

THE INTERACTION OF INTERNAL AND EXTERNAL FOCUS IN SOCIAL ANXIETY:
CLARIFYING COGNITIVE BEHAVIORAL MODELS

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ABSTRACT

Title: The interaction of Internal and External Focus in Social Anxiety: Clarifying Cognitive Behavioral Models

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The two preeminent cognitive behavioral models of social anxiety disorder (Clark & Wells, 1995; Rapee & Heimberg, 1997) indicate attentional bias as a process fundamental to the maintenance of the disorder. They differ, however, on their conceptualization of this process. Clark and Wells suggest that socially anxious persons look only to themselves, their thoughts, and their images during social situations. Although Rapee and Heimberg agree that socially anxious persons become highly self-focused, they also assert that self-focus and vigilance to threat in the environment coexist and interact throughout social situations. This study provides a direct test of this discrepancy, predicting that persons who scored high and low on a measure of communication anxiety would exhibit differences on measures of self-focused attention and environment-focused attention, in support of the model of Rapee and Heimberg. Participants in this study were randomly assigned to speak to audiences of confederates who were trained to demonstrate either mostly negative or mostly positive behaviors. Rapee and Heimberg's predictions were supported, but only on a measure of anxious participants' cognitions and in exploratory correlational analyses. Overall, the evidence was not sufficient to support one model over another. However, the current study is novel in its design, combination of assessment instruments, and examination of attentional processes that have thus far been studied in isolation.

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CHAPTER 1 INTRODUCTION

Socially anxious persons commonly fear that they will behave in a way that will result in other people thinking they are weak, unintelligent or awkward, or that others will notice their anxiety. Implicit in this definition is the notion that the predominant concerns related to social anxiety are the fear of being negatively evaluated by others and the fear that one will behave in a way that will lead to such evaluation. Cues indicative of these outcomes may then be evident in others and in oneself, respectively.

Recently, social anxiety disorder has enjoyed increased attention from researchers, and cognitive behavioral frameworks have undeniably been most fruitful in the study of this disorder. In the 1990s, two cognitive behavioral models of social anxiety were advanced and have served as the foundation for much of the research since that time. These models have emphasized the central role of attentional processes in the maintenance of social fear (Clark & Wells, 1995; Rapee & Heimberg, 1997). Clark and Wells suggest that self-focused attention is the central, if not only, critical attentional process that generates anxiety, impairs performance, and precludes the perception of information inconsistent with social fear. However, although Rapee and Heimberg similarly suggest that self-focused attention is critical in the maintenance of social anxiety, they also speak to the importance of vigilance to socially relevant threat stimuli in the environment, namely, cues of potential negative evaluation from audience members, a process that is not included in the Clark and Wells model. This difference between otherwise very similar models may have particularly important implications for the conceptualization of social anxiety. For instance, Clark and Wells' assertion that socially anxious persons reliably direct their attention toward internal (and effectively away from external) cues may suggest that, among socially anxious individuals, assessment of danger in social situations is independent of threat

actually present in the environment. However, Rapee and Heimberg suggest that socially anxious individuals monitor both internal *and* external threat cues, although not in isolation. Rather, they predict a potential interactive relationship between close monitoring of the self and attention to perceived environmental threat; for instance, attention to audience members' or interaction partners' socially evaluative behaviors may motivate socially anxious persons to monitor themselves more closely and critically to determine how likely their feared consequences are likely to be at any given moment.

Two relatively separate empirical literatures have developed that provide support for the notion of attentional bias for threat stimuli over non-threat alternatives in social anxiety. First, a number of studies have demonstrated the importance of *self*-focused attention in social anxiety, particularly to negative cognitions and negative self-images. Second, many studies have demonstrated that anxious persons are likely to attend preferentially to threat information in the environment, and this has been evident in persons with high levels of social anxiety, including those who meet criteria for a diagnosis of social anxiety disorder (see Amir & Foa, 2001, for a review). However, internal and external focus have been explored in relative isolation, providing little opportunity for the direct examination of the potential interactive relationship between attentional processes (although in social anxiety research, theorists are beginning to explore the possibility that different types of cognitive biases, e.g., interpretation biases and memory biases, interact in important ways; see Brendle & Wenzel, 2004; Hirsch, Clark, & Mathews, 2006a). Bögels and Mansell (2004) comprehensively review both processes in social anxiety. However, they do not speculate on the potential for a more integrative model of attention in social anxiety, as delineated by Rapee and Heimberg (1997). Rather, they indirectly illustrate the relative isolation in which these two literatures have developed. The purpose of the current review is to

examine the relative roles played by internal and external focus of attention in the two primary cognitive behavioral models of social anxiety, with consideration of areas in need of future empirical and theoretical development, particularly as relates to the potential interaction of different attentional processes. Previous reviews (e.g., Bögels & Mansell, 2004) have underscored the integral roles of these processes, discussing each separately. Only one review published to date has examined what evidence might support more strongly one cognitive behavioral model of social anxiety over another (Schultz & Heimberg, 2008). Schultz and Heimberg conclude that the paradigms used to study internal and external attention to threat cues are useful but not adequate to suggest that attention during social situations is exclusively self-focused. Rather, they urge caution in interpreting the results of this extensive literature, as a number of methodologically sound studies indicate that attentional processes may be interactive, and these studies appear to lend tentative support to the Rapee and Heimberg model.

Cognitive Behavioral Models of Anxiety

Beck, Emery, and Greenberg (1985)

Current cognitive behavioral conceptualizations of the anxiety disorders owe much to the comprehensive framework proposed by Beck et al. (1985). Their model is similar in many ways to Beck, Rush, Shaw, and Emery's (1979) cognitive model of depression, particularly the broad emphasis on the role of the schema; however, in this case, it relates to the process of threat appraisal and subsequent reaction to that appraisal. According to Beck et al. (1985), the response to threat involves assessments similar to those delineated by Lazarus (1966), e.g., primary and secondary appraisals.

The story begins with detection of a threat or potential threat. As will be expounded below, threat in social anxiety may be detected in the environment or within one's self, such as

in the form of physical symptoms of anxiety that may be visible to others or in the form of threat-relevant imagery. Primary appraisal of this threat involves the orientation toward the threatening stimulus. In fear responding, this orientation likely involves an element of perceptual sacrifice, as the individual may ignore important details of the social stimulus, preferring a broader view, or conversely, may sacrifice an assessment of the wider field in preference for particular aspects of the threat. According to Beck et al., a fundamental goal of threat detection is to determine whether the information being perceived affects the individual's "vital interests" (p. 38), such as her survival, individuality, functioning, or interpersonal attachment. If compromise of such interests is perceived to be imminent, the individual reacts with a "critical response" (p. 39), described as an egocentric emergency response in which data that are not central to the threat or to the process of self-preservation are minimized.

Whereas the primary level of appraisal involves detection and initial activation, the secondary stage of appraisal involves the individual's evaluation of his ability to cope with the perceived threat. In this sense, one's ability to cope may be defined by the individual's perceived resources for controlling the damage associated with the threat. However, primary and secondary appraisals should not be considered as separate processes. According to Lazarus (1966), they are likely to co-occur as the individual perceives danger and assesses the potential damage it may inflict, relating back to his ability to manage it. Beck et al. (1985) contend that mobilization under threat should be in proportion to the stimulus and the individual's estimate of its inherent danger, with consideration for predisposition, learning experiences, and memories of similar events.

This explanation of threat response involves the rapid assessment of potential threat and mobilization of resources to minimize injury (psychological or physical). According to Beck et

al. (1985), rapid perception and response presupposes the existence of a relevant schema. Preexisting beliefs and expectations allow the individual to enter situations without the necessity of appraising them anew (in terms of measuring threat and contemplating response). Beck (1976) postulates that expectations and beliefs form a structure that orients an individual to his world. Given the speed and prejudice involved in the *fear* response, Beck et al. (1985) apply the theory of schema to their conceptualization of anxiety disorders. In the case of anxiety, the schema (comprised of rules for cognition, behavior, and affect) orients the individual to threat as it helps him discern features of threat rapidly, preparing him to fight or to flee.

The schema may be activated by anticipation of or confrontation with threat and subsequently assigns meaning to such situations. It is in the determination of meaning that the schema influences the individual's perception, interpretation, association, and memory of situational stimuli. For example, Beck et al. (1985) suggest that socially anxious individuals possess a schema of themselves as unable to manage the demands of interpersonal and performance situations, which results in the appraisal of such situations as dangerous. When social experiences are imminent, this social schema is activated, particularly its rules governing what others expect and how one should behave. Thus, Beck et al. suggest that upon activation, the phenomenologically constructed reality of the threatening situation is contingent to some degree upon both factual information *and* this cognitive filter. The ultimate function of the schema is to detect the maximum amount of threat-relevant information in a minimum amount of time so that the individual can remain safe while giving danger a wide berth. The experience of anxiety in the face of threat involves the three components of cognition, behavior, and affect. There are bi-directional causal links between individual components of this model, with each

being dependent on the others (Beck et al., 1985). However in their theory, Beck et al. clearly assert that the genesis of this process is rooted in cognition, particularly the schema.

Importantly, once the schema detects danger, if the individual considers that he cannot cope with the threat, his feared outcome looms. As the schema continues to detect danger throughout engagement with threat, anxious individuals become increasingly aware of the experience of thinking and behavior and are “exquisitely sensitive” to errors in both (Beck et al., 1985, p. 77). In other words, they become increasingly self-focused. Individuals with elevated levels of social anxiety often believe that self-focus can inform them of the proximity of negative evaluation (the feared outcome). However, Beck et al. emphasize that this self-focused attention is also accompanied by the magnification in awareness of threatening stimuli in the *environment*. For example, a socially anxious individual giving a speech will monitor his own speech and behavior with great sensitivity to errors or visible signs of anxiety or incompetence, leading him to believe that he is performing relatively poorly. Beck et al. further predict that this will also likely result in the detection of greater scrutiny by the audience. Thus, the schema scans all possible locations (internal and external) for signs of threat in an ongoing interaction of attentional biases. In social anxiety, these locations may be based on the individual’s performance and the reactions of the audience. If self-focus results in a heightened awareness of failure, the individual’s schema casts a wider net for signs of negative evaluation among those who might provide it.

Foa and Kozak (1986)

Current cognitive behavioral models of social anxiety also owe much to Foa and Kozak’s (1986) review and conceptualization of the emotional processing of fear. Whereas Beck et al. (1985) speak of cognition in threat detection and appraisal, Foa and Kozak elucidate behavior

and affect. As such, much of what they propose speaks to the implications of Beck's schema, drawing from Lang (1977; 1979) and Rachman (1980). Although their major aim was to explain how exposure therapy reduces fear, Foa and Kozak also give much background on the nature of fear and anxiety, which also necessarily influenced current models of social anxiety.

According to Foa and Kozak (1986), fear is essentially a memory network with interconnections between three fundamental components: 1) information about the feared stimulus/situation; 2) information about verbal, physiological, and behavioral responses in the face of threat; and 3) interpretations about the meaning of the stimulus and response elements of the network. Taken together, these elements can be considered a "program for escape or avoidance behavior" (p. 21) and can be found in both pathological and nonpathological fear. However, the anxiety disorders clearly involve distress and impairment not typically evidenced in normal fear reactions. Foa and Kozak (1986) suggest that the fear structure in the anxiety disorders is overactive such that, in the face of threat, pathologically anxious individuals experience exaggerated response elements (component 2). Furthermore, the meanings that they assign to stimuli and their own responses (component 3) are different than the meanings constructed by less anxious individuals. Similar to Beck et al. (1985), Foa and Kozak contend that individuals with anxiety disorders are more liberal in their assessment of stimuli as threatening and are more rigid in their beliefs that their sometimes-extreme patterns of behavior are appropriate.

The fear structure can be considered activated when an environmental stimulus matches a representation of danger elements in the memory network. The "match" between a real-world stimulus and a corresponding fear memory can occur through a number of different sensory experiences. For example, the sound of the voice of an approaching young woman may generate

much anxiety for a socially anxious young man. If this man's feared consequence is negative evaluation (which is probable if we assign him a diagnosis of social anxiety disorder), the auditory stimulus of her voice will match the representation in his memory of potential threat (the sounds of a young woman's voice imply her imminent presence, and her mere presence increases in the probability of negative evaluation). However, given the nature of Foa and Kozak's fear structure, the auditory stimulus node in this man's memory *network* is interconnected with the cognitive (e.g., appraisals of probability that she is likely to evaluate him negatively), physiological (e.g., increased sweating and heart palpitations and awareness of these sensations), and behavioral (e.g., hastening in the opposite direction) elements of his fear. For illustrative purposes, the stimuli associated with the young woman were limited to her voice. In reality, individuals with anxiety disorders are often confronted with many stimuli at any given time. According to Foa and Kozak, the match between fear-evoking stimuli and fear memories evokes arousal in proportion to the threat inherent in the match (which is a prediction similar to Beck et al.'s, 1985). For example, an audience of 5 "experts" will likely evoke more severe anxiety in a socially anxious lecturer than will an audience of 50 less esteemed colleagues. Importantly, Foa and Kozak predict that *for the duration* of the feared situation, the ongoing detection of feared outcomes should be associated with the continued activation of the fear structure and a decreased likelihood of habituation. In the case of a social situation, a person with high social anxiety is likely to demonstrate ongoing attention for cues indicative of negative consequences (his failure), such as those generated internally (e.g., his image of how he must look) and externally (e.g., frowns by members of the audience).

Because the fear structure is a program for escape/avoidance, frequent activation should be strongly associated with the tendency or desire to avoid. Indeed, more severe social anxiety is

positively and significantly correlated with avoidance (see Liebowitz, 1987). Therefore, the detection of stimuli that are consistent with the fear memory (Foa & Kozak, 1986) or with the fear-relevant schema (Beck et al., 1985) would result in anxiety and the compulsion to escape, to the exclusion of data that are inconsistent with the fear structure and which would facilitate the process of habituation. Therefore, anxious individuals' ongoing detection of threat in the environment is likely to play a powerful role in the onset and maintenance of anxiety disorders, including social anxiety disorder (see Williams, Watts, MacLeod, & Mathews, 1997). Again, cognition is central, particularly in terms of information processing. Each of these theorists has speculated that biases in cognition and information processing may be fundamental to the maintenance of social anxiety disorder and that the consistent detection of threat in the (external or internal/intrapersonal) social environment should preclude disconfirmation of fears and subsequent habituation.

Cognitive Behavioral Models of Social Anxiety Disorder

Clark and Wells (1995)

“A key component of our model is the idea that social phobics use interoceptive information to construct an impression of themselves, which they assume reflects what other people observe, and that this information is relatively more important than observation of others' actual behavior” (Clark & Wells, 1995, p. 82).

Clark and Wells contend that socially anxious individuals direct their attention in maladaptive ways (see Figure 1). According to these theorists, the onset of anxiety symptoms for the socially anxious person begins with the detection of an audience. Individuals with social anxiety disorder possess dysfunctional beliefs and assumptions, including the belief that others hold high standards for one's social performance, conditional beliefs regarding social evaluation,

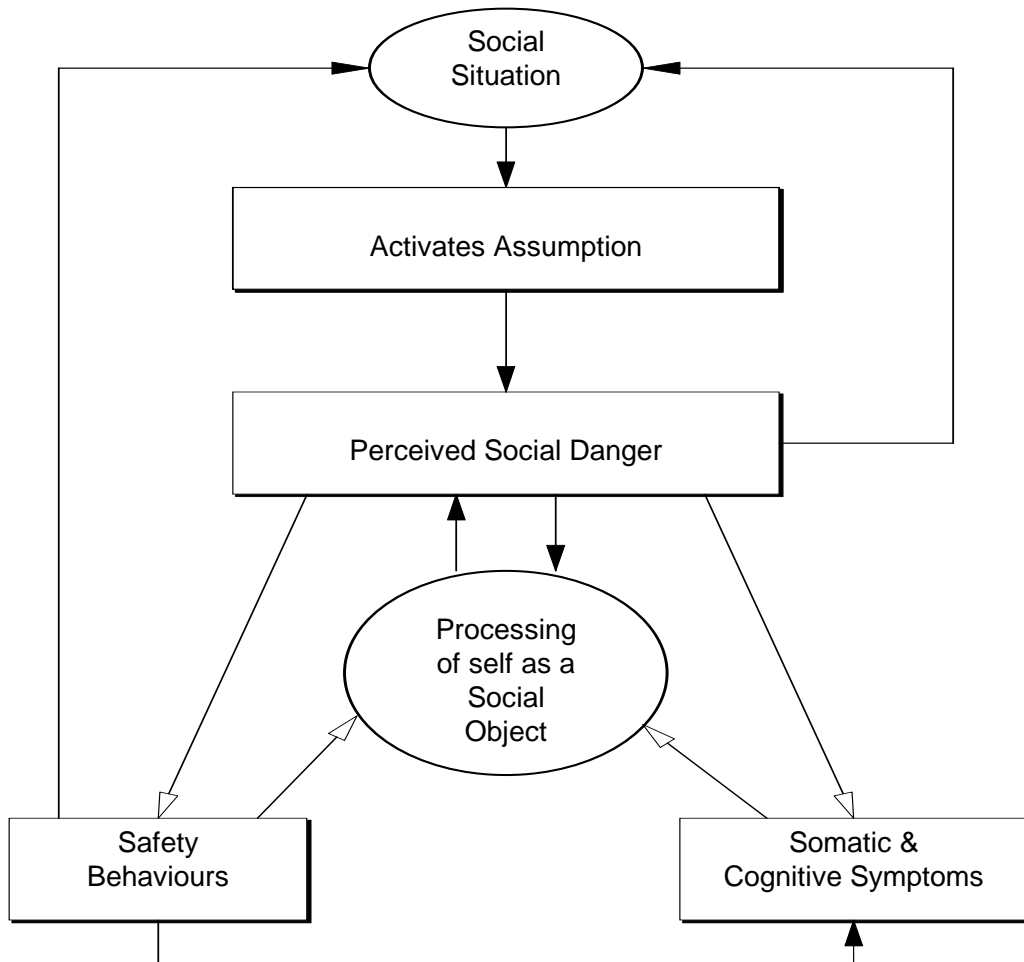


Figure 1. Clark and Well's (1995) and Clark's (2001; p. 407) model of cognitive and behavioral processes that occur when a socially anxious person enters a social situation.

and unconditional beliefs about the self. From these assumptions come negative cognitions, which tell the socially anxious individual that he is consistently at risk for behaving in a manner that will be considered (by others) flawed and unacceptable and that this behavior will result in rejection and/or the loss of esteem and worth. Therefore, the mere presence of others who might detect unacceptable behavior makes feared outcomes more likely. When an audience is detected and the social situation is thus realized, then begins an “anxiety programme [which is] automatically and reflexively activated” (Clark & Wells, p. 70). Clark and Wells emphasize that the activation of the anxiety program centers on a unidirectional but critical process: self-focused attention and creating the impression of oneself as a social object.

