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The Development of a Comprehensive Model of Social Anxiety and Anticipatory Social Appraisals

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THE DEVELOPMENT OF A COMPREHENSIVE MODEL
OF SOCIAL ANXIETY AND ANTICIPATORY
SOCIAL APPRAISALS

A Thesis
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Science
in
Psychology:
Clinical Counseling

by
Lance Joseph Johns
June 2017

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ABSTRACT

In anticipation of a future social interaction, socially anxious individuals (SAIs) may imagine themselves appearing stupid or foolish and predict and exaggerate the probability and costs of conveying these undesirable social images both on oneself (e.g., “I will feel stupid”) and on others impressions of oneself (e.g., “Others will think I’m stupid”). However, there is a paucity of research examining the latter bias; moreover, research regarding SAIs estimates of the probability and costs of conveying a positive impression (e.g., “I will feel smart”) has typically been neglected. Thus, the a novel questionnaire was created in order to develop a more comprehensive model of SAIs estimates of probability and costs. We expected that positive and negative, self- and other-related judgments will represent four distinct, latent constructs that will be related to trait social anxiety indirectly through fears of positive and negative evaluation per the evolutionary model of social anxiety. Structural equation modeling was used to test study hypotheses. The final sample included four hundred and seventy-four college students (307 males and 167 females). Results generally supported study hypotheses. After minor theoretically justified modifications, the hypothesized model provided good fit to the data, $\chi^2(94) = 151.78$, CFI = .99, TLI = .99, RMSEA = .04. All social appraisals with the exception of other-negative appraisals were indirectly related to social anxiety through fears of positive and negative evaluation. Contrary to expectations, other-positive appraisals were negatively related to fear of negative evaluation and other-negative appraisals

were uncorrelated with fear of positive evaluation, providing partial incremental validity of the novel questionnaire used in this study. Results provide preliminary evidence that suggests future research should extend evaluation of SAs anticipatory social appraisals beyond negative, self-related social impact. Implications, limitations, and future directions of the research are be discussed.

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CHAPTER ONE

INTRODUCTION

Cognitive models assert that social anxiety is maintained by biased information processing, including biases in attention towards threat-related social cues, more negative and less positive interpretations of ambiguous social situations, and judgment biases involving exaggerated estimates of the probability and cost of negative social situations (Heinrichs & Hofmann, 2001; Hirsch & Clark, 2004). In regards to the latter cognitive bias, cognitive models of anxiety posit that specific judgmental biases may exist across the range of anxiety disorders, and may play a causal role in their development and persistence (e.g., Beck Emery, & Greenberg, 1985; Foa & Kozak, 1986; Clark & Wells, 1995; Rapee & Heimberg, 1997).

Indeed, although conventional wisdom argues that our emotions directly cause our behavior (e.g., anxiety causes avoidance), it is often our judgments of future events that have implications for what we pursue and what we avoid (see, Baumeister, Vohs, DeWall, & Zhang, 2007). As a result, from a cognitive-behavioral standpoint, socially anxious individuals' anticipatory judgmental biases may be one of the more important cognitive mechanisms through which social anxiety is maintained. Research has shown that socially anxious individuals (SAIs) overestimate the probability and costs of negative social events (e.g., Foa, Franklin, Perry, & Herbert, 1996). That is, compared to non-anxious controls

(NACs), SAIs estimate that a negative social event will be more likely to occur and have dramatically greater negative consequences if it were to actually happen.

Moreover, treatment studies have established that one of the mechanisms of change for cognitive-behavioral treatments for social anxiety are reductions in probability and cost estimates (e.g., Hoffman, 2004; Foa et al, 1996; Gregory, Peters, Abbott, Gaston & Rapee, 2015). However, most studies of inflated probability and cost estimates have primarily examined SAIs estimates of the impact of negative social events upon oneself (e.g., Foa et al., 1996; Uren, Szabo, & Lovibond, 2004; Nelson, Deacon, Lickel, & Sy, 2010) and not SAIs' estimates of the impact the social event would have on other peoples' perceptions of oneself. Additionally, these studies have also typically neglected the assessment of SAIs' probability and cost estimates of anticipated *positive* social events/outcomes. Because of these limitations in previous studies, I argue that research has failed to adequately address the comprehensive nature of SAI's judgmental biases.

Self and Other's Perceptions of Oneself

When socially anxious individuals anticipate a future social interaction they typically engage in anticipatory processing that consists largely of negative self-images, and thoughts of how they will be perceived by others (Clark & Wells, 1995, Hinrichsen and Clark, 2003; Vassilopoulos, 2005). To infer how they will be viewed by others, SAIs engage in self-focused attention, erroneously relying

upon their own emotions and bodily sensations to infer what others are thinking (Clark & Wells, 1995; Clark, 2001). For instance, a socially anxious individual who is ridden with anxiety and self-doubt in anticipation of a speech may use this self-induced anxiety and doubt to infer that others will perceive them as incompetent or unintelligent. This suggests that when SAs anticipate a social interaction, they not only anticipate the impact that the social outcome would have on oneself (e.g., “I am going to appear incompetent and I will feel like a stupid person”), but also the impact that the social outcome would have on others perception of oneself (e.g., “I am going to appear incompetent and *people* will think I’m a stupid person) (Clark & Wells, 1995; Alden & Taylor, 2004, 2010; Taylor & Alden, 2008).

Judgmental Biases of Oneself

Supporting the existence of self-related judgmental biases, Foa, Franklin, Perry, and Herbert (1996) examined the probability and cost estimates of negative social and non-social situations among a group of individuals diagnosed with generalized social phobia (GSP) and non-anxious controls (NACs). The researchers also examined the effectiveness of a cognitive behavioral treatment for reducing probability and cost estimates. Fifteen individuals who, according to DSM-III-R criteria, were diagnosed with GSP were recruited for the study. Any participant meeting criteria for major depression, substance abuse or dependence, a history of psychotic disorder or the presence of another anxiety disorder was excluded from the study.

A questionnaire consisting of participants probability and cost estimates of 20 negative socially irrelevant events (e.g., “You will lose your house keys”) and 20 negative socially relevant events (e.g., “During a job interview, you will freeze”; “Someone you know won’t say hello to you”) was administered. All four scales demonstrated high internal consistency. The participants also received 14-week group cognitive-behavioral therapy for social anxiety consisting of exposure, cognitive restructuring and social skills training. Matched t-tests between pre and post treatment scores revealed large effect sizes on measures of social anxiety and depression, indicating that the treatment was effective in reducing social anxiety. Moreover, at pretreatment, SAIs rated negative social situations as more costly and probable compared to NACs. Results indicated that SAIs had higher probability estimates at pre and post-treatment for social events compared to nonsocial events, but that social estimates of probability and cost decreased from pre to post-treatment, revealing a large effect.

Although the previous study was conducted with a small sample ($n = 15$), subsequent research has found similar results (e.g., Uren, Szabo, & Lovibond, 2004; Nelson et al., 2010; Taylor & Alden, 2008; Trew & Alden, 2009; Moscovitch, Rodebaugh & Hesch, 2012; Moscovitch, Waechter, Bielak, Rowa & McCabe, 2015). For instance, SAIs tend to overestimate the negative impact of imagined social mishaps on oneself (e.g., appearing anxious or clumsy; Moscovitch, Rodebaugh & Hesch, 2012), this finding has also extended to individuals diagnosed with social anxiety disorder who have been shown to

exaggerate the costs of imagined social mishaps compared to both anxious and non-anxious controls (Moscovitch, Waechter, Bielak, Rowa & McCabe, 2015).

These studies, however, did not assess SAI's probability and costs estimates of others' perceptions of oneself.

Judgmental Biases of Others' Perceptions

There is reason to believe that, in addition to inflated probability and cost estimates on oneself, SAIs also have inflated estimates of a social events impact on others' perceptions of oneself. The nature of social anxiety is such that it can be conceptualized as a fear of the self as a social object for others. That is, cognitive and evolutionary models of social anxiety propose that SAIs may have an underlying fear that one is an aversive social object for others and will thus evoke negative evaluation and resulting loss of interest and ostracism, etc. (Clark & Wells, 1995; Gilbert, 2001; Trower & Gilbert, 1989; Moscovitch, 2009). Indeed, research has revealed that decreases in SAIs anticipatory estimates of cost on others perceptions correlates with reductions in social anxiety (Taylor & Alden, 2008). Furthermore, reductions in the extent to which SAIs evaluations of themselves were dependent on feedback from others was also associated with treatment outcome. These findings provide evidence for the existence of SAIs exaggerated anticipatory judgements of others perceptions, but the clinical literature lacks additional research in this area.

However, findings from the social psychology literature on the spotlight effect provide a possible explanation of why SAIs may anticipate exaggerated

reactions from others. Research on the spotlight effect suggests that people overestimate how much other people pay attention to their external appearance (Gilovich, Savitsky, & Medvec, 2000). In other words, people tend to think they are in the spotlight when, in fact, they are not. For example, when, on a particularly hasty day, one has spilled coffee on their shirt, the appearance of the light brown stain is perceived to be exaggeratedly apparent to others as one walks into their morning meeting.

To study this spotlight effect, Gilovich, Savitky, and Medvec (2000) recruited one hundred and nine unselected undergraduate students. These participants were asked to walk into a room with an embarrassing shirt on (e.g., with a picture of a dated pop-star prominently displayed) and make estimates of the number of people who noticed their shirt. This estimate was then compared with the actual number of people who noticed the shirt. Results indicated that, compared to the actual estimates, the person wearing the embarrassing shirt overestimated the number who noticed the shirt. The researchers found the same effect when participants were asked to wear a shirt of their choice, suggesting that this effect generalizes to non-embarrassing situations. Importantly, the spotlight effect was found to exist for positive behavioral acts of self-presentation as well. Groups of three to seven participants were asked to engage in a group discussion and estimate their advancement of the group discussion, and the amount of remarkable comments they made as seen by others. Again, the researchers found that people overestimated the extent to

which others noticed one's contributions to the group. This suggests that the spotlight effect occurs in both positive and negative social situations.

Additional findings suggest an illusion of transparency or the tendency for people to feel that their internal thoughts and feelings (e.g., self-doubt, anxiety) are seen by others more than they actually are (Gilovich, Medvec, & Savitsky, 1998). For example, participants overestimate the extent to which others would detect their lies. This finding has been shown to generalize to emotions of disgust, in which participants were asked to taste a series of foul-tasting drinks and maintain an as neutral impression as possible. Nonetheless, participants overestimated the extent to which their disgust was detected by observers. Researchers have hypothesized on the proximal cause of these overestimations.

The spotlight effect and the illusion of transparency have been proposed to stem from an anchoring and adjustment process wherein people anchor on their current emotional state to judge others perceptions. However, people typically recognize that other people are not as likely to be as focused on their presence as is oneself and adjust for this accordingly (Gilovich et al., 1998, 2000). This adjustment is typically insufficient and results in an overestimation of others perceptions of oneself. For instance, if participants wearing the embarrassing shirt were given time to habituate to the shirt and thus were less focused on the shirt, participant's estimates were less biased compared to actual estimates. Furthermore, the illusion of transparency has been shown to manifest only in situations in which one is experiencing particularly pronounced internal

experiences, such as lying, and tasting a foul-tasting drink (Gilovich, Medvec, & Savitsky, 1998). In contrast, the illusion of transparency is not found among less pronounced internal experiences, such as telling the truth and tasting a pleasant tasting drink. This is also consistent with the anchoring and adjustment explanation in that when experiencing less intense emotions participants' adjustments are made from a minor emotional anchor resulting in a less biased estimation of others perceptions. How is the anchoring and adjustment explanation relevant to SAIs estimates of others perceptions?

As individuals tend to anchor on their current emotional state and adjust accordingly, the heightened emotional arousal of SAIs may result in particularly biased adjustments due to a higher emotional anchor, augmented by heightened self-focused attention. Thus SAIs may not only overestimate the costs of negative social situations, they may also overestimate the costs on others perceptions of oneself. Consistent with this idea is research on Theory of Mind (ToM), indicating that when theorizing about others' mental states, SAIs attribute more meaning and intensity to others emotional states and thoughts that are disproportionate to the context (Washburn, Wilson, Roes, Rnic, and Harkness (2016; Hezel & McNally, 2014). Moreover, previous research (Brown & Stopa, 2007) has shown that SAIs in situations of high social evaluation exhibit elevated levels of a spotlight effect compared to SAIs in a situation of low social evaluation.

