahar, and Gilboa-Schechtman (2009) asked a nonselected sample of women about their perceptions of social rank, attachment, social anxiety and depression. The group found support for a hypothesized mediational model wherein perceptions of the self as having low social rank contributed to elevated social anxiety, which, in turn, was associated with increased symptoms of depression. In a related study by the same group, Weisman, Aderka, Marom, Hermesh, and Gilboa-Schechtman (2011) examined self-reported measures of social rank, types and quality of relationships, as well as mood and anxiety symptoms, in four groups of participants: Individuals with SAD and comorbid depression, individuals with SAD without comorbid depression, individuals with other anxiety disorders and depression, and healthy controls. Weisman and colleagues used self-report measures to demonstrate that individuals with SAD tend not only to perceive themselves as being inferior to others overall, but also as having inferior interpersonal relationships (i.e., having lower intimacy and closeness) in comparison to nonanxious controls. Furthermore, given the diversity of their sample, these researchers were able to demonstrate that the tendency among participants to perceive the self and their relationships as being inferior to those of others were distinctly associated with social anxiety, over and above the impact of symptoms of depression.

Experimental Manipulation of Social Comparisons

While these studies have contributed greatly to the present understanding of social comparisons in social anxiety, there are many questions that remain unanswered. In particular, do upward comparisons elicit different appraisals, emotional reactions, and behaviour from socially anxious individuals in social interactions than same-level or downward comparisons? Antony et al. (2005) and Weisman et al. (2011) have advanced the current understanding of social comparisons in social anxiety through studying naturalistic social comparisons. A recent

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study by Mitchell and Schmidt (2014) experimentally manipulated and studied social comparisons in an analogue sample of students high vs. low in social anxiety by assigning participants to compare themselves to an experimentally manipulated vignette describing either a high or typically achieving fellow student. The authors found that individuals with higher levels of social anxiety who compared themselves to a high performing student (as compared to an average student) engaged in more negative self-appraisals of their own personality and signs of anxiety. On the other hand, the comparison manipulation did not seem to impact self appraisals of individuals low in anxiety. This study was the first that experimentally manipulated social comparisons to examine how individuals with high and low levels of social anxiety may differ in the ways they are impacted by such comparisons. One important limitation of this study is the use of a student sample, which may limit the generalizability of the findings to clinical populations.

Present Study

The aim of the current study was to advance emerging understanding of social comparisons in social anxiety and their downstream impact on predictions and behaviour. It was predicted that the extent to which socially anxious individuals view themselves as being inferior or unable to “measure up” to their interaction partners directly impacts their interpersonal predictions of how their partner might react to them, with upward comparisons resulting in negative expectancies and predictions (see Leary, Kowalski, & Campbell, 1988; Strauman & Higgins, 1987; Wallace & Alden, 1991). While a variety of self flaws or perceived shortcomings likely contribute to negative appraisals and upward comparisons amongst individuals with SAD that they are unlikely to make the desired impression on social partners (e.g., see Moscovitch, 2009), there is some evidence to suggest that information related to the level of anxiety or

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confidence displayed by the self and others may be one particularly important moderating factor in guiding interpersonal predictions about interactions with specific partners. This view is supported by the writings of Mussweiler and Strack (2001) who argued that social comparisons are likely to occur when particular types of self-knowledge becomes salient. In social situations, individuals with social anxiety are highly internally focused on their own anxious cognitions and physical sensations, and may therefore seek to contrast this experience with those around them. They are also likely to make attributions about what their anxiety means about them, and what anxiety (or its apparent lack as in visible confidence) means about others. Consistent with this, socially anxious individuals have been shown in several studies to treat visible anxiety (or confidence) of new social partners as highly informative in predicting other attributes about an individual. For instance, in one study (Purdon, Antony, Monteiro, & Swinson, 2001), undergraduate participants with high or low levels of social anxiety were asked to reflect on how visible anxiety symptoms displayed by another person would affect their impressions of that person. In this study, individuals with high social anxiety attributed harsher judgments to individuals with observable symptoms of anxiety in social situations, such as perceiving them as having less strength of character and attractiveness as compared to the appraisals provided by participants with low levels of social anxiety. Similarly, Roth, Antony, and Swinson (2001) asked individuals with SAD and healthy controls to indicate how they tended to interpret anxiety symptoms (e.g., sweating, trembling, blushing) displayed by others, and how such symptoms were interpreted by others when they themselves displayed them. Results demonstrated that individuals with SAD tended to believe that others appraise the display of social anxiety symptoms as being more abnormal or indicative of severe anxiety or a psychiatric condition, rather than perceiving these to be normative experiences (Roth, Antony, & Swinson, 2001).

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Additional support for the potentially key role of appraisals and comparisons related to what it means to display social anxiety or confidence comes from the psychoevolutionary account of social anxiety. As described above, this account emphasizes that the socially anxious individual, like any lower-ranking member within the animal hierarchy, perceives him or herself as inferior and submissive. Consequently, this individual is likely to experience anxiety due to being in a state of perpetual readiness to respond to threat, and is constantly preoccupied with scanning the environment for threat cues. From this perspective, it seems likely that socially anxious individuals must use certain schema to guide their decisions about whether another member of the pack is likely to be dominant, hostile, and potentially threatening to them. The psychoevolutionary models of social anxiety emphasize that the “reptilian brain” (e.g., limbic system) – i.e., the less sophisticated, older parts of the brain that is shared throughout the animal kingdom – might be important for this task, since it is highly attuned to competitive acts and identifying and responding to potential threat (e.g., see Trower & Gilbert, 1989). In support of this view, more recent theories that have linked cognitive and psychoevolutionary models of social anxiety (e.g., Weeks et al., 2009) place a central, causal role on upward social comparisons in triggering a class of submissive cognitions which contribute to the experience of social anxiety, depression, and self-protective behaviours such as social withdrawal.

It appears, therefore, that threatening appraisals generated through social comparisons may be of crucial and even causal importance in the progression and maintenance of social anxiety symptoms. Taken together, there appears to be a maladaptive cycle wherein socially anxious individuals hold negative self-relevant beliefs and believe themselves to be inferior to others around them. On the basis of these beliefs, they also expect and predict negative social outcomes such as rejection or exclusion (much like the low-ranked member of an animal

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hierarchy). This expectancy creates a heightened sense of threat during social interactions, and impedes actual social success. Importantly, it appears that individuals high in social anxiety may then appraise their own anxious cognitions, sensations, and behaviours as further evidence of their own inferiority and inadequacy. Further understanding this last component within the negative interpersonal cycle was one of the major aims of the current study: What appraisals do individuals with SAD make about what it means to display anxiety (and confidence), and how do these differ from the appraisals about anxiety and confidence made by healthy individuals?

Given the seeming importance of upward social comparison information to fuelling these cycles and maintaining anxiety, a central remaining question underlying the current study is how social comparison processes integrate salient information across self-relevant beliefs (e.g., that one's anxiety is obvious to others and signals inferiority and weakness) and partner-relevant observations (i.e., seeing anxious or confident cues in social partners and appraising the meaning of these displays of anxiety or confidence). Under what circumstances does this information signal relative threat or safety in specific social interactions, and what kind of impact do such self-other comparisons have on predictions and interpersonal behaviour?

If the presence of visible symptoms of anxiety is indeed seen as being particularly meaningful in the eyes of those with higher levels of social anxiety, an interesting question that follows is whether the absence of anxiety (or the presence of social confidence) is also seen as especially meaningful or informative in the eyes of those with social anxiety. With the exception of the 2013 study conducted by Bielak and Moscovitch (2013), no prior studies have examined the impact of observable social confidence (in addition to observable anxiety) on interpersonal evaluations and predictions in socially anxious participants. The study conducted by Bielak and Moscovitch (2013), was designed to determine whether individuals with high social anxiety

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differed from those low in social anxiety with respect to their appraisals of visibly anxious and visibly confident partners. Female undergraduate participants who were preselected as being either high ($n = 60$) or low ($n = 59$) in trait levels of social anxiety read a series of two vignettes describing a first encounter with an unfamiliar male student. In the first vignette, the male partner's anxiety or confidence was left ambiguous, whereas in the follow-up vignette he was described as being either visibly anxious or confident. Participants were randomly assigned to one condition or the other. Participants provided ratings of the partner across five desirable characteristics (intelligence, happiness, strength of character, ambition, and achievements) before and again after receiving information indicating that the partner was either anxious or confident. Consistent with hypotheses, results supported the notion that socially anxious individuals' evaluations of social partners were not entirely top-down or schema-driven but were, rather, quite sensitive to the presence of unambiguous cues signifying that interaction partners were either anxious or confident.

In the anxious partner condition, all participants judged the visibly anxious partner as being significantly less desirable relative to baseline ratings. Contrary to hypotheses, however, participants high in social anxiety did not perceive the anxious partner as being even less desirable than participants low in social anxiety. While these findings failed to replicate previous findings in which socially anxious participants tended to perceive the display of anxiety as more costly than non-socially anxious participants (e.g., Purdon et al., 2001; Roth et al., 2001), these results did mirror those of several other studies in which participants both high and low in social anxiety were shown to be similarly harsh in judging individuals who disclosed or displayed symptoms of anxiety within the social context (Ashbaugh, Antony, McCabe, Schmidt, & Swinson, 2005; Gee, Antony, Koerner, & Aiken, 2012). Irrespective of their own social anxiety

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status, participants tended to negatively judge others who appear nervous during social interaction.

When social partners were depicted as being visibly confident, the desirability ratings reported by participants high in social anxiety increased significantly from baseline to postmanipulation (for both the composite Desirability Index and the individual attributes). In contrast, desirability ratings provided by participants low in social anxiety did not significantly change from baseline to postmanipulation for any of the attributes (with the exception of character strength). This pattern was interpreted as indicating that individuals with high levels of social anxiety have an idealized view of interpersonal confidence. Their tendency to associate social confidence with exaggerated worth across other (ostensibly unrelated) personal attributes may help to explain why socially anxious individuals typically compare themselves so unfavorably with potential or imagined social partners in their day-to-day social interactions (e.g., Antony et al., 2005). In contrast, participants low in social anxiety are probably aware from their own personal experiences and observation of others that visible social confidence is not necessarily perfectly predictive of one's standing in other domains, such as character strength or ambition. Socially anxious individuals, however, may jump to positively biased conclusions about confident others because they do not have access to contradicting information from their own personal experiences, and only aspire to be more like these confident counterparts. Thus, potential interaction partners who appear confident may be viewed by socially anxious individuals as being highly desirable, but also as embodying unreachable social standards. This bias appears to resemble or to be a specific subtype of the well-documented *halo effect*, wherein individuals possessing desirable attributes in one specific domain (e.g., physical attractiveness)

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are perceived as possessing other, ostensibly unrelated desirable attributes such as kindness or intelligence (see Eagly, Ashmore, Makhijani, & Longo, 1991).

This preliminary study raised a number of intriguing questions about both the nature of social anxiety and treatment implications for SAD, which served as the theoretical foundation for the current dissertation. The results of the preliminary study described earlier (Bielak & Moscovitch, 2013) suggested that individuals with high vs. low levels of social anxiety react quite negatively to visibly anxious social partners. Given that Bielak and Moscovitch (2013) used ratings that were based on imagined interactions with an individual who was described in a hypothetical vignette, the current study was designed to examine whether this pattern of results would be replicated when a real potential social partner who exhibits visible signs of anxiety or confidence replaces the written vignette in which participants were instructed simply to imagine such cues.

The current study was aimed at examining whether such biases are observable in actual encounters with real, rather than imagined, social partners. In so doing, this study was designed to extend the understanding of the role of social comparisons in perpetuating negative beliefs and self-protective behaviours in social anxiety. The present study represents one of the first efforts to experimentally manipulate social comparisons in individuals with SAD in order to examine the causal impact of upward (versus same-level and downward) comparisons on social predictions and performance. The current study investigates how differing types of social comparisons influence the interpersonal attitudes and beliefs of individuals with SAD in advance of a socially threatening set of tasks (i.e., being asked to deliver a speech and anticipating a conversation with another participant whose speech you had previously watched).

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In addition, this study was designed to explore whether visible anxiety versus confidence might moderate participants' perception of the costs of social blunders committed by the anxious versus confident presenters. Previous research has found that individuals with high levels of social anxiety perceive social blunders as being more interpersonally costly, embarrassing, shameful, and likely to elicit negative reactions from others than similar blunders rated by participants low in social anxiety (e.g., Moscovitch, Rodebaugh, & Hesch, 2011). Some studies have also found that these harsher evaluations and more rigid standards are more pronounced when individuals with SAD are reflecting on their own behaviour versus that of others (e.g., Amir, Foa, & Coles, 1998; Voncken, Alden, & Bögels, 2006). However, Moscovitch et al. (2011) found that socially anxious participants rated imagined blunders more harshly than low socially anxious individuals both when they envisioned the blunders occurring to themselves and to a third person. A possible explanation for this is that Moscovitch et al. (2011) did not control for the possibility that, when asked to imagine unknown "others" committing social blunders, individuals with high social anxiety may have simply projected their own expectations and biases onto the subject they were imagining. The approach chosen in the current study has controlled for this possible confound by providing an actual (rather than imagined) subject who is either anxious or confident for participants to imagine committing various social blunders, thus allowing us to extend previous research in this area. Specifically, if individuals with SAD indeed perceive confident individuals as having highly desirable attributes in general, as was found in the earlier study, this may lead these participants to make additional specific, positively biased predictions about the abilities of confident people to respond effectively to social blunders as compared to visibly anxious individuals, rendering such blunders, when committed by confident individuals, less costly than for anxious individuals. To this end, this study was aimed at

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determining whether the confident (as compared to the anxious) presenter was viewed by participants with SAD as being: (a) less likely to commit social blunders in the first place; (b) less likely to be embarrassed or experience strong feelings of shame as a result of committing blunders; (c) less likely to incur interpersonal costs as a result of their blunders by virtue of having high “social currency” (even though the blunders participants were asked to consider were identical in both conditions); and (d) more likely to take immediate, effective reparative action so as to minimize the lasting impact of the blunder. In this way, this study is designed to determine of whether individuals with SAD believe social blunders bear catastrophic consequences for everyone who commits them due to violating some rigid social norm, or whether there are factors that moderate the perceived impact of such a blunder on interpersonal status, such as whether one appears to be a confident or anxious person.

The current study was designed to enable the study of self and other-evaluative processes and social comparisons in social anxiety, as well as their downstream effects on interpersonal predictions (e.g., desire for future interaction and perceived desire by another to interact with the self), negative and positive affect, and interpersonal behaviour. Participants with a principal or co-principal diagnosis of SAD (excluding the performance only subtype, according to the criteria of the DSM-5) as well as healthy control (HC) participants were invited to participate in a study examining first impressions. They were told that they would be watching a speech by another person (a fellow participant) and evaluating their first impressions of him, and then would produce a similar speech to be evaluated by the other participant. They were told to expect to meet the other participant for a 5-minute “getting to know you” conversation at the end of the study. In reality, all participants were randomly assigned to watch and evaluate one of two speeches (the content was scripted to be the same in both) created by the same confederate, one

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in which he appeared anxious or another in which he appeared confident. Participants then delivered their own speeches which they believed would be similarly rated by the other participant (these were later coded by trained research assistants blind to participant group membership). Participants were then debriefed about the study purpose and hypotheses. A detailed description of the process undertaken for the creation and pilot testing of the stimulus speeches are provided in the Method section. As well, a visual schematic diagram of the study sequence is provided (Figure 1). Based on the extant literature, the following hypotheses were advanced:

Hypotheses

Anxiety, positive affect, and negative affect.

1. Participants with SAD were expected to report more anxiety about future interactions than HCs overall, and participants with SAD in the confident presenter condition to report more anxiety about future interactions than participants with SAD in the anxious partner condition.
2. Participants with SAD who were asked to contemplate giving their own speech following a confident presenter, as compared to those who watched an anxious presenter, were expected to report (i) increased negative, and (ii) decreased positive affect on the PANAS from baseline to the time of contemplating their upcoming speech.

Desirability and desire for future interaction.

3. Consistent with the previous study, both participants with SAD and HCs were expected to rate an anxious presenter as less desirable at postmanipulation relative to baseline. Participants with SAD, relative to HCs, were expected to show a more dramatic increase in

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the presenter's desirability at postmanipulation relative to baseline when the presenter appeared confident than when he appeared anxious.

4. Participants with SAD were expected to indicate more desire for future interaction with the presenter who appeared anxious than the presenter who appeared confident; whereas HC participants were expected to desire more future interaction with the presenter who appeared confident as compared to a presenter who appeared anxious
5. Participants with SAD were expected to anticipate a more negative response (i.e., less perceived desire for future interaction by the presenter with the participant) from the confident than the anxious presenter. Conversely, control participants were expected to anticipate a more positive response (i.e., more perceived desire for future interaction) from the confident than the anxious presenter.
6. Participants with SAD, relative to controls, were expected to rate their own standing on desirable attributes as being lower than the speech presenter, irrespective of their assigned condition. Furthermore, participants with SAD in the confident presenter condition were expected to rate their own desirable self attributes as lower relative to the presenter than SAD participants in the anxious presenter condition.

Social comparisons and their impact on desire for future interaction.

7. Participants with SAD were expected to report more motivation to engage in social comparisons in their daily lives, as indicated by higher scores on the INCOM questionnaire.
8. The interaction between participant group and partner type was expected to lead to differing types of social comparisons for different combinations of participant and partner, and social comparisons were expected to mediate the relationship between the group-by-condition interaction and the desire of the participant to interact with the speech presenter they were

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assigned to watch. Specifically, individuals with SAD were expected to make more numerous upward comparisons with the confident presenter, and these upward comparisons were expected to lead them to desire less interaction with him, reflecting greater negative interpersonal expectancies about such an interaction and higher motivation to avoid such an interaction. Conversely, participants with SAD were expected to make same-level or downward comparisons with an anxious presenter and perceive such an interaction as more equal, less intimidating, and more “safe.” HCs, on the other hand, were expected to make downward or same-level comparisons with the confident presenter and downward comparisons with the anxious presenter, and to desire more interaction with the confident presenter than the anxious one.

Similarity and desire for future interaction.

9. Participants with SAD were expected to see themselves as more similar to the anxious presenter, while HC participants were expected to see themselves as less similar to the same presenter at postmanipulation relative to baseline. In the confident presenter condition, HCs were expected to see themselves as more similar to the confident presenter and participants with SAD to see themselves as less similar. Moreover, a positive correlation was predicted between similarity and desire for future interaction ratings in the overall sample collapsed across both HCs and participants with SAD.

Speech quality and Self-Portrayal Concerns.