Initially, an individual with social anxiety disorder detects a potential audience, and his assumptions regarding the likelihood of social failure and its consequences are activated. Clark and Wells (1995) posit that the fear of negative outcomes (i.e., performing poorly and being evaluated negatively by the audience) triggers a crucial shift in attention. The person with social anxiety disorder begins closely monitoring *himself* in a process of detailed, self-focused observation. Because feared consequences are deemed probable, physiological arousal is likely to be elevated past homeostasis, and these physical cues become a major target of the shift in attentional focus. The individual uses this interoceptive information to create an impression of how he appears to his audience, which is mistakenly assumed to be an accurate representation of self-presentation. Furthermore, Clark and Wells claim that the socially anxious person does not look to his audience or interaction partners to determine how he is being received, but rather he attends to his own internal impression of himself and assumes this is how others see him. Because the elements used to build this impression are symptoms of anxiety, self-focus confirms the fears of coming across as ineffectual and flawed, and the assumption that others also hold

one's own self-evaluations then exacerbates the experience of social anxiety. For example, a woman with social anxiety disorder may approach a podium to deliver a speech to a sizeable audience and have a feeling of shakiness. According to Clark and Wells, she is likely to assume that the audience sees her hands shaking. Clark and Wells also suggest that such negative self-impressions can be experienced as vivid images of the self, as seen by the audience. For instance, this socially anxious individual may actually take an observer perspective (i.e., imagine herself as if through the eyes of an audience member) during her speech and "see" herself shaking violently. According to Clark and Wells, this vivid image is quite compelling because it seems to the person to be consistent with what an observer might see or think. Accordingly, the negative impression/image exacerbates social anxiety in the situation by leading the individual to perceive social danger as more likely and more imminent.

In addition to increased anxiety, Clark and Wells (1995) also suggest that self-focus is responsible for compromised social performance. The focus on internal impressions/images leaves fewer attentional resources available for the task at hand, interfering with the processing of the audience's behavior. For example, an individual with social anxiety disorder may focus more on an image of himself blushing than on what his supervisor is telling him to do on an upcoming project. According to Clark and Wells, self-focus siphons attention away from important sources of external information inherent to the task. This necessarily impairs performance and makes feared consequences more likely.

Extensive focus on internal experiences (i.e., images, interoception, and negative cognitions) leads the individual with social anxiety disorder to sense he is being perceived in a negative way; thus, he engages in a range of compensatory behaviors (Clark, 2001; Clark & Wells, 1995; Wells et al., 1995). Clark and Wells refer to these efforts as safety behaviors, as

they are fundamentally intended to make negative evaluation less likely, and they are often directly related to interoceptive cues and cognitive impressions/images. For example, the man above who focuses on his blushing in the presence of his supervisor may hold his hands to his face to prevent his supervisor from noticing a change in skin coloration. Importantly, Clark and Wells suggest that in many instances, these behaviors make feared consequences *more* likely. For instance, the man holding his hands to his face may be drawing more attention to himself than he might otherwise. Furthermore, safety behaviors may require even greater self-focus, which may intensify the effects described above, and, with his hands, this man is likely to continue monitoring the feeling of warmth in his face and to continue focusing on an image of how red his face must look to his boss. Although beliefs about social situations in social anxiety disorder typically involve catastrophic embarrassment, rejection or loss of status, Clark and Wells claim that these outcomes are very unlikely in most social situations. However when these outcomes are not realized, socially anxious individuals are likely to attribute their success in “surviving” the encounter (i.e., the absence of true catastrophe) to their safety behaviors and not to their own abilities. Thusly, these compensatory behaviors preclude unambiguous disconfirmation of negative beliefs while maintaining maladaptive behavior and cognition.

Clark and Wells (1995) also suggest that the processing of self and performance continues after the conclusion of the social encounter, leading up to the next. Post-event processing involves the individual’s repeated consideration and potential reconstruction of his performance following a social situation (see review by Brozovich & Heimberg, 2008). However, this ruminative process is also distorted by the nature of attentional focus during the situation. For instance, the available evidence regarding one’s social performance is colored by impressions and images of oneself performing poorly with exaggerated anxiety. According to

Clark and Wells, this further strengthens the social anxiety-relevant schema when the situation is processed at a later time. What Clark and Wells did not include in their model was a component that predicts an attentional bias for external threat cues over other cues, such as a socially anxious person's greater likelihood of noticing one interaction partner yawning than another smiling and nodding. This attentional bias to external threat has been considered by other theorists to be particularly important in both general and social anxiety.

Rapee and Heimberg (1997)

“On encountering a social situation, an individual forms a mental representation of his/her external appearance and behavior as presumably seen by the audience and simultaneously focuses his/her attentional resources onto both this internal representation and onto any perceived threat in the social environment...Attentional resources are allocated to the salient aspects of the self-image (generally those features which are relevant to the situation and potentially negative) and also to monitoring of potential external threat” (Rapee & Heimberg, 1997, pp. 742-743; see Figure 2).

In a fashion similar to Clark and Wells (1995), Rapee and Heimberg (1997) define social situations broadly, suggesting that the presence of a perceived audience may constitute significant threat. When these situations are encountered, individuals with social anxiety disorder experience fear because they assume that others are naturally critical, and negative evaluation, then, is probable. Also, individuals with social anxiety disorder consider being liked and regarded with high esteem as fundamentally important. In the presence of threat (i.e., after the detection of an audience), socially anxious individuals become increasingly vigilant for cues that would signal the realization of their feared outcomes, and they attend to several sources for possible information on the proximity of these outcomes: environmental cues, a mental

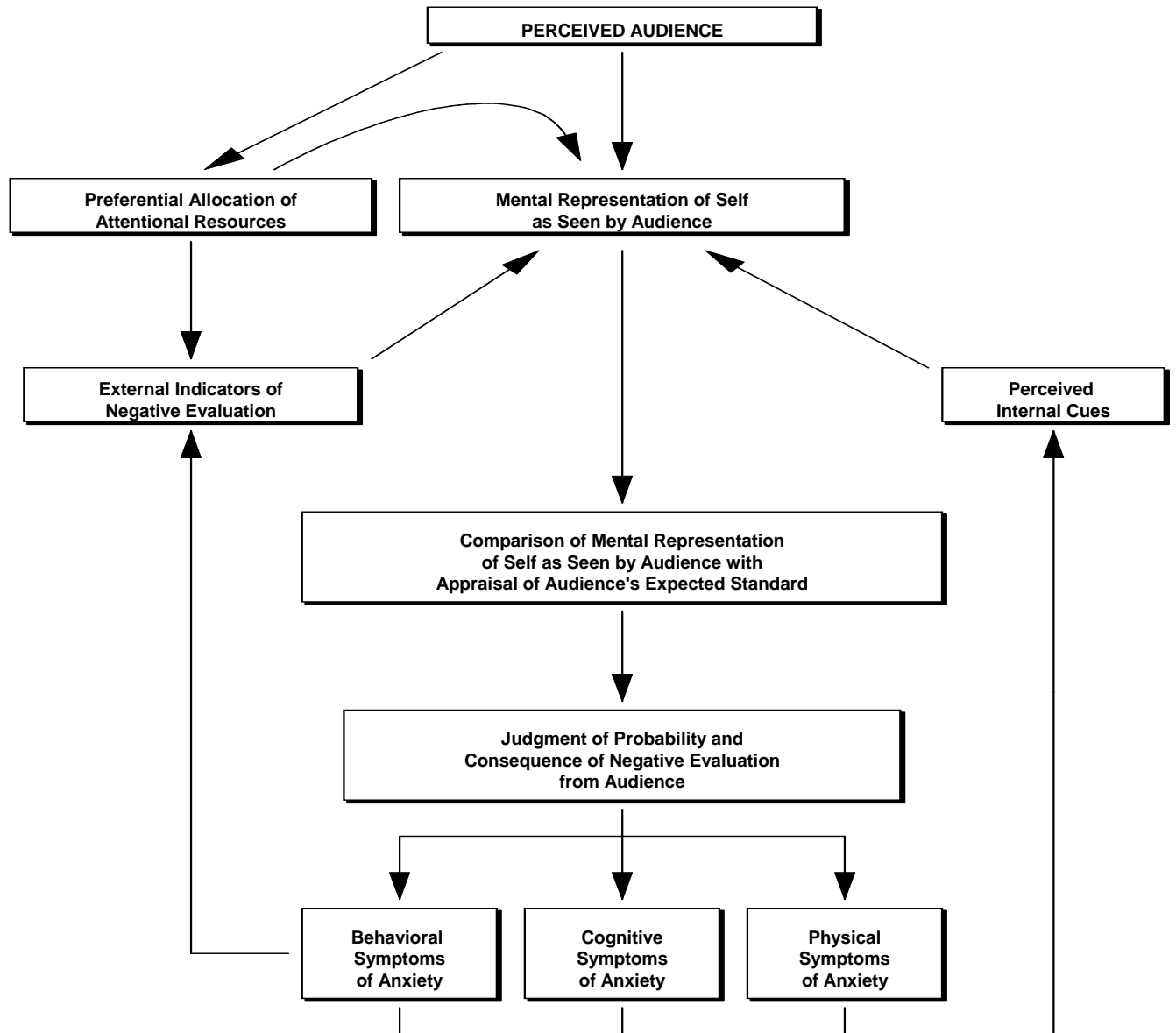


Figure 2. Rapee and Heimberg's (1997) cognitive behavioral model of social anxiety's generation and maintenance. (p. 743).

representation of how they believe they appear to others, and cognitive, behavioral, and affective cues related to the severity of anxiety in the moment (Rapee & Heimberg).

First, individuals with social anxiety disorder commonly detect negative cues despite the presence of more positive alternative feedback (e.g., noticing one audience member frowning while 3 others nod and smile). Rapee and Heimberg (1997) cite evolutionary models that claim that socially anxious individuals are vigilant for cues of anger/aggression (which may signal the loss of status and access to resources; e.g., Öhman, 1996; Trower & Gilbert, 1989) and evidence of information processing biases observed in individuals with high trait anxiety (e.g., MacLeod, Mathews, & Tata, 1986). Vigilance for threat cues in the environment, according to Rapee and Heimberg, is similar in function to the vigilant internal focus prescribed by Clark and Wells (1995); in each case, the socially anxious individual scans for information regarding the likelihood of negative outcomes.

Similar to Clark and Wells (1995), Rapee and Heimberg (1997) suggest that the socially anxious individual focuses on an internal, mental representation of the self as seen by the audience. This representation may be an image or a vague sense of how one appears to others, which likely involves seeing oneself as if through the eyes of the audience. Rapee and Heimberg suggest that the mental representation of the self is a composite formed from a number of different sources. For instance, this image may be informed by a sense of how one generally appears to others (information obtained in mirrors, photographs, etc.) and past difficult experiences in social situations which are consistent with core beliefs and the self-schema (see Beck, 1976; Beck et al., 1985). These inputs may constitute a “baseline image” (p. 745) that is modified by external and internal inputs during distressing social situations.

According to Rapee and Heimberg (1997), the mental representation of the self should be influenced by autonomic symptoms of anxiety, particularly those that may be visible to others, such as blushing and sweating. The socially anxious individual may also monitor his behavior (e.g., fidgeting, wiping one's brow) and exaggerate how this must appear to audience members, as well as what it must mean about his competence. Furthermore, socially anxious persons' behavior may also involve perceived social performance deficits, such as stuttering or coming across as "boring" or "quiet," which would also be exaggerated in the mental representation of the self, and become foci of attention. Clearly both physiology and behavior are the objects of ongoing cognitive appraisal, which Rapee and Heimberg suggest includes negative thoughts about the internal components of the anxiety response. These cognitions feed back into the mental representation of the self and result in its readjustment in a negative direction, which is a cycle likely to be repeated multiple times over the course of an ongoing social situation.

Rapee and Heimberg (1997) assert that the socially anxious person's focus on external threat cues and the mental representation of the self as informed by internal anxiety symptoms (i.e., physiological, behavioral, and cognitive) exacerbates state anxiety and maintains social anxiety disorder. However, they also suggest that these processes do not operate in isolation and that each component interacts with the others in the form of a positive feedback loop. For instance, the biased detection of negative audience behaviors (e.g., frowning, yawning) would likely result in greater focus on the internal representation of the self (e.g., cognitions regarding how uninteresting one is or images of the self coming across as boring; also see Heimberg & Becker, 2002; Roth & Heimberg, 2001; Turk, Lerner, Heimberg, & Rapee, 2001). In line with Clark and Wells (1995), Rapee and Heimberg have also suggested that focus on the mental representation of the self should exacerbate internal sensations of anxiety. However, they further

assert that focus on the mental representation of the self should also affect the detection of negative audience behaviors. As an individual with social anxiety disorder looks to his mental representation for information about how he comes across, he necessarily sees a negatively biased caricature informed by anxious feelings and assumptions about others' evaluations when, realistically, the data needed to support such self-assessment cannot be obtained in ambiguous social situations. This person may then look to the audience to confirm his fears and is likely to find information consistent with his self-appraisals.

During social situations, the complex interaction of external and internal information typically provides the socially anxious person with evidence that his performance has fallen short in a number of ways. Having gathered such negative information from various sources, the socially anxious individual then weighs the likelihood that his feared consequences will be realized (Rapee & Heimberg, 1997). To do this, he compares his evaluation of his performance to what he believes the audience expects of him. If the individual believes that he is unlikely to meet the expectations of the audience, he will be more likely to experience anxiety and fear of negative evaluation.

Implications of the Models

Clark and Wells (1995) and Rapee and Heimberg (1997) have put forth models that are relatively similar in their emphasis on the role of the socially anxious individual's internal representations during social situations. However, the models do not converge on the phenomenon of vigilance for threat in the external environment. In fact, Clark and Wells clearly have not made a place for this process in their model, and their research group has stated repeatedly that internal self-focus is most important to the experience of anxiety and the poorer performance of socially anxious individuals (Clark, 2001; Clark & Wells, 1995; Stopa & Clark,

1993). Furthermore, Clark and Wells describe this process as an “anxiety programme” (p. 70), which suggests that the anxiety response is a closed system that does not incorporate new, incoming information which could moderate the response (Clark, 2001). What must follow from this is the interpretation that a change in the environment (e.g., a behavioral shift by the audience/interaction partner), perhaps even to be more positive toward or accepting of the anxious person, would have minimal impact on the socially anxious person’s programmatic anxiety experience. However, it is unclear what is necessary to trigger the shift inward. Clark and Wells have suggested that the mere expectation of an audience is enough to compel the socially anxious individual to monitor himself, and Clark added that initial detection of a single negative audience behavior is sufficient, but these explanations do not easily accommodate the data suggesting attentional bias to threat cues in the environment (reviewed below).

Rapee and Heimberg (1997) have suggested that vigilance for negative, external social cues may also be a significant component of social anxiety disorder unto itself *and* serve as an input into self-focus, particularly during the formation or (re)calibration of the mental representation of the self as seen by others. In this model, a major implication is that changes in the nature of the environment, such as audience behavior, influence the anxious individual’s mental representation/image of himself. However, this conclusion may only be drawn if one predicts a markedly different attentional process in the fear response of a person with social anxiety than described by Clark and Wells (1995). Namely, the socially anxious person must continue to be engaged with his audience throughout the social situation as he shifts attention between his mental representation of self as seen by others and vigilant observation of audience behaviors. As this occurs, each process is likely to be influenced by the other.

Internal Focus in Social Anxiety

Defining Self-Focus in Social Anxiety

Several studies suggest that self-focused attention is associated with negative affect (Burgio, Merluzzi, & Pryor, 1986). Ingram (1990) defined self-focused attention as “an awareness of self-referent internally generated information that stands in contrast to an awareness of externally generated information derived through sensory receptors” (p. 156). In the psychopathology and social psychology literatures, self-focus is commonly defined as either private or public (Fenigstein, Scheier, & Buss, 1975). Private self-focus involves goals that are autonomous and egocentric, which do not require a consideration of others’ reactions to one’s behavior. Public self-focus, on the other hand, is related to behaviors that take into account the reactions, needs, or desires of others and thus is necessarily influenced by the aim for social consensus or a consideration for how one’s actions influence others’ perceptions of oneself (Carver & Scheier, 1987). Accordingly, public self-focus may be associated with positive and adaptive self-monitoring as well as the self-focus common to social anxiety, such as negative assumptions made regarding others’ assessment of one’s own blushing or sweating. Although such a bifurcation of self-focus is typically considered a matter of trait self-focus (i.e., self-consciousness), the split between private and public may be seen in state self-focus as well (Carver & Scheier, 1987; Mor & Winquist, 2002).