This was tested by a modified version of a measure that assesses public and private self-awareness. In the high social-evaluative condition participants performed a memory task while they were knowingly videotaped and were told that their performance would be evaluated later by experts. In the low social-evaluative condition participants were secretly videotaped. Thirty participants in each condition were recruited based on cut off scores on the brief fear of negative evaluation scale. The researchers measured the spotlight effect and illusion of transparency by comparing participants rating of their own public and private self-awareness with the assessors. Results suggested that the spotlight effect was present under high social-evaluative condition compared to low, whereas the illusion of transparency did not differ across conditions. Socially anxious individuals in the high social-evaluative condition were more anxious and thus began from a higher emotional anchor when attempting to adjust for estimates of others perceptions.

These findings suggest that SAIs are particularly prone to the spotlight effect, but only in certain social conditions (e.g., highly visible and evaluative social situations) and that the illusion of transparency was present across social situations and thus may reflect more of a stable trait. Accordingly, if SAIs overestimate their positive reactions to positive social events, this same insufficient adjustment may occur when SAIs are asked to estimate the costs of positive social situations on others perceptions of oneself. However, research in this area is sparse.

Judgmental Biases of Positive Social Events

Although research supports the idea that SAIs overestimate the probability and costs of conveying a negative, *undesirable* impression to others, the question remains, do SAIs also overestimate the probability and costs of conveying a positive, *desirable* impression to others (e.g., “If I make a funny joke, everybody will think I’m an enjoyable person to be around and will want to hang out with me”)? While cognitive models assert that, when anticipating a social interaction, SAIs typically hold a negative image of themselves as they appear to others (e.g., looking boring or anxious), it seems reasonable to assume that there are times when SAIs do actually anticipate conveying a desired image to others (e.g., appearing funny or confident) as opposed to a negative, undesirable one. This is because these cognitive models also suggest that SAIs are highly motivated to convey a desired impression, although they may feel uncertain in doing so (Schlenker & Leary, 1982; Clark & Wells, 1995; Rapee & Heimberg, 1997; Hoffman, 2007). Additionally, SAIs have been shown to value themselves based upon others’ appraisals (Alden & Taylor, 2008); that is, their sense of self may depend largely on others’ perceptions. Thus, one possible explanation for the existence of exaggerated positive judgmental biases is that, when anticipating making a desirable impression, SAIs may overestimate the probability and cost of this desirable impression due to the value this may bring to their sense of self.

Research on SAIs probability and cost estimates of future positive social situations has been mixed. Indirect evidence comes from Bielak and Moscovitch (2013) who had female SAIs imagine a hypothetical social interaction with a visibly confident (e.g., relaxed, strong, clear voice) male social partner. Results indicated that, compared to individuals low in social anxiety, SAIs had higher positive impressions of this confident partner in that they rated him as possessing higher amounts of desirable characteristics, such as ambition, happiness, achievement, and intelligence. These findings suggest that, if SAIs were to anticipate conveying such qualities themselves (e.g., appearing visibly confident to others), SAIs may overestimate the extent to which they, themselves, and others would react positively to such conveyed desirable qualities.

In support of this notion, Gilboa-Schechtman, Franklin and Foa (2000) directly assessed SAIs, non-anxious controls (NACs) and individuals diagnosed with obsessive-compulsive disorder (OCD) anticipated reactions to positive and negative social scenarios on a variety of outcomes/domains including, probability, magnitude, duration, strength of bodily reactions and changes in self-esteem. The researchers argued that previous research on judgmental biases entailed SAIs appraisals of neutral or moderate negative social events. Thus the differences between SAIs and NACs could possibly be due to SAIs tendency to interpret social events more negatively and consequently overestimate the corresponding social costs of these social events.

To rule out this interpretation bias, these researchers used unambiguous positive and negative social events. A factor analysis confirmed that the questionnaire consisted of three factors, positive and negative impact factors (magnitude, duration, bodily reaction, self-esteem) and a probability factor. The results of the factors scores indicated that SAIs had exaggerated expectations of emotional reactions to both negative and positive social events, compared to NACs and OCDs. However, SAIs did report stronger expectations for the impact of negative social events compared to positive social events with NACs reporting the opposite pattern. Specifically, SAIs overestimated the magnitude, duration, bodily reaction and change in self-esteem in reaction to negative social events relative to both OCDs and NACs. For positive events, SAIs overestimated the duration, bodily reaction and increase in self-esteem relative to their OCD and NAC counterparts.

In contrast, Vassilopoulos (2006) had individuals high and low in social anxiety estimate the probability and emotional costs of unambiguous positive and negative social events and found that the two groups did not differ in their predicted emotional costs of these positive events. However, this study did not emphasize the anticipation of these events or ensure that participants felt that they were certain about conveying a desired impression. Moreover, this study did not investigate other aspects of an emotional reaction as Gilboa-Schechtman et al. (2000) had. Still, the participants in the Gilboa-Schechtman et al. study had

unusually high levels of social anxiety, thus the findings may be attributable to the most severe levels social anxiety.

Overall, it is still relatively unclear if SAIs actually do exhibit probability and cost biases when anticipating conveying a desired, positive impression. Moreover, minimal research has assessed SAIs anticipatory appraisals of others perceptions. Therefore, we argue that previous research has failed to develop a more comprehensive model of SAIs judgmental biases. Given that, to our knowledge, Gilboa-Schechtman et al. (2000) is only the study to find a positive judgmental bias among SIAs, we created a questionnaire modeled after Gilboa-Schechtman et al's study to gain a more comprehensive understanding of SAIs social anticipatory appraisals of self and other—including both types of valence.

Social Impact Bias Scale

Because previous research indicates that SAIs interpret positive scenarios more negatively and less positively than NACs (see Hirsch & Clark, 2004 for a review), it is important to make the social scenarios as unambiguous as possible. Thus, similar to Gilboa-Schechtman et al. (2000), we did not want participants' interpretations of the scenarios confounding their appraisals. That is, specifically in regards to assessing SAIs appraisals of conveying a desired impression, it is possible that participants may interpret a given social scenario negatively and we may thusly fail in measuring SAIs anticipatory appraisals of conveying a positive impression. Thus, in constructing the SIBS, care was taken to ensure that

participants were imagining and anticipating the probability and costs of social events in which they were *certain* of conveying a *desired* impression.

I argue that although Gilboa-Schechtman et al. (2000) attempted to remove ambiguity from social scenarios, participants' responses may still have been confounded by their interpretations of the scenario when deciding whether or not a desirable impression will be conveyed. For example, when asked to rate the probability and costs of the social scenario "A co-worker thanks you for your help during a work crisis" the extent to which a positive impression has been conveyed is still left up to interpretation. That is, was the person's response an exaggerated thanks or a mild praise for something that was expected to have been done anyway?

Thus, Gilboa-Schechtman et al.'s scenarios measuring positive appraisals (e.g., "A co-worker thanks you for your help during a work crisis.") as well as other research with scenarios measuring negative appraisals (e.g., "I will be ridiculed for voicing my opinion") imply the conveying of a certain impression; however, the anticipation of conveying an impression is ambiguous and susceptible to interpretation unless a reaction from the other person(s) in the scenario is made explicit. This is because theoretical formulations of social anxiety assert that when in anticipation of conveying a certain impression, SAs are primarily concerned with how other people will respond, even adopting an observer perspective to imagine how they will appear in the eyes of others (e.g., Gilbert, 2001; Schlenker & Leary, 1982; Tower & Gilbert, 1989; Trower, Gilbert &

Sherling, 1990; Clark & Wells, 1995). Thus, it is the responses from other people that determines whether one has conveyed a desired or undesired impression. Moreover, although *actual* social situations typically entail ambiguous reactions from others (e.g., a nod of the head), I argue that anticipated social situations and their *imagined* desired and undesired impressions/outcomes are unambiguous in the SAIs mind (e.g., they anticipate eliciting a response of “that sounds stupid” or “that is impressive”).

Measurement Model of the Social Impact Bias Scale

The proposed measurement model of the SIBS is one consisting of separate, distinct, latent factors for social impact biases of self-positive, other-positive, self-negative, and other-negative. Indicators of these domains will include magnitude, duration, bodily sensations, and self-esteem, with probability estimates constituting a separate factor for each of these four subscales. Additionally, given that self-esteem may function as a gauge of one’s sense of social belonging (i.e., sociometer hypothesis; Leary, Tambor, Terdal, & Downs, 1995), it is possible that social impact and probability estimates of anticipated social impressions may cause self-esteem. That is, self-esteem may not be an indicator of overall social appraisals, but may be a consequence of one’s social appraisals. Thus, we anticipate that if model fit is poor, including self-esteem as a distinct, latent factor may be necessary to improve model fit indices. After the measurement model of the SIBS has been established, the second purpose of the study is to test a structural model of the SIBS.

An Evolutionary Model of Social Anxiety and Fears of Evaluation

An evolutionary account of social anxiety provides a theoretical basis for the existence of both positive and negative, self- and other- judgmental biases. The bivalent fear of evaluation theory of social anxiety (Weeks & Howell, 2012) posits that socially anxious individuals fear evaluation in general. Included in this model are both fears of negative (FNE) and positive evaluation (FPE). Fear of negative evaluation is the fear of being evaluated negatively (Watson & Friend, 1969), while fear of positive evaluation is proposed to be associated with distress over anticipated and received positive evaluation from others (Weeks, Jakatdar, & Heimberg, 2010). Although fear of positive and fear of negative evaluation moderately correlate together (Weeks & Howell, 2012), fear of positive evaluation may be related and yet also distinct from fear of negative evaluation. First, it has been proposed that fear of positive evaluation may be a form of delayed fear of negative evaluation in that positive evaluation raises SAIs perceived expectations that others hold, making it less likely that they will meet these heightened expectations, thus ultimately resulting in negative evaluation (Weeks Jakatdar, & Heimberg, 2010). Consistent with this account is the finding that, in response to a positive social interaction, SAIs experience negative reactions and believe that others hold higher social standards for their future behavior (Wallace & Alden, 1995; Wallace & Alden, 1997).

Second, however, Weeks, Rodebaugh, Heimberg, Norton, and Jakatdar (2009) suggest that positive and fear of negative evaluation can be seen from

Gilberts' (2001) evolutionary perspective of social anxiety. Gilbert's (2001) evolutionary model of social anxiety posits that SAIs contextualize themselves as existing in a social hierarchy wherein SAIs perceive themselves as relatively inferior and as vulnerable to losing their status in this hierarchy. People inevitably compete for the social resources of approval, support and help. Because SAIs perceive themselves as being inferior in the social hierarchy, however, they revert to certain behavioral mechanisms such as social comparison, submissiveness (e.g., eye-gaze avoidance) and self-monitoring (e.g., self-focused attention), due to their fear of losing social status as well as the fear of gaining social status, which would put themselves in a position to compete with dominant others for social resources.

For example, one may fear being viewed as boring (i.e., losing social status) because of the risk of being ostracized by others, and also fear being viewed as funny (i.e., gaining social status) because of the risk of others social reprisal or a perceived inability to defend the heightened social status against seemingly dominant others. Therefore, social anxiety arises when individuals attempt to acquire or defend social resources (e.g., attempting to attract a romantic partner or maintain one's friends when more dominant others are present, respectively) and that such behavioral and psychological mechanisms as social comparison, submissiveness, and self-monitoring are used as a means to regulate arousal (i.e., anxiety) and avoid threat.

Thus, Weeks, Rodebaugh, Heimberg, Norton, and Jakatdar (2009) suggest that both fears of evaluation can be seen from the evolutionary model of social anxiety in that SAs are motivated to avoid negative evaluation (i.e., fear negative evaluation) for fear of decline in the social hierarchy and resulting ostracism, and also to avoid positive evaluation (i.e., fear positive evaluation) for fear of advancement in the social hierarchy, leading to possible social reprisal due to superseding superior others (Gilbert, 2001). Consistent with the idea that fear of positive evaluation is associated with distress and avoidance of upward shift in social status, fear of positive evaluation has been negatively associated with pride in response to positive feedback. Conversely, consistent with the idea that fear of negative evaluation is associated with avoidance of a downward shift in social status, fear of negative evaluation has been positively associated with pride in response to positive feedback (Reichenberger, Wiggert, Wilhelm, Weeks & Blechert, 2015).

Moreover, fear of positive and negative evaluation both predict submissive behaviors and tendencies to compare oneself unfavorably to others, indicating large and small effects, respectively (Weeks, Jakatdar, & Heimberg, 2010). In addition, SAs concerns of social reprisal due to positive impressions mediated the relationship between fear of positive evaluation and socially anxious individuals tendency to discount positive social outcome, suggesting that socially anxious individuals may discount positive feedback as a means of

reducing anxiety via maintaining an inferior position in the social hierarchy (Gilbert, 2001; Weeks & Howell, 2012).