10. Participants with SAD who were asked to contemplate giving their own speech after watching a confident presenter, as compared to those who watched an anxious presenter, were expected to make more negative predictions about their own speech performance and to be more concerned about their negative self-attributes.

Costs of interpersonal blunders.

11. Participants with SAD and HC participants were not predicted to differ in their evaluations of the costs of imagined blunders for an anxious presenter, rating this presenter's blunders as more numerous and more costly as compared to a confident presenter. Conversely, the groups were expected to differ in their ratings of the costs of blunders committed by a confident presenter in a pattern consistent with the findings from the initial study, with SAD participants rating the blunders of a confident presenter as less numerous and less costly, as compared to control participants. Furthermore, participants with SAD were expected to rate blunders as most costly across both conditions, relative to HCs. Finally, all participants were expected to rate the blunders committed by an anxious presenter as more costly relative to blunders committed by a confident presenter.

Coded ratings of desirability.

12. Coders were expected to rate participants with SAD in both conditions as less interpersonally desirable than HC participants.

Coded ratings of speech quality.

13. With regard to the speech quality of speeches produced by participants with SAD and controls in either of the two conditions, a main effect of group was predicted, such that speeches produced by HCs would be rated as being of higher quality relative to speeches produced by participants with SAD. As well, a group by condition interaction was predicted, wherein participants with SAD in the confident presenter condition would receive even lower speech quality ratings than participants with SAD in the anxious presenter condition and relative to HCs in both conditions.

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14. When directly comparing self and coder ratings of speech quality, it was predicted that participants with SAD would exaggerate the negative attributes and underemphasize the positive attributes of their own speeches in their own ratings, relative to ratings of the speeches provided by coders.

Coded ratings of dominance and warmth.

15. Participants with SAD were expected to be rated as less dominant and less warm in their recorded speeches, as compared to HCs. It was also predicted that participants with SAD in the confident partner condition would be rated as even less dominant and less warm than participants with SAD in the anxious partner condition.

Method

Participants

Ninety participants were recruited for the current study. Of these, 43 participants had a principal DSM-5 diagnosis of SAD. For participants with multiple diagnoses, the principal diagnosis was the one that was judged by the diagnostic interviewer as being the most distressing or interfering for the participant. Forty-seven healthy control (HC) participants were also recruited, all of whom denied experiencing significant current or past psychological difficulties.

In the clinical sample of individuals with principal SAD, 81% (35 participants) were recruited through the *Anxiety Studies Division* (ASD) at the University of Waterloo Centre for Mental Health Research (CMHR), whereas the remaining 19% (8 participants) were recruited from the waitlist for therapy services at the CMHR. The CMHR is a comprehensive community mental health clinic located at the University of Waterloo, and the ASD is a research pool within the CMHR for nontreatment-seeking participants with anxiety difficulties. After data screening (see Data Screening section for details), 3 participants with SAD were excluded from any further

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analysis. The resulting sample of participants with SAD ($N = 40$) was comprised of 72.5% females, and the mean age was 29.0 (SD 11.6) years, as outlined in Table 2. The sample was predominantly Caucasian (60%), Asian (25%), Black (10%), with the remaining 5% identifying as members of other ethnicities/racial groups.

All participants in the clinical sample had a principal diagnosis of SAD, and the overall sample had a moderate severity, with a mean Clinical Severity Rating (CSR) of 5.3 (SD .72) on an 8-point scale and a CSR of 4 serving as the clinical cut-off, as per Brown and Barlow (2014). Principal diagnoses were those associated with the highest CSR ratings by virtue of clinician judgment that they were most interfering/distressing for participants. For participants for whom a second diagnosis was deemed to be equally interfering and distressing as the principal SAD diagnosis, a coprincipal diagnosis was noted. Participants for whom criteria were met for additional diagnoses at lower CSRs than SAD were considered to have additional diagnoses. It is noteworthy that these categories were not mutually exclusive, with a subset of participants having both co-principal and additional diagnoses. Seventy percent of the sample had coprincipal and/or additional diagnoses, with depressive disorders and other anxiety disorders the most common types of comorbid diagnoses. Of the participants with SAD, 22.5% had a coprincipal depressive disorder and 12.5% had an additional depressive disorder diagnosis. Ten percent had a coprincipal diagnosis of another anxiety disorder and 30% had an additional anxiety disorder diagnosis. Please see Table 2 for more information.

The timing of the current study coincided with the transition within the ASD and CMHR from using the DSM-IV-TR to the DSM-5. All of the clinical participants were assessed and diagnosed by trained graduate students using the *Mini International Diagnostic Interview* (MINI) version 6.00 for DSM-IV (Sheehan & Lecrubier, 2009) or MINI 7.00 for DSM-5 (Sheehan,

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Harnett-Sheehan, Sheehan, & Gray, 2014), which were supplemented by sections from the *Anxiety Disorders Interview Schedule*, ADIS-IV (Brown, Di Nardo, & Barlow, 1994) and ADIS-5 (Brown & Barlow, 2014). For participants who were assessed based on DSM-IV-TR criteria using the MINI 6.00 (prior to the transition to DSM-5 criteria) as having a principal diagnosis of Generalized SAD, a post-hoc review of their individual symptoms checklists was conducted based on the symptoms that were reported at their diagnostic interview to establish whether they would qualify for a diagnosis of SAD (excluding those with the Performance Only subtype) based on DSM-5 criteria. Potential participants were excluded if they endorsed active symptoms of mania or psychosis or significant suicidality.

HC participants were recruited via advertising in the Kitchener-Waterloo community and on campus at the University of Waterloo. Potentially eligible control participants were administered an online version of the MINI 6.00 Screener. Participants who denied any current or past psychological difficulties were invited to participate in the study. After the data were screened (see Data Screening section), the data from 5 HCs was excluded from any further analysis. The resulting sample of HCs ($N = 42$) was comprised of individuals who denied any current psychological difficulties. This group was 61.9% female, had a mean age of 23.7 (SD 8.95) years, and were predominantly Caucasian (57.5%), Asian (40 %), and Black (2.5%). Please see Table 2 for more information.

Measures

Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS is a 20-item rating scale containing 10 adjectives representing positive affect, and 10 adjectives representing negative affect. While the PANAS can be used to rate emotional experiences either in the present or recent past, the PANAS was used as a present-focused state

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measure of affective experiences. Participants rated each item on a 5-point Likert scale to represent their affective experiences in the present moment. The PANAS is a widely used measure of affective experiences with strong psychometric properties (e.g., Cronbach's alphas of .84-.90 in the original sample; for a review of relevant literature, see Sloan & Kring, 2007). In the present study, the Cronbach's alphas ranged from .88 to .90 for the positive subscale across the three time points, and from .88 to .89 for the negative subscale.

Partner Desirability Ratings (Bielak & Moscovitch, 2013). Participants rated the speech presenter on the following five characteristics: character strength, achievements, happiness, intelligence, and ambition. These were chosen to be identical to the list used in the initial study described earlier (Bielak & Moscovitch, 2013), so that results from the two experiments could be compared directly. Participants rated how much they believed the interaction partner possessed each item in comparison to the average person, from -3 ("much less than average") to 3 ("much more than average"). As was the case in the earlier study, these ratings were used to calculate a Desirability Index (an average desirability score across these five unique attributes) on which to base the desirability analyses. In the current study, the Desirability Index showed good internal consistency, with Cronbach alphas of .85 and .81 in the anxious and confident presenter conditions at baseline, and .80 and .91 for the anxious and confident presenter conditions at postmanipulation.

Desire for Future Interaction Scale (DFI; Coyne, 1976). The DFI is a measure that participants used to rate their desire to interact further with the presenter across eight distinct interpersonal situations (e.g., sitting next to him on the bus, working with him). Each statement is rated from 1 ("not at all") to 5 ("very much so"). It is generally considered a measure of interpersonal liking or the acceptability of another person as an interaction partner (e.g., Voncken

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& Dijk, 2013). It has been used widely in studies examining the interpersonal consequences of SA. In the present study the DFI was used in two distinct ways: (a) the measure in its typical form was administered to serve as a measure of participant desire for future interaction of the speech presenters; and (b) the items on the DFI were reversed to ask about the perceived desire of the target person (speech presenter) to interact with the self. In this way, this modified version served as a measure of participant perception of the speech presenter's desire to interact with the self. In the present study, the DFI showed strong internal consistency across both forms (Cronbach's alphas of .85-.87).

Similarity between Speech Presenter and the Self. A 3-item measure assessing perceived similarity between the self and the speech presenter globally was administered. The three items were previously used by Papsdorf and Alden (1998) to measure similarity to the self. The similarity scale has been shown to have strong psychometric properties (e.g., Cronbach's alphas $> .92$ in Papsdorf & Alden, 1998, and Voncken et al., 2008). In the present study, the brief measure demonstrated acceptable internal consistency, with a Cronbach's alpha of .67.

Perception of Speech Performance Questionnaire (PSP; Rapee & Lim, 1992). The PSP questionnaire assesses perceived performance across a number of domains important in public speaking. There are two subscales, one assessing positive speech qualities (e.g., "made a good impression") and another assessing negative qualities (e.g., "stuttered"). In the current study, the PSP was used three times: (1) for participants to assess their predicted performance on the upcoming speech task, (2) for participants to assess their own recently completed speech, and (3) for coders to assess the quality of participant video recorded speeches. The PSP has been shown to have adequate to strong psychometric properties (e.g., Cronbach's alphas in the .79-.86 range for the various subscales in the original sample). In the present study, both the positive and

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negative subscales of the PSP showed excellent internal consistency at both baseline (Cronbach's alphas of .80 for the positive subscale and .90 for the negative subscale) as well as postmanipulation (Cronbach's alphas of .93 for the positive subscale and .89 for the negative subscale).

Ratings of own desirability compared to the speech presenter. The same set of five desirable attributes (see Presenter Desirability Measure above) was compiled into a measure of self-rated desirability as compared to the speech presenter. On the same domains of desirability on which they rated the presenter, participants were asked to rate themselves as compared directly to the speech presenter (e.g., ambition, strength of character, etc.). Higher values indicated more favourable ratings of the self relative to the presenter. In the present study, this measure showed excellent internal consistency (Cronbach's alpha of .92).

Modified Blunders Task. The *Blunders Task* (Moscovitch, Rodebaugh, & Hesch, 2012) evaluates participant reactions to imagined social blunders committed by themselves and by others. In the present study, four blunders were selected from the originally ones used by Moscovitch et al. (2012). The blunders chosen for use in the current study included situations that could be experienced by both students and nonstudent adults, rather than situations that specifically occur in a college/university context. Participants were asked to imagine observing the speech presenter committing these blunders, and to respond to several questions related to their reactions to the blunder. Participants were asked to rate the extent to which the presenter would see the blunder as embarrassing, shameful, socially costly and likely to elicit negative reactions from others (these were the same four outcomes assessed by Moscovitch et al., 2012). In the modified version of the *Blunders Task*, participants were also asked questions to assess how much they believed this or similar types of blunders typically occur in the presenter's life, to

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what extent they thought the speech presenter would be able to take corrective action (e.g., making a joke, a sincere apology) to successfully repair the situation and minimize the impact of the blunder, and their perception of the lasting social cost of the blunder for the presenter. A single composite score was created across the four blunders by adding the totals across each individual blunder. The composite is intended to represent the social probability and cost of social blunders for each participant. In the present study, the composite score showed strong internal consistency (Cronbach's alpha of .95).

Warmth and Dominance Ratings. Video coders were asked to rate the warmth and dominance of each of the study participants after watching the speeches recorded in the study session. Warmth and dominance were each rated on a 1-item Likert scale (e.g., from -3 "cold" to 3 "warm", and from -3 "submissive" to 3 "dominant").

Negative Self-Portrayal Scale (NSPS; Moscovitch & Huyder, 2011). The NSPS is a 27-item questionnaire designed to assess participants' concerns that specific self-attributes that they view as flawed or deficient will be exposed to scrutiny and evaluation by critical others in social situations. Each attribute (e.g., stuttering, sweating, being poorly dressed) is rated on a scale from 1 ("not at all") to 5 ("extremely") in terms of the concern about displaying this attribute in social situations. The NSPS has been shown in previous studies (e.g., Moscovitch & Huyder, 2011) to tap into three main domains of concern: physical appearance, signs of anxiety, and social competence. In the current study, the instructions were modified slightly, and participants were asked to complete the NSPS in reference to self-relevant attributes they were concerned about revealing over the course of the upcoming speech task. The NSPS showed excellent internal consistency in the current study (Cronbach's alpha of .96 for the Total score).

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Iowa-Netherlands Social Comparison Orientation Scale (INCOM; Gibbons & Buunk, 1999). The INCOM is an 11-item scale on which participants rate their interest in seeking social comparison information as well as tendencies to engage in social comparisons. Participants provide responses ranging from 1 (“strongly disagree”) to 5 (“strongly agree”) for each statement (e.g., “I often compare myself with others with respect to what I have accomplished in life”). The scale shows good psychometric properties (e.g., Cronbach’s alpha of .83 in the original sample published by Gibbons & Buunk, 1999). Since its publication, the INCOM has been used extensively to study social comparison behaviors across a wide range of samples, including clinical populations such as individuals with dysphoria (e.g., Giordano, Wood, & Michela, 2000), as well as eating disorders (e.g., Morrison, Waller, Meyer, Burditt, Wright, Babbs, & Gilbert, 2003). The INCOM was completed by participants during the present study to provide a descriptive exploration of the differences in social comparison orientation between those with SAD and HCs. In the present study, the INCOM demonstrated acceptable internal consistency (Cronbach’s alpha of .70).

Social Phobia Inventory (SPIN; Connor et al., 2000). The SPIN is a 17-item self-report instrument that measures fear, avoidance, and physiological discomfort in social situations (e.g., fear of people in authority; avoids parties; distressed by sweating). Each item is rated on a scale from 0 (“not at all”) to 4 (“extremely”). The full scale score ranges from 0 to 68. The SPIN has been shown to be an excellent measure of social anxiety symptoms, has good test-retest reliability, strong convergent and divergent validity, good construct validity, and high levels of internal consistency (Antony, Coons, McCabe, Ashbaugh, & Swinson, 2006; Connor et al., 2000). In the current study, the SPIN was administered at the end of the experiment. The data of participants were excluded from analysis if their in-session SPIN scores fell 2 or more standard

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deviations above or below the mean for their respective groups (see Table 6 for group means and standard deviations). For this reason, the data of five participants (3 SAD participants and 2 HCs) were excluded. Thus, the final sample consisted of 40 SAD participants with a mean SPIN score of 40 (range: 25-65) and 42 HC participants with a SPIN mean score of 11 (range: 1-24). These scores are very consistent with mean scores for individuals with SAD and healthy samples in other studies. For example, Connor et al. (2000) reported that their nonpsychiatric control group had a mean SPIN total score of 12.1. Connor et al. (2000) also proposed a cut-off score of 19 and higher to select participants likely to have SAD, and other investigators have used cut-off scores of 30 and above (e.g., Moscovitch, Rodebaugh, & Hesch, 2012). The mean and range of the sample of participants with SAD appears to be consistent with these guidelines. The SPIN showed excellent internal consistency in the present sample (Cronbach's alpha of .96).

The Depression Anxiety Stress Scales – 21 item version (DASS-21; Lovibond & Lovibond, 1995) Depression Subscale. The DASS-21 is a 21-item self-report measure divided into three subscales designed to assess anxiety, depression, and stress. The DASS-21 depression subscale was used as a brief measure of depressed mood, primarily to ensure that the two groups (HCs and SADs) differed in the expected ways in terms of their ratings of depressive symptoms, as well as to ensure that across the two conditions, members of the same group showed did not differ significantly in their levels of depression (i.e., SADs in the confident and anxious partner conditions should show similar levels of depressive symptoms, as should HCs across the two experimental conditions) The depression subscale of the DASS-21 showed good internal consistency in the present sample (Cronbach's alpha of .81).

Confederate (“Presenter”) Training and Construction of Videos across Conditions

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All participants in this study watched one of two pre-recorded speeches created by a trained research confederate. The confederate was a graduate student in his mid-20's and was chosen to reflect a plausible research participant in terms of age and appearance. He was also selected due to having past recreational acting experience. He was trained on how to appear visibly socially anxious and confident. The training of the confederate and speech content was based on the approach used by Ashbaugh et al. (2005). The speech topic and content were kept as consistent as possible across the two conditions. In the current study, the recorded speeches were on the topic "Places to see in the Kitchener-Waterloo area". This was chosen as being a neutral topic not related to anxiety or psychology, and similar to the topic of "visiting Paris" that was used by Ashbaugh et al. (2005). For the visibly anxious condition, the confederate was trained to display interpersonal behaviours consistent with the experience of social anxiety, including appearing tense, fidgeting, speaking in a soft or uncertain tone of voice, pausing conspicuously, and reducing direct eye contact with the camera (see Moscovitch & Huyder, 2011; Rapee & Lim, 1992; Stopa & Clark, 1993, Taylor & Alden, 2005; Taylor & Alden, 2011;). For the confident speech, the confederate was trained to display calm and confident (but not cocky or arrogant) behaviours. He was trained to show behaviours that were opposite to those used in the visibly anxious speech, including speaking in a clear, animated tone and minimizing excessive pauses, appearing relaxed and using appropriate hand-gestures, and maintaining strong eye contact with the camera.

Prior to running the study, pilot ratings for the two confederate videos were collected from 11 volunteer raters, who were friends and family members of the author who responded to an appeal for raters posted on the author's social media (Facebook) page. Individuals were only included if they did not have any knowledge of the current dissertation research focus, study

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design, or research questions. In order to confirm that the two videos differed on expected variables, such as presenter anxiety, warmth, nervousness, friendliness, and likeability, each of the 11 raters (8 females and 3 males; mean age = 29.81, $SD = 6.78$) watched and rated only one of the two videos, rating a number of attributes on a scale from 0 (not at all) to 5 (extremely). Raters were blind to the purpose, procedure, or expected results of the current study. For the pilot ratings, participants also rated how real, natural, or believable the individual in the video appeared. Means and SDs, as well as independent-samples t -tests comparing the confident and anxious videos are presented in Table 1. As expected, participants rated the visibly anxious speech presenter as less calm, less warm, less likeable, less friendly, less confident, and less happy than the confident speech presenter. As expected, they also rated the anxious speech presenter as more nervous and anxious than the confident one. The two videos did not differ on ratings of intelligence and competence. Finally, the presenter in the confident video was rated as behaving more realistically/naturally (i.e., without pretense) than the same presenter in the anxious videos ($M_s = 2.45$ and 4.18 , respectively on a 0-5 scale). Nonetheless, both videos were rated as being at least moderately natural/realistic across these raters.