Social anxiety appears to be strongly related to public self-focus. For example, Hope and Heimberg (1988) found a significantly stronger relationship between public self-consciousness (i.e., trait self-focus related to others’ perceptions) as measured by the Self-Consciousness Scale (SCS; Fenigstein et al., 1975) and self-reports and naïve observers’ ratings of social anxiety. Schlenker and Leary (1982) contend that heightened public self-focus may be a prerequisite for

significant social anxiety (also see Buss, 1980). They suggest that social anxiety is the product of a discrepancy between the desire to make a particular impression on others and the doubt that one can do so. Therefore heightened public self-focus may make an individual *more* aware of the image he wants to convey in a social situation, which results in greater efforts toward impression management and greater vulnerability to social anxiety.

As suggested by Clark and Wells (1995) and Rapee and Heimberg (1997), the excessive public self-focus common to social anxiety may detract to some degree from external focus on tasks at hand, which has been demonstrated in both the social anxiety and test anxiety literatures (see Hartman, 1983; Wine, 1971; respectively). Research in the field of cybernetics has also suggested that internal and external focus are discrete processes requiring attentional resources and that allocation to one area reduces resources available for the other (Carver, 1979). Kimble and Zehr (1982) reported that participants who scored high on a measure of trait self-focus remembered significantly less information from a social interaction than participants who scored low. Similarly, Hope, Heimberg, and Klein (1990a) found that socially anxious individuals were less accurate in their recall of partner information than nonanxious controls after a social situation (see also Hope, Sigler, Penn, & Meier, 1998). The implications for social anxiety are that one would be attending to how he comes across to his audience through self-monitoring of a number of self-relevant domains (see below), and if sufficient attentional resources were allocated to this self-monitoring, social *performance* would be expected to suffer (Clark & Wells, 1995; Rapee & Heimberg, 1997). For example, a socially anxious woman who is attending to physiological sensations of nervousness as she attempts to discern whether her trembling is noticeable to others may not attend adequately to the topic of a conversation. Rapee and Heimberg also contend that attentional focus to external threat cues may produce the types

of performance deficits often attributed to internal focus. However, less research has explored this premise.

Although it has been linked to social anxiety, public self-focus is a broad and multifaceted construct (Mor & Winquist, 2002). These facets are evident in the examples offered above. Specifically, self-focus can be tied to cognitive, affective (including physiological), and behavioral components. For instance, someone high in public self-focus may experience cognitions about how he is being perceived (e.g., “They think I am performing horribly”) as well as vivid self-focused imagery (e.g., “seeing” oneself blushing). In addition, these facets may overlap, such that someone who is high in public self-focus may monitor self-generated imagery about his posture or mannerisms, experience negative cognitions about how he looks, and then alter his behavior to address these cognitive self-appraisals. Each of these facets has received attention in empirical research and will be addressed in turn. Empirical evidence has also implicated the causal nature of these processes; these data will be reviewed as well.

Negative Cognition and Self-Focus in Social Anxiety

Overall, negative thoughts have been demonstrated to be particularly important to the morbidity of social anxiety (see Bruch, Heimberg, & Hope, 1991). While engaged in social situations, socially anxious persons experience negative self-evaluation with thoughts such as “I am being boring” (Beidel, Turner, & Dancu, 1985; Cacioppo, Glass, & Merluzzi, 1979, Glasgow & Arkowitz, 1975), and they experience a higher proportion of negative thoughts than positive thoughts (Cacioppo et al., 1979; Heimberg, Bruch, Hope, & Dombeck, 1990), as well as more negative thoughts than nonanxious individuals (Dodge, Hope, Heimberg, & Becker, 1988).

Although these studies suggest that self-focused cognition might be particularly important in social anxiety, they only measured inward direction and thus offered no potentially

competing evidence for focus on the audience. Daly, Vangelisti, and Lawrence (1989) directed a sample of high and low speech-anxious participants to deliver a presentation to an audience, who evaluated their performance. The high-anxiety participants were found to pay less attention to their environments and also experienced more negative, self-focused cognitions than the low anxious group. The high-anxious group also performed more poorly than the low-anxious group (as determined by the audience), and focus on self and negative self-relevant cognitions was negatively correlated with audience and self-ratings of performance.

Stopa and Clark (1993) further explored cognition related to social anxiety, but directed participants to provide open-ended responses (i.e., spoken and written narratives) regarding their cognitions during a role-played social situation. These responses were later rated on valence (positive versus negative) and were classified as self-focused (e.g., self-evaluative thoughts such as “I’m boring”; p. 264) or audience-focused (e.g., thoughts regarding evaluation by the audience “*She* thinks I’m boring”; p. 264). Stopa and Clark found that during a social interaction the individuals with social anxiety disorder experienced a significantly greater number of negative thoughts than anxious and nonanxious controls. Importantly, Stopa and Clark reported that nearly all listed cognitions were self-focused and thus not related to the confederate’s evaluation of the participant. Lastly, Stopa and Clark predicted that socially anxious individuals would not only experience self-focused cognitions, but would also demonstrate impaired external attention for their environment during the speech, evidenced by difficulty recalling non-evaluative environmental information (e.g., the clothing worn by the study confederate). This prediction was based on the theory that increased self-focused attention would usurp overall attentional resources. Although this effect has been demonstrated (Hope et al., 1990a), Stopa and Clark

(1993) did not find support for their prediction, as anxious and nonanxious participants did not differ in their recall of external information.

Mahone, Bruch, and Heimberg (1993) employed a thought-listing protocol with an unselected group of male undergraduate students and examined the content of self- and other-relevant (both were requested) thoughts recorded by these participants before a conversation with an attractive female confederate. Negative self-thoughts were inversely related to self-efficacy ratings before and during the social interaction and were positively correlated to anxiety ratings during the interaction. Perceptions of the positive attributes of the female were predictive of objectively rated signs of anxiety. Mahone et al. suggest that both self-focused and other-focused thoughts play significant roles in social situations, including positive perceptions of others. However, this study forced participants to list both self- and other-focused cognitions, whereas Stopa and Clark allowed for a more naturalistic recording of thoughts. In addition, Mahone et al. did not assess participants' possible cognitions regarding the audience's evaluation of them. However, in a recent study of the thoughts provided by socially anxious clients in preparation for exposure to feared situations in cognitive-behavioral group therapy (Hope, Burns, Hayes, Herbert, & Warner, in press), reported thoughts did often focus on the evaluations of the other. The four most commonly coded categories, accounting for two-thirds of more than 900 reported thoughts, were *Performance* (e.g., "I won't make a good impression."), *Negative Outcome* (e.g., "He won't want to talk to me."), *Other-labeling* (e.g., "She'll think I'm an idiot."), and *Symptoms* (e.g., "I'll be embarrassed.").

Overall, it is apparent that cognition in social anxiety is negative and focused on the self, which supports Clark and Wells' (1995) and Rapee and Heimberg's (1997) assertions that individuals with social anxiety are more focused on themselves during social situations than

nonanxious persons. However, these results are not definitively supportive of Clark and Wells' and Stopa and Clark's (1993) claim that self-focused attention is *more* important to social anxiety than other-focused attention. Mahone et al.'s results appear to indicate a role for other-focused cognition; unfortunately, they do not address evaluation by others. In addition, it seems that some cognitions rated by Stopa and Clark as self-focused might also be considered other-focused. "I'm boring" (p. 264) may be understood as "I'm boring myself" (clearly self-focused) *or* "I'm boring her" (clearly other-focused). Clearly, Hope et al. (in press) uncovered many other-focused thoughts in their analysis of clients' in-session reports. Lastly, unlike Hope et al. (1990a), Stopa and Clark did not find that their anxious group was less able to recall environmental information, given their elevated self-focus compared to nonanxious persons. Although there appears to be abundant support for the hypothesis that there is substantial impairment in social performance related to an internal focus of attention, this explanation alone may be insufficient, as Rapee and Heimberg have also predicted impaired social performance attributable to focus of attention on both internal *and* external threat. In other words, vigilance for one's own visible blushing *and* vigilance for frowns or audience disinterest may interfere with the perception of more consequential environmental information, such as the topic of conversation.

Physiological Symptoms, Self-Focused Imagery and Social Anxiety

A central tenet of cognitive psychopathologists has been that the operation of an anxiety schema is predicated upon the *meaning* of threat and its consequences. According to cognitive theory, individuals with anxiety disorders commonly see catastrophe resulting from contact with feared situations. For example, panic attacks in panic disorder are feared and situations are avoided because the person assumes/predicts that his pounding heart and tightness in his chest

are not the symptoms of anxiety but of myocardial infarction; this assessment exacerbates anxiety and the symptoms of the attack (Clark, 1986). According to Beck (1976), such crucially important meaning elements can be successfully (and perhaps efficiently) accessed through imagery (also see Lang, 1977; 1979). Clark and Wells (1995) and Rapee and Heimberg (1997) have indicated that imagery may be a central aspect of self-focus in social anxiety as well. Fear imagery in social anxiety often concerns one's own appearance, particularly as it relates to the fear of demonstrating visible symptoms of anxiety. Indeed, Johannsson and Öst (1982) found that individuals with social anxiety disorder are particularly attentive to increased physiological symptoms of anxiety, and McEwan and Devins (1983) found that socially anxious individuals who experience a number of physical symptoms are especially likely to believe that their anxiety is noticeable to others. However, although the models agree on the baseline content of self-images, they disagree on what determines the content and valence of the images as ongoing social situations unfold; this point is discussed below.

Negative Self-Imagery and the Observer Perspective

As noted, emphasis has been placed on the processing of the self as “a social object” (Clark & Wells, 1995, p. 72) or “as presumably seen by [the] audience” (Rapee & Heimberg, 1997, p. 742). Because social threat may be evident in one's own poor performance or visible anxiety symptoms, these models predict that focus may be directed toward negative self-imagery, but as seen by others. Clark and Wells suggest that much of the increased self-focus in social anxiety would be achieved by seeing oneself in negative imagery from an observer perspective (i.e., as if through the eyes of the audience) as opposed to a field perspective (i.e., as if through one's own eyes). Less directly, Rapee and Heimberg also emphasize that socially anxious individuals monitor negative impressions of themselves as someone in the audience

might see them. Although cognitions have been shown to reflect self-focus during social situations (e.g., Stopa & Clark, 1993), a socially anxious person actually “seeing” himself as he speaks to an audience is a very clear demonstration of attentional focus. Therefore the observer perspective has been studied rather extensively, and results have been consistent.

Several studies have explored the nature of self-focused imagery in social anxiety with the use of semi-structured interviews. Hackmann, Surawy, and Clark (1998) found that persons with social anxiety disorder were more likely than controls to report *spontaneously* occurring images during anxiety-provoking social situations, meaning that these images were likely to occur without clear cues (beyond the presence of an audience and increased anxiety). Compared to controls, the images described by the socially anxious participants were more negative, more anxiety provoking, and more likely to be seen from the observer perspective. These results were replicated by Hackmann, Clark, and McManus (2000), who also demonstrated that *particular* negative, self-referent images are likely to recur over time during new social situations. Furthermore, these images were often experienced for a number of years and were linked to specific social memories reported by the participants. Over half (57%) of participants reported that they were not socially anxious before the occurrence of the recalled situation, and 81% of participants recalled that the event occurred no longer than one year after the onset of their social anxiety.

Wells, Clark, and Ahmad (1998), Coles, Turk, Heimberg, and Fresco (2001), and Wells and Papageorgiou (1999) asked socially anxious individuals and persons without social anxiety to recall recent social situations and to rate these occasions on the perspective of the imagery that came to mind, on a continuum ranging from -3 (*entirely looking out through my eyes; field perspective*) to $+3$ (*entirely observing myself from an external point of view; observer*

perspective). Investigators of all three studies found that socially anxious persons were more likely to take the observer perspective during social situations, whereas persons with less social anxiety were more likely to take a field perspective. Coles et al. further demonstrated that this perspective may vary *within* socially anxious persons, such that highly anxiety-provoking social situations were associated with higher ratings of the observer perspective for individuals with social anxiety disorder than situations that evoke medium or low levels of social anxiety. Also, viewing the self from an observer perspective appears to be specific to social anxiety, relative to other forms of anxiety disorder (e.g., agoraphobia; Wells & Papageorgiou, 1999). Thus, overall, self-focus is an important and unique process in social anxiety.

Causal Effects of Self-Focus – General Manipulation

Studies examining cognition, physiological symptoms, and imagery have established that self-focused attention is a robust phenomenon among socially anxious individuals. Clark and Wells (1995) and Rapee and Heimberg (1997) have also suggested that increased self-focus in social anxiety disorder has negative causal implications for anxiety and social performance, which has been confirmed by a number of studies.

Burgio et al. (1986), Woody (1996), Hofmann and Heinrichs (2003), Bögels and Lamers (2002), and Bögels, Rijsemus, and De Jong (2002) manipulated self-focus in individuals high in social anxiety (e.g., with the presence of video cameras, mirrors, etc). In part, results show that socially anxious participants in the self-focus conditions were concerned more about escape and less about performing well (Burgio et al., 1986) and had greater anticipatory anxiety and poorer objective performance (Woody, 1996). Similarly, Bögels and Lamers' (2002) self-focused participants reported higher anxiety.

Hoffman and Heinrichs (2003) and Bögels et al. (2002) report findings discrepant from those above. In their studies, mirrors were used with the intention of inducing self-focus. Hofmann and Heinrichs' participants with generalized social anxiety disorder listed *fewer* negative personality characteristics than the nonanxious controls. Hofmann and Heinrichs suggest that this result is inconsistent with Clark and Wells' (1995) model, as increased self-focused attention (attributed to presence of the mirror) did not result in greater negative self-perception. If the mirror acted as an external/environmental source of information which socially anxious participants used to adjust their self-perceptions, this conclusion may be more consistent with Rapee and Heimberg's (1997) claim that external information is important in the modulation of the mental representation of the self (also see Lundh & Öst, 1996). Similarly, Bögels et al. (2002) also did not find the presence of mirrors to induce self-focus in a manner consistent with predictions. Nevertheless, overall these studies demonstrate self-focus' strong and unique association with elevated social anxiety. The studies reviewed below demonstrate that this process of self-focused attention is likely responsible for much distress and interference related to elevated social anxiety.

Causal Effects of Self-Focus: Manipulating Physiology, Perspective, and Imagery

A number of studies have also found that negative self-focus can be particularly disruptive to social performance. Specifically, socially anxious persons who are informed that their physical symptoms of anxiety (e.g., heart rate) are increasing during a social situation (regardless of the veracity of this information) report greater subjective anxiety and more negative cognitions about the situation's outcome than if they are told their physical symptoms are diminishing (Wells & Papageorgiou, 2001). It has also been shown that an individual's purposeful use of an observer perspective (compared to a field perspective) during a social

situation results in more frequent negative cognitions, greater use of safety behaviors, and poorer subjective self-evaluation of performance, regardless of one's overall level of social anxiety (Spurr & Stopa, 2003).

The content of self-images is also thought to be causally related to social outcomes. Specifically, holding in mind negative self-images during a social situation has been found to result in greater anxiety, beliefs that anxiety symptoms are more visible to a social partner, and subjective self-ratings of one's performance as poorer (compared to when holding in mind neutral images; Hirsch, Clark, Mathews, & Williams, 2003). Further, socially anxious individuals rate the experience of negative self-imagery and its related dysfunction as familiar and ego-syntonic (Hirsch, Clark, Mathews, & Williams, 2006b; Vassilopoulos, 2005a). These negative self-images, thought to be specific to social anxiety, even result in disrupted performance that it is detectible to social partners, as they are more likely to rate social interactions less enjoyable when their partner holds in mind negative (rather than neutral) self-images (Hirsch, Meynen, & Clark, 2004). Thus, although self-focus may indeed be a product of social anxiety (by definition, social anxiety is fear of with how one is perceived), it also acts to worsen anxiety. Self-focused attention then is not simply epiphenomenal, but rather an integral process that works to exacerbate and maintain this complex disorder.

Conclusions

Clark and Wells (1995) and Rapee and Heimberg (1997) constructed cognitive behavioral models of social anxiety that assign a role of significant importance to self-focused attention. Altogether, research findings are consistent with these models of social anxiety. However, divergent conclusions may be drawn from these results. For instance, Hackmann et al. (1998; 2000) have reported the spontaneous and recurrent nature of self-images in social anxiety,

and these researchers have claimed that the consistency with which particular images are recalled may be indicative of the anxiety “programme” (p. 70) described by Clark and Wells (1995). Accordingly, the socially anxious individual encounters a social situation and experiences the stereotypical image of himself, which becomes the exclusive focus of his attention for the duration of the ongoing social encounter. Because the socially anxious person does not acquire information from his environment to determine how he is being received, he looks to his own self-image from the observer perspective to draw conclusions about his own performance and to decide whether his feared outcome (negative evaluation) was realized (Wells et al., 1998; Wells & Papageorgiou, 1999). Therefore, by the nature of the findings related to self-focused attention, a typical fear response in social anxiety operates as a closed system based on past memories and present symptoms of anxiety, incorporating little or no environmental information, and thus maintaining social fears as the individual is unable to see that feared consequences are actually not realized (Clark, 2001).