Additional research indicates that fear of positive evaluation relates positively to discomfort in response to positive social feedback, whereas fear of negative evaluation is not related to discomfort in response to positive social feedback (Weeks, Heimberg, Rodebaugh, & Norton, 2008). However, fear of negative evaluation has been associated with increased social evaluative concerns, pursuit of approval and avoidance of disapproval (Watson & Friend, 1969). Moreover, fear of positive evaluation has been shown to account for variance in social interaction anxiety above and beyond that of fear of negative evaluation, suggesting fear of positive evaluation is a distinct construct (Weeks, Heimberg, Rodebaugh & Norton, 2008).

Confirmatory factor analyses have also indicated that a two factor structure of fear of negative and fear of positive evaluation is superior to a single factor structure indicating that fear of negative and fear of positive evaluation represent related, but distinct constructs (Weeks, Heimberg & Rodebaugh, 2008; Weeks, Jakatdar & Heimberg, 2010). This model was cross-validated in another independent sample confirming that fear of positive evaluation, fear of negative evaluation and also depressive cognitions represent distinct latent factors (Weeks, Rodebaugh, Heimberg, Norton & Jakatdar, 2009). Importantly, these factors then loaded onto a higher order factor of social anxiety-related submissive cognitions. This factor correlated more strongly to measures of social

anxiety and social submissiveness than did measures of general anxiety and worry. Moreover, fear of negative evaluation and fear of positive evaluation were more strongly related to social anxiety than to general anxiety.

These findings provide support for the evolutionary account of social anxiety as existing in a social hierarchy and that fear of positive evaluation, fear of negative evaluation and, in certain social contexts, depression can serve the purpose of maintaining social harmony and signal submissiveness to other, more dominant others (Weeks, Rodebaugh, Heimberg, Norton & Jakatdar, 2009; Gilbert, 2001). However, given that fear of positive evaluation is still a relatively new construct, further distinguishing fear of positive evaluation as distinct construct from fear of negative evaluation is critical. Since these constructs are at the core of social anxiety, the second purpose of the current study is to explore the differential relationship between probability and cost estimates of positive and negative, self- and other-social appraisals and both loci of fear of evaluation.

Temporality of Fears of Evaluation and Judgmental Biases

Although several cognitive theories of social anxiety propose that anticipatory judgmental biases play a causal or maintaining role in social anxiety symptomology (e.g., Foa & Kozak, 1985, 1986; Clark & Wells, 1995), the temporality of judgmental biases and social anxiety is still relatively uncertain. That is, do judgmental biases of probability and cost cause social anxiety, including fears of positive and negative evaluation, or does social anxiety cause

judgmental biases, or is this relationship reciprocal? The research currently available to answer this question stems from cognitive-behavioral therapy (CBT) treatment studies. It has long been argued that CBT may exert its influence on anxiety reduction through decreases in inflated probability and cost estimates (Foa & Kozak, 1986).

Although a variety of studies (for a review, see Smits, Julian, Rosenfield & Powers, 2012) have evaluated judgmental biases as a mediator in the CBT and social anxiety reduction relationship and have established that judgmental biases are correlated with change in social anxiety symptoms, only a couple have examined the temporal relationship between judgmental biases and social anxiety symptoms. For instance, past research has revealed that probability and cost biases each account for unique variance in participants' reduced levels of self-reported fear (Smits, Rosenfield, McDonald & Telch, 2006).

Additionally, through repeated measurement of fear and judgmental biases throughout treatment, this same study was able to establish temporal precedence. Specifically, this study found that reduced probability biases predicted self-reported fear, but that this reduced fear then predicted subsequent reductions in probability biases, indicating a reciprocal relationship. Reduced cost biases were not predictive of reduced fear, instead, reduced fear predicted reduced cost biases, suggesting fear precedes biased estimates of cost. However, this study measured participants levels of self-reported fear on a single-item scale and did not use an established measure of social anxiety as a

primary outcome, thus these conclusions of temporality are limited. Nonetheless, subsequent research (i.e., Calamaras, Tully, Tone, Price & Anderson, 2015) using fear of negative evaluation as the primary outcome has found similar results, with probability bias predicting subsequent reduction in fear of negative evaluation. In this study, fear of negative evaluation did not predict subsequent changes in probability bias, suggesting a non-reciprocal relationship. Cost bias was not a significant predictor of change in this study.

Finally, only one study has evaluated self versus other probability and cost estimates in treatment. Results indicated that participants' probability and cost estimates of others (other-related) reactions were more strongly associated with social anxiety reduction compared to participants probability and cost estimates at the level of the self (self-related) (Taylor & Alden, 2008). This offers additional evidence that further delineating self versus others judgmental biases may have important treatment implications. However, this study did not control for other-related judgmental biases, so the extent to which other-judgmental biases contributed to unique social anxiety symptom reduction above and beyond self-judgmental biases is unclear. Additionally it is still uncertain whether other-related judgmental biases and self-related judgmental biases constitute distinct constructs. In sum, because of the paucity of the research in this area and because, to our knowledge, no study has manipulated SAIs appraisals of future social outcomes, the causal relationship between social anxiety and judgmental biases is relatively uncertain. Therefore, a more comprehensive model of

judgmental biases and social anxiety is needed, both for treatment and theoretical purposes.

Hypotheses: Evolutionary Basis of Social Anxiety and Social Appraisals

According to the evolutionary theory of social anxiety, fear of negative evaluation and positive evaluation are adaptive cognitive mechanisms whereby individuals fear and thus avoid decline (i.e., loss of social status) or incline (i.e., increase in social status) in the social hierarchy, respectively (Gilbert, 2001). The present study seeks to answer the question, how do fears of negative and fears of positive evaluation arise and lead to social anxiety? Fear arises and influences behavior, in part, because of anticipated, and perhaps exaggerated, threat of future outcomes—it is the anticipatory estimates of future consequences that typically have repercussions for what we pursue and what we avoid (e.g., “Negative evaluation will be devastating, I must avoid it at all costs,” see, Baumeister, Vohs, DeWall, & Zhang, 2007). Thusly, it is proposed in the current study that fear of positive and negative evaluation stem from exaggerated estimates of the impact of anticipated social impressions.

Specifically, exaggerated appraisals regarding the impact of a negative social impression (e.g., “I will look stupid and no one will want to be my friend”) may cause a fear of negative evaluation and subsequent social anxiety. That is, a fear of decline in the social hierarchy may exist insofar as one believes that a negative social impression will result in dramatically negative consequences—

this appraisal may be the fundamental basis through which fears of evaluation come to fruition and induce social anxiety. Indeed, if one does not anticipate inflated negative repercussions of a social impression there would likely be nothing to fear. Thus, it is proposed that exaggerated anticipatory social appraisals (self-related and other-related) of conveying a negative, undesirable impression will positively predict fear of negative evaluation (Hypothesis 1a).

It is expected that overestimates of the impact of positive social impressions may also result in fear of negative evaluation. Fear of negative evaluation has been associated with a fear of social reprisal due to positive social impressions (Weeks & Howell, 2012). Because socially anxious individuals perceive themselves to exist low in social rank in the social hierarchy, a socially anxious individual may exaggerate the expected consequences of conveying a positive impression because this may enable them to avoid further decline in the social hierarchy (e.g., “I will look smart and gain valuable support from friends;” avoid ostracism and further loss of already perceived deficient social resources). However, the greater the social impact that an individual anticipates a positive social impression to have, the greater the extent of the upshift in the social hierarchy. This inflated upshift has the repercussion, however, of greater social competition, and, crucially, socially anxious individuals may perceive themselves as incapable of defending social gains (Gilbert, 2001), this may induce greater fear of negative evaluation.

As positive impressions may lead to perceived upshifts in the social hierarchy, an exaggerated expectation about the impact of positive social impressions may lead to exaggerated anticipated shifts in the social hierarchy, and thusly increased fears of negative evaluation. Therefore, it is proposed that another mechanism that fear of negative evaluation may stem from is through exaggerated estimates of the impact of positive social impressions—that is, an underlying overestimated upward shift in the social hierarchy (e.g. “If I speak articulately, I will look very smart and it will increase my sense of social status, but I cannot compete and I will thus be viewed unfavorably”). Therefore, it is expected that anticipatory appraisals (self-related and other-related) of conveying a positive, desirable impression will also positively predict fear of negative evaluation (Hypothesis 1b). It is unclear if participants’ appraisals of positive, desirable impressions will be predictive of fear of positive evaluation. Because fear of positive evaluation has been associated with distress in reaction to positive feedback as well as tendencies to discount positive feedback (Weeks & Howell, 2012), no a priori hypotheses are stated for this relationship. It is, however, proposed that negative appraisals will be predictive of fear of positive evaluation.

Previous research has indicated that SAIs may fear positive evaluation due to subsequent negative social impressions. Socially anxious individuals may anticipate social impressions to bring heightened, and thereby unreachable, expectations, and thus anticipate resulting negative social impressions. (e.g.,

Wallace & Alden, 1997). According to evolutionary theory, this may have had the benefit of impelling individuals to avoid anticipated upshifts in the social hierarchy by overestimating the perceived danger of the competitive consequences of such upshifts. It is thusly posited that fear of positive evaluation may exist insofar as participants overestimate the impact of negative social impressions. Therefore it is expected that anticipated social appraisals (self-related and other-related) of conveying a negative social impression will positively predict fear of positive evaluation (hypothesis 1c).

The current study implemented a structural equation model (SEM) approach to assess the association between judgmental biases and social anxiety constructs (i.e., trait social anxiety, fear of positive and fear of negative evaluation). Two competing SEM models were tested (hypothesis 2). That is, one in which social appraisals act as a predictor of social anxiety, with fears of evaluation as a mediator. This model is presented in Figure 2. Conversely, one in which fears of evaluation act as a predictor of social anxiety, with social appraisals as a mediator. This model is presented in Figure 1.

In addition, I argue that in order to have a comprehensive model of social appraisals, individuals' estimates of the impact of social impressions on others (other-related social appraisals) need to be included. Thus, other-related appraisals were examined as a distinct construct and predictor, or outcome, of fears of evaluation compared to self-related social appraisals (hypothesis 3). Finally, although previous research (i.e., Trew & Alden, 2009) has shown that

social anxiety and depression do not interact in their prediction of negative social appraisals, it is unclear how depression may affect positive social appraisals. Thus, depression will be statistically controlled for in the present study.

CHAPTER TWO

METHOD

Participants

Participants were students from California State University San Bernardino social science classes, who participated to receive extra credit. Seven participants were deleted for indicating that they did not respond to the questionnaires honestly, 39 participants were deleted for a completion time of less than 15 minutes, 65 were deleted for failing the random response check items, five participants were deleted for response times over 500 minutes. The Mahalanobis distance test was used to determine multivariate outliers. Mahalanobis distance determines an outlier by assessing the distance of a given score from the center of the data (Mahalanobis, 1936). A larger distance suggests that the case is an outlier. Mahalanobis distance follows a chi-square distribution and thus multivariate cases can be identified by their magnitude and significance. Multivariate values that fell below 0.1% were removed. Thus, 33 multivariate outliers (Mahalanobis d -squared > 34 , $p < .001$) were identified and deleted.

The final sample consisted of 474 participants (male = 307; female = 167) with ages ranging from 17 to 65 ($M = 22.39$; $SD = 5.52$). The ethnic composition of the sample was 6.5% Asian American, 0.4% American Indian, 5.3% African American, 65.4% Hispanic/Latino, 1.5% Pacific Islander, 16% White, and 4.9% Other. Sixty-four percent of students reported that their yearly income ranged

from \$0 to \$15,000, 18% reported a yearly income between \$15,000 and \$30,000, with the remaining participants reporting incomes of \$30,000 or greater. For their parent or caretakers highest level of education completed, 24% of participants reported some college, 22% reported a high school diploma, 17% a college degree, 12% some high school, 10% reported grade school and 7% reported a post-graduate degree.