Procedure: Overview

The current study was advertised to potential participants as a study about the ways individuals made first impressions of new people they encounter, and factors that influence these impressions. Upon arrival for the present study, participants were asked to provide baseline negative and positive affect ratings on the PANAS (Watson, Clark, & Tellegen, 1988). Following completion of the PANAS, participants were told that the current study examines how people evaluate others whom they meet for the first time. They were told that to examine initial evaluations, they were paired at random with another study participant who started the study 15

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minutes earlier, and was in the process of recording a short (approximately 3-minute) video of himself that the participant would be asked to watch. Participants were informed that they would be asked to evaluate the other participant's speech, and that after they do this they would record their own speech which would likewise be evaluated by the other participant. Finally, participants were told that at the very end of the study, they would get to meet the other participant for a short (5-minute) "getting to know you" conversation.

In reality, the video presented to participants was one of two pre-recorded, standardized videos prepared in advance by a research confederate, as described above.

Detailed Procedure

At the onset of the study following scripted instructions were conveyed to participants:

For the current study, participants have been randomly paired in advance of the study, and you will take turns watching each other's short speeches and evaluating them. Your partner was chosen to be evaluated first, so his study session began earlier than yours, and he has recorded a short speech for you to watch and evaluate. Then, you will complete your own speech for him to watch and evaluate. For the first task, I will ask you to watch this speech and provide some ratings about the speech presenter and the quality of his speech. Before I let you watch the other participant's speech, I will just show you his picture and ask you to answer a few questions about your first impressions of him. Please remember that at the end of today's study session, you will meet the other participant for a short "getting to know you" task.

All participants were presented with a picture of the male presenter ("Daniel") and were told the title of the speech he will be presenting ("places to see in the Kitchener-Waterloo area"). Participants complete the baseline ratings of presenter desirability based solely on this information. For the baseline desirability ratings (completed prior to watching the presenter's

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speech), participants were asked to predict how the presenter would perform on the speech task and make general “first impression” ratings of him solely based on his picture. The researcher left the room while participants completed these (and all subsequent sets of) ratings. When participants had completed the ratings, the researcher returned to provide the following instructions:

Now you will watch the other participant’s speech. While you watch this speech, please keep in mind that you will soon meet the presenter for the first time, and you will have a conversation with him in which you will have a chance to get to know one another briefly. With this in mind, please watch and judge the quality of his speech according to the questions provided.

As stated above, participants were randomly assigned to watch a 3-minute video of a speech that was prepared earlier by a confederate in which the presenter appeared visibly anxious or confident.

Following the video, participants completed the postmanipulation set of presenter desirability ratings (described above). Participants were then instructed to deliver their own video recorded speech under the threat of observation and future interaction with the presenter. (In reality, the speeches were recorded and later coded by trained research assistants, and the interaction with the other presenter did not actually occur, although participants were deceived to believe it would; participants were fully debriefed about this at the end of the study.)

As participants prepared for giving their own speech, they responded to a series of questions assessing their level of anxiety and comparing their anticipated performance on the upcoming speech as compared to the other participant’s speech. Specifically, participants were given the following instructions:

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Now please take the next 3 minutes to think about your upcoming speech, which will be on the topic “places to see in the Greater Toronto Area.” Remember that your speech will be evaluated by the other participant before the two of you get a chance to interact at the end of the study. Please think about what the other participants might expect from your speech performance, and how well you think you will do on the speech task as compared to the speech you watched earlier. Here are a few questionnaires for you to answer while you think about your upcoming speech.

Participants then completed the PSP with reference to their own upcoming speech task. Participants also completed the NSPS as well as rating their current negative and positive affect on the PANAS prior to giving their own speech.

Participants were then asked to perform their own 3-minute speech on the topic “places to see in the Greater Toronto Area”. This is a topic that is meant to be similar to the presenter’s speech topic and one which thought to be relatable for most people. The speech was video recorded by the researcher. Following performing their own speech, participants completed the PANAS questionnaire once more, as well as the *Blunders Task*. For the *Blunders Task*, participants were instructed to imagine that the speech presenter had experienced each of the blunders when responding to the questions related to each blunder.

Participants were then asked three questions to determine their level of suspicion or belief in the experimental deception, consistent with the Funnel Debriefing approach used by others (Bargh & Chartrand, 2000). They were asked the following questions, in the order below: (1) What are your thoughts about the study so far? (2) What is the purpose of the current study? (3) Was there anything strange or suspicious about the study? Each participant was given a score from 0 (no suspicion) to 2 (significant suspicion). Participants who obtained a score of 2,

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indicating that they were confident that there was deception involved in the study (e.g., that the other participant did not exist or that the purpose was different from what they were told) were excluded from the study. Three participants from the original sample of 90 were excluded for this reason.

Coding of Participant Videos by Blind Raters

Two trained raters, one male and one female, watched and coded each of the videos that study participants created over the course of the study. The goal of this task was to determine, first, whether the behavioural performance in videos generated by participants with SAD differed systematically from those created by HCs, and second, whether being assigned to create a recorded speech following watching a confident (as compared to anxious) video affected participants with SAD (and HCs) differently in terms of the quality of their produced speech. The two video raters were undergraduate research assistants not otherwise involved in this study. Raters were blind to the diagnostic status (SAD or HC) of participants. They were trained by the author to code the presenter's attributes using many of the same measures that participants used to evaluate the confederate videos (described in detail in the Confederate Training and Construction of Videos Across Conditions section, above). These included: presenter desirability, desire for future interaction with the presenter (DFI), perceived similarity between the self and the presenter, perception of speech performance (PSP), and the modified Blunders Task.

In order to determine the level of agreement between the two raters across these variables, Intraclass Correlation Coefficients (ICC; Consistency) were calculated. These are presented in Table 3. The consistency definition of the ICC examines to what extent the raters provided a similar pattern of ratings). The goal was to determine whether the ratings were similar

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enough to be collapsed across raters. Fleiss (1981) and Cicchetti and Sparrow (1981) recommended considering ICC values of between .6 and .74 as “good” agreement and values above .75 as “excellent” agreement. Analyses and interpretations were limited to those variables that exhibited ICC (Consistency) values above .60. These included Desirability Index (ICC of .72), DFI (ICC of .76), positive and negative subscales of the PSP (ICC of .89 and .83 respectively), warmth and dominance (ICC of .74 and .81 respectively), and Blunders Composite (ICC of .74).

Data Screening

The data were screened for deviations from normality using visual inspection of Q-Q plots, examination of the absolute values of skewness and kurtosis, as well as with the Kolmogorov-Smirnov (K-S) test of normality. Lei and Lomax (2005) recommend the following ranges when examining absolute values of skewness and kurtosis: values between 0 and 1.0 indicate minimal nonnormality, values of 1.0-2.3 indicate moderate nonnormality, and values above 2.4 are suggestive of severe deviation from normality within a specific variable. As well, significant *p*-values associated with the K-S test are also suggestive of significant deviations from normality. However, Field (2009) indicated that the test can yield statistically significant values even when there are no practically significant deviations from normality. The skewness, kurtosis, and K-S test values for the key variables in the current study are presented in Table 4. Using the ranges suggested by Lei and Lomax (2005), no variables had severe skew. However, three variables had significant positive kurtosis. Positive kurtosis suggests that the distribution deviates from normality by being unusually “peaked” at the centre, as well as having a higher than usual proportion of its distribution in the tails (DeCarlo, 1997), in comparison to the normal distribution. All three instances of significant kurtosis were in symptom measure variables,

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which would not necessarily be expected to be normally distributed in the two groups of clinical participants (SADs) or completely healthy populations (HCs). Given the specific instances of positive kurtosis in the current study, it seems probable, for example, that the positive kurtosis of the values of the negative affect subscale of the PANAS (both at baseline and at post-speech) around a very low mean on that subscale convey important information about the way PANAS (negative affect) scores are distributed. Given this rationale, which is supported by emerging concern among methodologists about the impact of data transformation on type I and II errors and data interpretability (e.g., see Garcia-Perez, 2012), it was decided to leave the data untransformed and treat the results as tentative in analyses where nonnormality was a significant concern.

Finally, outlier analyses were conducted on each of the variables of interest separately for the HC and SAD participant groups. Specific analyses cases that had z -scores more extreme than 2 SDs above or below the means (calculated separately for each group). Instances in which outliers were excluded from specific analyses for this reason are identified in the relevant results section.

Results

Preliminary Analyses

Sample characteristics. Participant groups and conditions were first compared across several demographic and symptom indices using a 2 (group: SAD, HC) by 2 (condition: anxious, confident) two-way between-groups Analysis of Variance (ANOVA). Means and SDs for these variables are provided in Table 2.

With respect to participant age, there was a main effect of group, such that participants with SAD were slightly older than HC participants¹, $F(1,78) = 5.56$, $p = .02$, $\eta^2_p = .07$. There was

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no main effect of partner type, $F(1,78) = .03, p = .86, \eta^2_p = 0$. There was no group by partner type interaction, $F(1,78) = .50, p = .48, \eta^2_p = 0$.

With respect to gender, the proportions of female (vs. male) participants are provided in Table 2. A Chi-Square test of Independence revealed no association between gender and study group or condition, $\chi^2(3) = 2.08, p = .56$.

With respect to ethnicity, participants were asked to select their ethnicity from the following five categories: Caucasian, Asian, Black, Latino, and other. A Chi-Square Test of Independence revealed no association between participant ethnicity and group or condition, $\chi^2(12) = 10.77, p = .55$.

Baseline symptom measures. Participant scores on the Social Phobia Inventory were compared using a two-way between groups 2 (group: SAD, HC) by 2 (condition: anxious, confident) ANOVA. There was a main effect of Group, $F(1,78) = 393.42, p < .001, \eta^2_p = .84$, with SAD participants reporting significantly higher SPIN scores than HCs. There was no statistically significant main effect of partner type, $F(1,78) = 2.38, p = .13, \eta^2_p = .03$, nor a group by partner type interaction, $F(1,78) = .03, p = .88, \eta^2_p = 0$.

Participant groups also differed in the expected direction on the depression subscale of the DASS-21, which served as a brief measure of low mood. A two-way between-groups 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) ANOVA was conducted comparing scores on this subscale across the two groups and conditions. Participants with SAD had higher DASS-21 depression scores, $F(1,58) = 34.46, p < .001, \eta^2_p = .37$. There was no main effect of condition, $F(1,58) = .40, p = .53, \eta^2_p < .01$, nor a group by condition interaction, $F(1,58) = .05, p = .83, \eta^2_p = 0$.

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Anxiety. Participants with SAD were expected to report more anxiety about future interactions overall as compared to controls, and participants with SAD in the confident presenter condition were expected to report even more anxiety about future interactions than participants with SAD in the anxious partner condition. The first part of this hypothesis was supported. A two-way between-groups 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) ANOVA with anxiety about interacting with the presenter entered as the dependent variable revealed a strong main effect of group, $F(1,78) = 54.90, p < .001, \eta^2_p = .47$, with participants with SAD reporting higher levels of anxiety about interaction with the presenter than HCs. However, there was neither a main effect of condition, $F(1,78) = .52, p = .48, \eta^2_p < .01$, nor a group by condition interaction, $F(1,78) = .94, p = .34, \eta^2_p = .01$.

Positive and Negative Affect. With respect to changes in positive and negative affect, participants with SAD who were asked to contemplate giving their own speech following a confident presenter, as compared to those who watched an anxious presenter, were expected to report (i) increased negative, and (ii) decreased positive affect on the PANAS from baseline to the time of contemplating their upcoming speech. To test this hypothesis, a 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) by 3 (time: baseline, pre-speech, post-speech) three-way repeated measures ANOVA was conducted on the positive and negative affect subscales of the PANAS separately. With respect to negative affect, there was a significant main effect of time, $F(2,156) = 40.34, p < .001, \eta^2_p = .34$, a significant main effect of group, $F(1,78) = 160.19, p < .001, \eta^2_p = .67$, and a significant time by group interaction $F(2,156) = 18.16, p < .001, \eta^2_p = .19$. There was no condition by time interaction, $F(2,156) = .02, p = .98, \eta^2_p = 0$, nor a condition by time by group interaction, $F(2,156) = .70, p = .50, \eta^2_p < .01$. Follow-up independent-samples *t*-tests conducted on negative affect scores at each time point revealed that

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SAD participants were higher in negative affect across all time points than HCs (t 's > 8.60 , p 's $< .001$). In addition, while both groups experienced an increase in negative affect from baseline to the pre-speech time point (t 's > 4.70 , p 's $< .001$), the post-speech scores for HCs no longer differed from their baseline scores, $t(41) = 1.25$, $p = .22$. Conversely, the post-speech scores for participants with SAD were still significantly higher than baseline, $t(39) = 4.34$, $p < .001$. Independent samples t -tests confirmed that there were no statistically significant differences between participants with SAD in the two conditions at any of the time points (t 's $< .79$, p 's $> .44$). Thus, the hypothesis that giving a speech following a confident presenter (as opposed to an anxious one) would lead to more negative affect in the SAD group was not supported.

With respect to positive affect, a different pattern of results emerged. There was a significant main effect of time, $F(2,77) = 9.02$, $p < .001$, $\eta^2_p = .19$. There was also a time by group interaction that approached statistical significance, $F(2,77) = 2.93$, $p = .06$, $\eta^2_p = .07$. There was not a significant time by condition interaction, $F(2,77) = .02$, $p = .98$, $\eta^2_p < .01$, nor a group by time by condition interaction, $F(2,77) = .21$, $p = .83$, $\eta^2_p = .0$. Given the marginally significant group by time interaction, changes in positive affect across the three time points were examined separately in each of the presenter conditions. Follow-up independent samples t -tests revealed that at all time points, there were significant or nearly significant differences between HCs and participants with SAD, with HCs reporting more positive affect (t 's > 1.83 , p 's $< .071$). In addition, while the positive affect scores on the PANAS for HC participants did not change significantly from baseline to pre-speech, $t(41) = .23$, $p = .82$, nor from baseline to post-speech, $t(41) = 1.56$, $p = .13$, the positive affect scores of participants with SAD dropped significantly from baseline to pre-speech $t(39) = 3.8$, $p < .001$, and remained significantly lower than baseline at post-speech, $t(39) = 4.20$, $p < .001$. As was the case with negative affect, however, there was

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no significant main effect of condition nor interaction between condition and either of the other variables. *T*-tests confirmed that there were no differences in positive affect among participants with SAD in the anxious vs. confident presenter conditions at any of the time points (t 's $<.67$, p 's $>.51$). Thus, the hypothesis that giving a speech following a confident presenter (as opposed to an anxious one) would lead to the experience of less positive affect in the SAD group was not supported.

Desirability of anxious and confident presenters. With respect to the desirability of the anxious and confident presenters, a pattern of results consistent with the earlier study (Bielak & Moscovitch, 2013) was expected to emerge, wherein both participants with SAD and HCs were expected to rate an anxious presenter as less desirable at postmanipulation relative to baseline, and participants with SAD, relative to HCs, would show a more dramatic increase from baseline in their ratings of the presenter's desirability at postmanipulation when the presenter appears confident, resulting in a group by time interaction. Planned contrasts were used to examine change in Desirability Index scores (average desirability ratings across the five attributes of intelligence, ambition, achievement, happiness, and strength of character) in each of the two experimental conditions separately. Please see Figures 2 and 3. The results of 2 (time: baseline, postmanipulation) by 2 (group: SAD, HC) planned contrasts partially supported hypotheses. In the anxious partner condition, as in the previous study, there was a main effect of time, $F(1, 38) = 6.15$, $p = .02$, $\eta^2_p = .14$, but no effect of group, $F(1,38) = .21$, $p = .65$, $\eta^2_p = .01$, and no group by time interaction, $F(1,38) = .02$, $p = .89$, $\eta^2_p = .00$. Across both groups, participants rated an anxious speaker as less desirable at postmanipulation relative to baseline. In the confident partner condition, a complementary pattern emerged within the Desirability Index ratings. Again, a main effect of time emerged, $F(1,39) = 37.87$, $p <.001$, $\eta^2_p = .49$). Unlike the previous study, there

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was no significant main effect of group, $F(1,39) = .33, p < .57, \eta^2_p = .01$, nor group by time interaction, $F(1,39) = 1.23, p = .27, \eta^2_p = .03$. In the current study, participants across both groups evaluated the confident speaker as more desirable at postmanipulation relative to baseline.

Desire for future interaction. It was expected that participants with SAD would indicate more desire for future interaction with the presenter who appears anxious than the presenter who appears confident, whereas control participants would desire more future interaction with the presenter who appears confident. To determine the impact of condition and group on desire for future interaction, 2 (time: baseline, postmanipulation) x 2 (group: SAD, HC) planned contrasts were used in each of the conditions separately. The pattern of results that emerged was quite inconsistent with these hypotheses. In the anxious partner condition, there was no significant effect of time, $F(1,38) = .15, p = .70, \eta^2_p = 0$, but there was a significant time by group interaction, $F(1,38) = 5.86, p = .02, \eta^2_p = .13$. Follow-up paired t -tests revealed that while HCs rated their desire for future interaction with the anxious presenter lower at postmanipulation as compared to baseline, $t(20) = 2.47, p = .02$, participants with SAD did not report a similar drop in their desire for future interaction, $t(18) = 1.20, p = .24$. In the confident partner condition, there was a significant main effect of time, $F(1,39) = 51.86, p < .001, \eta^2_p = .57$, but no significant interaction between time and group, $F(1,39) = 2.71, p = .11, \eta^2_p = .07$. The ratings of desire for future interaction with a confident presenter for both groups increased significantly from baseline to postmanipulation, t 's $> 4.94, p$'s $< .001$. In summary, both groups desired more interaction with a confident presenter relative to their baseline scores, but only HCs (and not participants with SAD) reported a drop in their desire for future interaction with the anxious

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presenter. Overall, both groups desired significantly more interaction with the confident presenter than the anxious one, t 's > 2.34 , p 's $< .03$.