No *direct* evidence yet exists to confirm this assertion. Rapee and Heimberg (1997) contend that self-focused attention does not operate in the same type of closed system proposed by Clark and Wells (1995; Clark, 2001). Rather, based on Rapee and Heimberg’s predictions, it is suggested here that self-focused attention is modulated by the nature of audience behaviors that are perceived by the socially anxious person. Although the self-image that is an object of focus during a social situation may indeed be based on the recurrence of a stereotypical social memory and the experience of physiological symptoms, these inputs are unlikely to operate alone in an internal, closed circuit.

Attentional Bias to External Threat

Background

The general models of the maintenance of anxiety described above (Beck et al., 1985; Foa & Kozak, 1986) assume the primacy of cognition in the detection of threat stimuli (also see Lazarus, 1982). Threat recognition as a broad cognitive construct has very fundamental implications for humans. Quick detection of cues that indicate danger will improve an organism's chances of survival, which naturally affords it greater opportunity to breed. This is true for humans as it is true for other species of primates and mammals, universally. According to the cognitive models of fear and anxiety discussed above, the detection of cues that imply the imminence of threat is one of the first and most vital aspects of fear (e.g., Beck et al., 1985).

Threat perception has significant implications for fitness and survival. Importantly, this detection has been documented to occur rapidly enough in humans that it necessarily precedes conscious information processing (see Öhman, 1996). This may be especially true for environmental danger information. Öhman relies heavily on preparedness theory to explain the nature of automatic attendance to threat. For instance, humans and other primates evidence phobias that may have been acquired through biologically prepared classical conditioning. Primates with a fear of potentially venomous species such as snakes were more likely to live longer and breed more actively than their less anxious, less vigilant peers. Evolutionary theory also suggests that if this is true, the evolutionary basis of phobic fear would necessitate rapid, preconscious recognition of threat cues to allow for fast action and increased safety. In fact, the appearance of endothermic, social mammals marked the importance of quick detection of cues indicating danger or aggression, which preceded the appearance of higher-level cortical processes (MacLean, 1985). Spider phobics and snake phobics experience greater skin

conductance responses to spider and snake stimuli (respectively) than to stimuli inconsistent with their phobia, even when the fear-relevant stimuli are presented for just 30 milliseconds and subsequently masked (Öhman & Soares, 1994). Further, the application of these findings may apply as readily to social threat stimuli. Öhman (1996) argues that detection of facial expressions of anger/disapproval in others has implications as significant as detection of poisonous reptiles and arachnids.

Trower and Gilbert (1989) propose an evolutionary model specific to social anxiety, suggesting that deference to dominant conspecifics may ensure an individual's continued status and participation in a social group, which ostensibly confers on the individual a share of the group's resources and protection from harm. Although warm-blooded mammals generally do not demonstrate the same territorial behavior as lower level reptiles, social hierarchies continue to be important, especially in the social communities particular to the class (Trower & Gilbert, 1989). Thus, rapid detection of cues related to anger or disapproval would allow the socially anxious individual to locate more dominant individuals (or aggressive signs from conspecifics with or without clear dominance in the group) and to engage in behaviors of submission in order to maintain proximity to the group and access to appetitive resources (Gilbert, 2001).

Research has suggested that facial expressions are particularly important in human information processing, as study participants have demonstrated shorter reaction times in detecting angry faces in crowds of happy or neutral faces than in detecting happy faces in crowds of angry or neutral faces (see Öhman, 1996). Öhman suggests this demonstrates the importance of detecting *particular* emotions, rather than simply any emotion expressed with the face. Furthermore, these social detection biases occur outside of conscious awareness (Hansen & Hansen, 1988). Importantly, human detection of anger and potential negative evaluation (as is

common in elevated social anxiety) happens rapidly and automatically in a manner similar to the detection of more traditional evolutionary cues of threat, such as snakes and spiders (Öhman, Esteves, & Soares, 1995). Therefore, if anger is considered an emotional proxy for negative evaluation, then rapid detection of angry facial cues should be central and fundamental to the experience of an individual with social anxiety, particularly if such threat detection occurs in a rapid fashion similar to preattentive detection of poisonous animals.

General Evidence

Adopting methodologies from cognitive psychology, researchers have demonstrated that anxiety in general is indeed marked by attentional bias toward threat stimuli in the environment. Many studies have explored the nature of this effect and have utilized a number of experimental paradigms and stimuli to do so. The findings of these studies have varied with the hypotheses tested. However, it is apparent that persons with elevated anxiety experience difficulty ignoring perceived environmental threat and are quick to direct their attention to areas in their visual field in which threat stimuli are present.

A modified version of the Stroop color-naming task has been used extensively in the study of attention in anxiety. In its original format, Stroop (1935) directed participants to name the color of the ink with which words and non-words were written. Response times were slowed when the printed stimulus was the word of a color antagonistic to the color of the ink used to write it (e.g., the word *green* written in blue ink). Other studies have shown that respondents are also slower to name words that occur commonly in English, particularly if such words are often associated with color (e.g., grass, sky; Scheibe, Shaver, & Carrier, 1967). The Stroop task is thus considered a measure of attentional bias because participants are slowed in naming the colors of words that are presumably more difficult to ignore.

Several studies have shown that participants with high trait anxiety are slower to name the color of words indicative of threat (e.g., *injury*, *ashamed*) than more neutrally valenced words, whereas this effect is not evident in nonanxious persons. Mathews and MacLeod (1985) found that not only were anxious participants more likely to demonstrate slowed color-naming when presented with threat words, they also demonstrated particularly slowed color-naming when those threat words were consistent with their primary concerns. For example, participants with social concerns (similar to social anxiety) were slower to color-name social threat words such as *embarrassed* than physical threat words such as *injury*, a phenomenon that has been replicated reliably (Fox, 1993; MacLeod & Hagen, 1992; MacLeod & Rutherford, 1992; Mogg, Mathews, & Weinman, 1989; Richards & Millwood, 1989).

A major interpretation offered by Mathews and MacLeod (1985) suggests that the anxious participants possess danger schemata (see Beck et al., 1985) that are activated by threat-relevant environmental cues in the form of words on cards. Because these stimuli are affectively valenced in a manner meaningful to danger schema, they are more difficult to ignore than nonaffective stimuli, impairing the participants' performance. Therefore, the preferential processing of the target words' meanings over less relevant properties like ink color may constitute an attentional bias for threat. However, apparent weaknesses have been suggested in the modified Stroop color-naming task. Mathews and MacLeod (1985) contend that anxious and nonanxious persons might actually attend to words in a similar fashion, but that threat words affect response (not perception), perhaps by startling anxious individuals and delaying their color naming. Similarly, other investigators (Cloitre, Heimberg, Holt, & Liebowitz, 1992; de Ruiter & Brosschot, 1994) have proposed that the effect of attentional bias cannot be confidently assumed

in the delay of color-naming given the potential effect of cognitive avoidance on reaction times in color naming.

Several investigators thus adopted a probe-detection paradigm (see Posner, Snyder, & Davidson, 1980) to examine attentional bias as it relates to anxiety. In such tasks, participants are commonly instructed to attend to a computer monitor on which two visual stimuli (e.g., words) are presented, one just above center-screen, the other just below. The words are then removed from the screen, one of which is replaced by a “probe” (e.g., a small dot). Participants are instructed to press a hand-held button or a key on a computer keyboard (e.g., the spacebar) as quickly as possible after finding the probe. Attentional bias is again measured by reaction time, and improved performance on such tasks (e.g., shorter latencies) is indicative of this bias. In other words, detecting probes faster when they replace a threat word is considered evidence of attentional bias toward threat, as a respondent will locate the dot more quickly when he is already attending to the part of the screen where it appears. A number of studies have found that anxious persons are faster to detect probes following threat stimuli than neutral stimuli when words are used as threatening cues (Broadbent & Broadbent, 1988; MacLeod et al., 1986; MacLeod & Mathews, 1988; Mogg, Bradley, Hallowell, 1994). Also, several researchers have demonstrated that anxious persons are similarly more vigilant for auditorily presented threat information than neutral information (Burgess et al., 1981; Mathews & MacLeod, 1986; Parkinson & Rachman, 1981). The results of these studies are relatively compelling in that respondents are making *neutral* responses (pressing a button) to *neutral* cues (probes), and thus the probe-detection paradigm does not confound attendance and response to threat as readily as the color-naming/Stroop paradigm.

In addition to general evidence that anxiety is associated with difficulty ignoring threatening information (from the Stroop paradigm) and preferential processing of threat cues in the environment (from probe-detection paradigm), it is evident that anxious participants are able to detect threat when it is presented outside of their conscious awareness. To assure that threat is not consciously processed, a number of researchers have presented threat cues for very short periods of time (e.g., 14 ms), sometimes also employing a masking procedure in which random stimuli are superimposed on the area of the visual field in which the threat was presented, ostensibly erasing cortical visual traces. Anxious persons have consistently located probes following threat-related information faster than probes following neutral information, even when this information is presented outside of their conscious awareness; this effect is not evident in nonanxious persons. Also, preconscious attentional vigilance has been shown in studies using different types of threat stimuli such as negatively valenced words (MacLeod & Hagen, 1992; MacLeod & Rutherford, 1992; Mogg, Bradley, & Williams, 1995; Mogg, Bradley, de Bono, & Painter, 1997) and pictures of angry faces (Bradley, Mogg, Falla, & Hamilton, 1998; Bradley, Mogg, & Millar, 2000).

Altogether, evidence has supported the claims made by cognitive behavioral and psychoevolutionary theorists, namely that high anxiety is associated with preferential allocation of attention toward external threat-consistent stimuli in the environment. Furthermore, this phenomenon may operate very rapidly, outside of conscious awareness, in response to words and faces, both of which may carry particularly important social meaning.

Vigilance for Negative Evaluation: Detection of External Threat in Social Anxiety

Threat recognition as a broad cognitive construct has very fundamental implications for humans. Quick detection of cues that indicate danger will improve an organism's chances of

survival, which naturally affords it greater opportunity to breed. This is as true for humans as it is for other species. According to cognitive models of fear and anxiety (e.g., Beck et al., 1985), the detection of cues that imply the imminence of threat is one of the first and most vital aspects of fear (also see Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007).

A number of studies have demonstrated that socially anxious persons are vigilant for threat in their environment. Several paradigms have been utilized to test this effect, including modified Stroop color-naming tasks, probe detection tasks (using words and faces as social threat stimuli), face-in-the-crowd detection paradigms, eye tracking, and naturalistic role-play (e.g., speaking to an audience) tasks. These studies, reviewed in this section, fall into two major categories. First, a number purport to investigate relatively straightforward vigilance for threat in the social environment, suggesting that socially anxious persons demonstrate a bias for social threat stimuli over neutral stimuli, even when such cues are presented outside of conscious awareness. However, some of these studies have not demonstrated clear evidence for attentional vigilance, and some investigators (e.g., Mansell, Clark, Ehlers, & Chen, 1999) have contended that the findings of these studies may suggest that socially anxious persons *avoid* social threat stimuli in a manner consistent with the predictions in Clark and Wells' (1995) model of social anxiety. Second (and in line with Mansell et al.'s contentions), across the paradigms used to study attention in social anxiety, several have been modified to address, somewhat more directly, attention to oneself and to the external social environment. For example, several studies using the probe detection paradigm have included two or more stimulus onset asynchronies (SOAs; e.g., 500 ms and 1250 ms) to assess whether socially anxious persons demonstrate evidence of hypervigilance for environmental threat or whether their vigilance is merely evident when they

are immediately presented with threat stimuli but not after (i.e., initial vigilance and subsequent avoidance, although other interpretations are available, as well).

Difficulty Ignoring Threat: The Modified Stroop Task

A number of studies have shown that socially anxious participants are particularly slow to color-name social threat words. Mattia, Heimberg, and Hope (1993) demonstrated that socially anxious persons were slower to color-name social threat words than nonthreat words whereas nonanxious controls did not show this effect. Other Stroop research suggests that individuals with social anxiety disorder might also demonstrate an attentional bias toward self-relevant physical threat stimuli if these threats were potentially visible to an audience (represented by social anxiety-relevant threat words such as *blushing*) rather than those that are not (e.g., *breathless, failure*; Spector, Pecknold, & Libman, 2003). Several studies have also demonstrated specificity of the Stroop effect in social anxiety by comparing socially anxious persons to participants with other anxiety disorders and nonanxious controls. Hope, Rapee, Heimberg, and Dombeck (1990b), Becker, Rinck, Margraf, and Roth (2001), and Maidenberg, Chen, Craske, Bohn, and Bytritsky (1996) all found socially anxious persons to be slower color-naming words specifically related to social threat than other anxiety-related threats, including threats common to panic disorder, generalized anxiety disorder, and health anxiety. Interestingly, the presence of depression or dysphoria appears to undo this attentional bias in social anxiety. Grant and Beck (2006) found that persons high in social anxiety and low in depression took longer to color-name social threat words, but those with high social anxiety and high depression showed no bias.

Allocating Attention to Threat in the Environment:

Face-in-the Crowd Tasks, Eye-Tracking, and Probe Detection

Gilboa-Schechtman, Foa, and Amir (1999) presented participants with social anxiety disorder and nonanxious controls with matrices composed of photographs of a human face (all taken from the same person). Participants were told to look at each matrix and decide as quickly as possible whether all of the faces were similar or if there was a dissimilar face in the crowd. The faces themselves expressed neutrality or a number of different emotions including anger, disgust, and happiness. The social anxiety group evidenced an attentional bias (speeded reaction times) when detecting an angry face in a neutral crowd compared to a happy face in a neutral crowd. Also, they were significantly more distracted than controls when searching angry crowds for neutral faces; however, they were slower than controls when searching happy crowds. Therefore, both negative and positive facial expressions distracted socially anxious participants more than they did controls. Gilboa-Schechtman et al. suggest that, to persons with high levels of social anxiety, expression of positive emotion (i.e., smiling) may connote ridicule as opposed to more innocuous general happiness, which may be as undesirable as anger-related negative evaluation. Horley, Williams, Gonsalvez, and Gordon (2003; 2004) employed an infrared corneal reflection technique to record the visual scanpaths of participants with social anxiety disorder and those with no psychiatric diagnoses when presented with pictures of faces expressing sadness, happiness, and neutrality. Socially anxious individuals spent less time than controls scanning salient facial features such as eyes, noses, and mouths. Further, this finding was more prominent in response to sad and neutral faces than happy faces. Garner and Mogg (2006) reported similar results when tracking eye movements with a camera. Taken altogether, eye tracking results tentatively suggest that persons with social anxiety disorder may engage in

both attentional vigilance and avoidance, as they initially direct their gaze toward threat, before diverting it.

Studies using probe detection paradigms have generally employed words or pictures of faces as social threat stimuli. However, studies using words have found somewhat nonspecific evidence of allocation of attention to perceived environmental threat stimuli. Asmundson and Stein (1994) were the first to employ a probe detection task in the study of attentional bias in social anxiety disorder. Their socially anxious group was faster to detect probes following social threat words. These results appear to tentatively support the findings of color-naming studies such that in particular trials, persons with social anxiety disorder demonstrated attentional bias to words consistent with their primary concerns.

Only one study of social anxiety using a probe-detection paradigm addressed the potential effect of high levels of depression. Musa, Lépine, Clark, Mansell, and Ehlers (2003) conducted a probe detection study using words as stimuli, with participants with social anxiety disorder, social anxiety disorder with concurrent depression, and nonanxious/nondepressed controls. The results of this study are in line with those of Grant and Beck (2006) using the Stroop task and show rather clearly that those individuals with social anxiety disorder without concurrent depression demonstrated an attentional bias *toward* social threat stimuli. Although socially anxious participants with a concurrent depressive disorder had more severe social anxiety than their nondepressed counterparts, they did not show any attentional bias effect.

Several studies using words as social threat stimuli have not clearly demonstrated attentional bias in social anxiety (e.g., Horenstein & Segui, 1997; Amir, Elias, Klumpp, & Przeworski, 2003). Thus, in probe detection paradigms in the study of social anxiety, the use of words as social threat stimuli has produced mixed findings. Mogg and Bradley (2002) suggested

that the use of pictures in probe detection tasks may be more ecologically valid, arguing that pictures of facial expressions may be closer to naturalistic social evaluation than words, and therefore may provide clearer findings in the study of attentional bias to threat. They employed a probe detection task with face stimuli (demonstrating threatening, neutral, or happy expressions) presented to participants who were selected based on trait anxiety scores. Faces were presented for just 17 ms, after which they were masked (before the probe appeared), to test the hypothesis that anxious persons are able to detect environmental threat even when it occurs outside awareness. Anxious participants demonstrated a clear allocation of attention toward the location of threat.

Mansell et al. (1999) and Chen, Ehlers, Clark, and Mansell (2002) presented socially anxious and low anxious participants with pictures of positive, neutral, and negative (displaying anger, disgust, fear, or sadness) faces preceding probes by 500 ms. However, the design of these studies differed from previous research in that pictures of faces were paired with pictures of household objects such as clocks, sofas, and vacuum cleaners (rather than other faces). In Mansell et al.'s study, half of the participants in each group were told that they would deliver a controversial speech to an audience (and to locate evaluative behaviors in audience members) after their participation in the probe detection task; Chen et al. offered no such manipulation. In their no-speech condition, Mansell et al. found that socially anxious participants showed no evidence of attentional bias and did not differ from low anxious controls; however, when threatened with a speech, results were in line with the findings of Chen et al.'s study: anxious participants demonstrated *slowed* reaction times to probes following both positive and negative faces. The authors of both studies concluded that their results were indicative of attentional *avoidance* of faces and support Clark and Wells' (1995) assertion that individuals with social

anxiety disorder direct their attention away from external threat (and possibly toward internal threat cues, although this was not directly assessed). Although happy faces are not generally thought to convey negative evaluation, Mansell et al. echo the statement by Gilboa-Schechtman et al. (1999) that socially anxious persons might construe such cues as indications of ridicule.