To rule out confounding results stemming from gender differences, we also examined the social anxiety related variables separately for males and females. Females ($M = 19.60$; $SD = 7.75$) and males ($M = 20.80$, $SD = 8.32$) scored equally on measures of fear negative evaluation, $t(472) = 1.53$, $p = .128$, these levels of FNE are similar to established norms in a sample of multiracial students and slightly above community samples (Rodebaugh et al., 2011). Moreover, genders scored equally on measures of fear of positive evaluation, with female ($M = 26.54$, $SD = 14.15$) and male ($M = 27.52$, $SD = 15.17$) mean differences being nonsignificant, $t(472) = .688$, $p = .492$. Genders also scored equally on measures of social interaction anxiety with female ($M = 19.55$, $SD = 13.73$) and male ($M = 19.65$, $SD = 13.92$) participants mean differences, $t(472) = .071$, $p = .944$, being nonsignificant as well. Therefore, male and female participants were analyzed simultaneously. Mean social anxiety in this present sample is slightly above community sample norms and similar to student sample norms (Rodebaugh et al., 2011).

Procedure

Surveys were distributed through the use of Qualtrics, an online survey editorial system. Participants accessed the study through SONA, an online department research management system, and completed the surveys from personal or lab computers at their convenience. No names or other identifying information were recorded. Each participant received the SIBS first, this was done to reduce the carry over effects from the other social anxiety related measures in the survey flow (i.e., FPE, FNE, and SIAS). Participants received the subsequent surveys in a random order, with the exception of the demographic information form, which participants always received last.

Measures

Depression Anxiety and Stress Scale

The Depression, Anxiety and Stress Scale (DASS-21; Lovibond & Lovibond, 1995) was used to control for depression, anxiety and stress. The DASS-21 was chosen for its ability to measure several divergent constructs in a succinct manner—each subscale of depression, anxiety and stress contains seven items. Participants report symptoms experienced over the course of the previous week on a 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*) Likert scale. The DASS-21 has Cronbach's alpha coefficients ranging from .87 to .94, has been shown to correlate strongly with other established measures of depression and anxiety and has exhibited an excellent

factor structure in clinical samples (Antony, Bieling, Cox, Enns, & Swinson, 1998).

Social Interaction Anxiety Scale—Straightforward Score

The 20-item Social Interaction Anxiety Scale (SIAS) measures fears of general social interaction and discriminates between social anxiety and other anxiety disorders (Mattick & Clarke, 1998). Participants are asked to respond on a 5-point Likert type scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). The SIAS-S has been found to have excellent internal consistency in undergraduate samples with a Cronbach's alpha coefficient of .93 (Rodebaugh, Woods & Heimberg, 2007). The reverse-scored items have been shown to compromise the factor structure of the SIAS and show weaker relationships to convergent measures compared to the straightforwardly worded items. Thus removing the reverse-scored items has been shown to improve the construct and factorial validity of the scale (Rodebaugh, Woods & Heimberg, 2007). Moreover, previous research indicates that the SIAS reverse-scored items may be moderated by higher age and lower education and thus compromise the validity of the scale (Rodebaugh, Heimberg, Brown, Fernandez, Blanco, Schneier, & Liebowitz, 2011). Therefore, only the 17 straightforward items of the SIAS (SIAS-S) will be used to calculate total scores.

Brief Fear of Negative Evaluation Scale—Straightforward Score

The Brief Fear of Negative Evaluation Scale (Leary, 1983) is a truncated version of the original 30-item FNE (Watson & Friend, 1969). The BFNE consists

of 12-items measuring a core component of social anxiety, fear of negative evaluation. Using a five-point Likert scale (0 [*not at all characteristic of me*] to 4 [*extremely characteristic of me*]). Similar to the SIAS, however, the BFNE has revealed a 2-factor structure with the reverse-worded and straightforwardly worded items loading on separate dimensions, and weaker convergent validity for the reverse-worded items relative to the straightforwardly-worded items (Weeks et al., 2005; Rodebaugh, Woods, Thissen, Heimberg, Chabless, & Rapee, 2004; Carleton, McCreary, Norton & Asmundson, 2006). Thus, the straightforwardly worded items and the reverse-worded items were given but only the eight straightforwardly worded items (BFNE-S) were used to calculate total scores. The BFNE-S has demonstrated excellent internal consistency (Cronbach's alphas > .92) in undergraduate samples and clinical samples (Rodebaugh et al., 2004; Weeks et al., 2005).

Fear of Positive Evaluation Scale

The Fear of Positive Evaluation Scale (FPES; Weeks, Heimberg, & Rodebaugh, 2008) is a 10-item measure using a 10-point Likert scale (0 [*Not at all true*] to 9 [*Very True*]) that measures apprehension and distress associated with positive evaluation and demonstrated strong internal consistency in an undergraduate sample (Cronbach's alpha = .80), good test-retest reliability, have been found to comprise a single latent factor and has demonstrated support for discriminant and convergent validity (Weeks, Heimberg & Rodebaugh, 2008). Participants are asked to respond to the statements as though they are relevant

to people they do not know very well to control familiarity biases. Sample items include “I feel uneasy when I receive praise from authority figures” and “I generally feel uncomfortable when people give me compliments.” The FPE scale contains two reverse coded items that are not used in the calculation of total scale scores. The FPES has been shown to be related, but distinct to FNE.

Social Impact Bias Scale

The Social Impact Bias Scale (SIBS; Johns & Lewin, unpublished) is a novel measure created for the purposes of measuring socially anxious individuals' probability and cost estimates of anticipated unambiguous positive and negative social events. To make the anticipation of conveying a desired or undesired impression salient, each social scenario entailed a response ending with an adjective from the other person(s) in the scenario, thus eliminating ambiguity (e.g., “As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person smiles and responds with “Wow, you seem really interesting”). After reading the scenario, participants were asked to rate the extent to which they, themselves, would feel this way if this were to happen, using the same adjective that came from the person(s) in the scenario (i.e., “If this were to happen, rate the degree to which you would feel that you are interesting”). Consistent with Gilboa-Schechtman et al., we also emphasized that participants imagine and anticipate such a scenario, even if they thought it was unlikely or felt uncertain about it.

The same design was used to assess participants' probability and costs of others perceptions, except, after reading the scenario, participants were asked to rate the degree to which other person(s) in the scenario perceived the participant on that adjective (i.e., "If this were to happen, rate the degree to which this person would feel that you are _____, e.g., interesting"). Conversely, negative social scenarios were constructed in a manner that was identical to the positive scenarios, but was different in the outcome in that individuals did not receive the desired response from the other person(s) in the scenario. The negative scenarios also did not end in a negative adjective as it was determined that this would make the scenarios unrealistic. Thus, the scenarios ended in a more likely negatively conveyed impression (e.g., "As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person frowns and responds with "is that supposed to be interesting?"). As opposed to an outright negative reaction (e.g., the person says "you're boring").

However, similar to the positive scenarios, participants did rate their responses based on the relevant adjective (e.g., "If this were to happen, rate the extent to which you would feel that you are boring"). These adjectives were chosen because they represented the opposite of the positive adjectives (e.g., interesting vs boring). Like the positive scenarios, participants also responded to an other-subscale for the negative scenarios. As an attempt to replicate Gilboa-Schechtman et al., the only study to find anticipated positive judgmental biases among SAIs, we included the same subscales of probability, magnitude,

duration, physical reaction, and self-esteem for each scenario as measures of probability and impact. Thus the SIBS consists of 20 social scenarios (i.e., 5 self-positive scenarios [SP], 5 other-positive scenarios [OP]; 5 self-negative scenarios [SN], and 5 other-negative scenarios [ON]) each scenario included subscales of anticipated probability, magnitude, duration, physical arousal, and self-esteem of the corresponding scenario to measure respondents estimated social impact. Each social scenario was matched closely in terms of content and wording. The SIBS can be found in Appendix C.

Design

The current study employed a non-experimental design. Fears of negative/positive evaluation were tested as predictors of social anxiety with appraisals as a mediators. Alternatively, appraisals were tested as predictors of social anxiety with of fears of negative/positive evaluation as mediators.

CHAPTER THREE

RESULTS

Analysis Strategy

We used SPSS AMOS to test the hypothesized model presented in Figure 1. To statistically control for depression, we regressed depression on the measures fear of negative evaluation, fear of positive evaluation, and social interaction anxiety to obtain unstandardized residuals. The unstandardized residuals were used in model analysis. The subscales of the SIBS for each dimension of social impact biases (i.e., self-positive and negative, other-positive and negative) were parceled by summing each subscale of the SIBS dimension and using the sum of the dimensions respective subscales as indicators. The use of parcels has several advantages. Most relevant is the parsimonious use of subscales as indicators (Little, Cunningham, Shahar & Widaman, 2002). The use of parceling reduces the overall parameters in the current model dramatically, resulting in a much more parsimonious model. This is done in particular because as mentioned the purpose of the current model is the measurement of the relevant construct (i.e., social appraisals) and not the individual items.

Because the interest of the present study is on the development of the construct, social appraisals, and not the development of a scale, the relevance of what each individual item is measuring is not as important as capturing the construct. That is, the purpose of the current study is not scale construction but comprehensive measurement of the relevant construct. Moreover, parceling has

the potential to reduce sampling error, improve the stability of the solution, resulting in smaller standard errors and more stable estimates of parameters (Little, Cunningham, Shahar & Widaman, 2002). Cronbach's alpha was used to assess the internal consistency of the questionnaires before SEM analysis. For consistency, participants replied to the self-esteem subscale for both the self-related and other-related dimension of the SIBS, but the other-related self-esteem subscale was not used in statistical analyses for lack of theoretical justification.

Psychometric Properties of the Social Impact Bias Scale

A reliability analysis revealed that removal of the physical arousal subscale was necessary in order to improve the overall internal consistency of the latent factors. Table 1 shows the final model's internal consistency for each of the SIBS dimensions. As indicated in Table 1, after removal of the physical arousal subscale, each of the SIBS dimensions demonstrated excellent internal consistency (all Cronbach's alphas > .90). However, for the purposes of testing probability as a distinct measured variable, the physical arousal subscale was retained in initial model analysis, because although it resulted in reduced internal consistency (SN = .84 versus .90; ON = .70 versus .81; SP = .78 versus .80; OP = .62 versus .70), this reduction was minimal and this subscale's presence was necessary as the deletion of this subscale would leave the other-appraisal domains with two indicators and a minimum of three indicators are needed for each latent factor. It is important to note that because of the present study's use

of parceling, latent variable alphas could be based on the summation of subscales (i.e., adding the sum of responses on magnitude, probability, and duration) or on the summation of individual items (i.e., the sum of item-level responses to each of the social scenarios on each of the subscales). Latent variable alphas reported in Table 1 are based on item-level responses. The use of scale-level alphas are nearly identical.

Table 1. Descriptive Statistics and Correlations for Study Variables.

Variable	Mean (SD)	Scale alpha	Correlations						
			1	2	3	4	5	6	
1. SIAS-S	19.61 (13.84)	.94	1.00						
2. BFNE-S	20.37 (8.14)	.93	.52**	1.00					
3. FPE	27.18 (14.81)	.83	.38**	.10**	1.00				
4. Self-Negative	74.35 (40.03)	.93	.30**	.35*	.29**	1.00			
5. Other-Negative	61.65 (25.18)	.94	.22**	.29**	.21**	.68**	1.00		
6. Self-Positive	114.34 (26.35)	.95	.08	.11*	.07**	.21**	.31**	1.00	
7. Other-Positive	76.39 (21.20)	.94	.06	.03	.05*	.16**	.34**	.79**	1.00

Note: * $p < .05$, ** $p < .001$. Correlations shown in table are after statistically controlling for depression.

Table 2 delineates the reliability of the subscales for each dimension of the SIBS. A reliability analysis revealed that the subscales of the self-positive dimension demonstrated good internal consistency (each Cronbach's alpha > .80). The self-esteem subscale of the self-negative dimension demonstrated good internal consistency (Cronbach's alpha = .85). The remaining subscales on the self-negative dimension revealed adequate to good internal consistency

(Cronbach's alphas > .77). Reliability analyses for the other-negative domain revealed good internal consistency for each subscale (Cronbach's alphas > .83), similar findings arose with the other-positive domain with each subscale indicating good internal consistency (Cronbach's alphas > .86). No removal of SIBS questionnaire items would improve internal consistency. The SIAS, BFNE, and FPE each demonstrated good to excellent internal consistency.

Table 2. Descriptive Statistics for the Subscales of the Social Impact Bias Scale.