Perceived desire for future interaction with the self. It was predicted that SAD participants would expect a more negative response (i.e., less perceived desire for future interaction by the presenter with the participant) from the confident than the anxious presenter, whereas control participants would expect a more positive response (i.e., more perceived desire for future interaction) from the confident than the anxious presenter. Planned contrasts in each condition separately revealed a pattern of results that differed from the one hypothesized. In both conditions, there were significant main effects of group, with SAD participants believing the presenters desired less interaction with them as compared to HC participants (F 's > 6.59 , p 's $< .02$, $\eta^2_p > .14$). In the anxious partner condition, there was a main effect of time, $F(1,38) = 7.46$, $p < .01$, $\eta^2_p = .16$. Both groups experienced a significant drop in their perception of the anxious presenter's desire to interact further with them. There was no significant group by time interaction, $F(1,38) = .24$, $p = .63$, $\eta^2_p = .01$. In the confident partner condition, there was no significant main effect of time, $F(1,39) = .07$, $p = .79$, $\eta^2_p = .01$, but there was a group by time interaction approaching statistical significance, $F(1,39) = 3.40$, $p = .07$, $\eta^2_p = .08$. To better understand this interaction, paired-samples t -tests were conducted within each group separately, comparing baseline and postmanipulation scores of perceived desire for future interaction. Neither participants with SAD nor controls experienced a significant change in their perceived desire for future interaction relative to baseline (t 's < 1.45 , p 's $> .17$). In summary, both groups rated an anxious presenter as less likely to desire interaction with them at postmanipulation as compared to baseline. Conversely, the perceived desire of the confident presenter to interact with the self did not significantly change from baseline to postmanipulation.

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Social comparisons between the speech presenter and self. It was hypothesized that participants with SAD, relative to HCs, would rate their own standing on desirable attributes as being lower than that of the speech presenter, irrespective of their assigned condition. Furthermore, it was expected that participants with SAD in the confident presenter condition would rate their own desirable self attributes as lower relative to the presenter, compared to SAD participants in the anxious presenter condition, resulting in a group by condition interaction. A 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) two-way between-groups ANOVA was conducted to examine the impact of group and condition on comparisons with the speech presenter. There was a main effect of group, $F(1,78) = 15.82, p < .001, \eta^2_p = .16$, with HCs consistently providing higher self ratings than participants with SAD. There was also a main effect of condition, $F(1,78) = 10.82, p = .002, \eta^2_p = .12$, with participants in the anxious presenter condition rating themselves higher as compared to those in the confident presenter condition. There was no significant group by condition interaction, $F(1,78) = .87, p = .35, \eta^2_p = .01$. Independent samples post-hoc *t*-tests conducted within the two conditions separately comparing self-comparison ratings of HCs and participants with SAD revealed that although in both conditions participants with SAD tended to compare themselves with the presenters less favourably than HCs, in the anxious presenter condition there was only a marginally significant difference between the average ratings of the self as compared to the anxious speech presenter, $t(39) = 1.89, p = .07$. Conversely, when rating the self as compared to a confident presenter, there was a significant difference between participants with SAD and HCs, $t(29.4) = 4.10, p < .001$, with HCs seeing themselves as superior to the presenter, while participants with SAD rating themselves as inferior to him.

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In order to better understand the types of social comparisons in which participants with SAD and HCs engaged in each condition, the frequencies of upward, same-level, and downward social comparisons were examined and compared. Please see Figure 4. In order to determine whether the condition impacted the type of comparison in which individuals engaged, an index of each participant's typical type of social comparison was calculated. For the participant's rating on each item of the Self-Rated Desirability measure, a negative value, which indicated that the participant rated him or herself as being lower than the presenter (upward comparison), was assigned a score of -1; a value of 0, which indicated a same-level comparison with the presenter, was assigned a score of 0; and a positive value, indicating that the self was rated higher than the presenter (downward comparison), was assigned a score of 1. For each participant, the self-comparison on each of the five desirable attributes on the measure were averaged to serve as single index of the overall social comparison made by the participant between him or herself and the presenter. These scores were then averaged across all participants belonging to each of the four cells in the current study (SADs and HCs in either presenter condition), resulting in a continuous variable ranging from -1 to 1, which served as an index of the average comparison elicited by each presenter within each group and condition.

In order to better understand the pattern of comparisons within each group and condition, the proportion of each type of comparison based on the ratings of the participant's own desirability as compared to the speech presenter were calculated. These were then averaged across the five desirable attributes. Participants with HC responded in a consistent way in both conditions, generally seeing themselves as more desirable than the speech presenter, with 76% of HCs engaging in downward comparisons with the anxious presenter and 71% in downward comparisons with the confident presenter. Participants with SAD, however, appeared to be more

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influenced by the condition and the presenter's anxiety versus confidence. In the anxious presenter condition, the predominant type of comparison was downward even among participants with SAD, with 65% of participants engaged in downward comparisons. Conversely, in the confident condition, 65% of participants with SAD made upward comparisons with the presenter and rated themselves as less desirable than the presenter. Thus, participants in general tended to see themselves as superior to the speech presenter except in the case of participants with SAD comparing themselves to a confident individual, which resulted predominantly in upward comparisons.

Motivation to engage in social comparisons. With respect to social comparisons in general, it was hypothesized that participants with SAD would report more frequently comparing themselves to others in general, as assessed by the INCOM questionnaire. This prediction was supported. An independent-samples *t*-test was conducted on total INCOM scores, comparing scores for the SAD and HC groups. A significant, albeit somewhat modest difference was found, $t(80) = 2.48, p = .02$, with SAD participants reporting significantly higher scores on the INCOM, reflecting a greater tendency to engage in social comparisons in their daily lives.

Impact of social comparisons on desire for future interaction. It was predicted that participants with SAD would see themselves as more inferior to the confident presenter (relative to the anxious presenter and to HCs in both conditions) and this upward comparison would lead them, in turn, to desire less interaction with him. To evaluate this hypothesis, a mediated moderation analysis using the bias-corrected bootstrapping approach was conducted using the structural equation modelling software AMOS (version 22.0.0). A mediated moderation model was constructed in which the categorical variables of group (SAD and HC), condition (anxious and confident presenter), and their interaction (the product of group and condition) were entered

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as predictors, Self-comparison (the average rating of the self as compared to the speech presenter across desirable attributes) was entered as the mediator, and the total score on the DFI questionnaire was entered as the outcome variable. This model suggested that the direct effect of condition on Self Comparison approached significance ($\beta = .23, p = .09$), the direct effect of Self Comparison on DFI was significant ($\beta = -.23, p = .04$), and the direct effect of condition on DFI was significant ($\beta = .43, p = .002$). The mediated moderation hypothesis was tested using the bias-corrected bootstrapping method but was not supported for the test of the indirect path from the group by condition interaction term to DFI through Self Comparison, with the confidence intervals crossing zero ($\beta = .07, p = .24, 95\% \text{ CI } -.05, .36$). Moreover, the model did not support a mediated relationship between group and DFI ($\beta = .03, p = .57, 95\% \text{ CI } -.13, .24$). However, Self-comparison approached being a significant mediator of the relationship between condition and DFI ($\beta = .05, p = .05, 95\% \text{ CI } 0, .16$).

Given that the hypothesis of a mediated moderation relationship was not supported, in order to better understand the relationships between group, condition, self-comparison and DFI, two simple mediation models were created (Figures 6 and 7) with group and condition as the single predictors, Self-comparison as the mediator, and DFI as the outcome variable. When testing the relationship between condition and DFI as mediated by Self Comparison (collapsing across group), it was found that the direct effect of condition on Self Comparison was significant ($\beta = -.32, p = .003$), the direct effect of Partner Type on DFI was significant ($\beta = .36, p < .001$), and the direct effect of Self Comparison on DFI was at the level of a trend toward a significant ($\beta = -.17, p = .10$). However, the indirect (i.e., mediated) relationship of condition on DFI approached statistical significance ($\beta = .06, p = .08, 95\% \text{ CI } 0, .16$). When testing the relationship between group and DFI as mediated by Self Comparison (collapsing across condition), it was

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found that the direct effect of group on Self Comparison was significant ($\beta = -.39, p < .001$), the direct effect of group on DFI was not significant ($\beta = -.17, p = .14$), and the direct effect of Self Comparison on DFI was significant ($\beta = -.35, p = .002$). There was also support for the indirect (i.e., mediated) relationship of group on DFI ($\beta = .14, p = .002, 95\% \text{ CI } .06, .24$).

To summarize, the findings provided support for the notion that both one's own level of SAD (SAD vs. HC) and the type of presenter he or she considered interacting with (anxious or confident) impacted desire for future interaction with the presenter. Further, part of the relationship was mediated by differing types of social comparisons between the self and that partner. Participants who had SAD (relative to HCs) and those who watched a confident (versus anxious) presenter tended to make more favourable (i.e., upward) social comparisons. The more positively the social partner was rated relative to the self, the more the participant desired interaction with that social partner, while the more inferior the social partner was relative to the self, the less the participant wished to have further interaction with the presenter..

Similarity and desire for future interaction. A pattern of results was hypothesized wherein participants with SAD would see themselves as more similar and HC participants would see themselves as less similar to the anxious presenter at postmanipulation relative to baseline. In the confident presenter condition, the opposite pattern was expected, with HCs seeing themselves as more similar to the presenter at postmanipulation as compared to baseline, and participants with SAD seeing themselves as less similar to the presenter relative to baseline. To test these hypotheses, 2 (group: SAD, HC) by 2 (time: baseline, postmanipulation) two-way repeated-measures ANOVAs were conducted in each condition. In the anxious presenter condition, there was no main effect of time, $F(1,38) = .45, p = .51, \eta^2_p = .01$, no main effect of

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group, $F(1,38) = .17, p = .68, \eta^2_p < .01$, and no group by time interaction, $F(1,38) = .71, p = .41, \eta^2_p = .02$. Thus, the hypothesis related to this condition was not supported.

In the confident presenter condition, the main effect of time approached significance, $F(1,39) = 3.44, p = .07, \eta^2_p = .08$, with participants overall seeing themselves as more similar to the confident presenter at postmanipulation relative to baseline. There was also a marginally significant main effect of group, $F(1,39) = 3.39, p = .07, \eta^2_p = .08$, with HC participants seeing themselves as more similar to the presenter overall, providing partial support for the hypothesis. There was no significant group by time interaction, $F(1,39) = 1.47, p = .23, \eta^2_p = .04$.

The perceived similarity between the self and the presenter was expected to be positively correlated with the desire for future interaction with him was. A bivariate correlation conducted across participants (regardless of group and condition) supported this hypothesis ($r = .33, p < .01$). Across group and condition, the more participants saw the presenter as similar to the self the greater their desire for future interaction with him.

With respect to ratings of similarity between the self and the anxious and confident presenter, it was predicted that the anxious partner would be rated as more similar to the self by participants with SAD and less similar to the self by HC participants. Conversely, it was expected that HCs would rate the confident presenter as more similar, and that participants with SAD would rate the same presenter as less similar. However, in the anxious partner condition, there was no main effect of time, $F(1,38) = .45, p = .51, \eta^2_p = .01$. There was no main effect of group, $F(1,38) = .17, p = .68, \eta^2_p < .01$. There was also no group by time interaction, $F(1,38) = .71, p = .41, \eta^2_p = .02$. Thus, the visibly anxious presenter did not lead to judgments of less similarity relative to baseline, and ratings of similarity did not differ across the two groups.

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In the confident presenter condition, the main effect of time approached significance, $F(1,39) = 3.44, p = .07, \eta_p^2 = .08$. The main effect of group also approached significance, $F(1,38) = 3.39, p = .07, \eta_p^2 = .08$. There was no significant group by time interaction, $F(1,38) = 1.47, p = .23, \eta_p^2 = .04$. Thus, participants tended to see the confident presenter as more similar at postmanipulation relative to baseline, and HCs tended to see him as more similar to themselves overall, but the pattern of change in similarity from baseline to postmanipulation did not differ between the two groups.

Speech performance and self-portrayal concerns. It was predicted that participants with SAD who were asked to contemplate giving their own speech after watching a confident presenter, as compared to those who watched an anxious presenter, would endorse more concern related to revealing self-relevant flaws on the NSPS, and would make more negative predictions about their own speech performance as evaluated on the PSP. With respect to self-portrayal concerns based on the NSPS, the results of a 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) two-way between-groups ANOVA revealed a main effect of group, $F(1, 78) = 132.03, p < .001, \eta_p^2 = .63$, with participants with SAD reporting more NSPS concerns overall, but no main effect of condition, $F(1, 78) = .01, p < .91, \eta_p^2 = 0$, and no group by condition interaction, $F(1, 78) = 1.43, p < .24, \eta_p^2 = .01$. Thus, this hypothesis was not supported, and there was no differential impact on self-portrayal concerns as a function of watching (and comparing the self with) the confident or anxious speech presenter.

With respect to PSP scores, changes from pre to postmanipulation in the negative and positive subscales of the PSP were examined separately for each of the conditions. Results of the 2 (time: baseline, postmanipulation) by 2 (group: HC, SAD) two-way repeated-measures ANOVA examining the positive subscale of the PSP in the anxious presenter condition indicated

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that there was a main effect of group, $F(1,39) = 18.9, p < .001, \eta^2_p = .33$, with SAD participants endorsing fewer positive qualities related to their speeches. However, there was no significant main effect of time, $F(1,39) = 1.92, p = .17, \eta^2_p = .05$, nor a time by group interaction, $F(1,39) = .95, p = .34, \eta^2_p = .02$. In the confident presenter condition, there were main effects of time, $F(1,39) = 14.56, p < .001, \eta^2_p = .27$, with both groups rating the positive aspects of their speech lower at postmanipulation as compared to baseline. There was also a main effect of group, $F(1,39) = 14.84, p < .001, \eta^2_p = .28$, with participants with SAD endorsing fewer positive attributes in their speeches. There was no group by time interaction, $F(1,39) = .47, p = .5, \eta^2_p = .01$.

With respect to the negative subscale of the PSP in the anxious presenter condition, there was a main effect of group, $F(1,39) = 37.31, p < .001, \eta^2_p = .49$, with SAD participants rating their own speeches more negatively than HCs. The main effect of time approached significance, $F(1,39) = 3.45, p = .07, \eta^2_p = .08$, with negative PSP scores lower at postmanipulation. There was no significant group by time interaction, $F(1,39) = 2.53, p = .12, \eta^2_p = .06$. Similarly, in the confident presenter condition, there was a main effect of group, $F(1,39) = 49.66, p < .001, \eta^2_p = .56$, with SAD participants rating their speech more negatively than HCs. The main effect of time approached significance, $F(1,39) = 3.79, p = .06, \eta^2_p = .09$, with negative PSP ratings approached being significantly lower at postmanipulation relative to baseline. There was no group by time interaction, $F(1,39) = .69, p = .41, \eta^2_p = .02$. In summary, while there were consistent differences in the speech ratings between the HCs and participants with SAD in the expected directions (with SAD participants rating their speeches as having more negative and less positive qualities), there was no evidence that watching a confident or anxious speech impacted predictions about or perceptions of participants' own attributes or performance.

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Costs of interpersonal blunders. It was expected that SAD and control participants would not differ in their evaluations of the cost of imagined blunders for an anxious presenter, rating this presenter's blunders as more interpersonally costly than those of a confident individual. Conversely, the groups were expected to differ in their ratings of the costs of blunders committed by a confident presenter, with participants with SAD rating the blunders of a confident presenter as less costly and the presenter as more able to repair the situation, as compared to control participants. A 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) two-way between-groups ANOVA was conducted to examine this hypothesis. This hypothesis was not supported by these results. There was a main effect of group, $F(1,77) = 10.42, p = .002, \eta^2_p = .12$, with participants with SAD rating blunders as more costly overall. There was also a main effect of condition, $F(1,77) = 15.63, p < .001, \eta^2_p = .18$. All participants evaluated the blunders of an anxious presenter as more costly than those of the confident presenter. Contrary to predictions, there was no significant group by condition interaction $F(1,77) = 1.70, p = .19, \eta^2_p = .02$. Socially anxious participants were no harsher on the anxious presenter, nor any more lenient on the confident presenter than the HC participants when it came to estimating the cost of imagined social blunders.

Desirability of healthy controls relative to participants with SAD. Coders were expected to rate participants with SAD in both conditions as less interpersonally desirable than HC participants, based on their performances in their video-recorded speeches. A 2 (group: SAD, HC) by 2 (condition: anxious, confident) two-way between-groups ANOVA was conducted to examine the desirability of participants according to group and condition. There was a main effect of group, $F(1,80) = 10.33, p = .002, \eta^2_p = .11$. As predicted, HC participants were rated as more interpersonally desirable than participants with SAD. There was no main effect of

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condition, $F(1,80) = .32, p = .58, \eta^2_p < .01$, and no group by condition interaction, $F(1,80) = .60, p = .44, \eta^2_p = .01$).

Coded ratings of speech quality. With respect to coder ratings of the quality of the speeches produced by HCs relative to participants with SAD, it was predicted that there would be a main effect of group, with HC speeches being rated more positively and less negatively. It was also expected that a group by condition interaction would emerge, such that participants with SAD who compared themselves to a confident speaker would perform more poorly than SAD participants who compared themselves with an anxious speaker. Two 2 (group: SAD, HC) by 2 (condition: anxious presenter, confident presenter) two-way between-groups ANOVA were conducted to examine these hypotheses, using the positive and negative subscales on the PSP separately. These hypotheses were partially supported. With respect to negative qualities within the speeches, there was a main effect of group, $F(1,84) = 16.23, p < .001, \eta^2_p = .16$. There was no significant main effect of condition, $F(1,84) = .64, p = .43, \eta^2_p < .01$, or group by condition interaction, $F(1,84) = .51, p = .48, \eta^2_p < .01$. With respect to the positive qualities of the speeches, the same pattern of results emerged. There was a main effect of group, $F(1,84) = 12.89, p = .001, \eta^2_p = .13$. There was no main effect of condition, $F(1,84) = .09, p = .76, \eta^2_p < .01$, nor was there an interaction between group and condition, $F(1,84) = .61, p = .43, \eta^2_p < .01$. Coders evaluated the speeches of participants with SAD as having more negative and fewer positive qualities as evaluated by the PSP, but the condition did not impact ratings.

The relationship between participant and coder ratings of participant speeches was examined across the positive and negative subscales of the PSP separately. In order to calculate the discrepancy between self and observer ratings of speeches, standardized residual scores reflecting participant ratings of speeches with observer ratings partialled out were calculated

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(e.g., Gavric, 2014; Rodebaugh & Rapee, 2005; Taylor & Alden, 2011). This was done using a regression analysis in which observer ratings were used as a predictor and self-ratings as the outcome variable. This was done once for the positive and again for the negative PSP subscale. The standardized residual values in each regression were saved as separate variables as an index of the amount of variance in self-ratings that could not be accounted for by objective (i.e., observer) ratings of speeches, and was considered a useful measure of any existing bias in the self-evaluation of participant speech performance. In this case, positive values indicate positive bias (i.e., over-endorsement of positive or negative speech characteristics) and negative scores indicate negative bias (i.e., under-endorsement of positive or negative speech characteristics).