Mansell et al. (1999) and Chen et al. (2002) state that, although the results of their respective studies are dissimilar from other probe detection studies of attentional bias that utilized words as social threat stimuli (e.g., Asmundson & Stein, 1994; Musa et al., 2003), their methodologies are more ecologically valid (because their probes were faces rather than words) and their results are more likely to be consistent with naturalistic social experiences (e.g., meeting with someone face-to-face). It is important to note, however, that although the color-naming task and probe detection tasks using words may not be similar to actually meeting a stranger or giving a speech, words themselves may be at least comparable in ecological validity to pictures of faces, given the importance that particular self-labels hold as part of the cognitive schemata of socially anxious persons. Therefore, words related to negative evaluation or negative core beliefs (see Beck 1963; 1964, and Beck et al., 1979; 1985) may be more personally relevant to a socially anxious individual than pictures of unfamiliar faces that have no personal significance. Individuals with social anxiety disorder are often most adept at differentiating pictures of angry faces from real angry faces that are actually directed at them. Importantly, the notion that pictures of faces are especially ecologically valid has yet to be subjected to empirical validation. Last, perhaps a more parsimonious interpretation of for Mansell et al.'s results may be that social threat manipulation may have actually served as a distraction for the socially anxious persons, who may have been more engaged with the thought of future social evaluation than with the task at hand, accounting for their slowed reaction times.

Sposari and Rapee (2007) utilized the same method and stimuli as Mansell et al. (1999) with the intention of testing the vigilance-avoidance hypothesis with a sample of participants diagnosed with generalized social anxiety disorder. However, for threat induction, their participants were told that they would give a speech, but *not* that they would be asked to locate audience behaviors (so that they would ostensibly not begin engaging in such behaviors during the probe detection task at a rate higher than what would occur naturally). Sposari and Rapee found that participants demonstrated a pronounced attentional bias for emotional faces over nonsocially-relevant objects, more so than controls. These results directly contradict those of Mansell et al. (1999) and Chen et al. (2002) and support Rapee and Heimberg's (1997) assertion that social anxiety is marked by vigilance to environmental threat.

Overall, the literature suggests that socially anxious persons deploy attentional resources to their environment in the search for threat stimuli that are consistent with their fears of negative evaluation. However, a number of studies reviewed above (e.g., Mansell et al., 1999) have found evidence that might be understood as consistent with a vigilance-avoidance attentional process. However, in the Clark and Wells (1995) model of social anxiety, the implication is that attention may be initially vigilant, but then is very quickly diverted away, in avoidance of threat, perhaps in a manner inconsistent with attentional bias as it is put forth by Rapee and Heimberg (1997). Therefore an area of literature has developed (reviewed below) which considered both internal and external attentional processes in social anxiety. Unfortunately, these paradigms are likely over-reliant on arbitrarily established SOAs.

Studies Addressing Both Internal and External Attentional Bias in Social Anxiety

Amir, Foa, and Coles (1998) examined vigilance versus avoidance among persons with social anxiety disorder in a lexical decision making task. Socially anxious persons and

nonanxious controls were presented with sentences ending in homographs, half of which might hold social meaning as well as neutral meaning (e.g., *mean*, which may describe unkind human behavior as well as a statistical average). Subsequent to the presentation of the homograph, a cue word was presented and participants were directed to determine if the cue word was related to the meaning of the sentence. For example, participants were presented with a sentence that stated “She wrote down the mean” and the cue word was “Unfriendly.” Participants were required to determine if the word “unfriendly” related to the word “mean.” Longer latencies on this task are thought to indicate activation of the inappropriate (socially evaluative) meaning of the homograph. The cue words in this study were presented either 100 ms or 850 ms after the presentation of the sentence. At the shorter duration, socially anxious persons showed slowing of response to socially relevant trials (compared to controls); however, they showed speeding of response at the longer latency. The authors interpret these findings to mean that, in socially anxious persons, inappropriate social meaning was activated when cues were presented quickly, but this effect was suppressed over time, which they posit is supportive of a vigilance-avoidance conceptualization of social anxiety. These results are indeed compelling and have been tentatively replicated in probe detection studies.

With a dot-probe task, Vassilopoulos (2005b) presented health and social threat words, positive social words, and neutral words to university students high and low in fear of negative evaluation at two different SOAs: 200 ms and 500 ms. Socially anxious participants, compared to low anxious controls, demonstrated an attentional bias toward *all* emotional words (including positive social words and both types of threat words) at the 200 ms SOA. At the longer SOA, socially anxious participants were slower than controls to attend to all emotional words. These results partially support the vigilance-avoidance theory of attentional bias in social anxiety,

although, the effects were not specific for social threat words. However, the results should be interpreted with caution given the findings of Grant and Beck (2006) and Musa et al. (2003), as depression was not accounted for in the study's design and Vassilopoulos showed that high levels of depression were associated with the avoidance of social threat stimuli.

Mogg, Philippot, and Bradley (2004), also using a dot-probe task, measured response times for individuals with social anxiety disorder and nonanxious controls with the intention of examining the time course of attentional bias and testing the vigilance-avoidance hypothesis. The shorter SOA, 500 ms, was selected to represent initial attentional orientation to task stimuli (angry, happy, neutral faces), as has been done in previous research. The longer SOA (1250 ms) was chosen to allow for attentional shift to assess for ongoing vigilance versus avoidance of threat. Stimuli in this study were not masked at either SOA. The social anxiety sample showed very clear attentional bias for threat faces compared to happy and neutral faces at initial attentional orientation, whereas the control participants did not, although controls' self-reported scores of fear of negative evaluation were correlated with threat vigilance. At the longer SOA, socially anxious participants did not show significant evidence of vigilance or avoidance and were similar to controls in this regard. Mogg et al. conclude that these results offer tentative evidence for vigilance and avoidance in clinical social anxiety; however, socially anxious persons were not significantly *slower* to detect social threat cues in this experiment, which is perhaps a required condition to make a more conservative conclusion of avoidance.

Although it is clear that socially anxious persons' attentional vigilance was not evident at 1250 ms, the probe detection paradigm does not allow for further speculation about this finding. Also, given that anxious persons demonstrate allocation of attention to threat at much shorter SOAs (e.g., 17 ms; Mogg & Bradley, 2002), it is possible that the 500 ms SOA utilized in this

study was too long to serve as an adequately sensitive index of initial orientation of attention to threat, which suggests that the interpretation of vigilance-avoidance effects in this study should be made only with caution. Although probe detection tasks with multiple SOAs allow for tentative testing of the vigilance-avoidance hypothesis in social anxiety, the implications of the above studies' findings cannot be drawn directly to the predictions made by Clark and Wells (1995) and Rapee and Heimberg (1997).

Therefore, Mansell, Clark, and Ehlers (2003) modified the probe detection task to account for this potential attentional shift. They utilized a probe detection task similar to those employed by Mansell et al. (1999) and Chen et al. (2002) and instructed participants to remain vigilant for internal probes as well. To measure attention to internal cues, Mansell et al. utilized bogus physiological assessment devices. Participants were told the device would monitor their physical anxiety level, and that when this level increased sufficiently, they would receive a slight vibration to the index and middle fingers of their left hand. In reality, these internal probes were not related to physiological responses but were programmed to occur at particular points during the task. Finally, half of the participants in each group received a stress induction (notification of a speech to be given later). Mansell et al. found bias to any probes only in the high fear of negative evaluation group and only when they were threatened with a speech. Under such circumstances, these individuals directed their attention away from the onscreen cues and toward tactile cues (showing slowed reaction times to onscreen probes when stimulated with bogus notification of internal cues). There was not evidence to suggest that this tendency occurred during particular trials such that anxious participants might be more likely to direct attention inward when presented with an emotional face. Mansell et al. interpret this non-finding to mean that the focus of attention to internal cues is a stable phenomenon that would make an interaction

effect between external and internal cues less likely. In other words, once started, attentional bias to internal cues is programmatic and unlikely to be broken in the service of attending to external cues.

Although this study was one of only a few that claims to directly address attention to external and internal threat cues, the nature of the simulation of internal threat (in this case bogus notification of increased arousal) makes the results difficult to interpret. First, the physiological activation that participants believed was being monitored was relatively undifferentiated; specifically, it is unknown if this arousal was linked to the possibility that persons would experience *visible* anxiety (see Spector et al., 2003). Second, the closeness of the vibration to the natural experience of increased physiological activity is unlikely, given the limited amount of time participants were allotted to make the association and without the presence of an unconditioned stimulus. Lastly, the notification of increased physiological arousal may be less important to socially anxious persons not engaged with an audience.

Pineles and Mineka (2005) also attempted to measure external and internal focus of attention in persons with high social anxiety and, with a design similar to Mansell et al.'s (2003). The authors also did not find evidence of attentional bias to external threat cues in the high anxiety group. They concluded that these results are particularly supportive of Clark and Wells' (1995) claim that internal threat cues are of greater importance than external threat cues. However, Pineles and Mineka's findings may also be open to alternative interpretation. Specifically, both external and internal cues were presented to participants externally, which may limit the generalizability of the findings, as socially anxious persons in actual social situations typically become aware of internal threat cues via interoception. Also, the faces presented to the

participants in external threat trials may not have been as evocative as the presence of actual audience members demonstrating positive or negative evaluation.

Only one study in the social anxiety literature has studied attentional bias using a live audience. Veljaca and Rapee (1998) directed participants high and low in social anxiety to record positive and negative audience behaviors while giving a speech. Audience members in this study were confederates who emitted prescribed positive (e.g., smiling and nodding) or negative (e.g., frowning and yawning) behaviors at moments determined (online, by the confederates) to be most appropriate during the speech, with the provision that they demonstrate one evaluative behavior per minute. Participants with high social anxiety were not only more accurate than controls at detecting negative audience behaviors, they were also more liberal in determining what constituted negativity. Furthermore, the control group was more accurate than the anxious group in detecting positive audience behaviors. Therefore, vigilance for social threat was clearly demonstrated in a relatively naturalistic task, and this vigilance for external threat continued through the task, suggesting some degree of sustained attention to the audience despite the fact that the high social anxiety group evidenced greater public self-consciousness scores than the control group. This finding seems to contradict the contentions of Clark and Wells (1995), Clark (2001), Stopa and Clark (1993), Mansell et al. (1999), Chen et al. (2002), and Mansell et al. (2003), which state that after socially anxious individuals detect threat in their environment (or simply detect an audience in general), they turn their attention inward and focus less on negative audience behaviors, and that this is a process that continues relatively unbroken until the social situation has come to an end. Veljaca and Rapee's results are particularly encouraging because they support online attentional bias in social anxiety with what is still perhaps the most ecologically valid paradigm utilized in the literature.

Perowne and Mansell (2002) report concern that Veljaca and Rapee's (1998) audience members' evaluative behaviors were left to their discretion in an unstandardized fashion. According to Perowne and Mansell, this methodology may have allowed for participants' behaviors to contaminate the role-play by indirectly evoking more or less positive or negative feedback. Given these concerns, Perowne and Mansell asked participants high and low in social anxiety to deliver a speech to an audience that was reportedly watching them live, via a closed circuit television. However, the audience had been previously taped, and all participants received the same audience feedback. During the taping, the audience members were trained to demonstrate differing evaluative behaviors. High socially anxious persons believed the audience judged their performance more negatively than the control group did. Also, the high socially anxious group selectively discriminated audience members who evaluated them negatively (on a recall task after the study), whereas the control group selectively discriminated the audience members who evaluated them positively. However, there was no evidence that the high anxiety group selectively detected particular audience *behaviors* that would indicate negative evaluation or that the low anxious group selectively detected positive audience behaviors. In fact, all emotional behaviors were better detected than neutral behaviors in both groups, and these ratings were consistent with those of independent raters of audience behavior. High socially anxious participants did not demonstrate less external focus of attention, contrary to the authors' predictions. However, Perowne and Mansell did find that high socially anxious participants reported more self-focus during the speech than did controls.

Perowne and Mansell (2002) conclude that the anxious group's selective detection of negative audience members but inability to detect particular audience behaviors emitted by these confederates is evidence of initial detection of negative evaluation followed by avoidance of

external cues with preference for internal representations of threat. However, the control group was also unable to detect particular audience behaviors indicative of positive evaluation, and this is unlikely to be attributable to attentional avoidance given their low anxiety and the ostensible lack of threat. Furthermore, there is not evidence that the anxious group was less focused on external cues than the control group. Therefore, some of Perowne and Mansell's conclusions drawn from the study's data may be open to other interpretations. Pozo, Carver, Wellens, and Scheier (1991) conducted a study with a similar design (upon which Perowne & Mansell's, 2002, study was based); however, the experimental and control group performed no differently on these ratings, failing to indicate vigilance for either internal or external negative social cues.

Conclusions

In their discussion, Mansell et al. (1999) have posited that, although Veljaca and Rapee's results appear to support Rapee and Heimberg's (1997) claim that socially anxious persons engage in vigilance for environmental threat, Veljaca and Rapee *directed* their participants to be aware of audience evaluation. Therefore, Mansell et al. (1999) suggest that probe-detection studies may be more reliable assessments of attentional process in social anxiety given that they have not actually required participants to attend to threat, but rather measured the naturalistic course of attentional focus. Mansell et al. (1999) conclude that probe detection tasks parallel natural social situations in this way, such that socially anxious persons are not explicitly told to look for environmental threat and thus are apt to monitor themselves and their own internal threat cues (i.e., cognitions, physiology, and imagery). It is suggested here, however, that given the understanding of social anxiety schemata described by both cognitive behavioral models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997), socially anxious persons

regularly expect to encounter feared outcomes in social situations, and direction to attend to this may not be any more unnatural than asking them to deliver a speech.

General Considerations

Clear conclusions regarding attentional process in social anxiety are not possible given the nature of the research conducted thus far, as several of the paradigms used to explore attention in social anxiety are limited. For instance, debate about the nature of attentional vigilance and avoidance is based primarily on information processing paradigms that assess attention allocation over very short periods of time. Furthermore, attentional avoidance is claimed to be a significant part of the social anxiety fear response (e.g., Mansell et al., 1999). However, the evidence for this conclusion is not reliably based on *significantly slowed* attention to threat cues at longer periods of time. If one accepts that the study of these processes must be validated with more ecologically valid methodologies that present socially anxious persons with naturalistic feared situations and outcomes (e.g., a live audience), then vigilance for external threat has received the most significant support in the literature (Veljaca & Rapee, 1998). Ongoing attentional avoidance of social threat stimuli in the environment with unbroken attention for internal threat cues has not been demonstrated beyond indirect measurement (e.g., Mansell et al., 1999; Perowne & Mansell, 2002) and reliance on ecologically limited methodologies (Mansell et al., 2003).

Mansell et al. (1999; 2003) report that socially anxious persons are likely to direct their attention away from social threat cues such as pictures of emotional (and possibly evaluative) faces, particularly when these participants are threatened with the prospect of delivering a speech to an audience (also see Amir et al., 1996). Mansell et al. (1999; 2003) suggest that social threat (in this case an upcoming speech) leaves socially anxious persons more likely to attend to

internally generated threat cues, such as their own interoception or self-imagery. However, it is not clear that the participants in these studies are in fact directing their attention away from external threat toward internal threat. A more parsimonious explanation may be that socially anxious individuals expecting to give a speech are simply thinking about this looming threatening situation and not adequately attending to the probe detection task at hand, regardless of the stimuli presented to them. Furthermore, it is not always wise to suggest what is occurring on the basis of what is not – we know that vigilance is not always maintained in some of these studies, but we simply do not know well where (if anywhere) attention has been directed. This conclusion makes an interpretation of reaction times more difficult, particularly within the conceptual framework of attentional vigilance versus avoidance.

The nature of attentional focus in social anxiety clearly requires direct investigation. With evidence independently supportive of external and internal focus in social anxiety, investigation of the interaction of these processes during social situations may best elucidate the discrepancies between Clark and Wells (1995) and Rapee and Heimberg (1997). Because Clark and Wells, Clark (2001), Stopa and Clark (1993) and Mansell et al. (2003) describe attention in social anxiety to be consistently focused on the self throughout the duration of a social situation, interaction of this internal monitoring of the self and monitoring of external cues of threat is unlikely, if not impossible. Because Rapee and Heimberg posit that such an interaction is not just likely, but that it is also a critical process that maintains socially anxiety, socially anxious persons who encounter a positive (or at least less critical audience) should demonstrate less focus on mental representations of themselves and that focus should be less negative as well. For example, it is predicted here that socially anxious persons encountering a less critical audience should be less likely to experience negative self-imagery, negative self-evaluative cognitions,

and self-monitoring than socially anxious persons encountering a more critical audience. Of course, this claim presupposes that socially anxious persons remain vigilant to external threat cues during social situations (despite the content of audience feedback) as well as self-focused.