Scale	No. of items	<i>M</i> (<i>SD</i>)	Alpha
Other-Negative			
Magnitude	5	17.59 (7.10)	.83
Probability	5	17.54 (7.30)	.85
Duration	5	12.40 (7.82)	.86
Other-Positive			
Magnitude	5	17.43 (4.20)	.89
Probability	5	23.23 (5.70)	.88
Duration	5	12.44 (6.00)	.86
Self-Negative			
Magnitude	5	15.30 (8.67)	.78
Probability	5	15.46 (8.80)	.79
Duration	5	11.80 (8.20)	.77
Self-esteem	5	17.20 (8.72)	.85
Self-Positive			
Magnitude	5	30.20 (6.82)	.90
Probability	5	30.33 (7.00)	.90
Duration	5	21.26 (9.77)	.92
Self-esteem	5	32.55 (7.13)	.84

Structural Model

Structural equation modeling (SEM) was implemented using SPSS AMOS. Based upon the current study's medium to large sample size and the acceptable assumptions of normality and independence, Maximum Likelihood (ML) was used for model estimation (Hu, Bentler, & Kano, 1992). Model fit was assessed utilizing the Comparative Fit Index (CFI; Bentler, 1988) with values of .95 or higher suggesting good fit (Hu & Bentler, 1999); the Standardized Root Mean Square Residual (SRMR; Hu & Bentler, 1999), values of .08 or less being indicative of a good fitting model; the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993), values of RMSEA that are .06 or less suggest a good fit (Hu & Bentler, 1999), whereas values .10 or higher suggest a model that fits the data poorly (Browne & Cudeck, 1993).

The initial model consisted of latent factors of self-positive (indicators of magnitude, duration, self-esteem, and physical arousal), other-positive (indicators of magnitude, duration, physical arousal), self-negative (indicators of magnitude, duration, self-esteem and physical arousal) and other-negative (indicators of magnitude, duration, and physical arousal). The probability subscale was implemented as a distinct, measured variable. This model is presented in Figure 1. This initial model indicated a poor fit, $\chi^2(168, N = 474) = 6103.22$, RMSEA = .256 [.249, .264]; CFI = .38; GFI = .56, SRMR = .26.

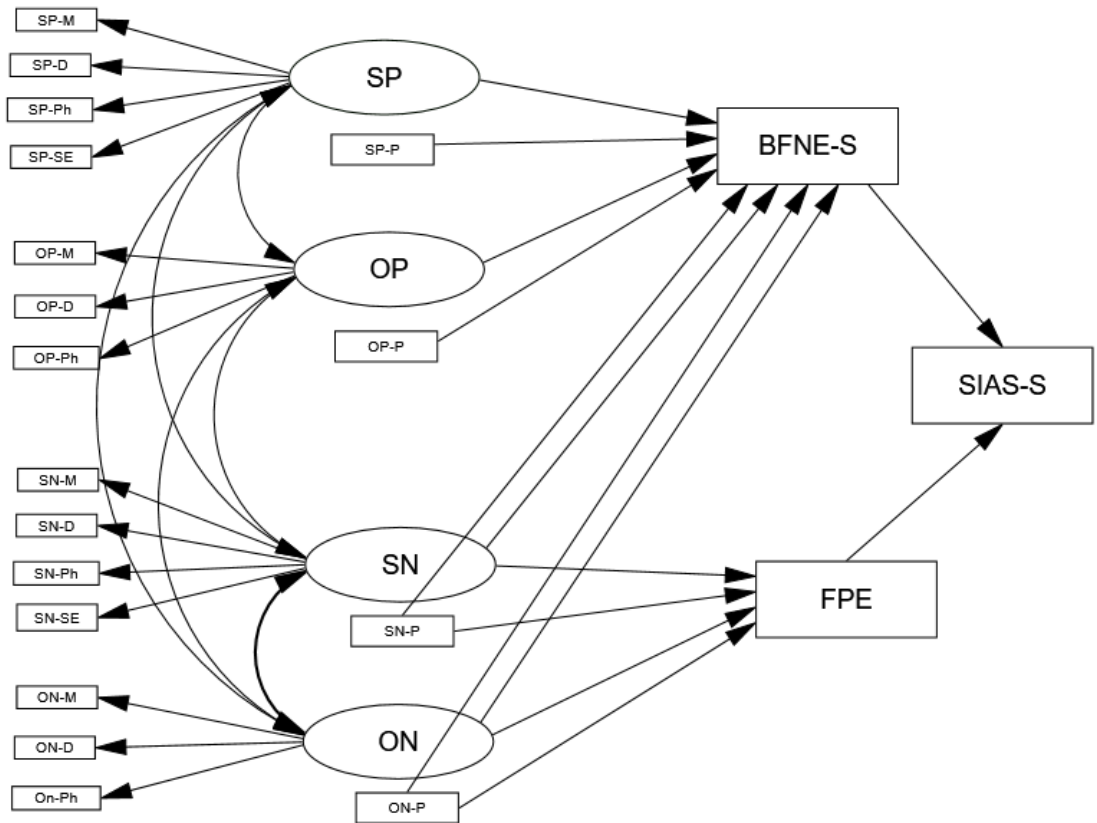


Figure 1. The Hypothesized Model.

Note: For indicators, M = Magnitude, D = Duration, SE = Self-esteem, Ph = Physical arousal. For factors, SP = Self-positive, OP = Other-positive, SN = Self-negative, ON = Other-negative, SP-P = Self-positive probability, OP-P = Other-positive probability, SN-P = Self-negative probability, ON-P = Other-negative probability.

Evaluation of modification indices suggested that probability was not a distinct latent factor. Thus, consistent with literature indicating that probability and magnitude are highly correlated (e.g., Foe et al., 1996), and therefore not distinct,

probability was used as an indicator of the latent factors. Because previous reliability analyses revealed that removal of the physical arousal subscale would improve the internal consistency of the SIBS domains, we replaced the physical arousal subscale with the probability subscale as an indicator of SIBS social appraisal domains. Further modification indices revealed that correlated measurement error was necessary to improve model fit. This correlated measurement error is expected since the subscales of each reaction entail a shared method component (Brown 2015). Specifically, each subscale of every social scenario assesses the same construct (i.e., anticipatory social appraisals), with similar wording, using the same or similar social scenarios under the same method (i.e., questionnaire); thus the presence correlated measurement error is theoretically justified. Since the specific subscales of each scenario and dimension of the SIBS were presented in randomized order, neither correlations are assumed to be causal in nature (Brown, 2015).

The final model consisted of four distinct latent factors of self-positive (indicators of magnitude, probability, duration and self-esteem), other-positive (indicators of magnitude, probability, duration), self-negative (indicators of magnitude, probability, duration and self-esteem), and other-negative (indicators of magnitude, probability, and duration). The final model yielded a good fit (Hu & Bentler, 1999), $\chi^2(94, N = 474) = 173.80$, RMSEA = .042 [.032, .052]; CFI = .99; GFI = .96; SRMR = .04. Moreover, the 90% CIs of the RMSEA included values less than .06. This final model is presented in Figure 2.

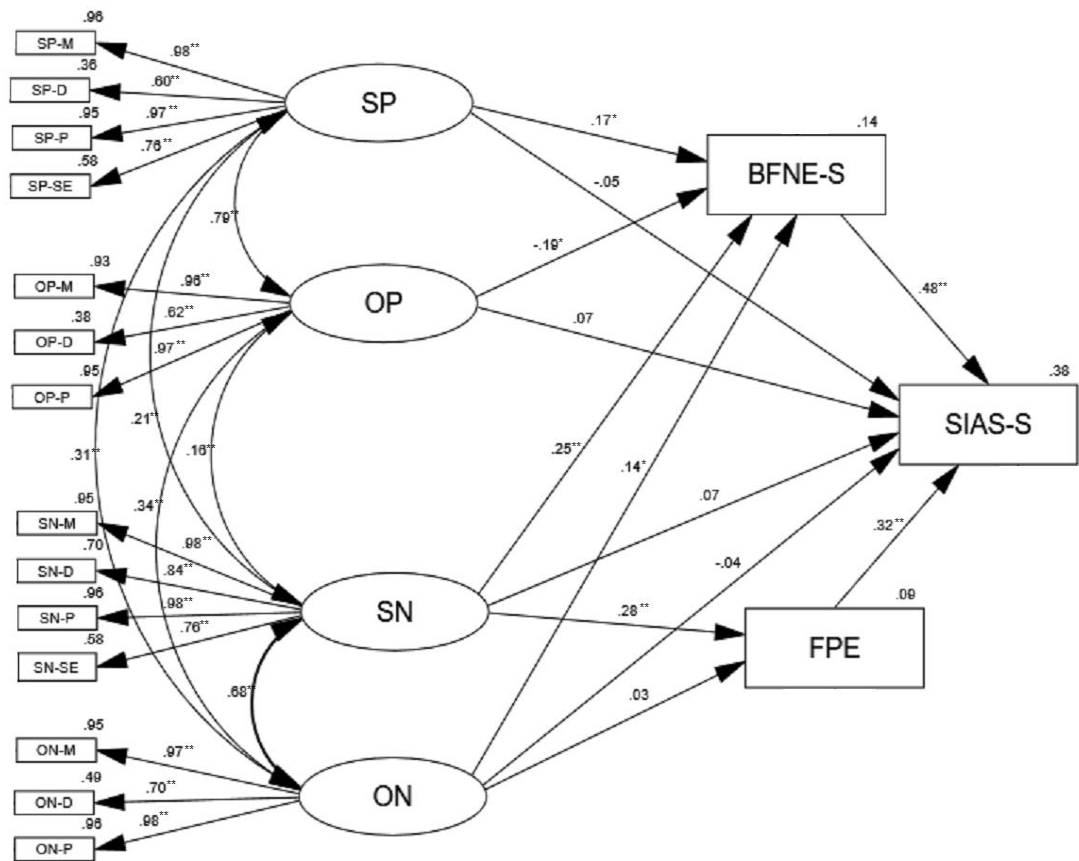


Figure 2. The Final Model.

Note: * $p < .05$, ** $p < .001$. For indicators, M = Magnitude, D = Duration, SE = Self-esteem, P = Probability. For factors, SP = Self-positive, OP = Other-positive, SN = Self-negative, ON = Other-negative. Standardized coefficients are displayed.

As Table 3 shows, factor loadings revealed that all indicators loaded strongly on their respective latent factors. Standardized factor loadings ranged from .60 to .98 and were all significant at the $p = .001$ level. To further examine the importance of each indicator, we examined the amount of variance that each

latent factor accounted for in their respective indicators. The self-negative latent factor accounted for the most amount of variance in the probability indicator subscale (97%), followed by the magnitude subscale (95%), the duration subscale (70%), and the self-esteem subscale (58%). The other-negative latent factor accounted for the most amount of variance in the probability subscale (96%), followed by the magnitude subscale (95%), and the duration subscale (50%). The self-positive latent factor accounted for the most amount of variance in the magnitude subscale (96%), followed by the probability subscale (95%), the self-esteem subscale (58%) and the duration subscale (36%). The other-positive latent factor accounted for the most amount of variance in the probability subscale (95%), followed by the magnitude subscale (93%), and the duration subscale (38%). These findings suggest that across all latent factors, the magnitude and probability indicators may represent the “core” (see, Little, Cunningham, Shahar & Widaman, 2002) of social appraisals with duration and self-esteem playing an important but less critical role in anticipatory social appraisals.

Table 3. Factor Loadings of the Social Impact Bias Scale.

Factor	Standardized loading
Self-negative	
Magnitude	.98
Duration	.84
Probability	.98
Self-esteem	.76
Other-negative	
Magnitude	.97
Duration	.84
Probability	.98
Self-positive	
Magnitude	.98
Duration	.60
Probability	.97
Self-esteem	.76
Other-positive	
Magnitude	.97
Duration	.62
Probability	.97

Note: All factors loadings $p < .001$.

Testing of Hypotheses

To test the present study's specific hypotheses, we examined the association between the latent factors of the SIBS and fears of evaluation. Bias corrected (BCa) bootstrapped confidence intervals based on 10000 samples were used to determine the significance of coefficients. Consistent with the expectations of hypothesis 1a, self-negative anticipatory appraisals were positively associated with fear of negative evaluation (standardized coefficient =

.25, $p < .001$); other-negative anticipatory appraisals were positively associated with fear of negative evaluation as well (standardized coefficient = .14, $p = .036$). Consistent with expectations of hypothesis 1c, self-negative appraisals were positively associated with fear of positive evaluation (standardized coefficient = .28, $p < .001$). However, inconsistent with expectations of hypothesis 1c, other-negative appraisals were associated with fear of positive evaluation (standardized coefficient = .03, $p = .641$). This suggests that other-negative appraisals may have the potential to differentiate fears of negative from fears of positive evaluation.