2 (group: SAD, HC) by 2 (condition: confident presenter, anxious presenter) between-subjects ANOVA were conducted on these standardized residuals within the negative and positive subscales of the PSP separately. With regard to the negative subscale of the PSP, there was a significant main effect of group, $F(1,76) = 21.28, p < .001, \eta^2_p = .22$. There were no significant main effects of condition, $F(1,76) = .83, p = .37, \eta^2_p = .01$, nor any significant group by condition interaction, $F(1,76) = .37, p = .55, \eta^2_p < .01$. Participants with SAD were significantly more likely to over-endorse the negative aspects of their speech relative to HCs, across both experimental conditions.

With regard to positive attributes of speeches, a complementary pattern of results emerged. A significant main effect of group emerged, $F(1,76) = 11.11, p = .001, \eta^2_p = .13$. There was no significant main effect of condition, $F(1,76) = 2.08, p = .153, \eta^2_p = .03$, nor a significant group by condition interaction, $F(1,76) = .09, p = .77, \eta^2_p = .001$. Participants with SAD showed a tendency to under-endorse the positive attributes of their own speeches relative to HCs.

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Coded ratings of dominance and warmth. It was predicted that participants with SAD would be rated as less dominant and less warm in their recorded speeches, as compared to HCs. It was also expected that participants with SAD in the confident partner condition would be rated as even less dominant and less warm than participants with SAD in the anxious partner condition (with a stronger effect on warmth than on dominance). Separate 2 (group: SAD, HC) by 2 (condition: anxious, confident presenter) two-way between-groups ANOVA were conducted on coders' ratings of participants' dominance and warmth. Please see Figure 8.

For dominance, there was a main effect of group, $F(1, 84) = 9.81, p = .002, \eta^2_p = .11$. There was no main effect of condition, $F(1, 84) = .19, p = .67, \eta^2_p < .01$, and no group by condition interaction, $F(1,84) = .24, p = .63, \eta^2_p < .01$. Similarly, with regard to warmth, there was a main effect of group, $F(1, 84) = 5.29, p = .02, \eta^2_p = .04$. There was no main effect of condition, $F(1, 84) = .02, p = .88, \eta^2_p < .001$, and no group by condition interaction, $F(1,84) = .45, p = .51, \eta^2_p < .01$. Participants with SAD were judged as less dominant and less warm across both conditions, but neither type of rating was impacted by condition.

Summary of Results

To summarize these findings, all participants rated the presenter as less desirable when he showed visible anxiety and as more desirable when he displayed social confidence, relative to baseline. Similarly, coders rated SAD participants as less desirable than HC participants after viewing their recorded speeches. It appears that visible anxiety leads one to be judged by others as less socially desirable, while signs of social confidence confer the opposite effect.

With respect to social comparisons, individuals with SAD reported being more motivated to engage in social comparisons in general and tended to evaluate themselves more poorly as compared to the speech presenters than HCs. Whereas participants with SAD tended to make

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upward comparisons with the confident speaker and downward comparisons with the anxious presenter, HCs made downward comparisons with both types of presenters. This pattern of results closely corresponds to the desirability ratings described above (anxiety leading to lower desirability and confidence leading to higher desirability). Thus, signs of anxiety vs. confidence may represent important information that leads socially anxious individuals to see the self as inferior to confident others, and HCs to view themselves as superior to anxious others. Furthermore, separate mediation models found support for the role of social comparisons as mediating the relation between both participant group (SAD vs. HC) and condition (anxious vs. confident), on one hand, and desire for future interaction, on the other. These findings indicate, simply, that evaluating a partner as inferior as compared to the self makes him or her less desirable for future interacting.

With respect to desire for future interaction, both groups reported an increase in their desire for future interaction with the confident presenter as compared to baseline, but only HCs (and not participants with SAD) reported a drop in their desire for future interaction with the anxious presenter. Importantly, all participants viewed an anxious speaker as less likely to desire interaction with them (compared to baseline), whereas there was no change relative to baseline in participants' perception of the confident speaker's desire for future interaction with them. In addition, there was a positive relationship (i.e., correlation) between perceived similarity of self with partner and the desire to have future interaction with the partner.

With respect to anxiety, positive affect, and negative affect, participants with SAD experienced more anxiety about interaction than HCs regardless of their assigned condition. In addition, participants with SAD experienced more negative affect and less positive affect throughout the study, and experienced more long lasting, negative changes in affect (e.g.,

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decrease in positive affect and increases in negative affect) after finding out about the demanding nature of the study tasks (anticipated speech delivery and social interaction).

Regarding speech quality, participants with SAD rated their own speeches and self-portrayal as poorer than HCs. These ratings matched the pattern of speech quality ratings provided by coders. However, a direct comparison of self and coder ratings of speeches revealed that while both participants with SAD and coders agreed that the speeches produced by participants with SAD were poorer than those produced by HCs, individuals with SAD were also biased in their ratings of their own speeches, tending to exaggerate the negative attributes and under-report the positive attributes of their own speeches.

With respect to social blunders, participants with SAD rated blunders as being more costly in general. In addition, participants across groups rated the blunders of the anxious speaker as more costly than those of a confident speaker. Finally, coders blind to diagnostic status rated the costs of hypothetical blunders committed by participants with SAD as being higher than those of HCs committing the same blunders.

Finally, participants with SAD were rated by speech coders as being less interpersonally warm (i.e., colder) and less interpersonally dominant (i.e., more submissive) than HCs based on their recorded speeches. Absolute values indicated that whereas HCs were seen by coders as being somewhat warm and dominant, participants with SAD came across, on average, as somewhat cold and submissive.

Discussion

The current study was designed to examine the interpersonal appraisals that socially anxious and nonanxious individuals make about confident and anxious social partners. Based on the extant literature and the earlier study in the present program of research (Bielak & Moscovitch, 2013), there is evidence to suggest that individuals with SAD tend to exaggerate both the negative social implications of showing visible anxiety (e.g., Purdon et al., 2001) and may also exaggerate the positive implications associated with interpersonal confidence (Bielak & Moscovitch, 2013). It was predicted that given these evaluative tendencies, individuals with SAD engage in numerous unfavourable social comparisons between the socially anxious self and confident others, which would result in a heightened sense of social threat, negative interpersonal predictions, and less desirable interpersonal behaviour. These predictions are grounded in contemporary cognitive, interpersonal, and psychoevolutionary models of SAD.

It was expected that the results of the present study would replicate and extend the central finding of the earlier, vignette-based study (Bielak & Moscovitch, 2013) wherein individuals with SAD exhibited a “halo effect” bias to overvalue the positive attributes of a confident individual. The current study attempted to improve on the methodology of the earlier study by translating the vignette-based task in which they imagined possible social partners into laboratory-based one with a real social partner who they were asked to evaluate and with whom the participants were led to believe they would interact. In this way, the design of the present study allowed for the assessment of interpersonal predictions as they occurred in the anticipation of a real rather than imagined social interaction. The design of the current study also provided an opportunity to maintain experimental control over the object of comparison by ensuring that all participants viewed and responded to the same social stimuli through the use of two pre-

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recorded, pilot-tested videos depicting a single speech presenter delivering the identical speech in either a confident or anxious manner. The current study is one of the only studies to date that experimentally induced and manipulated social comparisons and examined their consequences within the context of social anxiety, and the first to do so in a clinically diagnosed sample of participants with SAD (see also Mitchell & Schmidt, 2014). By asking all participants to compare themselves to the same individual, the design used in the current study enabled the attribution of any group differences to the social comparison tendencies of the participants or the manipulated differences in the qualities of the comparison target across conditions.

Evaluations of Self and Others: Social Comparison Processes

A central aim of the present study was to examine the role of social comparisons in the interpersonal predictions and behaviour of those with SAD. The present study examined the process of social comparisons in two ways. First, participants were asked to report on their tendency and motivation for social comparisons in general on the INCOM questionnaire. Consistent with previous findings (e.g., Antony et al., 2005), it was found that individuals with SAD were more motivated to compare themselves frequently to others in their daily lives. Next, inspired by the earlier findings related to the differences in evaluations of confident others by anxious versus healthy raters, it was hypothesized that the “halo” of desirability that socially anxious individuals attribute to confident others would result in more numerous upward comparisons with such social partners. To examine this, participants were asked to compare themselves with the anxious and confident speech presenter. While there did not appear to be any differences between groups in the seemingly universal tendency to evaluate confident others as highly desirable, strong support was found for the prediction that individuals with SAD tended to make numerous upward social comparisons with new social partners who are confident, whereas

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HCs typically made downward comparisons, seeing themselves as equally or even more desirable than both the anxious and confident presenters. Further, coder ratings that mirrored these upward comparisons suggested that these upward comparisons may not be distorted, but may in fact reflect real differences in the ways anxious and confident people are perceived by others. There has been extensive theory and research evidence supporting the notion that downward comparisons have a positive impact while upward comparisons have negative impact on mood and self-esteem (e.g., Wood & Lockwood, 1999). In light of this evidence, these findings suggest that individuals with SAD may have a heuristic of evaluating confident others as superior to the self across a range of attributes may help explain the heightened sense of social threat experienced in social interactions, and the tendencies to submit, self-protect, or withdraw in social situations (e.g., Weeks et al., 2009).

One of the central, and perhaps troubling, findings of the current study is the surprisingly high level of concordance between the patterns of self evaluations of individuals with social anxiety, who consistently view themselves as inferior and less desirable, with the unfavourable ratings elicited amongst participants by the anxious (relative to the confident) presenter, as well as the more negative ratings provided by naïve coders of participants with SAD (as compared to HCs). It appears that the notion that visible anxiety suggests shortcomings and a lesser social status or desirability is a notion that is not unique or distorted in the minds of anxious individuals, but a perception that might be shared, to some extent, by all participants across own level of anxiety. As others have also shown (Antony et al., 2005), individuals with SAD in the present study perceived themselves as inferior, having less desirability or “social currency” than confident individuals with whom they interact, as evidenced by their tendency to compare themselves in an upward fashion with the confident speech presenter. It appears that displaying

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visible signs of anxiety (versus confidence) plays an important role in determining interpersonal desirability. Interestingly, in both the current study and earlier work (Bielak & Moscovitch, 2013), the negative attributions related to visible anxiety were not unique to socially anxious individuals. In the 2013 study, both anxious and nonanxious participants experienced a decrease in the perceived desirability of a person described as visibly anxious. The same pattern of results emerged in the current study with respect to both the interpersonal desirability and desire for interaction with the anxious speech presenter. All participants saw the anxious presenter as someone they would less like to interact with, while rating the confident presenter as someone they would very much like to interact with and as having a higher level of desirability or social currency.

Further support for this notion emerged from coder ratings of the desirability and desire for interaction of participants based on their own speech recordings. Coders watched and rated all of the videos produced by study participants, and were blind to the group or condition to which each participant belonged and to the nature and hypotheses of the current study. Based solely on the recorded speeches, there was a clear group difference wherein coders rated participants with SAD as less desirable, and as being less appealing for future interaction. The fact these group differences emerged from actual videos produced by individuals with SAD and healthy controls suggests that the prior findings in Moscovitch and Bielak (2013) were not merely an artefact of the experimental stimuli, but an actual reliable impression related to visible anxiety. It is worth noting however, that even though a true difference in the ways individuals with visible anxiety and those without were evaluated was found, participants with SAD did also show a biased tendency to exaggerate the shortcomings (and underemphasize the positive qualities) of their own speeches as compared to the actual objective ratings of these speeches

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provided by objective raters. It appears that the upward comparisons those individuals with SAD engage in when interacting with others who appear confident and their sense of being ranked lower within the social hierarchy may not be an entirely distorted view but rather one that has been reinforced by less positive reactions from the social world.

This combination of exaggerated negative perceptions and bona fide negative evaluations by observers has direct implications to interventions for SAD. The emphasis in cognitive-behavioural interventions for SAD tends to be on identifying and challenging negative, distorted, unhelpful thinking patterns and interpersonal predictions. As cognitive-behavioural therapists, clinicians appear to be very keen to help clients notice, identify, and challenge distorted cognitions related to the probability and cost of negative social outcomes related to appearing visibly anxious. Not surprisingly, negative distortions related to the objective performance were found in the current study in the form of exaggerated negative and diminished positive self-ratings of participant speech quality relative to coder ratings. The troubling empirical evidence that is emerging from a number of recent studies including our own (e.g., Gee et al., 2012; Norton & Hope, 2001) suggests that in addition to these negative self-evaluative biases, the negative beliefs, self-appraisals, and predictions made by individuals with SAD also have some realistic basis. The social world does appear to judge and potentially even reject individuals who appear visibly socially anxious. Thus, the valuable and limited time clinicians spend with clients may be most effectively spent in dealing with both the existing distortions, as well as changing the unhelpful behaviours that contribute to actual negative evaluations, and/or adaptively dealing with and accepting the implications of one's anxiety. Clients may benefit from having a better understanding of what it is about their anxiety or associated behaviours that may be poorly received by social partners. It may then be possible to coach clients in ways to counteract the

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deleterious effects of anxiety on relationship-building (e.g., appearing aloof, disinterested, withholding self-disclosure) and more accurately convey their social motivations and level of engagement (e.g., increasing warm behaviours and the willingness to share). These ideas are consistent with current gold-standard CBT treatments for social anxiety, but with an added emphasis on explicitly coaching each client to develop a more socially adaptive repertoire of relationship-facilitating interpersonal behaviours. There is preliminary evidence for the notion that, while affiliative behaviour may not come as easily or effortlessly to some clients with SAD as they do for other individuals, it is possible to effectively train these if time is set aside within therapy to do so (e.g., see Alden & Taylor, 2011). These ideas are revisited in more detail, below.

Interpersonal Costs of Appearing Anxious

This is not the first study to document that socially anxious individuals receive negative evaluations from others (e.g., Ashbaugh et al, 2005; Bielak & Moscovitch, 2013, Creed & Funder, 1998; Gee et al, 2012; Voncken & Dijk, 2013). The data from the current study, however, provide important additional information regarding the mechanisms underlying these apparent interpersonal rejections. First, support was found for notion that social comparisons mediate the relationship between social anxiety and desire for future interaction. Across all of our participants, the higher the ratings of the self as compared to the presenter, the lower the participant's desire for interaction with the presenter. Conversely, the lower the ratings of the self as compared to the presenter, the higher the desire for future interaction. Participants clearly wish to interact with those who are perceived as being equal or better than the self. Considering this finding in addition to the findings that confident individuals are seen as highly desirable and anxious individuals as less desirable, our data seem to suggest that the upward social

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comparisons in which individuals with SAD engage when encountering confident others are not necessarily exaggerated or biased, but may reflect a real tendency for the social world to respond unfavourably, or even reject, to those displaying visible anxiety. While research has shown that individuals with SAD overestimate how visible their anxiety is to other people (e.g., Brown & Stopa, 2007), it is noteworthy that our coders, who were blind to participant condition, did rate our SAD participants as having performed more poorly and as less warm and desirable for future interaction, relative to our HCs, suggesting that there were clear, observable differences in the ways the groups performed and the impressions they made on the audience. Thus, our data suggest a sobering and somewhat surprising concordance between the perception of individuals with SAD that they are inferior and less desirable than confidence others, and the less-than-optimal interpersonal evaluations of them that are made by their social partners and observers. It is noteworthy (though perhaps not entirely surprising), that participants with SAD also tended to exaggerate the negative (and minimize the positive) attributes of their own performance when they reflected on their own speeches, relative to objective ratings of the same speeches. In sum, while individuals with SAD appear to truly perform more poorly than HCs on social (e.g., speech) tasks and elicit more negative responses from the audience, their impression of just how poorly they performed appeared to be exaggerated relative to their objective performance.

Given the evidence that the negative beliefs held by participants with SAD regarding their own performances were at least somewhat consistent with objective ratings (even if exaggerated), it is worthwhile to examine potential reasons for the negative social reactions these participants elicited. One potential explanation for the negative social responses elicited by the anxious presenter in our study participants -- and, in parallel, by the SAD participants in coders' ratings -- may pertain to perceived similarity. Previous research has shown that nonanxious

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people rate individuals with SAD as less similar to themselves, and this contributes, at least in part, to the interpersonal rejection of these individuals (e.g., Voncken, Bögels, & Roelofs, 2008). However, in our study, all participants, regardless of their own anxiety level, did not rate the visibly anxious presenter as less similar to the self than they rated the confident presenter. Thus, it is unlikely that a sense of dissimilarity would account for the lower ratings of desirability or diminished desire to interact with the anxious presenter. It is noteworthy, however, that while similarity did not appear to be a factor in the interpersonal rejection of the anxious partner, participants did tend to rate the confident presenter as more similar to themselves after watching his video relative to baseline ratings of similarity, and there was a positive relationship between similarity and desire for future interaction. Thus, in our study there appeared to be other factors leading to rejection (e.g., the perception that the anxious presenter was disinterested and his colder and more submissive interpersonal stance, as discussed in more detail below). On the other hand, it is important to note that while the anxious presenter did not elicit decreased ratings in perceived similarity among participants in either group, the confident partner's speech elicited robust increases in such ratings, with a trend for HCs relative to participants with SAD to rate the confident partner as more similar to themselves. There is ample evidence that mere exposure and familiarity to another person tends to increase both liking and ratings of similarity (e.g., Moreland & Zajonc, 1982). The increased similarity ratings obtained after participants watched the confident speech might reflect this natural tendency to identify with people one gets to know and notice ways in which one is similar to others as more information becomes available about them. It is thus perhaps surprising and informative that after watching the anxious presenter's speech, ratings of similarity did not reflect the expected increases in similarity and liking as they

did in the confident partner condition (e.g., see also Rodebaugh, Bielak, Vidovic, & Moscovitch, 2015).

Warmth, Dominance, and Impression Formation

A key piece of relevant information comes out of the ratings provided by participants of their perceptions of the anxious and confident speakers' desire to interact with them. Both groups of participants rated the anxious presenter as appearing less interested in interacting with them. To begin to unpack what it is about the interpersonal stance of socially anxious individuals (as compared to nonanxious individuals) that communicates a general sense of disinterest in interaction, video coders were asked to code the dominance and warmth of all of our participant videos. As reviewed above in the Introduction, the two orthogonal attributes of warmth (or affiliation) and dominance are central to the interpersonal circumplex model of personality (Leary, 1957). The results of the current study indicated that anxious participants came across, on average, as less dominant (or more submissive) and less warm (or colder) than HCs.