Overview of the Current Research

The current study directly explored the relationship between vigilance for negative evaluation in the audience and one's mental representation of the self as seen by the audience. In line with recent research on the role of the mental representation of self during social situations, the current study was primarily concerned with cognitions and self-imagery, particularly their modulation based on the nature of the audience's behavior. Cognitions and imagery were elicited and compared between two groups of participants scoring high or low on a measure of communication anxiety. Participants from each group were randomized to either a high threat condition or a low threat condition. Participants in the high threat condition delivered a five-minute speech to a small audience of confederates who demonstrated mostly negative socially evaluative behaviors. Participants randomized to the low threat condition delivered a five-minute speech to a small audience of confederates demonstrating mostly positive socially evaluative behaviors. It was predicted that awareness of environmental threat would be causally related to the frequency and valence of self- and audience-related cognitions, as well as participants' focus on and valence of self-imagery. Specifically, the detection of a proportionally large number of negatively evaluative audience behaviors, compared to the detection of more positive audience behaviors, was expected to generate a greater number of negatively valenced self- and audience-evaluative cognitions and was also expected to generate more negative, vivid, engaging, situationally typical self-imagery, likely to be seen with a greater degree of observer perspective. Also, it was expected that socially anxious persons who were presented with more cues for

negative evaluation would show a greater awareness of such stimuli than socially anxious persons presented with fewer cues for negative evaluation. Ultimately, then, the major goals of the current study included 1) the demonstration of vigilance for environmental threat and 2) the demonstration of a causal relationship between this vigilance for external negative evaluative cues and focus on internal representations of how one appears to an audience. In this way, the current study represents an extension of the literature by exploring further the nature of the disagreement between the major cognitive behavioral models of social anxiety.

Hypotheses Related to Cognition during the Speech

A group x condition interaction was predicted, with high speech anxious participants in the negative audience condition demonstrating more self-evaluative cognitions, audience-evaluative cognitions, and more overall negative cognition than high speech anxious participants in the positive audience condition, and low speech anxious participants in both the negative and positive audience conditions. It was also predicted that, more specifically, the high anxiety group in the negative audience condition would report more negative self-focused cognitions, more negative-audience focused cognitions, fewer positive self-focused cognitions, and fewer positive audience-focused cognitions than high anxiety participants in the positive audience condition, low anxiety participants in the negative audience condition, and low anxiety participants in the positive audience condition.

Hypotheses Related to Self-Imagery during the Speech

A group x condition interaction was also predicted for the dependent variables related to self-imagery during the speech. Specifically, it was expected that, compared to speech anxious persons in the low threat condition and low speech anxious persons in either condition, high speech anxious participants in the high threat condition would report 1) imagery with a more

negative valence, greater vividness of imagery (in both the visual and auditory modalities), greater imagery absorption, taking an observer perspective to a greater degree, images that are more typical of images experienced in non-experimental social situations, and greater awareness of anxiety symptoms and greater (self-perceived) performance deficits.

Hypotheses Related to Environment-Directed Attention (Awareness of Evaluation)

A group x condition interaction was expected for dependent variables related to vigilance for threat in the environment. It was predicted that, compared to high speech anxious persons in the low threat condition, low speech anxious persons in the high threat condition, and low speech anxious persons in the low threat condition, high speech anxious persons in the high threat condition would perceive a greater number of negative audience behaviors. It was also hypothesized that high speech anxious participants in the high threat condition would perceive fewer positive audience behaviors than low speech anxious participants in the high threat condition and both high and low speech anxious persons in the low threat condition.

Hypotheses Concerning the Comparison of Participants' Ratings with Those of Expert Coders

Uninformed of Participants' Groups and Conditions

A group x condition x rater interaction was predicted for the comparison of participants with the coders who were not aware of participants' groups or assignment to conditions. Specifically, high speech anxious participants in the high threat condition were predicted to report greater awareness of anxiety symptoms and performance deficits during their speech than the coder was able to detect, whereas this difference was not predicted for the high speech anxious persons in the low threat condition and low speech anxious persons in either condition. Low speech anxious participants in the high threat condition were predicted to report awareness

of anxiety symptoms and performance in a manner similar to the ratings made by the expert coder (i.e., no significant differences in ratings).

High speech anxious participants in the high threat condition and in the low threat condition were expected to perceive a greater number of negative audience behaviors than detected by the coder. High speech anxious participants in the high threat condition and in the low threat condition were expected to perceive fewer positive audience behaviors than detected by the coder.

Hypotheses Concerning Correlations between Attentional Processes

It was predicted that in the high anxiety group, across conditions (high and low social threat), 1) the valence of self-imagery would be negatively correlated with the number of negatively evaluative audience behaviors detected, 2) the vividness of visual and auditory self-imagery would be positively correlated with the number of negatively evaluative audience behaviors detected, 3) the awareness of anxiety symptoms and self-perceived performance deficits would be positively correlated with the number of negatively evaluative behaviors audience detected, 4) the degree of observer perspective would be positively correlated with the number of negatively evaluative audience behaviors detected, and 5) the number of self-evaluative thoughts (quantified by expert coder) would be positively correlated with detection of negatively evaluative audience behaviors.

CHAPTER 2 METHOD

Participants

The sample of participants in this study was drawn from the subset of students taking Psychology 60 and Psychology 1061 who completed the screening measures administered by the Department of Psychology at the beginning of each academic semester, including fall, 2006; spring, 2007; summer, 2007; fall, 2007; and spring, 2008. Participants were selected based on their anxiety about public speaking. A high speech anxiety sample was selected as the experimental group and a low speech anxiety sample was selected as a control group. Classification was determined on the basis of participants' scores on the Personal Report of Communication Apprehension (PRCA; McCroskey, 1982). Cutoff scores for participation in the experimental and control groups were determined based on data that were available from a sample of 734 undergraduates who were previously enrolled in Psychology 60 at Temple University and who completed the PRCA. With these data, quartile scores were calculated. PRCA total scores of 54 and below indicated respondents who scored in the lowest quartile of the sample's PRCA scores, whereas scores of 78 and above indicated respondents who scored in the highest quartile. Thus, in the present study respondents scoring 54 and below were recruited for participation in the control group and respondents scoring 78 and above were recruited for participation in the experimental group.

The total number of participants recruited for the current study was 92, as suggested by the power analysis (described above). The proposed n for each cell of the study was 23. Because of random assignment of participants to speech condition (positive or negative audience), the actual distribution of participants per cell was as follows: high anxiety in the negative audience condition, $n = 25$; high anxiety in the positive audience condition, $n = 23$; low anxiety in the

negative audience condition, $n = 24$; low anxiety in the positive audience condition, $n = 20$. Therefore, overall, there were 49 participants in the negative audience condition and 43 participants in the positive audience condition. There were 48 high anxiety participants and 44 low anxiety participants. Despite slight discrepancies from the projected n s, the participants were relatively evenly distributed across the study's four cells. One participant refused to deliver her speech to the audience. This participant had been assigned to the negative audience condition.

In terms of age, there were no differences between groups ($F(1, 66) = .28, p = .69$) or audience conditions ($F(1, 66) = .65, p = .57$). The average age of participants in the study was 20.33 ($SD = 3.92$). In terms of gender, females outnumbered males in total (69 to 23, respectively), in the high anxiety group (34 to 14, respectively), in the low anxiety group (35 to 9, respectively), in the negative audience condition (30 to 10, respectively), and in the positive audience condition (30 to 13, respectively). Although these differences appear to be large, they were not statistically significant between groups ($\chi^2 = .82, p = .37$) or conditions ($\chi^2 = 1.18, p = .28$).

Statistical Power

Statistical power was determined with the use of *G-power*, a general power analysis program (Faul & Erdfelder, 1992). *G-power* requires the input of alpha level, proposed effect size, and power coefficient. For the current study, alpha level and power coefficient were set at $p = .05$ and $.8$, respectively. However, the design of the current study is unique to the study of imagery and cognition in social anxiety in that previous research has either emphasized the manipulation of imagery itself (as opposed to the examination of imagery as a dependent variable) or involved live audiences but examined detection of audience behaviors as the dependent variable. Although it is unique in specific design, the present study explored

constructs generally consistent with previous literature; therefore, between-groups effect sizes have been calculated to determine the general magnitude of effects of imagery manipulation, as well as the detection of audience behaviors (in live action information processing tasks). No studies of social anxiety with self-imagery as the dependent variable have provided sufficient information (means and standard deviations) for the calculation of the effect size. In terms of qualifying the magnitude of effect sizes, Cohen's (1988) conventions for the effect size statistic d , in which 0.2 is considered small, 0.5 medium, and 0.8 large, were used.

Hirsch et al. (2003) found that among high socially anxious participants, those holding in mind negative self-images believed that they appeared significantly more anxious than those holding in mind neutral self-images, with a between-groups effect size of 0.95. Similarly, Vassilopoulos (2005) found, that among high socially anxious persons, those holding in mind negative images believed that they demonstrated more visible anxiety than those holding in mind positive self-images, with an effect size of 1.15. Additionally, Vassilopoulos reported that persons in the negative self-imagery condition rated their image as a more accurate self-representation than did participants in the positive image condition, with a between-groups effect size of 0.86. By only manipulating perspective (observer vs. field), Spurr and Stopa (2003) found effects that were more modest. Specifically, when taking an observer perspective during a speech, participants with high fear of negative evaluation experienced a greater number of negative thoughts and rated their performance more poorly than when taking a field perspective on a separate speech, with respective between-groups effect sizes of 0.3 and 0.2.

In studies with naturalistic designs measuring the detection of negative and positive audience behaviors, Veljaca and Rapee (1998) found that participants high in social anxiety noticed more negative audience behaviors than nonanxious participants as well as fewer positive

audience behaviors, with respective effect sizes of 0.98 and 0.74. Perowne and Mansell (2002) found that a group of high socially anxious participants was more adept at discriminating negative than positive audience members, with an effect size of 1.1.

Thus, previous studies measuring the effects of self-focused imagery on awareness of anxiety during social situations and those assessing the detection of audience behaviors during naturalistic role-played social tasks have found relatively large effect sizes both within groups of high socially anxious subjects and between groups of high versus low socially anxious subjects. However, for the purposes of the current study, a conservative, medium effect size of 0.6 was proposed. Therefore, with a power coefficient of 0.8, alpha level set to .05, and an effect size of 0.6, the total recommended sample size was 90 participants. However, a total sample of 92 participants was recruited to facilitate the equal distribution of 23 participants to each of the study's 4 cells.

Confederates

Nearly every participant (91 of 92) presented a 5-minute speech to a group comprised of the experimenter and 3 or 4 undergraduate research assistants at the Adult Anxiety Clinic of Temple University serving as audience members (1 participant refused to deliver a speech of any length). Confederates were carefully trained in a range of positive and negative socially evaluative behaviors and were uninformed about participants' group classification (high vs. low anxiety) as well as the hypotheses of the current study. The experimenter demonstrated only neutrality for the duration of the speech, in a fashion similar to the expression of confederates between their evaluative behaviors (see below). The audience's evaluative behaviors were standardized according to criteria described below.

Audience Behaviors

All confederate audience members were trained in the demonstration of positive (smiling, nodding, taking notes, and leaning forward) and negative (head-shaking, eye-rolling, sighing, and staring at the ceiling) socially evaluative behaviors. Confederates emitted each behavior in isolation; that is, audience members only smiled, without combining smiling and other positive behaviors such as nodding, to maximize control over the number of actual evaluative behaviors demonstrated. Behaviors varied in the time for which they were expressed to allow them to be demonstrated naturally, but also in a manner that would be detectable to study participants. Specifically, smiling, nodding and leaning forward were demonstrated for 7 seconds each and note taking was demonstrated for 10 seconds for each occurrence. Among the negative behaviors, head-shaking, eye rolling, and staring at the ceiling were demonstrated for 7 seconds, and sighing was demonstrated for 5 seconds (given its additional auditory component). Audience members were also directed to express neutrality when not portraying evaluative behaviors, which is to be understood as demonstrating attentiveness but not overt friendliness or criticism. Before each participant's speech began, confederates were randomized to the high threat or low threat condition for that particular speech. For instance, once the overall audience valence condition was determined, individual audience members were randomly assigned to demonstrate negatively or positively valenced behaviors. In the high threat condition, (depending on audience size of either 3 or 4 members) each audience member had either a $2/3$ or $3/4$ chance to be assigned to demonstrate negatively valenced behaviors and a $1/3$ or $1/4$ chance to demonstrate positive behaviors. In the high threat condition, 3 of the 4 or 2 of the 3 audience members demonstrated only negative socially evaluative behaviors, and the third/fourth demonstrated only positive socially evaluative behaviors. Conversely, in the low threat condition, 3 of the 4 or 2 of

the 3 audience members demonstrated only positive socially evaluative behaviors and the remaining confederate demonstrated only negative socially evaluative behaviors.

All audience members drew their behaviors from the appropriate pools of behaviors listed above. They were directed to demonstrate the behaviors of assigned valence at appropriate times, provided that they demonstrate 1 evaluative behavior per minute, similar to the instructions offered by Veljaca and Rapee (1998). Because participants were directed to speak to the audience for 5 minutes and each audience member was directed to demonstrate one evaluative behavior each minute, participants were presented with a total of 15 or 20 evaluative behaviors (again, depending on audience size), 10 or 15 of which matched the audience's randomly determined, predominant valence. All 4 evaluative behaviors of each valence type were demonstrated at least once during each speech to standardize the exact type of evaluative feedback given within and between threat conditions. The experimenter, expert in detecting behaviors actually emitted, viewed videotapes of audiences recorded during speeches and rated them using the Assessment of Audience Behaviors (see measure description below) on the overall valence and individual frequency of demonstrated positive and negative behaviors. The experimenter was unaware of the audience's assigned condition before viewing and making ratings.

Screening Measure

Personal Report of Communication Apprehension (PRCA; McCroskey, 1982). The PRCA is a 24-item self-report measure that assesses communication apprehension, which is a construct referring to the fear of verbal communication, particularly as it occurs during public speaking tasks (all study measures included in appendices). In this way, communication apprehension is similar to a domain of social anxiety, specifically fear of public performance.

Individual items on the PRCA are self-statements regarding particular situations that demand communication and require respondents to indicate their apprehension in that situation based on a 1 (*Strongly agree*) to 5 (*Strongly disagree*) Likert-type scale. Individual items include “I am tense and nervous while participating in group discussions” and “Certain parts of my body feel very tense and rigid while giving a speech.” The PRCA has demonstrated good predictive validity in that it has been found to predict anxiety, withdrawal, and avoidance in public speaking situations (Beatty, 1987; Beatty, Balfantz, & Kuwabara 1989) and has shown very good internal consistency in an undergraduate sample (Rodebaugh, 2004). Participants scoring above 78 and below 54 served as the study’s experimental and control groups, respectively. In the present sample, the PRCA evidenced acceptable internal consistency, ($\alpha = .85$).

Descriptive Measures

Demographics

The demographics form is a basic inventory that directs respondents to provide demographic information, particularly sex, class year, and current living situation. This form was not offered to roughly 1/3 of the sample, and thus only age and gender are used in the demographic analyses.

Social Phobia Scale

The Social Phobia Scale (SPS; Mattick & Clarke, 1998) is a 20-item self-report measure created to assess social anxiety as one is observed engaging in a number of activities. Example items include “I become anxious if I have to write in front of other people” and “I get tense when I speak in front of other people.” Instructions on the SPS ask participants to “Indicate the degree to which you feel the statement is characteristic of you,” and responses are made on a Likert-type scale that ranges from 0 (*Not at all*) to 4 (*Extremely*). The SPS has been shown to have high

internal consistency (ranging from .88 to .94) and high temporal stability (between .91 and .93) in clinical samples, and it discriminates between clinical and non-clinical samples and between patients with social anxiety and those with other anxiety disorders (Brown et al., 1997; Heimberg, Mueller, Holt, Hope, & Liebowitz, 1992). The SPS also demonstrated good internal consistency in an undergraduate sample ($\alpha = .9$; Mattick & Clarke, 1998). The SPS is more strongly correlated with scores on other social anxiety measures than with measures of general distress (Heimberg et al., 1992; Mattick & Clarke, 1998), and it has demonstrated treatment sensitivity as well (Ries et al., 1998). In this sample, the SPS demonstrated strong internal consistency ($\alpha = .94$).

Brief Fear of Negative Evaluation Scale

The 12-item Brief Fear of Negative Evaluation Scale (BFNE; Leary, 1983) assesses concern about evaluation by others and distressing thoughts about receiving criticism and disapproval from others. The BFNE was derived from the 30-item Fear of Negative Evaluation Scale (Watson & Friend, 1969) and is highly correlated with the original true/false version ($r = .96$; Leary, 1983). It is rated on a Likert-type scale (1 = *Not at all characteristic of me*; 5 = *Extremely characteristic of me*). Example items include “Sometimes I think I am too concerned with what other people think of me” and “I become tense and jittery if I know someone is sizing me up.” Weeks et al. (2005) report high internal consistency ($\alpha = .89$) in a sample of patients with social anxiety disorder. The BFNE has also demonstrated strong psychometric properties in an undergraduate sample with good internal consistency ($\alpha = .90 - .91$) and 4-week test-retest reliability ($r = .75$; Leary, 1983). Weeks et al. report the BFNE to have strong convergent validity, with high correlations with the Liebowitz (1987) Social Anxiety Scale, the Social Interaction Anxiety Scale (Mattick & Clarke, 1998) and the Social Phobia Scale (Mattick &

Clarke, 1998). Weeks et al. found the BFNE's discriminant validity to be strong as well, as demonstrated by modest correlations with the Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986) and the Beck Depression Inventory (Beck et al., 1979).

Confirmatory factor analyses of the BFNE in both undergraduate and clinical samples have shown that a two-factor model best fits the data, with one factor comprised of straightforwardly worded items and the other comprised of reverse-scored items (Rodebaugh et al., 2004; Weeks et al., 2005). Further, the BFNE is more strongly correlated with measures of social anxiety when reverse-scored items are not included in the total score (Weeks et al., 2005). Thus in the current study, only straightforwardly worded items were scored. In this sample, the BFNE straightforward items demonstrated excellent internal consistency ($\alpha = .95$).