Consistent with expectations of hypothesis 1b, self-positive anticipatory appraisals were associated with fear of negative evaluation (standardized coefficient = .17, $p = .023$), representing a small to moderate effect. However, unexpectedly, other-positive anticipatory appraisals were negatively associated with fear of negative evaluation (standardized coefficient = -.19, $p = .012$). Consistent with expectations, inclusion of self-positive (standardized coefficient = .06, $p = .448$) and other-positive (standardized coefficient = -.12, $p = .108$) paths to fear of positive evaluation did not improve model fit $\chi^2(92, N = 474) = 170.97$, RMSEA = .043 [.033, .052]; CFI = .99; GFI = .96; SRMR = .03 and standardized coefficients for these paths were small and insignificant, suggesting that positive anticipatory social appraisals may distinguish fear of negative from fear of positive evaluation. However, hypothesis 2 in which this model is compared to an alternative, competing model wherein anticipatory social appraisals are tested as

a mediator in the fears of evaluation—social anxiety relationship could not be tested utilizing the present study’s methodology. The relative strength of model fit indices of statistically equivalent models cannot be used to determine the validity of the models. This is because it is possible for model fit indices of an incorrect model that are statistically equivalent to have a model fit indices (Keith, 2014).

To test hypothesis 3 and examine the construct validity of the SIBS, we tested the distinctness of the other-appraisals from the self-appraisals by loading other-appraisal indicators for the other-negative and other-positive latent factors onto their respective self-negative and self-positive latent factors (i.e., a two-factor model of the SIBS). Poor model fit of this two-factor model of the SIBS, relative to the four-factor model in which both self- and other- appraisals are distinct, would support the notion that both self- and other-appraisals are distinct and thus necessary to measure. Results supported the latter, the two-factor model yielded a poor model fit, $\chi^2(104, N = 474) = 2094.30$, RMSEA = .201 [.194, .209]; CFI = .77; GFI = .70, SRMR = .09. That is, in support of hypothesis 3, the four-factor model in which self- and other-appraisals were modeled as distinct factors revealed a far superior fit to the data relative to the two-factor model, suggesting that both self- and other-appraisals are distinct. Table 4 summarizes the comparison of fit indices of the models used in the current study.

Table 4. Comparison of Fit Indices Among Competing Models.

Model	χ^2	df	CFI	RMSEA	SRMR
Final	173.80	94	.99	.042	.04
Initial	6103.22	168	.38	.256	.26
Two factor	2094.30	104	.77	.201	.09
Paths to FPE	170.97	92	.99	.043	.03

Indirect Effects

The findings of the indirect effects of anticipatory social appraisals on social anxiety through fears of evaluation were examined. Indirect effects may further lend evidence for the construct validity of the SIBS. Results revealed that with the exception of other-negative anticipatory social appraisals (standardized indirect effect = .07, $p = .074$), anticipatory social appraisals may influence social anxiety indirectly through fears of positive and negative evaluation (standardized indirect effects for self-negative = .21, $p < .001$; self-positive = .08, $p = .021$; other-positive = -.09, $p = .009$). All direct paths from SIBS factors to the SIAS were small and insignificant, all $ps > .18$, as shown in Figure 2.

Discriminant Validity of the Social Impact Bias Scale

Finally, it is possible that self and other, positive and negative social appraisals are associated with fears of evaluations due to anxiety, depression, or

stress. To rule this out, we assessed the discriminate validity of the SIBS; that is, whether the SIBS dimensions are specific to social anxiety or variables known to be related to social anxiety and social appraisals (i.e., stress, anxiety, and depression). High correlation between these variables and the SIBS would suggest poor discriminant validity. After statistically controlling for depression, the subscales of the SIBS did not correlate with stress or general anxiety (all r s < .07; all p s > .16), suggesting that depression is responsible for the subsequently reported relationships between the SIBS and general anxiety and stress.

However, because depression and anxiety are highly correlated, we examined the relationship between the SIBS and third variables controlling for anxiety and stress. After statistically controlling for anxiety, depression was negatively correlated with self-positive appraisals ($r = -.10, p = .024$), uncorrelated with other-positive appraisals ($r = -.03, p = .52$), positively correlated with other-negative ($r = .14, p = .002$) and positively correlated with self-negative appraisals ($r = .213, p < .001$). Stress was positively correlated with other-negative ($r = .10, p = .03$) and self-negative appraisals ($r = .13, p = .006$), but not positive appraisals (r s < .03). After statistically controlling for stress, a similar pattern emerged. Depression was correlated with self- ($r = .10, p = .006$), and other- ($r = .13, p = < .001$) negative appraisals and self-positive appraisals ($r = -.11, p = .016$), but not other-positive appraisals. Anxiety was only correlated with self-negative appraisals ($r = .11, p = .018$; all other p s > .09). Because stress and anxiety did not correlate with the SIBS when depression was

statistically controlled for, but correlated with the other DASS subscales when only anxiety or stress was controlled for, this pattern of results suggests that the small correlation between the SIBS and stress and anxiety may be attributed to depression. These findings lend evidence for the discriminant validity of the SIBS and further support for the appropriateness of statistically controlling for depression in the present study

CHAPTER FOUR

DISCUSSION

Research examining socially anxious individuals (SAIs) negative, self-relevant anticipatory social appraisals is abundant (e.g., Foa et al, 1996; Gilboa-Schechtman, et al., 2000; Bielak & Moscovitch, 2013). It is unambiguously clear that SAIs overestimate the impact that a negatively conveyed social impression would bring to their sense of self. But do such unidimensional appraisals fully capture SAIs social appraisals? In the current study, we utilized SEM to develop and examine a more comprehensive model of SAIs social appraisals, assessing other-negative (impact of negative social impressions on others), self-positive (anticipated impact of positive social impression on oneself), and other-positive (anticipated impact of positive social impression on others) in addition to self-negative appraisals. After theoretically justified adjustments, findings generally supported the hypothesized model. At the latent level, consistent with expectations and supporting past research, self-negative social appraisals were positively associated with fear of negative evaluation and fear of positive evaluation.

Also consistent with expectations and adding to past research, other-negative social appraisals were positively associated with fear of negative evaluation; inconsistent with expectations, however, other-negative appraisals were unrelated to fear of positive evaluation. Moreover, these other-negative

appraisals were not indirectly related to social anxiety through fears of evaluation. Consistent with expectations and further adding to the social appraisal (or judgement bias) and social anxiety literature, self-positive social appraisals were positively associated with fear of negative evaluation, contributed to increased social anxiety indirectly through fear of negative evaluation, but were unrelated to fear of positive evaluation. Interestingly, inconsistent with expectations, other-positive social appraisals were not associated positively, but negatively with fear of negative evaluation, and led to social anxiety indirectly through fear of negative evaluation. Thus SAs may not only anticipate that they, themselves, will respond negatively to a social mishap, but that others will respond nearly as negatively. Perhaps paradoxically, SAs may also anticipate an increased impact of a conveyed positive social impression on themselves, but less of this impact on others impressions.

Discussion of Findings

What explains the apparent contradictory finding that increased self-positive appraisals are predictive of increased fear of negative evaluation, but that other-positive appraisals are predictive of decreased fear of negative evaluation? According to the anchoring and adjustment hypothesis (Gilovich, Medvec & Savitsky, 2000), individuals anchor on their own positive appraisal of themselves, adjust, and extrapolate from their own experience what others will experience. In support of the anchoring and adjustment hypothesis, self-positive

and other-positive appraisals are both positively and highly correlated. From this view, we would expect that if increased self-positive appraisals predict increased fear of negative evaluation, then increased other-positive appraisals would also predict increased fear of negative evaluation. Thus, if SAIs were anchoring and adjusting according to their own internal state, we would expect decreased fear of negative evaluation among SAIs; of course, this is not the case. It may well be that SAIs do not rely on their own experience, but instead their beliefs about others; in contrast, non-SAIs may rely on their own internal state to infer and anticipate what others may think.

Therefore, one partial explanation for how fear of negative evaluation may develop is through decreased reliance on one's own positive internal states when in anticipation of conveying a positive impression. Social anxiety may develop when individuals rely on preexisting beliefs that others are hypercritical or that others have exaggerated social standards (e.g., Wallace & Alden, 1991; Schlenker & Leary, 1982; Clark & Wells, 1995), which may lead to decreased anticipated positive social appraisals from others and thus fear of negative evaluation. This supports theoretical perspectives that suggests that social anxiety is a disorder comprised of distorted perceptions of others' perceptions (Gilbert, 2001), and that social anxiety is associated with impairments in theory of mind such that SAIs exaggeratedly read into others' mental states (Washburn, Wilson, Roes, Rnic & Harkness, 2016). On the other hand, an increased reliance on one's own internal states to infer others positive reactions may lead to

reductions in fear of negative evaluation and thus decreased social anxiety. This view is supported by previous research indicating that SAI's self-worth is contingent upon others' perceptions and that reductions in contingent self-worth is related to reductions in social anxiety (Taylor & Alden, 2008).

Although within valence self-related and other-related anticipatory social appraisals were highly correlated in the present study, this high correlation is expected. Socially anxious individuals have been shown to base their sense of self on their appraisals of others responses (Taylor & Alden, 2008). This contingent self-worth may result in SAs basing self-negative and self-positive estimates of social impact in anticipation of others responses, which may have led to overlap among the self-related and other-related social appraisals. Nonetheless, a two-factor model in which self and other dimensions of the SIBS loaded on a single factor within their respective valence (i.e. positive and negative), resulted in a much poorer model fit relative to a four-factor model in which self-related and other-related, positive and negative dimensions of the SIBS loaded onto distinct factors.

Moreover, whereas self-negative appraisals were positively associated with both fear of positive and negative evaluation, other-negative appraisals were only associated with fear of negative evaluation. Whereas, self-positive appraisals were positively associated with fear of negative evaluation, other-positive appraisals were negatively associated with fear of negative evaluation and positive social appraisals were not associated with fear of positive

evaluation. These findings, although preliminary, suggest that measuring self-positive, other-positive, and other-negative social appraisals may add incremental validity in the prediction of fears of evaluation and social anxiety beyond the assessment of mere self-negative social appraisals.

The present findings support the evolutionary account of social anxiety—fear of positive and negative evaluation may arise when individuals overestimate consequences of social impressions (i.e., exaggerated upward and downward shifts in the social hierarchy). The present study suggests that individuals with social anxiety may anticipate that a positive impression will bring increased social status for themselves, but that this upshift in social rank may also put them in the position to compete with others. However, socially anxious individuals view themselves as unable to compete and defend social resources, this then results in fear of negative evaluation and subsequent social anxiety (Gilbert, 2001). Indeed, previous research has shown that fear of negative evaluation is associated with concerns of social reprisal from conveying a positive impression (Weeks & Howell, 2012).

In this sense, socially anxious individuals may fear negative evaluation because of an overestimation of rise in social status—that a positive impression would increase their social status to an inflated extent which increases the socially anxious individuals' perception that they are in competition with dominant others and fear of negative evaluation thusly ensues. This is supported by the present study's findings that anticipated positive reaction from others is

negatively associated with fear of negative evaluation. That is, self-positive and other-positive social appraisals may be associated in the opposite directions with fear of negative evaluation because the extent to which a positive impression has an impact on oneself (i.e., the increase in one's social status; "I will look smart and feel good about it, but I cannot defend this social image"), the less of a positive impact it will have on others (e.g., a higher likelihood of competition with others; "Looking smart may cause others to view me as a threat"), resulting in a fear of negative evaluation.

However, positive social appraisals were only associated with fear of negative evaluation in the present study and not fear of positive evaluation, what explains this differential association? Research suggests that SAs discount positive feedback in general, but that fear of positive evaluation may induce individuals to discount this feedback to avoid social reprisal, whereas fear of negative evaluation is not associated with disqualification of positive feedback due to a concern for social reprisal (Weeks & Howell, 2012).

It is possible that in the present study, those with higher fear of positive evaluation discounted and minimized positive outcomes and this disqualification of positive feedback led to a lack of association of positive social appraisals with fear of positive evaluation. This account fits with the evolutionary perspective in that fear of negative evaluation keeps one from moving too *low* in the social hierarchy (thus, discounting anticipatory positive social impressions would be counterproductive) and fear of positive evaluation is a mechanism in which keeps

one from moving too *high* in the social hierarchy (thus, discounting anticipatory positive social impression would be productive in that one avoids an upshift in the social hierarchy; Weeks & Howell, 2012; Gilbert, 2001).