The notion that many (but not all) socially anxious individuals appear cold has been documented in other studies (Cain, Pincus, & Holforth, 2010). It has been widely established in the interpersonal literature that behaviours conveying warmth are conducive to relationship initiation and maintenance. One way to understand the impact of warmth (vs. coldness) is to consider the interpersonal dimensions of warmth and dominance as a 45-degree rotation of extraversion and agreeableness, two attributes in the Big Five model of Personality that have particular relevance for interpersonal processes (e.g., Markey and Markey, 2009). It has been demonstrated that high extraversion is characterized by warm dominance, and high agreeableness is characterized by warm submissiveness. These qualities have been shown to be critically important to positive interpersonal relationships, with extraversion primarily relating to

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impression formation (Borkenau, Brecke, Mötig, & Paelecke, 2009) and agreeableness to longer-term liking, maintaining relationships, and relationship satisfaction (Wortman & Wood, 2011). Thus, the interpersonal style of individuals with social anxiety – lower on extraversion and somewhat lower on agreeableness (see for a review, see Levinson, Kaplan, & Rodebaugh, 2012) – may convey a message of disinterest in interaction. It may also convey a lack of the interpersonally valued qualities of agreeableness and extraversion, potentially signalling to social partners that the person might be challenging to interact with or get to know.

Another way to understand the important finding that nonanxious individuals come across as warm, while socially anxious participants are judged as being cold, is through the perspective of interpersonal complementarity (e.g., Carson, 1969; Sadler, Ethier, & Woody, 2011). This perspective suggests that people are drawn to, and have most productive and enjoyable interactions with, others who are like them on the affiliation dimension and dissimilar to them on the dominance dimension. Warm individuals are likely to seek out complementary others who are warm themselves (e.g., Rodebaugh, Bielak, Vidovic, & Moscovitch, 2015). Warm individuals thus have the advantage of being seen as complementary to other warm people, whereas cold individuals such as those with SAD are likely to be perceived as complementary by individuals who are themselves, not anxious and tend to be warm. In addition to being complementary, a colder, less friendly interpersonal stance is seen as involving less adaptive behaviours that foster interpersonal closeness such as self-disclosure (Alden & Taylor, 2011). In this way, individuals with SAD may be stuck in negative interpersonal transaction styles (Kiesler, 1996) where their own cold behavior elicits similarly cold reactions and behaviour from others, as appears to be the case in the current study.

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It is noteworthy that while our participants with SAD were also rated as being less dominant in addition to being less warm than HCs, writers within the interpersonal literature have not identified submissiveness as being as *consistently* and *globally* problematic for social interactions and impression formation as reduced warmth. Instead, such writers emphasize that the best interpersonal outcomes result from a higher degree of complementarity (or oppositeness) between partners in a given social interaction (e.g., Sadler, Ethier, Gunn, Duong, & Woody, 2009). Thus, while submissive behaviour may be more and less problematic across different interactions, the lack of warmth observed by our coders appears to be an attribute more consistently associated with interpersonal dysfunction, and will thus be the focus of our discussion related to the empirical and clinical implications of our findings for SAD.

A crucial distinction between interpersonal coldness or unfriendliness in general and the lack of warmth conveyed by socially anxious individuals is that individuals with SAD may *appear* cold, unfriendly or disinterested due to elevated anxiety, safety behaviour use, or a lack of interpersonal competence. In reality, however, these individuals typically have a strong desire for interpersonal connection with others (e.g., Clark & Wells, 1995). There has been considerable debate regarding whether the problematic interpersonal behaviours of SAD participants is better conceptualized as a skills deficit, a product of elevated anxiety and self-protection, or a stable personality style (e.g., Baker & Edelmann, 2002; Hofmann, 2007; Stopa & Clark, 1993; Thompson & Rapee, 2002; Voncken, Alden, & Bögels, 2006; Voncken, Alden, Bögels, & Roelofs, 2008; Voncken, Dijk, de Jong, & Roelofs, 2010; Rapee & Heimberg, 1997; see a review of this literature by Angelico, Jose, Crippa, & Lourreiro, 2013). The majority of studies examining social skills deficits in SAD have found that individuals with social anxiety (across both clinical and analogue samples) come across as less socially competent as compared

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to nonanxious individuals (e.g., Alden & Wallace, 1995; Norton & Hope, 2001; see review by Angelico et al., 2013). This robust finding is not surprising, yet the immense challenge in understanding this finding is in disentangling true deficits (i.e., a lack of certain interpersonal knowledge or the absence specific social skills) from the inability to access or utilize certain interpersonal knowledge or skills due to the physiological and cognitive consequences of anxiety (Barlow, 2002; Hofmann, 2007). From the extant literature, it appears likely that a combination of bona-fide deficits (including a lack of practice with a subset of social behaviours), as well as the cognitive, behavioural, and physiological manifestations of anxiety might, in varying combinations for each individual client, might be to blame. Regardless of whether the social deficits arise from one factor or the other (or a combination thereof), one consistent finding (including ours) is that the interpersonal behaviour of individuals with SAD is clearly leading to less positive engagement and a less affiliative response from others. As such, it seems clear that interpersonal competence is worth directly targeting in treatment.

As reviewed in the Introduction, a growing literature describes safety behaviour use in SAD and its consequences, which have typically been shown to be unhelpful and even counterproductive. Thus, contemporary cognitive-behavioural treatments of SAD (e.g. Clark & Wells, 1995; Hope, Heimberg, & Turk, 2006; McEvoy & Saulsman, 2014; Rapee & Heimberg, 1997) emphasize targeting and reducing safety behaviours. Some common safety behaviours observed in SAD include avoiding eye contact, limiting self-disclosure, being overly agreeable, hiding or masking certain physical flaws (e.g., makeup to hide blushing or blemishes), excessively rehearsing prior to social situations, and many others. The rationale for targeting such safety behaviours, as it is conveyed to socially anxious clients, is that safety behaviours maintain an exaggerated sense of social danger in the situation, eliminating the opportunity for

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clients to learn that without safety behaviours, their threatening predictions do not come true. That said, participants and coders alike in the present study indicated perceiving anxious individuals as less likable or appealing as interaction partners and as having less desirable attributes. These findings suggest that the perception of social threat (e.g., anticipating criticism or rejection) may not be entirely exaggerated and raises the question of whether there may be some utility to safety behaviours that function to conceal visible symptoms of anxiety. On the other hand, interventions involving the elimination of safety behaviours have been shown to have positive impact on both self-reported and partner-reported measures of social interactions (e.g., Taylor & Alden, 2010; Taylor & Alden, 2011). The key to reconciling these two sets of findings may lie in a more fine-grained analysis of safety behaviours, such as the one recently published by Plasencia, Alden, and Taylor (2011). These authors provided support for two distinct subtypes of safety behaviours: avoidance and impression management. Like in previous studies (Hirsch, Meynen, & Clark, 2004), they found that avoidance safety behaviours (e.g., low self-disclosure, reduced eye contact) were associated with more negative responses from others, while impression-management behaviours (e.g., rehearsal, feigning friendliness) were not. The authors reasoned that these impression management strategies may appear similar enough to the prosocial behaviour of nonanxious individuals, and may help fend off interpersonal rejection, at least in the short term. Given the established importance of extraversion in early impression formation, and our findings related to the impact of anxiety on partner perceptions of socially anxious individuals' desire for continued interaction, it makes sense that socially anxious individuals who deliberately choose to engage in friendly behaviours (even if not completely genuinely) in order to gain positive responses from others may succeed in doing so. In some ways, individuals with SAD seem to be locked in a lose-lose predicament: if they appear anxious

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or convey interpersonal coldness and submissiveness, they elicit negative responses from others. If they attempt to hide their anxiety or engage in impression management (also termed “innocuous sociability”), they end up feeling inauthentic, and their partners may pick up on this lack of genuineness and view their behaviour as being less natural and, therefore, less likable. Are there any circumstances under which socially anxious individuals may engage in a new set of more warm, more extraverted behaviours, while maintaining a sense of authenticity and gaining social acceptance? The results of Plasencia, Alden, and Taylor (2011) seem to suggest that the type of safety behaviour patients choose to use (avoidance vs. impression management) greatly impacts the outcome, as does whether the socially anxious individual perceives these new, unfamiliar ways of acting as inauthentic behaviours they must adopt in order to garner the liking of others, or as experimentation with new ways of being more friendly and open with others which allow others to get to know their authentic selves. It could be expected that these new, less practiced social behaviours may seem somewhat foreign or even fake to individuals with SAD initially. Therapists can guide the process by normalizing and providing feedback and encouragement, as well as reframing these behaviours not as a pretense or “act” necessary to gain the liking of others, but as a way of practice a set of useful, potentially forgotten or rusty interpersonal skills; guided by this therapeutic stance, the socially anxious client may gradually begin to integrate these behaviours into his or her interpersonal identity and behavioural repertoire. This reframe, the frank and encouraging support, and judicious use of gentle feedback, could enable the therapist (and other clients, if in a group setting), to help clients persist in the challenging early period of experimenting with less familiar, “safe”, or comfortable interpersonal behaviours.

Treatment Implications: Training Skills and Interpersonal Approach Behaviours

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Given that the interpersonal stance of individuals with SAD leads to less engagement and friendliness from others, and given that their own coping efforts (i.e., safety behaviours) are generally unhelpful, it is pertinent to consider the notion that treatment for social anxiety should include guidance and training of specific behaviours that are aimed at gaining more positive responses from social partners. Current gold-standard CBT treatments for SAD approach this issue somewhat indirectly. The focus tends to be on challenging negative predictions individuals hold related to the ways they come across and others will respond to them, and eliminating avoidance and safety behaviours which are seen as barriers to both new learning and genuine social connection. In light of our findings and those of others (e.g., Gee et al., 2012; Norton & Hope, 2001) there may be a “kernel of truth” in these negative cognitions, in that others do respond more poorly to individuals with SAD and see them as less desirable partners for future interaction. It is noteworthy that this negative evaluation or rejection may be quite subtle, nuanced, and gradual, making it elusive to identify clearly in client accounts of social events or on behavioural experiment records, which are some of the most widely-used and effective CBT tools in our clinical repertoire. For an illustrative example, consider a client with SAD who might report in CBT treatment the distorted prediction that a classmate would ridicule or outright ignore him if he attempted to begin a conversation with him. With the therapist’s guidance, the client may endeavour to test his predictions, and discover much to his relief, that the predicted social rejection did not take place – the classmate politely reciprocated in a short conversation and even seemed reasonable engaged. However, what the client and therapist may not realize is that the client may, at the same time, have come across as somewhat aloof and unapproachable to the classmate during the conversation, and thus be passed over for an invitation for an outing with other classmates some time later.

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As can be seen from this example, while there is certainly ample evidence to support the importance of the central task of challenging negative cognitions during CBT for SAD, the extant literature seems also to support the need to help clients better navigate social situations in order to succeed at the more distal outcome of connecting with others in positive ways and having others want to spend more time with them. In current CBT treatments, the primary strategy to achieve this end is through exposure in combination with the elimination of safety behaviours. As discussed in the Introduction, safety behaviours have been shown to contaminate social encounters and lead individuals to come across as more distracted, cold, or less genuine. The assumption in eliminating these behaviours is that if safety behaviours are reduced, other, more genuine, warm, socially desirable behaviours will emerge (e.g., eye contact, demonstrating interest in the other person and in the interaction, smiling, appropriate self-disclosure). For a considerable number of clients, these behaviours may be completely out of practice, or may have never been practiced or refined due to many years of social avoidance. The therapist (and other clients, if in a group) could be instrumental in providing a forum for safely experimenting and practicing ways of responding in pro-social ways, as well as offering invaluable genuine feedback on the ways subtle elements of an individual client's social stance impacts those around him or her. While these exercises are not absent from commonly used SAD treatment protocols, the emerging evidence suggests clients may need even more support in this domain, and that it cannot necessarily be assumed that such behaviours will spontaneously emerge when clients are instructed to drop safety behaviours. In other words, there are two sides to the equation—dropping safety behaviours and filling the vacuum with adaptive prosocial behaviours that are designed to foster social connection – and both require therapeutic emphasis.

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The notion that individuals with SAD may benefit from training specifically aimed at improving interpersonal skills is not a novel one. To this end, considerable research has examined the impact of augmenting cognitive-behavioural therapy for SAD with social skills training. The exact structure, content, and length of social skills training has varied from study to study, but it typically involves psychoeducation, therapist modeling, and structured exercises to practice one or several specific social skills, including (among others): initiating, maintaining, and finishing a conversation, giving and receiving feedback, making and refusing requests, expressing opinions, etc. (e.g., see Antony and Swinson 2008). Although social skills training may not directly target the general interpersonal stance of clients (e.g., making them appear friendlier), it is possible that training clients on how to cope with specific interpersonal situations in a more pro-social, friendly manner might improve interpersonal outcomes.

Studies on the effectiveness of integrating social skills training into existing CBT have yielded mixed findings. Several studies found that adding this component, while not reducing the effectiveness of standard CBT, led to outcomes that were no better than those of standard CBT for SAD (Mersch, 1994; Bögels and Voncken, 2008). Other studies, however, found that it did enhance the benefits or longevity of the impact of standard CBT (e.g., Argyle, Bryant, & Trower, 1974; Beidel et al., 2014; Herbert, Gaudiano, Rheingold, Myers, Dalrymple, & Nolan, 2005; van Dam-Baggen & Kraaimaat, 2000; also see review by Huppert, Roth, & Foa, 2003).

One recent study by Alden and Taylor (2011) attempted to directly modify the interpersonal stance of individuals with SAD. They applied interpersonal theory and the notion of complementarity (described above) to train clients to adopt a friendlier, warmer, more pro-social interpersonal stance when engaging with others. They used a modified treatment approach they called “Interpersonal CBT”, which incorporated many of the elements of traditional CBT

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for social anxiety (e.g., examination and testing of beliefs, identification of safety behaviours).

Their approach differed, however, from traditional CBT by introducing elements of Interpersonal Psychotherapy, which included identifying each client's recurrent interpersonal patterns and their impact on partners and interactions (both within the treatment group and in their daily lives), and helping clients test out different ways of interacting with others.

One of the stated aims of this treatment was to increase social approach behaviours of individuals with SAD, which are thought to be essential to relationship formation. The authors found that these relational treatment strategies were readily implemented by their clients with SAD. Clearly, clients saw the interpersonal approach strategies as potentially helpful and felt that they were able to put them into practice successfully. The authors found that the interpersonally focused CBT had comparable impact to a standard CBT protocol in reducing social fear and avoidance symptoms, and such benefits were maintained for the 6-month follow-up period. Interestingly, this treatment approach was also associated with increases in both social approach and relationship satisfaction. The latter finding is particularly encouraging as it suggests that a relationally-focused intervention for SAD was able to create impact that went beyond symptom reduction. In successfully addressing these central interpersonal difficulties of individuals with SAD in a consistent and sustainable way, Alden and Taylor (2011) provided a potential novel roadmap for improving the interpersonal functioning of individuals with SAD.

Study Limitations

The results of the present study should be considered in light of the study's limitations. It is important to note, in this respect, that the results of our present study did not fully support our main predictions, which were based on our earlier online study (Bielak & Moscovitch, 2013). To review, the main findings from our earlier study were suggestive of a bias in evaluations of

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confident partners by individuals with high levels of social anxiety (using an analogue sample). Our current findings, instead, indicated that all participants, including both individuals with SAD and HCs, tended to evaluate confident individuals positively and anxious individuals negatively, and supported the notion that socially anxious presentations are judged as being less socially desirable. While our findings did not support our main, they are consistent with a number of other studies. However, it is impossible to completely reconcile the differences in the patterns of results between this study and our previous study without conducting additional research. To this end, one limitation of the present study was that the current study examined a single clinical group in comparison to a healthy control group, thus making it impossible to determine to what extent our findings might apply specifically to SAD or more generally to any anxiety-related or mood-related disorder. Future studies on this topic could recruit clinical samples of individuals with SAD, and compare them to both samples of individuals with other anxiety disorders (to determine whether any effects are specific to SAD or general among clinically anxious individuals), as well as healthy controls.

A second limitation of this study arose from the necessity of deceiving participants about the true purpose of the study, and making them believe that another participant was completing the study at the same time they were. Participant suspicion was assessed using the funnel debriefing technique and excluded those participants who endorsed a high level of suspicion that the study purpose and structure (e.g., presence of another participant) was not as was initially stated. It is possible, however, that non-excluded participants still experienced mild levels of suspicion which impacted their responses to various measures over the course of the study.

Third, the issue of gender as a moderating factor in interpersonal expressions of social anxiety has been highlighted as important in other studies (e.g., Mitchell & Schmidt, 2013), but

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was not possible to examine empirically in the current one. A number of more specific interesting, potentially important questions related to the role of gender and gender match (same vs. opposite gender interactions) remain to be explored. However, given the low number of male relative to female participants in the current study, it was not possible to statistically study gender as a moderator. It was also decided to use the same male presenter across all participants to limit any differences between speech presenter and speeches that would impact social comparisons. These choices limited our ability to examine the influence of gender on any of our key findings, an issue that certainly merits further research attention in future studies.

Fourth, the confident presenter was rated during pilot-testing as appearing more “Natural/Realistic” in the video than the anxious presenter. Ideally, both videos would have been rated as being equally realistic. However, given that the vast majority of study participants believed the cover story for the study and believed that the speech presenter was, indeed, another participant, it appears that for most participants, the anxious video may have been sufficiently convincing. Moreover, it is possible that some of the pilot raters based their ratings of “natural/realistic” on the criterion of behaving in a natural rather than believable manner. This distinction is important, as the anxious presenter’s behaviours may have appeared somewhat less “natural” (i.e., more stilted) than those of the confident presenter’s, but perhaps not less believable per se. Nonetheless, using a pre-recorded speech and an actor to portray a socially anxious individual was certainly a limitation of the present study.

Fifth, the demographic characteristics of our samples of individuals with SAD and HCs raise some potential limitations in terms of both the validity and the generalizability of our findings. Because our participants with SAD were significantly older than our HCs (means of 29.0 years for our participants with SAD, and 23.7 for our HCs) it is impossible to categorically

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rule out the possibility that slightly older age may have impacted some of our findings of interest. In addition, the fact that many of our participants were generally young adults in their 20s or early 30s may limit the generalizability of our findings to older (or younger) individuals with SAD. Also, the vast majority of our participants in both groups were either Caucasian or Asian in descent. This is reflective of the racial/ethnic composition of the Kitchener-Waterloo community, but may limit the generalizability of our findings to individuals from other groups and backgrounds.

Finally, a related shortcoming of the study is the use of a speech rather than interaction task to make inferences about the impact of social anxiety on social skills and interpersonal impression-making. The use of a speech task allowed us to maintain stronger experimental control on the object of social comparison, ensuring that all participants were comparing themselves to the same two speech presenters based on comparable information. Maintaining such control would be very difficult in a dynamic interaction task, where one person's behaviour has an immediate impact on others. The threat of an upcoming interaction was used to elicit predictions about interacting with anxious and confident partners. Ideally, though, social comparisons and their influence would be best studied in the context in which they typically occur, namely in the course of meeting and interacting with individuals in daily life within their natural environments.