Beck Depression Inventory 2nd Edition

The Beck Depression Inventory, 2nd Edition (BDI-II; Beck, Steer, & Brown, 1996) an updated version of the Beck Depression Inventory (BDI; Beck et al., 1979), is a 21-item self-report measure rated on a scale from 0-3, which assesses DSM-IV (American Psychiatric Association [APA], 1994) criteria for depressive disorders, including affective, cognitive, and somatic aspects. Beck et al. (1996) found the BDI-II to have high internal consistency among college students ($\alpha = .93$) and outpatients ($\alpha = .92$), excellent one-week test-retest reliability in an outpatient sample ($r = .93$), and good convergent and discriminant validity. Several studies have replicated these findings in clinical and nonclinical samples (Dozois, Dobson, & Ahnberg, 1998; Osman, Downs, & Barrios, 1997; Steer & Clark, 1997; Whisman, Perez, & Ramel, 2000). In the current sample, the BDI-II evidenced strong internal consistency ($\alpha = .90$).

Measure of Anxiety during the Speech

Subjective Units of Discomfort Scale

The Subject Units of Discomfort Scale (SUDS) was used as a metric for the level of the participants' subjective sense of the maximum level of anxiety they felt during their speech. Subjects offered this rating, in writing, immediately after the speech. The scale that they were asked to use ranged from 0 to 100, with 0 representing "no anxiety whatsoever" and 100 representing "the worst anxiety you have ever experienced."

Measures of the Representation of the Self as Seen by Others

Perception of Speech Performance Measure

The Perception of Speech Performance (PSP; Rapee & Lim, 1992) is a 17-item self-report scale that measures respondents' subjective assessment of a past speech performance based on a number of negative (10) and positive (7) behaviors or outcomes that may have transpired during the speech. Negative items assess the degree to which respondents recall having demonstrated overt symptoms of anxiety such as "Blushed", "Trembled", and "Stuttered." Positive items assess respondents' sense that they performed well on a number of dimensions such as "Content was understandable" and "Had a clear voice". Each item is rated on a 4-point Likert-type scale ranging from 1 (*Not at all*) to 4 (*Extremely*). Researchers (e.g., Rapee & Lim, 1992) have used the PSP as a measure of social performance such that higher scores indicate better performance and lower scores indicate poorer performance. However, the PSP contains more items that may be viewed as negative than positive, suggesting that it may be more sensitive to negative than positive performance. Furthermore, the positive items of the PSP may actually be neutral (e.g., *Content was understandable*), possibly measuring adequate performance more than good performance (see Rodebaugh & Chambless, 2002). Given this

apparent bias toward negative performance and the scale's emphasis on the respondent's *appearance* while speaking, the PSP was included as a measure to determine the degree of anxiety that participants believe they demonstrated while they spoke, particularly as it relates to their own self-image. In addition, given the self-focused nature of the items on this measure, it is an appropriate supplement to the measurement of the observer perspective and a potentially useful extension to previous research on self-imagery during social situations. The PSP has been used repeatedly in the video feedback literature to capture anxious persons' ratings of how anxious they believed they appeared before and after a video feedback intervention (e.g., Rapee & Hayman, 1996; Rodebaugh, 2004; Rodebaugh & Chambless, 2002). Importantly, the PSP was designed to allow for the rating of apparent anxiety symptoms by speakers and by objective assessors alike, which, in the current study, facilitated the comparison of speakers' and coders' assessments of speech performance based on awareness of anxiety symptoms during the speech. Further, the PSP has demonstrated adequate interrater agreement rates between untrained observers (Rapee & Hayman, 1996) and good internal consistency in clinical and nonclinical samples (Rapee & Lim, 1992; Rodebaugh, 2004; Rodebaugh & Chambless, 2002). In the current sample, the positive and negative scales evidenced strong internal consistency (α 's = .92, .88, respectively); however, the full-scale internal consistency was not adequate ($\alpha = .40$). Given the poor internal consistency of the PSP, planned analyses (below) were conducted for each subscale separately, rather than for the PSP as a whole.

Interrater reliability was established for the subscales of the PSP in the current study. Interrater reliability was determined by comparing the ratings of an expert coder (the experimenter) with those of a first year graduate student with experience in the field of social anxiety and attentional bias. One-third of the study's sample ($n = 23$) was randomly selected to

be rated by the reliability coder. Training of the reliability coder involved meeting with the experimenter to discuss the PSP and to watch samples of video recording (not included in the reliability sample) to discuss potential ratings and the meanings of the PSP's anchors. The PSP negative subscale demonstrated good inter-rater reliability between study coders ($\kappa = .71, p < .001$). Within one point of agreement on the PSP negative subscale, inter-rater reliability was quite strong ($\kappa = .94, p < .001$). The correlation between the PSP negative subscale scores for the study coder and the reliability coder was also strong ($r(23) = .91, p < .001$). The PSP positive subscale also demonstrated good interrater reliability ($\kappa = .74, p < .001$), very good interrater reliability within one point of agreement ($\kappa = .93, p < .001$), and a strong correlation between raters ($r(23) = .90, p < .001$).

Imagery and Perspective Questionnaire

Developed for the current study, the Imagery and Perspective Questionnaire (IPQ) is a 6-item self-report questionnaire included to assess the nature of the imagery associated with participants' recall of their speech. Imagery was assessed in terms of how vividly it was recalled in both visual and auditory modalities, how closely it matched the occurrence of the event itself (i.e., absorption), how positively or negatively it was experienced (i.e., valence), the perspective from which it was viewed (ranging from 100% field to 100% observer perspective), and the typicality of its occurrence in other non-experimental social situations. Items are rated on 9-point Likert-type scales ranging from 0 (*Not at all*) to 8 (*Very much*) for vividness and absorption, and 0 (*Very negative*) to 8 (*Very positive*) for valence. Participants were also directed to indicate the degree to which they saw their speech-related imagery through their own eyes (field perspective) or as if through the eyes of someone watching them speak (observer perspective). For consistency with other studies of the observer perspective in social anxiety (e.g., Coles et al.,

2001; Coles, Turk, & Heimberg, 2002; Wells et al., 1998; Wells & Papageorgiou, 1999), imagery perspective was rated on a scale ranging from -3 (*Entirely look out through my own eyes*) to $+3$ (*Entirely observing myself from an external point of view*). Lastly, the image was rated on how typical it was as an image experienced during a social situation, compared to images experienced in other social situations outside of the laboratory. The typicality scale ranges from 0 (*Not at all typical*) to 8 (*Extremely typical*). The IPQ was included to provide indices of self-imagery related to participants' performance in high and low threat social situations. Because these several indices were considered separately, no coefficient of internal consistency was calculated.

Free Recall of Speech Task

The Free Recall of Speech Task (FRS) simply directed participants to write an open-ended account of cognitions they experienced during their speech, with prompts directing them to consider thoughts, images, and sounds that may have occurred while speaking to the audience (see appendix for specific instructions). Administration of the FRS allowed for cognitions to be quantified and coded based on their focus on the self versus the audience, as experienced during participants' speeches. Cognitions expressed on the FRS were scored by the uninformed experimenter who determined if they were self-referent, audience-referent, or both self- and audience-referent. Cognitions were scored as self-referent if they referred clearly to the self during the speech, particularly to the experience of anxiety symptoms (e.g., "I can't believe how much I am sweating") or quality of performance (e.g., "I am babbling like an idiot"). Cognitions were scored as audience-referent if clearly referring to the audience's behavior and evaluation of the speaker (e.g., "They think I am a moron") or the audience's noticing participants' anxiety ("Everyone can see how red my face is"). Any cognition not classified as self- or audience-

referent was classified as “other.” Cognitions were also rated for valence on a scale ranging from 0 (*Very negative*) to 8 (*Very positive*). Interrater reliability was determined by comparing the ratings of the experimenter with those of the same reliability coder mentioned above. Both the coders rated a random sample of 25% of the total study sample ($n = 23$). Because the FRS is an open-ended writing instrument, the individual items to be rated were determined by the study experimenter. These items were selected as individual, distinct cognitions. Training involved discussion of the focus and valence ratings scales and a review of typical self-statements that were independent of those used for reliability coding. Kappa coefficients were calculated, demonstrating that the two raters evidenced very good interrater reliability for both focus ($\kappa = .87, p < .001$) and valence of cognition ($\kappa = .83, p < .001$).

Attention to External Threat

Assessment of Audience Behavior

The Assessment of Audience Behavior (AAB) device was also created for the purposes of this study. It directs respondents to recall their image of their speech and to make ratings on the behavior of the audience that observed them. Respondents rate the audience, on a scale ranging from 0 (*Very negative*) to 8 (*Very positive*), as well as recall the frequency with which they were presented with negatively (e.g., *Head shaking; Eye rolling*) and positively (e.g., *Smiling; Nodding*) evaluative audience behaviors. Neutral behaviors (e.g., *Scratching nose; Shifting in seat*) were also included to minimize participants’ focus on exclusively positive or negative behaviors. In addition, positive and negative audience behaviors not prescribed by or demonstrated in the present study were also included to assess the accuracy of participants’ perception of social evaluation. Frequency ratings were estimates of the number of occurrences of the detected evaluative or neutral behavior based on a 4-point Likert-type scale ranging from 0

(*Never occurred*) to 3 (*Occurred more than 10 times*). Overall, the AAB was included to measure participants' subjective assessments of the audience's evaluative behaviors during the speech as they recalled them, and this measure was intended to allow for the comparison of uninformed ratings of audience behaviors with assessments made by high and low anxious participants as well as between-group comparisons outlined above. The AAB's interrater reliability was also calculated by identifying a random sample of 25% of the total study's total N and comparing the coders' ratings on the AAB responses for these participants. The reliability coder was the same who made ratings for the PSP. She was trained on making AAB ratings of audience behaviors in a manner similar to her training on the PSP, such that she met with the experimenter, discussed the scale, and watched video recordings not in the sample of randomly-selected recordings. For maximum comparability to subjects, both coders made their ratings off-line, i.e., after watching the video recording of each speech, as participants were not able to complete the AAB until after their speech was complete. The AAB was also found to have acceptable interrater agreement ($\kappa = .79, p < .001$) and internal consistency ($\alpha = .74$).

Procedure

Before the initiation of the experiment, all participants were asked to provide informed consent, which involved a detailed description of the experiment and the nature of their participation. The study was conducted in a room with 2 prominent video cameras positioned on audio-visual carts carrying DVD recording equipment. Before their arrival at the room in which the study was conducted, all participants were randomly assigned to the high threat or low threat condition. All participants had an equal (50%) chance of being assigned to either condition. After consent procedures were completed, initial descriptive measures, including the demographics form, the SPS, BFNE, and BDI-II, were administered. Participants were directed to pick a speech

topic from a list of 10 topics provided by the experimenter. All topics required that participants express their opinions about something (e.g., their opinions about the city of Philadelphia and whether it is a good/safe reasonable place to live). They were then given 2 minutes to prepare their topic mentally (and independently), without making notes or an outline, and the experimenter left the room during this time. After 2 minutes, the experimenter returned and positioned the participant at the podium in the front of the study room before leaving to summon the 3 or 4 audience members. Upon returning, the audience members were seated approximately six feet away from the speaker, whom they faced directly. Both video cameras and the recording equipment were started by the experimenter, with one focusing on the participant and the other on the audience, and the participant was then asked to provide his/her current SUDS rating and was reminded to speak on his/her topic for a full 5 minutes. The experimenter remained in the room for the duration of the speech, holding a neutral expression throughout. Participants who stopped speaking before 5 minutes had elapsed were directed to “do [their] best to continue speaking, please.” After the speech had ended, participants were again asked to provide their current SUDS score as well as their peak SUDS score during the task. Audience members were excused.

As soon as possible after the speech had ended, participants were directed to create an image of their speech as it had just occurred and to play this image in their mind for 2 minutes, from beginning to end with the following prompt: “Now I would like you to take a couple of minutes to recall the speech that you just gave. Please replay the speech in your mind from beginning to end as you remember it. I will give you 2 minutes for this part of the experiment. If you find your mind wandering, just refocus on the task. I will tell you when 2 minutes have passed.”

After the imaginal exercise, participants were administered measures to assess the nature of their mental representation of the self as seen by others during the speech, which included the FRS, the IPQ and the PSP. Participants were also administered the AAB which allowed them to indicate the degree to which they were aware of the audience's evaluative behaviors and their overall valences. When these questionnaires had been completed, participants were debriefed, thanked, compensated for their time (with their choice of research credit or \$10.00), and dismissed.

CHAPTER 3
RESULTS

Preliminary Analyses

Means, standard deviations, and analyses of difference of the study's screening and descriptive measures are presented in Tables 1 through 3 on the following pages. These analyses demonstrate that the high and low anxiety groups differed on the PRCA, SPS, BFNE, and BDI-II, with the high anxiety group scoring higher on all of these measures of anxiety and mood.

Table 1. Descriptive Measures: Means (*M*s), Standard Deviations (*SD*s), and Tests of Differences between High and Low Speech Anxiety Groups

	High Anxiety		Low Anxiety		<i>t</i> ^a
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
PRCA	89.73	8.82	44.27	8.05	25.88*
SPS	25.23	13.56	8.00	5.63	7.83*
BFNE	23.06	7.25	13.34	4.65	7.58*
BDI-II	15.65	10.65	6.72	5.72	4.90*

Note. * $p < .01$; *N*'s range from 91-92 PRCA: Personal Report of Communication Apprehension; SPS: Social Phobia Scale; BFNE: Brief Fear of Negative Evaluation Scale (8 straightforward-worded items only); BDI-II: Beck Depression Inventory, Second Edition. ^aOmnibus ANOVAs significant for all measures.

Within the high anxiety group and within the low anxiety group, there was no difference between conditions on any of these measures, suggesting that randomization to condition was successful and differences in key analyses should be attributable to study manipulations and not baseline differences between conditions (see Tables 2 and 3).

Table 2. Descriptive Measures: Means (*M*s), Standard Deviations (*SD*s), and Tests of Differences between Speech Conditions in the High Anxiety Group

	Negative Audience		Positive Audience		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age	20.19	2.76	20.00	3.04	ns
PRCA	90.16	10.11	88.91	7.35	ns
SPS	25.04	15.01	25.50	12.40	ns
BFNE	23.64	7.64	22.27	7.04	ns
BDI-II	16.52	11.08	15.05	10.40	ns

Note: *N*'s range from 47-48. PRCA: Personal Report of Communication

Apprehension; SPS: Social Phobia Scale; BFNE: Brief Fear of Negative

Evaluation Scale (8 straightforward-worded items only); BDI-II: Beck Depression

Inventory, Second Edition

Table 3. Descriptive Measures: Means (*M*s), Standard Deviations (*SD*s), and Tests of Differences between Speech Conditions in the Low Anxiety Group

	Negative Audience		Positive Audience		<i>F</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Age	19.72	1.27	21.50	6.80	ns
PRCA	43.21	9.30	45.55	6.30	ns
SPS	7.08	5.05	9.10	6.22	ns
BFNE	12.58	4.15	14.25	5.14	ns
BDI-II	6.30	6.21	7.20	5.21	ns

Note: *N*'s range from 43-44. PRCA: Personal Report of Communication Apprehension; SPS: Social Phobia Scale; BFNE: Brief Fear of Negative Evaluation Scale (8 straightforward-worded items only); BDI-II: Beck Depression Inventory, Second Edition

Correlations of the descriptive measures are displayed below in Table 4. All correlations were significant ($p < .001$) and demonstrate relatively large linear relationships between variables.

Table 4. Descriptive Measures' Zero-Order Correlation Matrix

	SPS	BFNE	BDI-II
PRCA	.68*	.66*	.49*
SPS		.85*	.74*
BFNE			.70*

Note. *Ns* range from 91-92. PRCA: Personal Report of Communication Apprehension; SPS: Social Phobia Scale; BFNE: Brief Fear of Negative Evaluation Scale (8 straightforward-worded items only) ; BDI-II: Beck Depression Inventory, Second Edition. * $p < .001$

Manipulation Check

The coder's ratings of audience valence on the AAB were examined to determine if the confederate audiences in each condition were significantly different from one another in their demonstration of positively and negatively evaluative behavior. This item on the AAB ranges from 0 (*very negative*) to 8 (*very positive*), with 4 labeled as *neutral*. Objective ratings of audience valence of the positive audience show a mean rating of 5.8 ($SD = 0.79$), whereas the objective mean rating of negative audience valence was 2.49 ($SD = 0.94$). Thus the confederate audiences were objectively successful in offering study participants conditions that differed significantly in terms of positive and negative valence ($t(87) = 17.36, p < .001$).

Anxiety Induction

An interaction effect was predicted related to the experience of anxiety during the speech, such that participants in the high anxiety group/negative audience condition would report maximum ratings of SUDS higher than participants in the study's other three cells. In the high anxiety group, participants in the negative audience condition reported mean maximum SUDS scores of 68.56 ($SD = 24.54$), and those in the positive condition reported mean maximum SUDS scores of 78.29 ($SD = 18.54$). In the low anxiety group, those participants speaking to the negative audience rated maximum SUDS of 32.12 ($SD = 26.73$), and those in the positive audience condition rated maximum SUDS of 26.58 ($SD = 24.63$). Pooled across conditions, anxious participants rated their maximum SUDS at 73.00 ($SD = 22.39$) and non-anxious participants rated their maximum anxiety at 29.67 ($SD = 25.68$). However, a 2 (group) x 2 (condition) analysis of variance (ANOVA) yielded nonsignificant omnibus results not only for the interaction ($F(1, 87) = 2.23, p = .139$), but also, for the main effect of condition ($F(1, 87) = 0.08, p = .83$). The main effect for group was significant ($F(1, 87) = 72.25, p < .001$).