Also consistent with the evolutionary account of social anxiety, negative self-related and other-related anticipatory social appraisals were positively associated with fear of negative evaluation. An anticipated negatively conveyed impression may bring a further decline in a socially anxious individual whom already perceives themselves to be low in social rank, the exaggerated anticipated extent of this may result in further fears of negative evaluation (Gilbert, 2001). Accordingly, the present results suggest that socially anxious individuals may also anticipate others to react nearly as negatively in response to the undesirably conveyed impression. Interestingly, self-negative anticipatory social appraisals were predictive of fear of positive evaluation, but other-negative anticipatory social appraisals were not.

Exaggerated self-negative anticipatory social appraisals may induce a fear of positive evaluation insofar as socially anxious individuals believe that positive evaluation may lead to negative, undesirable social impressions, including social reprisal (Weeks & Howell, 2012), due to the perceived heightened, and thus unreachable, social expectations that socially anxious individuals think positive impressions bring (Wallace & Alden, 1997). Indeed, one may not fear positive evaluation if one does not exaggerate the negative social outcomes that may result from positive social evaluations. However, the present study suggests that

other-negative anticipatory social appraisals are not as critical in the development of fear of positive evaluation. This finding is seemingly at odds with research indicating that fear of positive evaluation is associated with concerns of social appraisal, if this is the case, then we would expect that other-negative appraisals would be predictive of fear of positive evaluation (Weeks & Howell, 2012). However, fear of positive evaluation is a cognitive mechanism associated with fear of an increase in social status, and negative impressions have no relevance for increases in social status. Accordingly, the present study found no association between the impact of negative impression on others and fear of positive evaluation, supporting an evolutionary account of social anxiety.

It is important to address an alternative interpretation of the results from the evolutionary perspective. Namely, that in anticipation of conveying a positive or negative social impression, individuals may either overestimate the increase (e.g., “I will look very smart and everyone will notice and admire me, and I therefore cannot adhere to this admiration”) or overestimate the decrease in their position in the social hierarchy (e.g., “I will look very stupid and thus lose all of my friends”)—and this alone may be enough to induce fears of positive and negative evaluation. However, individuals may also overestimate their inability to obtain social resources after a decrease in social status (e.g., “I will never make friends after I look stupid”), or defend social gains after an increase in social status (e.g., “People will not think I’m very smart, but I cannot adhere to their admiration anyway”).

It is thus unclear if exaggerated social appraisals found in the present study stem from individuals' overestimation of social ranking shifting or underestimation of abilities to cope with this social rank shifting (e.g., it is not the social rank but perceived perception that one is incapable of coping with any rank shifting). It is possible that in the present study, self-related appraisals are measuring anticipated social ranking shifting (e.g., "I will gain or lose valuable social resources"), and other-related appraisals are measuring perceived inability to cope with such rank shifting due to anticipated dramatic reactions from others (e.g., "Others will see me a very stupid and thus I will never gain their friendship," "Others will see me as very smart and thus I will disappoint them").

The present study cannot conclude that anticipatory overestimates in social ranking is the cause of fears of evaluation. However, it is reasonable to assume that the greater overestimation of social ranking shifting that an impression is expected to bring the greater the likelihood that an individual will perceive themselves as incapable of defending or acquiring social gains (e.g. an anticipated change in social status so high or low it is impossible to cope). From this view, exaggerated expected social rank shifting may account for the association between anticipatory social appraisals and fear of negative and positive evaluation found in the present study. In this sense, it is suggested that social appraisals can be conceptualized as exaggerated upward or downward shifts in the social hierarchy.

Implications and Future Directions

It is important to also address the proximate cause of such exaggerated anticipatory social appraisals. Socially anxious individuals expect that others will have higher standards after a positive impression (Wallace & Alden, 1997), but may also perceive that others have greater expectations before a positive impression is conveyed (Wallace & Alden, 1991). Exaggerated self-positive appraisals may stem from SAIs perceptions that social standards are high and rigid; thus the mere perception of meeting such standards (i.e., conveying a positive impression) may result in an exaggerated anticipatory social appraisal. On the other hand, however, SAIs may set high social standards because of an underlying appraisal that the achievement of such elevated social standards will result in an increased social impact, an inflated shift in social status (Gilbert, 2001). Future research may benefit from the manipulation of social appraisals and social standards to parse out the directionality of such phenomena.

It has also been argued that inflated social appraisals about the costs of a negative impression may stem from core beliefs regarding SAIs perception of themselves as inherently defective and that anticipatory exposure of this defectiveness may result in anticipated disastrous social consequences (Moscovitch et al., 2015). This may well be the case, but the negative association between other-positive social appraisals and fear of negative evaluation found in the present study suggests that SAIs may continually view themselves as incapable of impacting others impressions positively, which could possibly create

a sense of defective self or stem from a sense of defective self, or both. Future research may examine the causal nature of SAIs positive anticipatory social appraisals and perceptions of self.

Importantly, most treatment studies to date have only examined self-negative appraisals (e.g., Calamaras, Tully, Tone, Price & Anderson, 2015). The present study suggests that although self-negative appraisals may be the primary mechanism through which CBT reduces social anxiety, other cognitive mechanisms through which treatment effectiveness may be evaluated include reductions in other-negative appraisals, self-positive appraisals and increases in other-positive appraisals. Although the causal nature of anticipatory social appraisals and social anxiety is beyond the scope of the present study, it remains a critical question to address due to the present study's assumption that anticipatory social appraisals precede social anxiety symptomatology. The current state of the literature is such that this question has been addressed through treatment studies and such findings are thus susceptible to the treatment as etiology fallacy—namely, that the mechanism through which treatment exerts its influence is the mechanism that causes the disorder. Thus, although studies that address the issue of temporal precedence exist (e.g., Smits, Rosenfield, McDonald & Telch, 2006; Calamaras, Tully, Tone, Price & Anderson, 2015), these studies are inconsistent in their conclusions and limited by the treatment as etiology fallacy.

Treatment studies may establish reduced social appraisals as a mechanism of change in CBT protocols for social anxiety, but we cannot confidently establish appraisals as causal factors or consequences of fear and social anxiety until we directly manipulate such variables. Importantly, the direct manipulation of social appraisals has the possibility to answer theoretically and clinically informative questions. For example, if socially anxious individuals engage in self-focused attention to monitor what they are conveying to others, it seems reasonable that this may be because they are exaggerating the impact that their impressions have on others, relative to non-anxious persons. This explanation is supported by an evolutionary account of social anxiety—that when perceiving themselves to be in low social rank or at risk for loss of social rank, SAIs may engage in certain behaviors that reduce chances of this anticipated danger from occurring, such as self-focused attention and signals of submissiveness (Gilbert, 2001). However, it could also be that exaggerated self-focused attention may lead to an exaggeratory anticipation of reactions from others. Future research can answer such questions through direct manipulation of social appraisals (e.g., the probability of being rejected is 10% versus 90%).

Limitations

The current study has several limitations that are important to consider. First, SPSS AMOS does not enable analysis of the independent contributions of indirect effects in multi-mediator models. Therefore, the extent to which

anticipatory social appraisals indirectly impact social anxiety through FNE, FPE, or both is difficult to determine. It is important to note, however, that standardized coefficients from self-related and other-related negative social appraisals to FNE were stronger relative to FPE, suggesting that indirect effects may be more strongly attributable to FNE. Second, because we modified the original hypothesized model, cross-validation of the final model is critical in lending further evidence for the validity of this model. Nonetheless, the validity of this model is supported by the strong model fit indices, particularly when compared to relevant competing models, and the fact that model modifications were minimal and based on previous research and theory.

Several limitations are also posed by the study's current questionnaire. First, the SIBS examined participants' anticipatory estimates of social outcomes regarding intense positive impressions and intense negative impressions. Additionally, we cannot be certain whether we actually tapped into anticipatory estimates or estimates of social appraisals after the fact. Regardless, the intention of the SIBS was to reconstruct the anticipatory process in which SAIs engage in before the conveying of a desired or undesired impression. Namely, SAIs anticipated reactions from others when such reactions are dichotomously and exaggeratedly negative or positive. Nonetheless, future research examining SAIs estimates of moderate positive social impression may prove fruitful.

Second, the subscales for each of the SIBS major dimensions may be somewhat redundant. That is, the core anticipatory social appraisals may be

magnitude, and probability and these may not be distinct from each other, as suggested by the high correlation between these two subscales. Due to the smaller correlations with the subscales of magnitude and probability, duration and self-esteem may be more peripheral, albeit important, indicators of anticipatory social impact. Third, the current study implemented a layperson definition of self-esteem, and not an actual validated measure. Thus, it is unclear how participants actually interpreted self-esteem. However, the correlation between self-esteem and the other subscales of the SIBS suggest that this indicator is related.

Fourth, the SIBS measures positive and negative social appraisals separately. However, SAIs may have negative reactions to positive social events (Gilboa-Schechtman, et al., 2000). It is possible that the inclusion of participants' estimates of negative reactions to anticipatory positive impressions may null or cancel out participants exaggeratedly anticipatory estimates of positive impressions. The current limitations of the SIBS notwithstanding, the SIBS offers incremental validity in that it provides insight above and beyond that which can be obtained from assessment of mere self-negative social appraisals. Moreover, the SIBS has distinguished FPE from FNE and this finding was not attributable to underlying depression, anxiety or stress.

Finally, the current study implemented a cross-sectional design with a sample of undergraduates; thus, it is unclear whether social appraisals induce social anxiety symptomology or social anxiety symptomology induce social

appraisals and if these findings are similar among individuals diagnosed with social anxiety disorder. Future research manipulating social appraisals may reveal the underlying temporality of these variables and validate this model in a sample of individuals diagnosed with social anxiety disorder or an analogue sample of socially anxious participants.

Conclusion

In sum, the present study supports the evolutionary account of social anxiety—that exaggerated anticipatory social appraisals may influence perceived social status and social competition, result in fears of evaluation and ultimately produce social anxiety. It may well be that anticipated social impressions are expected to bring about negative evaluation due to the exaggerated increases or decreases in social status and the perceived consequences of such social rank shifting. In this sense, treatment of social anxiety may be effective insofar as SAIs reduce expectations about the impact of social impressions on social statuses.

For instance, if SAIs estimate that a positive impression may bring an exaggerated increase in social status, treatment may then be geared towards facilitating more accurate estimations in the impact of social impressions on one's position in the social hierarchy. Specifically, on one hand, this impression may not necessarily lead to such a dramatic increase in social status and thus no resultant social competition may ensue. On the other hand, such an increase in

social status may occur, but may be viewed from others as admirable as opposed to competitive.

Because SAIs may perpetually see themselves as existing in a competitive social hierarchy, which may beget exaggerated social appraisals, it may be beneficial in treatment to facilitate the adoption of an alternative perspective of social life. Namely, that individuals are more concerned with developing relationships as opposed to judging and criticizing the SAI—that is, a social life characterized not by competition but by cooperation and meaningful relationships (Trower & Gilbert, 1989; Trower, Gilbert & Sherling 1990; Moscovitch, et. al., 2015). Otherwise, socially anxious individuals may not only live in a general fear of evaluation, but in a generally exaggerated social world wherein the anticipated probability and costs of positive and negative impressions lead to inflated and untenable social shifts in an perceived competitive social hierarchy.

APPENDIX A
INSTITUTIONAL REVIEW BOARD
DISPOSITION

**Human Subjects Review Board
Department of Psychology
California State University,
San Bernardino**

PI: Lewin, Michael; Johns, Lance
From: John P. Clapper
Project Title: Unambiguous Social Impact Bias
Project ID: H-16WI-05
Date: 1/26/16

Disposition: Administrative Review

Your IRB proposal is approved to include 240 participants. If you need additional participants, an addendum will be required. This approval is valid until 1/26/2017.

Good luck with your research!



John P. Clapper, Co-Chair
Psychology IRB Sub-Committee

APPENDIX B
INFORMED CONSENT

Informed Consent

Your participation in the research is completely voluntary.

This study has been designed to assess the relationship between social situations and anxiety. This study is being conducted by Lance Johns under the supervision of Dr. Michael R. Lewin, Professor of Psychology. This study has been approved by the Department of Psychology Institutional Review Board Sub-committee of the California State University, San Bernardino and a copy of the official Psychology IRB stamp of approval appears on this consent form. The University requires that you give your consent before participating in this study.

We are asking you to complete a survey, which will take approximately 35-40 minutes to complete. You will receive 2 extra credit points that can be used in selected courses at the discretion of your professor. Your participation is anonymous. We will not ask for your name. More importantly your answers will be assessed as a group and not individually. In order to award your extra credit points, your participation will be recorded via an anonymous ID number that will be kept separate from your responses and that will be used only to provide SONA extra credit. This anonymous ID will be deleted once the credit has been awarded.