Conclusion and Future Directions

Limitations notwithstanding, these findings extend the current understanding of SAD in a number of important ways. Like several earlier studies, the current study provides strong evidence that visible displays of social anxiety could be interpersonally costly. Social partners across the anxiety spectrum appear to evaluate the display of visible anxiety and/or associated

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interpersonal behaviours as indicators of lower overall desirability and greater interpersonal coldness and submissiveness, and socially anxious individuals are judged overall as being less appealing interaction partners. Socially anxious individuals seem to be acutely aware of their relatively low social status, engaging in frequent, unfavourable (i.e., upward) social comparisons with confident others. The present study and others (e.g., Weeks, 2009) suggest that these comparisons only reinforce the perception of social threat, and motivate continued submissive and avoidant social behaviours.

These findings have important implications for current cognitive behavioural interventions for social anxiety. Current CBT treatments SAD rely on two important assumptions, which are potentially clarified or challenged by this set of findings. First, CBT strategies imply that the social threat perceived by individuals with SAD and appraisals of the probability and cost of negative reactions from others (e.g., rejection or humiliation) are grossly exaggerated. These findings directly challenge this assumption, and provide strong evidence that the colder, more submissive interpersonal stance of individuals with SAD during social encounters leads to actual negative evaluations and higher rates of interpersonal rejection. As described in the example provided earlier, this rejection may not take the overt, hostile form that individuals with SAD predict that it would take (e.g., another person being overtly rude or unfriendly to them). It may, instead, simply lead social partners to opt to interact with warmer, nonanxious others and exclude or distance themselves from the individual with SAD, leading to missed social opportunities and propagating social isolation. While the case-by-case rejection may be quite subtle, if these missed opportunities should become a recurrent theme in an individual's social world, they may nonetheless make it more difficult for individuals with SAD to form satisfying, lasting connections with others.

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The second assumption underlying current treatments for SAD emphasizes the central role of safety behaviour reduction. Safety behaviours are seen as a primary obstacle to social success for individuals with SAD, with the underlying wisdom suggesting that as the individual becomes less preoccupied with concealing aspects of the self, more favourable, genuine, and desirable interpersonal behaviours should naturally emerge. The current study's methods did not address the second assumption directly, yet clinical experience in the treatment of social anxiety would suggest that in reality, this process unfolds very differently across clients. Some clients naturally thrive in current CBT treatments for SAD. As they begin to avoid less and challenge their negative cognitions, they begin to display warmer, more desirable interpersonal behaviours, and social partners respond very positively to their efforts, rewarding them with more interest, social opportunities, and the sense of connectedness they have longed for. However, a substantial proportion of clients, despite experiencing reduced avoidance and social fear, struggle to translate their reduction in fear and avoidance to increased social approach behaviours, and ultimately, into increased quantity and quality of meaningful interpersonal relationships. One possibility, and one that is indirectly supported by our findings, is that, even when these individuals engage more in the social world, they nevertheless struggle to make the behavioural changes (e.g., appearing interested and engaged, displaying warmth, sharing with others) that communicate to others that they are both interested in and worth getting to know. Our findings suggest that clinical interventions (and clinicians' ability to help both the former and latter groups of clients) may be enhanced by the addition of interpersonal strategies and explicit training of interpersonal awareness and behaviours that communicate warmth, interest, and engagement (e.g., appropriate nodding, smiling, eye contact, self-disclosure). Clinicians need to be mindful that these behaviours may be quite outside the normal interpersonal repertoire of

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individuals with SAD. The recent results of Alden and Taylor (2011), as well as others (e.g., Beidel et al., 2014) who have integrated a focus on interpersonal processes and social skills training, suggest that with skilled therapist guidance, clients are readily able to integrate more approach behaviours into their interpersonal repertoire

An even more unorthodox and dramatic interpretation of the relative importance of focusing on interpersonal dynamics (as opposed to specific CBT interventions) in the treatment of SAD comes from a recent study by Bjornsson et al (2011). Bjornsson et al. (2011) compared the effectiveness of a standard CBT group therapy for SAD with a psychotherapy group which was structurally equivalent, but which stripped away all the typical “content”, and focused entirely on group dynamics. The authors found that the two interventions were no different in their effectiveness for the treatment of SAD. Bjornsson et al. (2011)’s findings do not negate the value of the cognitive and behavioural interventions for SAD, but underscore an argument that has received substantial attention in interpersonal theories but has continued to be somewhat underutilized in group-based CBT: being in the presence of other people and allowing one another’s current behaviours, feelings, and reactions in the “here and now” to become the topic of discussion, rather than mere background to the discussion of “agenda topics”, can provide socially anxious clients with tremendous, timely insight into the ways they impact others, and can therefore effect tremendous change in both thought and behaviour (see Yalom & Leszcz, 1987). Bjornsson et al.(2011)’s surprising findings suggest that perhaps the future of CBT for SAD lies in paring down some of the cognitive-behavioural “content” of current content-heavy CBT interventions in order to free up some therapeutic time and space for a more unstructured, equally important focus on therapeutic and interpersonal “process”. Doing this may allow clients to gain important and rare insight into the ways their behaviour impacts other individuals in their

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presence and shape their interpersonal experiences, and how they can become more skilful, intentional, and genuine in the interpersonal messages they send. Such insight and practice, it appears, can be crucial in order to help clients (especially those for whom this process of interpersonal mastery not occur naturally) achieve their ultimate goal of gaining interpersonal connectedness and satisfaction.

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Footnote

¹ It was not predicted for there to be a significant relationship between age and any of the central outcomes in the current study. In order to determine whether this is the case, a preliminary exploration of any such relationship was examined by calculating Pearson correlations between age and the outcomes of interest in the current study, including: Desirability Index, DFI, similarity, blunders composite, and PSP. None of the correlations were statistically significant (r 's < .19, p 's > .09).

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Table 1. Pilot data for confident and anxious video stimuli (range for each item is 1 to 5)

Domain of Ratings	Anxious Video	Confident Video	<i>t</i> (10)	<i>p</i>
Intelligent	3.64 (.81)	3.91(.70)	1.40	.19
Calm	2.00 (.77)	3.91 (.54)	6.71	.00*
Warm	1.64 (.50)	3.27 (.9)	6.71	.00*
Nervous	4.00 (1.34)	1.91(1.14)	4.58	.00*
Likeable	2.64 (.67)	3.64 (.81)	3.03	.01*
Realistic/Natural	2.45 (1.13)	4.18 (.40)	5.19	.00*
Anxious	4.00 (1.18)	1.45 (.52)	7.48	.00*
Friendly	2.09 (.94)	4.00 (.63)	9.04	.00*
Confident	1.36 (.50)	3.91 (.70)	10.29	.00*
Competent	3.27 (.70)	3.91 (.90)	2.06	.16
Happy	1.91 (.94)	3.55 (.69)	6.71	.00*

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Table 2. Demographic and Clinical Characteristics for Participants with SAD and HCs within each experimental condition

Variable	Social Anxiety Disorder (Anxious Presenter Condition; <i>n</i> = 20)	Healthy Controls (Anxious Presenter Condition <i>n</i> =21)	Social Anxiety Disorder (Confident Presenter Condition <i>n</i> =20)	Healthy Controls (Confident Presenter Condition <i>n</i> =21)
Gender (% female)	75.0	61.9	70.0	61.9
Age – <i>M</i> (<i>SD</i>)	28.00 (12.47)	24.29 (10.32)	30.00 (9.90)	23.10 (7.58)
Ethnicity (%)				
<i>Caucasian</i>	52.4	50.0	61.9	65.0
<i>Asian</i>	42.8	30.0	38.1	20.0
<i>Black</i>	4.8	10.0	0	10.0
<i>Latino</i>	0	5.0	0	0
<i>Other</i>	0	0	0	5.0
Clinical Severity of Social Anxiety Disorder (8-point scale) <i>M</i> (<i>SD</i>)	5.2 (.77)	-	5.45 (.69)	-
% with additional diagnoses				
<i>Pure SAD</i>	40		20	
<i>Co-Principal</i>	30		55	
<i>Additional</i>	55		45	
Co-Principal Diagnoses (%)				
<i>Depression</i>	10		35	
<i>Other Anxiety Disorder</i>	10		10	

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<i>Other Disorders</i>	<i>10</i>	<i>10</i>
<i>None</i>	<i>70</i>	<i>45</i>
Additional Diagnoses (%)		
<i>Depression</i>	<i>25</i>	<i>0</i>
<i>Other Anxiety</i>	<i>15</i>	<i>45</i>
<i>Other Disorders</i>	<i>15</i>	<i>10</i>
<i>None</i>	<i>45</i>	<i>45</i>

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Table 3. Interrater reliability of video coding data

Variable	ICC (Consistency)
Desirability Index	.85
DFI	.76
PSP Positive	.89
PSP Negative	.83
Blunders Composite	.73
Warmth	.74
Dominance	.81
<i>Similarity to Self</i>	<i>.48</i>

Note: Variables with ICC values of less than .6 (italicized) were not averaged across coders and were not used in further analyses

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Table 4. Normality Indices for Descriptive and Independent Measures within the SAD and HC Participant Groups

Variable	N	Skew	SEskew	Kurtosis	SEkurtosis	K-S	P
PANAS Positive (baseline)	SA 40	.97	.37	.73	.73	.167	<.01
	HC 42	.32	.37	-.31	.72	.17	<.01
PANAS Negative (baseline)	SA 40	.33	.37	-.51	.73	.14	.04
	HC 42	1.50	.37	2.82	.72	.14	.03
PANAS positive (Anticipation)	SA 40	.25	.37	-.82	.73	.08	.20
	HC 42	.18	.37	.31	.72	.08	.20
PANAS negative (Anticipation)	SA 40	-.02	.37	-.59	1.02	.11	.20
	HC 42	1.04	.37	.87	.72	.11	.20
PANAS positive (Post-Speech)	SA 40	.82	.37	-.59	.73	.11	.20
	HC 42	.45	.37	.16	.72	.11	.20
PANAS negative (Post-Speech)	SA 40	.39	.37	-.35	.73	.09	.20
	HC 42	1.82	.37	2.92	.72	.09	.20
Desirability Index (Baseline)	SA 39	.38	.74	.27	.94	.08	.20
	HC 42	.37	.72	-.50	.27	.11	.20
Desirability Index (Postmanipulation)	SA 40	.37	.73	-.09	-1.06	.10	.20
	HC 42	.37	.72	.29	-.08	.10	.20
Desirability Social Comparison	SA 40	.37	.73	-.35	-.04	.23	<.01
	HC 42	.37	.72	1.10	.61	.23	.00
DFI (Baseline)	SA 39	.38	.74	.67	.22	.14	.06
	HC 42	.37	.72	.01	-.50	.09	.20
DFI (Postmanipulation)	SA 39	.38	.74	.09	-.60	.07	.20
	HC 42	.37	.72	.17	-.51	.08	.20
Perceived DFI	SA 39	.38	.74	.09	-1.08	.12	.15

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(Baseline)	HC 42	.37	.72	.60	.13	.13	.06
Perceive DFI (Postmanipulation)	SA 40	.37	.73	.72	.21	.14	.05
	HC 42	.37	.72	.16	-.21	.10	.20
INCOM	SA 40	.10	.37	.25	.73	.12	.15
	HC 42	.20	.37	.53	.72	.12	.19
SPIN	SA 40	-.35	.37	.09	.73	.07	.20
	HC 42	.40	.37	-1.00	.72	.13	.09
DASSDep	SA 27	.39	.45	2.44	.78	.09	.20
	HC 35	1.60	.40	-.50	.87	.25	.00
NSPS	SA 40	.60	.37	-.07	.73	.10	.20
	HC 42	1.03	.37	.40	.72	.16	<.01
BlundersComposite	SA 39	.38	.74	.58	-.00	.09	.20
	HC 42	.37	.72	-.10	-.42	.08	.20
Similarity (Baseline)	SA 40	-.27	.37	.02	.73	.15	.03
	HC 42	-.20	.37	.28	.72	.14	.05
Similarity (Postmanipulation)	SA 39	.39	.38	1.02	.74	.20	<.01
	HC 42	-.34	.37	-.37	.72	.17	<.01
PSPpositive(Baseline)	SA 40	.38	.37	.01	.80	.12	.15
	HC 42	.94	.37	.43	.71	.19	<.01
PSPnegative (Baseline)	SA40	-.33	.37	-.63	.73	.11	.20
	HC42	.72	.37	.00	.72	.12	.12
PSPpositive (Postmanipulation)	SA 40	.42	.37	-.21	.73	.11	.20
	HC 42	.55	.37	-.04	.72	.16	<.01
PSPnegative (Postmanipulation)	SA 40	-.33	.37	-.63	.73	.10	.20
	HC 42	1.16	.37	.63	.72	.20	<.01

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Table 5. Means and standard deviations for study variables by group and condition (participant ratings)

Measure	SAD Anxious Presenter	SAD Confident Presenter	HC Anxious Presenter	HC Confident Presenter	Measure Range
SPIN	48.40 (9.73)	45.30 (8.86)	11.97 (7.80)	8.43 (8.00)	0 to 68
PANAS Pos (Baseline)	25.00(6.80)	25.60 (5.67)	28.76 (7.66)	27.29 (6.89)	10 to 50
PANASNeg (Baseline)	19.40 (6.43)	19.71 (4.26)	11.76 (1.87)	11.76 (2.17)	10 to 50
PANASPos (Speech Anticipation)	21.15 (7.27)	21.85 (6.80)	28.61 (7.12)	26.95 (8.77)	10 to 50
PANASNeg (Speech Anticipation)	27.70 (7.31)	29.35 (5.89)	14.14 (3.09)	13.14 (2.57)	10 to 50
PANASPos (Post- Speech)	20.75 (7.46)	21.10 (7.15)	27.00 (6.71)	26.05 (8.64)	10 to 50
PANASNeg(Post- Speech)	24.35 (10.02)	26.20 (7.30)	12.90 (3.00)	11.86 (2.94)	10 to 50
Desirability (Baseline)	-.14 (.70)	.09 (.81)	-.02 (.91)	.37 (.76)	-3 to 3
Desirability (Postmanipulation)	-.52 (.95)	1.16 (.89)	-.37 (.66)	1.11 (.76)	- 3 to 3
Desirability – Self vs Presenter	.04 (.25)	-.13 (.19)	.17(.17)	.07 (.11)	-3 to 3
DFI (Baseline)	16.42 (4.02)	16.90 (5.00)	18.67 (5.89)	19.71 (4.35)	8 to 40
DFI (Postmanipulation)	17.42 (5.38)	21.60 (5.77)	17.29 (5.38)	22.67 (4.28)	8 to 40
Perceived DFI with Self (Baseline)	14.84 (4.46)	15.85 (4.69)	18.38 (4.68)	19.71 (5.31)	8 to 40
Perceived DFI with Self (Postmanipulation)	13.50 (4.01)	15.10 (5.93)	16.71 (4.21)	29.71 (5.08)	8 to 40
INCOM	37.05 (4.27)	36.80 (4.24)	35.29 (3.27)	34.52 (2.96)	8 to 40

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DASSDep	8.46 (6.72)	8.00 (5.53)	2.25 (2.27)	1.32 (1.60)	0 to 21
NSPS	80.25 (20.33)	76.70 (16.38)	38.43 (10.43)	42.76 (10.57)	0 to 135
Blunders Composite	81.79 (22.41)	62.70 (16.45)	65.33 (14.56)	55.71 (10.26)	0 to 96
Similarity (Baseline)	6.80 (2.24)	6.65 (1.90)	7.09 (1.84)	7.14 (1.35)	0 to 15
Similarity (Postmanipulation)	7.47 (1.47)	6.80 (1.24)	7.05 (1.53)	7.85 (1.59)	0 to 15
PSPpositive(Baseline)	8.75(5.43)	9.30 (3.74)	14.95 (4.25)	15.05 (6.06)	0 to 40
PSPnegative (Baseline)	20.45 (8.22)	20.80 (6.96)	7.81 (3.72)	8.71 (5.14)	0 to 52
PSPpositive (Postmanipulation)	7.65 (5.76)	7.25 (4.04)	14.76 (4.98)	13.62 (6.45)	0 to 40
PSPnegative (Postmanipulation)	17.40 (8.18)	17.95 (6.74)	7.57 (4.97)	7.57 (5.29)	0 to 52

INTERPERSONAL EXPECTANCIES IN SOCIAL ANXIETY

Table 6. Means and standard deviations for coded study variables by group and condition

Measure	SAD Anxious Presenter	SAD Confident Presenter	HC Anxious Presenter	HC Confident Presenter	Measure Range
Desirability	-.15 (1.23)	-.10 (.98)	.69 (.86)	.41 (.67)	-3 to 3
PSP Positive	16.93 (10.78)	18.93 (8.81)	24.96 (7.34)	24.09 (7.11)	0 to 40
PSP Negative	15.77 (9.45)	13.42 (7.11)	8.43(6.13)	8.30 (5.80)	0 to 52
PSP Positive (Residual)	-.17 (1.05)	-.53 (.71)	.46 (.86)	.22 (1.07)	Unlimited
PSP Negative (Residual)	.32 (1.03)	.62 (1.00)	-.48 (.77)	-.42 (.74)	Unlimited
Blunders	41.59 (17.82)	38.30 (16.11)	27.67 (11.39)	26.92 (9.00)	0 to 96
Warmth	-.18 (2.20)	-0.00 (1.69)	.85 (1.40)	.57 (1.31)	-3 to 3
Dominance	-1.05(2.03)	-1.03 (1.63)	.24 (1.70)	-.09 (1.19)	-3 to 3

INTERPERSONAL EXPECTANCIES IN SOCIAL ANXIETY

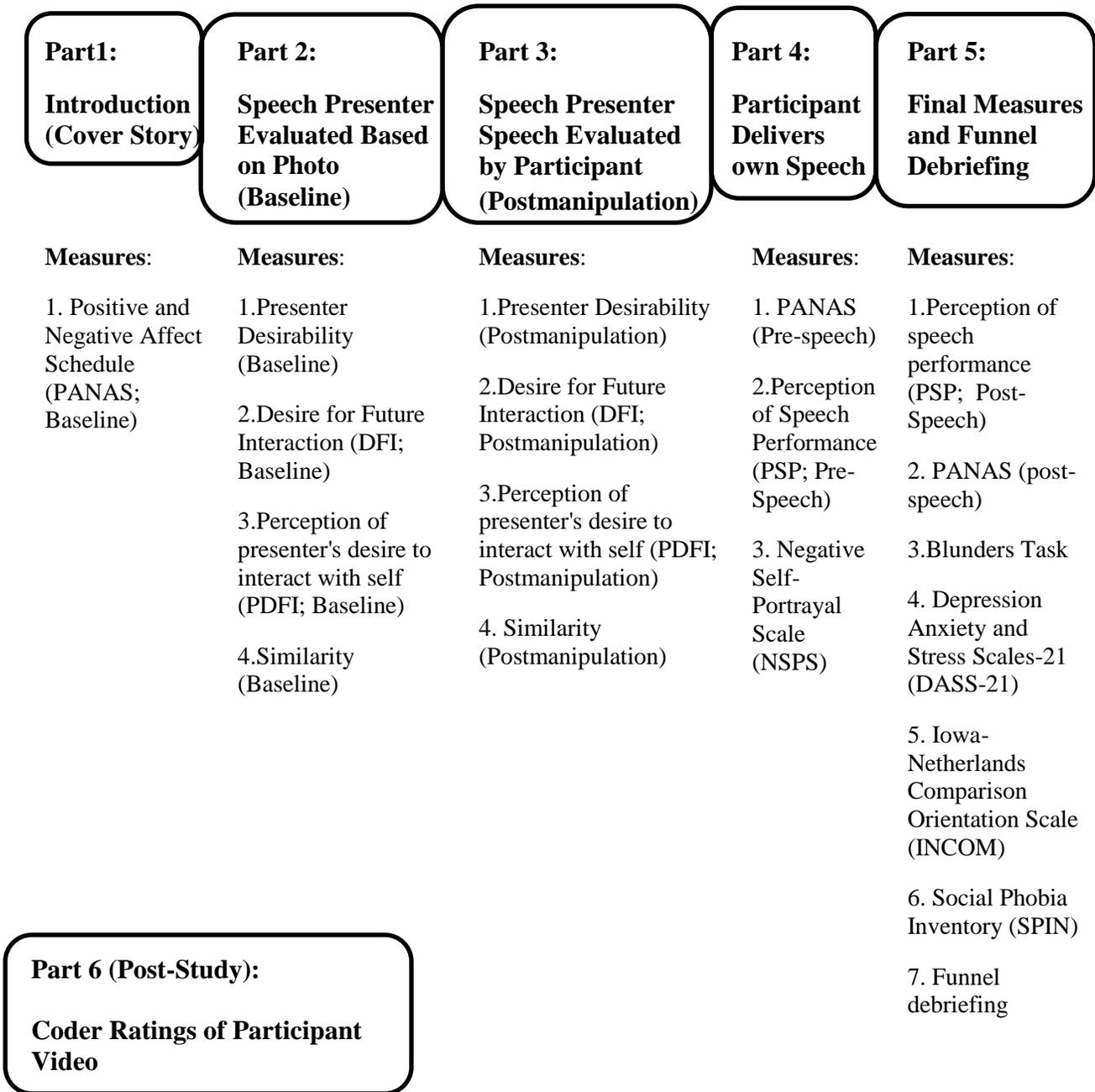


Figure 1. Sequence of study tasks and measures administered, as well as measures rated by coders in ratings of participant speeches.

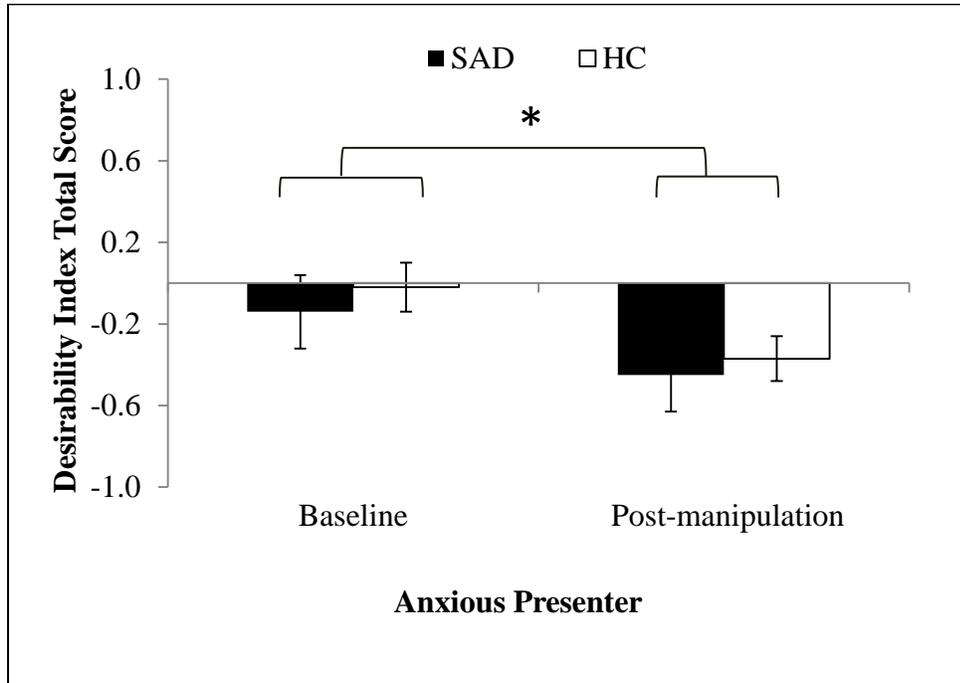


Figure 2. Desirability index scores (range -3 to 3) at baseline and postmanipulation in the anxious presenter condition. There was a significant main effect of time, with Desirability Index scores decreasing from baseline to postmanipulation. There was no main effect of group, nor a group by time interaction. Error bars represent 1 SD.

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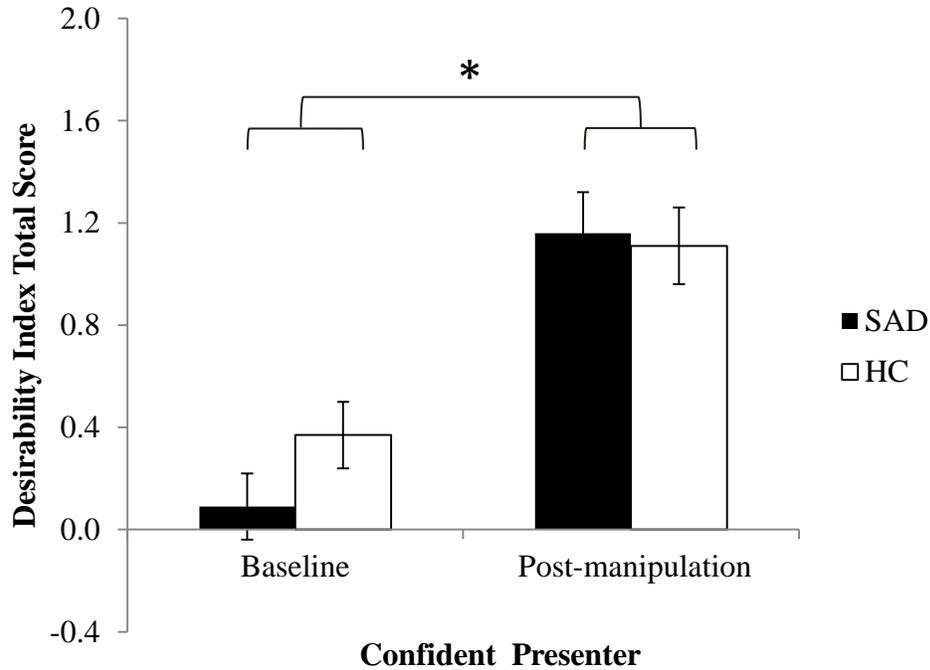


Figure 3. Desirability Index scores (range -3 to 3) at baseline and postmanipulation in the confident presenter condition. A main effect of time was found, with Desirability Index scores increasing significantly from baseline to postmanipulation. There was no main effect of group, and no group by time interaction. Error bars represent 1 SD.

INTERPERSONAL EXPECTANCIES IN SOCIAL ANXIETY

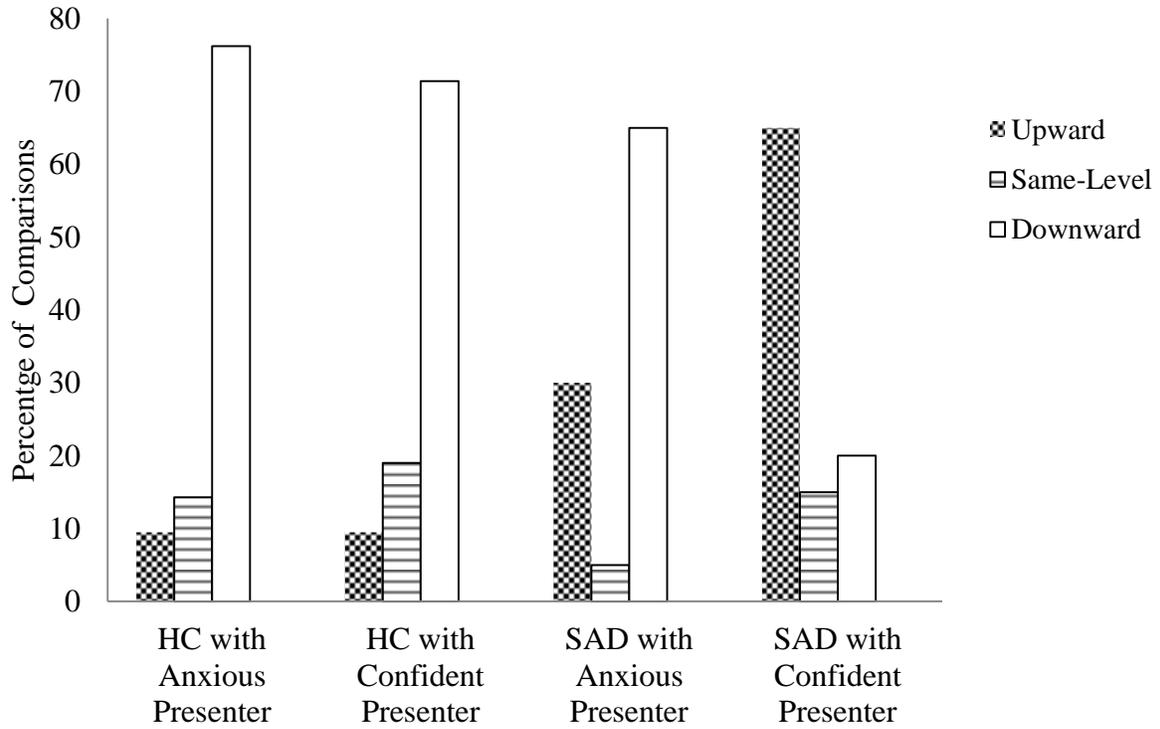


Figure 4. Percentage of upward, same-level, and downward comparisons across groups and conditions

INTERPERSONAL EXPECTANCIES IN SOCIAL ANXIETY

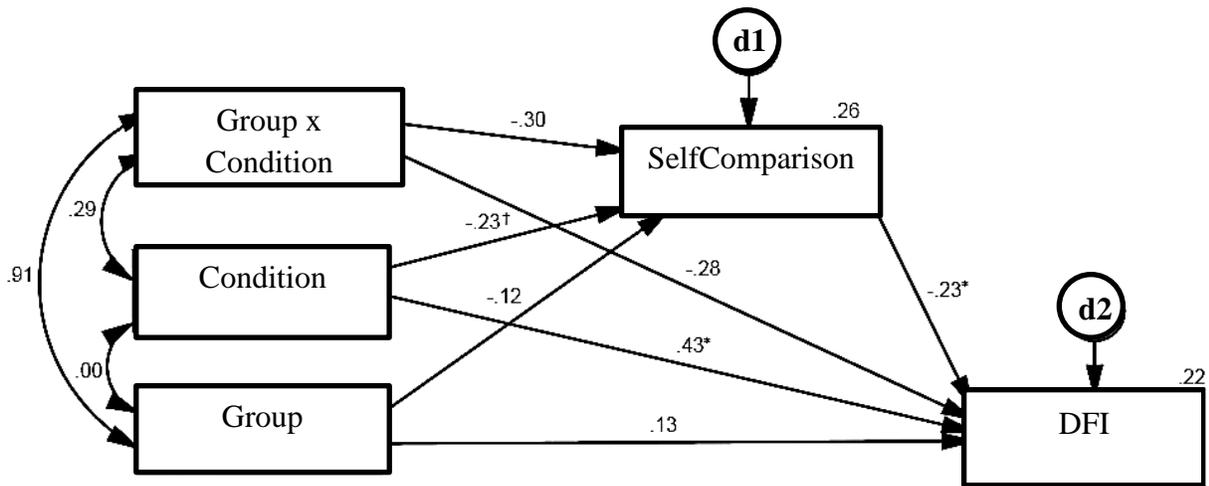


Figure 5. Standardized regression coefficients (β) for the associations between predictor variables group (HCs or SAD), condition (anxious or confident presenter), the interaction between group and condition, and the outcome variable Desire for Future Interaction with the partner (speech presenter), with Self Comparison (average rating of the self as compared to the presenter on five desirable attributes) as the mediator. Note * $p < .05$, † $p \leq .10$).

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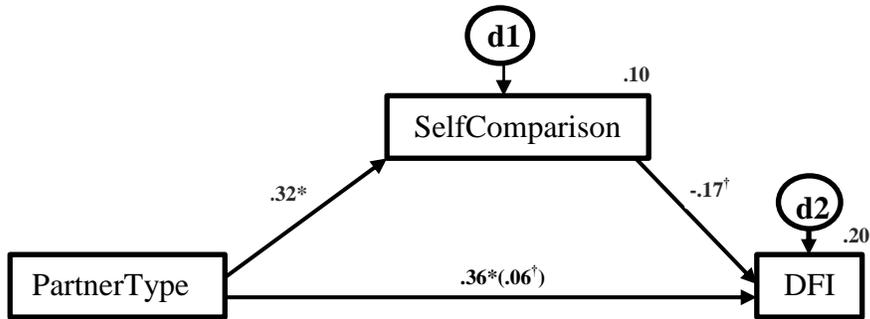


Figure 6.

Standardized regression coefficients (β) for the association between Condition (Anxious or Confident) and Desire for Future Interaction with the partner (speech presenter) mediated by Self Comparison (average rating of the self as compared to the presenter on five desirable attributes). The standardized regression coefficient for the relationship between condition and DFI controlling for Self-Comparison (i.e., the indirect effect) is provided in parentheses. Note $*p < .05$, $†p \leq .10$.

INTERPERSONAL EXPECTANCIES IN SOCIAL ANXIETY

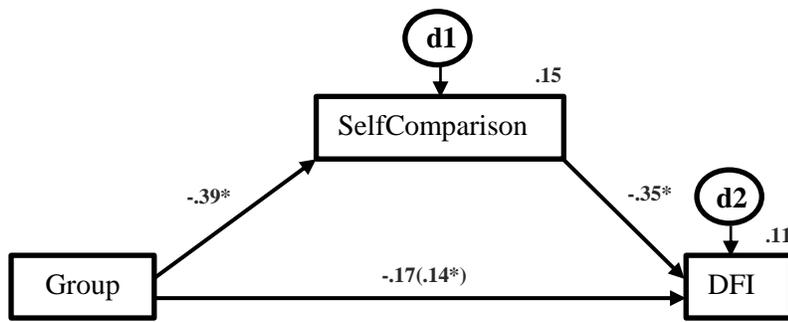


Figure 7. Standardized regression coefficients (β) for the association between Group (Anxious or Confident) and Desire for Future Interaction with the partner (speech presenter) mediated by Self Comparison (average rating of the self as compared to the presenter on five desirable attributes). The standardized regression coefficient for the relationship between group and DFI controlling for Self Comparison (i.e., the indirect effect) is provided in parentheses. Note $*p < .05$.

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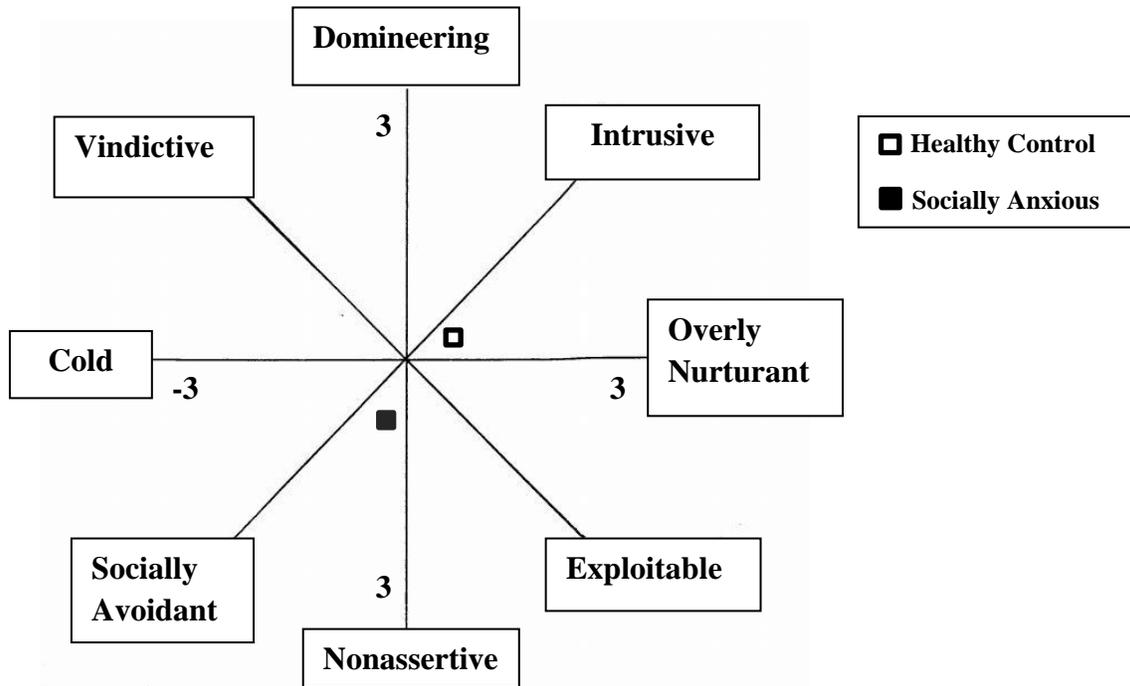


Figure 8. The Interpersonal Circumplex (Leary, 1957) uses the orthogonal dimensions of dominance and warmth to identify eight distinct octants. Each octant thus represents a unique combination of dominance and warmth. Dominance is represented on the vertical axis and warmth is represented on the horizontal axis, and each ranged from 3 (highest warmth and dominance) to -3 (lowest warmth or dominance or highest coldness and submissiveness). The average rating provided by coders for dominance and warmth for participants with SAD and HCs based on recorded speeches are provided. The octant names provided are taken from the Inventory of Interpersonal Problems (IIP-64; Horowitz, Alden, Wiggins, & Pincus, 2000).