The results of the study will be presented in group format only. Results will be presented in Lance Johns' masters thesis and may be presented at regional conferences, or published in peer reviewed journals. The data will be stored in a password protected computer in the researcher's locked lab space and will be destroyed seven years after publication. At the conclusion of the study in Fall 2016, you may receive a report of the results by contacting Dr. Michael R. Lewin at mlewin@csusb.edu.

Your participation in the research is completely voluntary and you are free to withdraw or refuse to answer any question at any time without penalty or withdrawal of extra credit to which you are otherwise entitled. In the unlikely event that answering questions about social situations and your mood led to distress, please do not hesitate to contact the CSUSB Psychological Counseling Center (537-5040). Additionally, if you have any questions regarding this study, please feel free to contact Dr. Michael Lewin, Associate Professor of Psychology (mlewin@csusb.edu or (909) 537-7303). If you have concerns about this study, you may also contact the Department of Psychology Institutional Review Board Sub-committee of the California State University, San Bernardino at psych.irb.csusb.edu.

Consent agreement:

I acknowledge that I have been informed of, and understand the true nature and purpose of this study, and I freely consent to participate. I acknowledge that I am at least 18 years of age.

Please indicate your desire to participate by placing an "X" on the line below.

Participant's X _____

Date: _____

CALIFORNIA STATE UNIVERSITY			
PSYCHOLOGY INSTITUTIONAL REVIEW BOARD SUB-COMMITTEE			
APPROVED	1/26/16	VOID AFTER	1/26/17
ID#	12-16191-01	CHIEF	<i>John P. Clapp</i>

APPENDIX C
SOCIAL IMPACT BIAS SCALE

Social Impact Bias Scales (SIBS)

This questionnaire involves people's anticipation of making a certain impression. Each scenario involves social situations that people sometimes anticipate happening. As you read, imagine yourself in each scenario and rate the degree to which you would have an impact on others' impression of you (e.g., the person(s) views you as funny or smart). Even if you feel that others would not view you this way or that the scenario is unlikely to happen, do your best to imagine their reaction if they did in fact view you this way.

For each scenario participants will be asked:

Magnitude Scale

"If this were to happen, rate the degree to which you (other person) would feel that you are (positive or negative adjective)" on a 9-point Likert scale anchored by "Not very (adjective)" (0) and "Very (adjective)" (8).

Probability Scale

"If this were to happen, how likely is it that you (other person) would feel that you are (positive or negative adjective)" on a 9-point Likert scale anchored by "Not at all likely" (0) and "Extremely likely" (8).

Duration Scales

"If this were to happen, for how long would you (other person) feel that you are (positive or negative adjective)" on a 9-point scale (0 _ "None"; 1 _ "Several minutes"; 2 _ "15 minutes"; 3 _ "About an hour"; 4 _ "Few hours"; 5 _ "About a day"; 6 _ "Few Days"; 7 _ "Two weeks"; 8 _ "More than a month").

Physical Reaction Scale

"If this were to happen, how would this affect your (other person's) physical reaction? on a 9-point bipolar scale (_4 _ "Strongly negative"; 0 _ "No bodily reaction"; _ "Strongly positive").

Self-Esteem Scale

"If this were to happen, how would this affect your (other person's) self esteem? on a 9-point bipolar scale (_4 _ "Make me feel worthless"; 0 _ "No effect on self-esteem"; 4 _ "Make me feel great").

1. Your professor is talking about a topic you happen to know a lot about. As a result, you make a comment in class and your professor smiles and responds by saying "good point, you're pretty smart."

2. As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person smiles and responds with “Wow, you seem really interesting.”

3. At a party, you are talking to a group of people you just met. You feel a little left out, so you tell a funny joke, everybody laughs and say “You’re pretty funny.”

4. As you are talking with your professor, you realize you have something insightful to say. You comment to the professor about it and the professor responds with “Wow, I have never thought of that perspective, you’re pretty insightful.”

5. You have just met someone from your class and you have a nice compliment you want to give them. When you see them walk by the next day, you give them the compliment and they respond with a big smile and tell you “thanks, you’re so nice!”

This questionnaire involves people’s anticipation of making a certain impression. Each scenario involves social situations that people sometimes anticipate happening. As you read, imagine yourself in each scenario and rate the degree to which the scenario would have an impact on yourself (e.g., you view yourself as funny or smart). Even if you feel that you would not view yourself this way or that the scenario is unlikely to happen, do your best to imagine your reaction if you did in fact view yourself this way.

1. Your professor is talking about a topic you happen to know a lot about. As a result, you make a comment in class and your professor smiles and responds by saying, “good point, you’re pretty smart.”

2. As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person smiles and responds with “wow, you seem like an interesting person.”

3. At a party, you are talking to a group of people you just met. You feel a little left out, so you tell a funny joke, everybody laughs and say “you’re pretty funny.”

4. As you are talking with your professor, you realize you have something insightful to say. You comment to the professor about it and the professor responds with “Wow, I have never thought of that perspective, you’re very insightful.”

5. You have just met someone from your class and you have a nice compliment you want to give them. When you see them walk about the next day, you give them the compliment and they respond with a big smile and tell you “thanks, you’re so nice!”

This questionnaire involves people’s anticipation of making a certain impression. Each scenario involves social situations that people sometimes anticipate happening. As you read, imagine yourself in each scenario and rate the degree to which you would have an impact on others’ impression of you (e.g., the person(s) views you as funny or smart). Even if you feel that others would not view you this way or that the scenario is unlikely to happen, do your best to imagine their reaction if they did in fact view you this way.

1. Your professor is talking about a topic you happen to know a lot about. As a result, you make a comment in class and your professor frowns and responds by saying “No, you need to take a look at your notes.”

2. As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person frowns and responds with “is that supposed to be interesting?”

3. At a party, you are talking to a group of people you just met. You feel a little left out, so you tell a funny joke, and no one laughs and everyone remains quiet.

4. As you are talking with your professor, you realize you have something intelligent to say. You comment to the professor about it and the professor responds with “No, you need to do more research.”

5. You have just met someone from your class and you have a nice compliment you want to give them. When you see them walk by the next day, you give them the compliment and they respond with a frown and walk away.

This questionnaire involves people’s anticipation of making a certain impression. Each scenario involves social situations that people sometimes anticipate happening. As you read, imagine yourself in each scenario and rate the degree to which the scenario would have an impact on yourself (e.g., you view yourself as funny or smart). Even if you feel that you would not view yourself this way or that the scenario is unlikely to happen, do your best to imagine your reaction if you did in fact view yourself this way.

1. Your professor is talking about a topic you happen to know a lot about. As a result, you make a comment in class and your professor frowns and responds by saying “No, you need to take a look at your notes.”

2. As you are talking to a person you have just met, an interesting personal event comes to mind and you tell them about it. The person frowns and responds with “is that supposed to be interesting?”

3. At a party, you are talking to a group of people you just met. You feel a little left out, so you tell a funny joke, no one laughs and everyone remains quiet.

4. As you are talking with your professor, you realize you have something intelligent to say. You comment to the professor about it and the professor responds with “No, you need to do more research.”

5. You have just met someone from your class and you have a nice compliment you want to give them. When you see them walk by the next day, you give them the compliment and they respond with a frown and walk away

Johns, L. J., & Lewin, M. R. (2017). *The development of a comprehensive model of social anxiety and anticipatory social appraisals*. Manuscript in preparation.

APPENDIX D
BRIEF FEAR OF NEGATIVE
EVALUATION SCALE

Brief Fear of Negative Evaluation Scale (BFNE)

Read each of the following statements carefully indicate the degree to which you feel the statement is characteristic of you, using the following scale. For each statement, respond as though it involves people that you do not know very well. Rate each situation from 0 to 9. Please choose only one response for each statement.

1. I worry about what other people will think of me even when I know it doesn't make any difference.
2. I am unconcerned even if I know people are forming an unfavorable impression of me.
3. I am frequently afraid of other people noticing my shortcomings.
4. I rarely worry about what kind of impression I am making on someone.
5. I am afraid that others will not approve of me.
6. I am afraid that people will find fault with me.
7. I am concerned about other people's opinions of me.
8. When I am talking to someone, I worry about what they may be thinking about me.
9. I am usually worried about what kind of impression I make.
10. If I know someone is judging me, it tends to bother me.
11. Sometimes I think I am too concerned with what other people think of me.
12. I often worry that I will say or do wrong things

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APPENDIX E
FEAR OF POSITIVE EVALUATION SCALE

Fear of Positive Evaluation Scale (FPES)

Read each of the following statements carefully indicate the degree to which you feel the statement is characteristic of you, using the following scale. For each statement, respond as though it involves people that you do not know very well. Rate each situation from 0 to 9. Please choose only one response for each statement.

1. I am uncomfortable exhibiting my talents to others, even if I think my talents will impress them.
2. It would make me anxious to receive a compliment from someone that I am attracted to.
3. I try to choose clothes that will give people little impression of what I am like.
4. I feel uneasy when I receive praise from authority figures.
5. If I have something to say that I think a group will find interesting, I typically say it.
6. I would rather receive a compliment from someone when that person and I were alone than when in the presence of others.
7. If I was doing something well in front of others, I would wonder whether I was doing "too well."
8. I generally feel uncomfortable when people give me compliments.
9. I don't like to be noticed when I am in public places, even if I feel as though I am being admired.
10. I often feel under-appreciated, and wish people would comment more on my positive qualities.

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APPENDIX F
DEPRESSION, ANXIETY AND STRESS SCALE

Depression Anxiety Stress Scale (DASS-21)

Please read each statement and circle the number (0, 1, 2 or 3) which indicates how much the statement applied to you over the past week. There are no right or wrong answers, Do not spend too much time on any statement.

The rating scale is as follows:

0 = Did not apply to me at all - NEVER

1 = Applied to me to some degree, or some of the time - SOMETIMES

2 = Applied to me to a considerable degree, or a good part of the time - OFTEN

3 = Applied to me very much, or most of the time – ALMOST ALWAYS

1. I found it hard to wind down
2. I was aware of dryness of my mouth
3. I couldn't seem to experience any positive feeling at all
4. I experienced breathing difficulty (e.g, excessively rapid breathing, breathlessness in the absence of physical exertion)
5. I found it difficult to work up the initiative to do things
6. I tended to over-react to situations
7. I experienced trembling (e.g, in the hands)
8. I felt that I was using a lot of nervous energy
9. I was worried about situations in which I might panic and make a fool of myself
10. I felt that I had nothing to look forward to
11. I found myself getting agitated
12. I found it difficult to relax
13. I felt down-hearted and blue
14. I was intolerant of anything that kept me from getting on with what I was doing
15. I felt I was close to panic
16. I was unable to become enthusiastic about anything
17. I felt I wasn't worth much as a person
18. I felt that I was rather touchy
19. I was aware of the action of my heart in the absence of physical exertion (e.g, sense of heart rate increase, heart missing a beat)
20. I felt scared without any good reason
21. I felt that life was meaningless.

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APPENDIX G
SOCIAL INTERACTION ANXIETY SCALE

Social Interaction Anxiety Scale (SIAS)

For each question, please circle a number to indicate the degree to which you feel the statement is characteristic or true of you. The rating scale is as follows:

0 = Not at all characteristic or true of me 3 = Very characteristic or true of me

1 = Slightly characteristic or true of me 4 = Extremely characteristic or true of me

2 = Moderately characteristic or true of me

1. I get nervous if I have to speak with someone in authority (teacher, boss, etc.).
2. I have difficulty making eye-contact with others.
3. I become tense if I have to talk about myself or my feelings.
4. I find difficulty mixing comfortably with the people I work with.
5. I find it easy to make friends of my own age.
6. I tense-up if I meet an acquaintance on the street.
7. When mixing socially, I am uncomfortable.
8. I feel tense if I am alone with just one person.
9. I am at ease meeting people at parties, etc.
10. I have difficulty talking with other people.
11. I find it easy to think of things to talk about
12. I worry about expressing myself in case I appear awkward.
13. I find it difficult to disagree with another's point of view.
14. I have difficulty talking to an attractive person of the opposite sex.
15. I find myself worrying that I won't know what to say in social situations.
16. I am nervous mixing with people I don't know well.
17. I feel I'll say something embarrassing when talking.
18. When mixing in a group, I find myself worrying I will be ignored.
19. I am tense mixing in a group
20. I am unsure whether to greet someone I know only slightly.

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