Cognitions during the Speech

Data regarding participants' cognition during their speeches was measured with the Free Recall of Speech free writing instrument (see Appendix C). Because the coding of self-focused cognition and audience-focused cognition was functionally interdependent, separate univariate ANOVAs (one for self-focused cognition, one for audience-focused cognition, and one for cognition valence) were conducted, to avoid violating multivariate assumptions of independence regarding the calculation of degrees of freedom. Predictions were that there would be significant evidence for a group x condition interaction such that high speech anxious persons in the negative audience condition would demonstrate more self-focused cognitions, more audience-

focused cognitions, and more negatively-valenced cognition than participants in the study's other 3 cells. It was also predicted that, more specifically, the high anxious group in the negative audience condition would experience more negative self-focused cognition and more negative audience-focused cognition than participants in the study's other 3 cells.

Audience-focused cognitions were determined as described above. Four participants did not complete the FRS. High speech anxious persons in the negative and positive audience conditions reported respective mean proportions of audience-focused cognitions of 23.8% ($SD = 20.33$) and 10.43% ($SD = 13.39$). Low anxiety participants in the negative and positive audience conditions reported respective mean proportions of 21.2% ($SD = 17.8$) and 33.63% ($SD = 24.6$). The group ($F(1, 87) = 0.64, p = .57$) and condition ($F(1, 87) = 0.001, p = .98$) main effects were not significant. However, there was a significant group x condition interaction for audience-focused cognitions, ($F(1, 87) = 9.80, p = .002$). Follow-up tests were Bonferroni corrected to control inflation of error rate among the six possible comparisons of means ($.05/6 = .0083$). Follow-up tests showed that high speech anxious persons in the negative audience condition reported no more audience-focused cognitions than high anxiety persons in the positive audience condition ($t(86) = 2.60, p = .014$), no more audience-focused cognitions than low anxious persons in the negative audience condition ($t(86) = 0.48, p = .64$), and no more audience-focused cognition than low anxious persons in the positive condition ($t(86) = 2.02, p = .04$). However, low anxious persons in the positive audience condition reported more audience-focused cognitions than low anxious persons in the negative audience condition ($t(86) = 2.28, p = .007$) and high anxious persons in the positive audience condition ($t(86) = 3.80, p = .001$).

Self-focused cognitions were also coded as explained above. High speech anxious participants in the positive audience condition reported cognition that was 74.91% ($SD = 26.16$)

self-focused, whereas high anxious persons in the negative audience condition reported cognition that was 55.20% ($SD = 20.61$) self-focused. In the low anxiety group, those in the positive audience condition reported 46.68% ($SD = 23.97$) of their cognition that was deemed to be self-focused, and those in the negative audience condition reported 59.62% ($SD = 24.21$) of cognition that was coded as self-focused. Main effects for group ($F(1, 87) = 0.52, p = .60$) and condition ($F(1, 87) = 0.05, p = .87$) were nonsignificant. However, the group x condition interaction was significant ($F(1, 87) = 10.44, p = .002$). A Bonferroni correction was again applied for follow up analyses ($.05/6 = .0083$). Follow-up tests demonstrated that high anxious persons in the positive audience condition reported more self-focused cognition than high anxious persons in the negative audience condition ($t(86) = 2.85, p = .007$), low anxious persons in the negative audience condition ($t(86) = 2.82, p = .006$), and low anxious persons in the positive audience condition ($t(86) = 3.55, p = .001$). All other comparisons of the four study cells yielded nonsignificant differences.

Although there was no evidence for a group x condition interaction in the test of cognition valence ($F(1, 87) = 0.003, p = .95$), there was a significant main effect for group ($F(1, 87) = 21.04, p < .001$) with high anxious participants demonstrating cognition that was more negative than low anxious participants. This would be expected (see Stopa & Clark, 1993) but adds little to the current study.

To examine the nature of participants' cognitions more closely, FRS data were also analyzed to determine the proportions of negative self-focused cognitions, positive self-focused cognitions, negative audience-focused cognitions, and positive audience-focused cognitions of participants in each of the study's 4 cells. High anxiety participants in the negative audience condition reported 25.79% ($SD = 18.48$) of their cognitions to be negative self-focused, 3.04%

($SD = 5.73$) to be positive self-focused, 12.18% ($SD = 11.87$) to be negative audience-focused, and 4.64% ($SD = 6.88$) to be positive audience-focused. High anxiety participants in the positive audience condition reported 31.83% ($SD = 23.27$) of their cognitions to be negative self-focused, 0% to be positive self-focused, 5.16% ($SD = 8.29$) to be negative audience-focused, and 3.30% ($SD = 5.70$) to be positive audience focused. In the low anxiety group, those in the negative audience condition reported cognitions that were 9.86% ($SD = 12.06$) negative self-focused, 6.91% ($SD = 11.60$) positive self-focused, 11.70% ($SD = 12.88$) negative audience-focused, and 3.95% ($SD = 6.28$) positive audience-focused. Those in the positive audience condition reported cognitions that were 10.93% ($SD = 9.16$) negative self-focused, 4.01% ($SD = 6.73$) positive self-focused, 9.38% ($SD = 11.61$) negative audience-focused, and 10.01% ($SD = 11.92$) positive audience-focused.

As explained above, because classification of cognitions as self- or audience-focused is interdependent, separate univariate omnibus analyses were conducted to avoid violating multivariate assumptions of independence regarding the calculation of degrees of freedom for multivariate analysis of variance. In examination of negative self-focused cognitions, results show nonsignificant main effects for group and condition and a nonsignificant interaction effect. However, for positive self-focused cognition, there was a significant main effect for group ($F(1, 87) = 318.8, p = .011$), such that low anxiety participants evidenced more positive self-focused cognition than high anxiety participants. The main effect for condition and the group x condition interaction were nonsignificant. In the analyses of negative audience-focused cognitions positive audience-focused cognition, there were no significant effects.

Self-Imagery

Attention to internally generated foci was assessed through participants' responses to items on the IPQ and the PSP subscales. A 2 (high vs. low speech anxious) x 2 (social threat condition) multivariate analysis of variance (MANOVA) was conducted to test hypotheses regarding imagery during the speech. Upon examination of the Wilks' Lambda test statistic, a multivariate interaction was not observed, contrary to study predictions, nor was a main effect for condition. However there was a significant multivariate main effect for group (see Table 5 for means and *SDs* for items on the IPQ; $F(8, 87) = 11.18, p < .001$). A Bonferroni correction was applied to follow up-tests to control for error inflation among all possible comparisons of the self-imagery dependent variables ($.05/8 = .006$). Follow up univariate analyses show that, compared to low anxiety peers, the high anxiety group rated their images during the speech more negatively ($F(1, 87) = 14.10, p < .001$), evaluated their performance on the speech more negatively on the negative PSP subscale ($F(1, 87) = 43.18, p < .001$), and rated their speech less positively on the positive PSP subscale ($F(1, 87) = 73.12, p < .001$). However, unexpectedly, the low anxiety group rated their images as seeming more realistic to them than the high anxiety participants rated their own ($F(1, 87) = 8.20, p = .005$).

Table 5. Means (*M*s) and Standard Deviations (*SD*s) of items on the Imagery and Perspective Questionnaire

	High Anxiety		Low Anxiety	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
How positive or negative were the images?	3.50	2.12	5.14	2.01
How vivid were the images?	4.16	1.75	4.91	1.74
How realistic or true were the images?	4.41	1.74	5.56	1.88
How much of an observer/field perspective did you take?	3.35	1.99	2.35	1.45
How clear were the sounds of the image?	3.41	2.10	4.63	2.38
How typical were these images for delivering a speech?	3.89	2.42	4.44	1.94
Total PSP score	37.3	10.81	19.14	8.81

Note: *N*'s range from 88-92. PSP: Perception of Speech Performance Scale

Audience Behaviors

Participants' attentional focus on the audience was assessed with the items of the AAB. See Table 6 for means and standard deviations of the AAB for the study's cells. Again a 2 x 2 MANOVA was conducted, and the Wilks' Lambda test statistic was examined to test hypotheses

about the positive and negative AAB subscales. Again, there was no evidence for the predicted interaction effect, and the main effect for group was not significant; however, there was a significant main effect for audience condition ($F(2, 87) = 13.85, p < .001$). A Bonferroni correction was applied to control error inflation among follow-up univariate tests ($.05/2 = .025$). Follow-up ANOVAs demonstrated that the individuals delivering a speech to a negative audience detected more negative behaviors than those delivering to a positive audience ($F(1, 87) = 9.60, p = .003$), whereas those delivering speeches to positive audiences reported noticing more positive behaviors than those delivering speeches to negative audiences ($F(1, 87) = 12.83, p = .001$).

Table 6. Means (*M*s), Standard Deviations (*SD*s) of Participant Responses on the Assessment of Audience Behaviors Questionnaire (AAB)

	High Anxiety				Low Anxiety			
	Negative Audience		Positive Audience		Negative Audience		Positive Audience	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
AAB Negative Items	6.29	3.22	3.61	2.33	6.33	3.71	4.94	2.57
AAB Positive Items	4.08	2.78	6.23	2.76	4.62	2.08	6.58	3.10

Note. *N*'s range from 19-21 per cell. Individual AAB items range from 0 (*Never Occurred*) to 4 (*Occurred more than 10 times*). The highest (7-item) score possible for either subscale is 28.

Comparing Participant Ratings with those of the Uninformed Coder

Participants' ratings were compared with those of the uninformed expert coder to test for predicted interaction effects in tests of several dependent variables: ratings of speech performance on the two PSP subscales and detection of audience behaviors on the subscales of the AAB. To test for these differences, a 2 (participant vs. coder) x 2 (anxious vs. non anxious groups) x 2 (negative vs. positive audience conditions) MANOVA was conducted, with "rater" (participant or coder) as the within-subjects factor and condition and groups as the between-subjects factors. Examination of the Wilks' Lambda multivariate test statistic revealed that there was only a significant main effect for rater ($F(4, 87) = 6.81, p < .001$). Contrary to prediction, there were no differences based on anxiety level or condition. A Bonferroni correction was applied to control alpha inflation among univariate follow up tests ($.05/4 = .013$). Follow-up analyses show that the coder's scores on the PSP negative scale ($M = 3.93, SD = 16.11$) were significantly less negative than those of the participants ($M = 14.27, SD = 7.95; F(1, 87) = 69.74, p < .001$). On the AAB, the coder ($M = 4.08, SD = 0.71$) reported fewer negative audience behaviors than the participants ($M = 5.60, SD = 3.27; F(1, 87) = 15.08, p < .001$). The coder ($M = 4.35, SD = 0.81$) also reported fewer positive audience behaviors than the participants ($M = 5.32, SD = 2.88; F(1, 87) = 9.68, p = .003$).

Correlational analyses

Several hypotheses were proposed regarding the linear relationships among dependent variables for the high anxiety group. However, each of these tests yielded nonsignificant results, and thus no hypotheses regarding these dependent variables were supported for the high anxiety group. Specifically, it was predicted that detection of negative audience behaviors (measured by the negative subscale of the AAB) would be negatively correlated with the valence of self-

imagery (measured by the IPQ; $r(44) = .021, p = .83$). It was also predicted that detection of negative audience behaviors (negative subscale of the AAB) would be positively correlated with the vividness of auditory and visual self-imagery (as assessed by specific IPQ items; $r(45) = .24, p = .11$; $r(45) = -.11, p = .49$), anxiety symptoms and self-perceived performance deficits (measured by the negative subscale of the PSP; $r(45) = .17, p = .27$), degree of observer perspective taken during the speech (IPQ item; $r(45) = .23, p = .11$), and proportion of negative self-focused thoughts ($r(45) = .07, p = .64$). It was also predicted that the detection of negative audience behaviors (AAB negative subscale) would be negatively correlated with perceived performance strengths during the speech (measured by the positive subscale of the PSP; $r(45) = -.28, p = .07$).

Follow-Up Exploratory Correlational Analyses

Although exploratory and worthy of more cautious interpretation, inspection of the correlation matrix of the same dependent variables among high anxiety participants revealed several significant linear relationships. To control for alpha inflation (given that these analyses were not planned), a Bonferroni correction was applied ($.05/14 = .003$). Specifically, for the high anxiety group, percentage of audience-relevant cognitions reported on the FRS was negatively correlated with the participants' report of overall image valence ($r(45) = -.48, p = .001$), suggesting a link between evaluation they perceived coming from the audience and how negative they rated their image to be. However, there was no significant correlation when negative and positive self-focused and audience-focused cognitions were examined more closely. Also, participant ratings of image vividness (visual component) was positively correlated with scores on the positive subscale of the PSP ($r(45) = .57, p < .001$), suggesting a relatively strong link

between vividness of internal representations of the self during the threatening speech and how well one believed he performed during that task.

CHAPTER 4 DISCUSSION

Study Overview

Attentional focus is a process that has been demonstrated in many studies using several different experimental paradigms, and which, in some form, is fundamental to the two predominant cognitive behavioral models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997). Clark and Wells suggest that attentional focus on internal threat cues is perhaps the most crucial attentional process in the social anxiety fear response. Specifically, they contend that, when threatened by social situations, socially anxious individuals become overly engaged with negatively biased self-focused cognitions and imagery and generally disengage from the cues that actually exist in their environment. Thus, as they consider their performance in past social situations, they are not able to incorporate potentially disconfirmatory environmental evidence. Rapee and Heimberg generally agree that socially anxious persons tend to engage in negative self-focused cognition and to focus on negative self-focused imagery. However, they disagree that this is the only form of attentional bias operating during social situations. Rather, the Rapee and Heimberg model also makes a place for attentional bias to external, environmental threat, such that socially anxious persons are likely to attend more to negative evidence that confirms their fears than positive or neutral information that does not. Further, Rapee and Heimberg's model suggests that socially anxious persons are likely to experience bidirectional interplay between internal and external attentional bias to threat. Specifically, Rapee and Heimberg posit that detection of threat cues in one area of attentional bias should influence the detection of threat in the other.

At this point, however, no study has tested hypotheses about the potential interplay of internal and external attentional bias by directing socially anxious persons to confront the

stimulus that they actually fear. The literature is rife with examples of computer-based experiments and lexical decision making or word-reading tasks. The problems with such paradigms are laid out above. The current study was proposed to add data to the literature that might offer clarification regarding the discrepancies between the Clark and Wells (1995) and Rapee and Heimberg (1997) models. The hypotheses set forth in this study were based on the Rapee and Heimberg model of social anxiety. As demonstrated above, a number of the hypotheses made in prediction of this interactive process were not supported. However, some of the results may offer some evidence to clarify the manner in which attentional bias is understood, tentatively supporting claims made by Clark and Wells and Rapee and Heimberg, regarding the nature of self-focus during anxiety provoking situations.

Primary Findings

Consistent with Rapee and Heimberg (1997), predictions in this study were that speech anxious persons speaking to negative audiences would be more likely to experience more self- and audience-focused cognition than participants in the study's other cells. However, the high anxiety group speaking to negative audiences did not differ in their experience of audience-focused cognitions from those speaking to positive audiences. Also, the high anxious persons in the negative audience condition did not differ in number of audience-focused cognitions from those persons low in anxiety in the negative audience condition or positive audience condition.

Examination of self-focused cognition yields more straightforward, yet unexpected results. The high anxious persons in the positive audience condition evidenced more self-focused cognition than the high anxious persons in the negative audience condition, as well as low anxious persons in both audience conditions. It was expected that the high anxiety participants in the *negative* audience group would evidence greater self-focus than those in the positive

audience. In terms of valence of cognition, there was a main effect for group, such that the high anxiety group evidenced more negative cognition than the low anxiety group.

Because these analyses did not allow for closer inspection of the type (i.e., valence) of cognition that was directed at the self or the audience, additional analyses were conducted, with the prediction that the high anxiety group speaking to a negative audience would experience more *negative* self-focused and audience-focused cognitions than the participants in the study's other 3 cells. However, these analyses also offered little support for the study's hypotheses. A main effect was found, however, suggesting that low anxiety participants evidenced more positive self-focused cognition than high anxiety participants.

Analyses did not reveal the expected interaction effect in self-imagery. Rather, a main effect for group was found such that, compared to low anxious participants, high anxious participants reported experiencing images during the speech that were more negative, and poorer evaluations of their own apparent anxiety and speech performance. Each of these findings would be expected; however, they are not sufficient to demonstrate differences between the Clark and Wells (1995) and Rapee and Heimberg (1997) models, and they do not suggest that the behaviors of the different audiences had any particular effect. Low anxiety participants reported that images felt more realistic to them than high anxiety participants did, with apparently clearer auditory components. Explanations for this difference may be considered surprising. Hirsch et al. (2006b), posit that among high socially anxious persons, negative images are likely experienced as quite representative of their life experience and, in their study, were rated as ego syntonic.

Also, there was no evidence for the interaction effects expected in the examination of the AAB and attention paid to the audience. There was evidence, however, for a main effect for condition. Specifically, those speaking to negative audiences recalled more negative audience

behavior than those speaking to positive audiences. Similarly, those speaking to positive audiences recalled more positive audience behaviors than those speaking to negative audiences. This also would be expected but did not support the hypothesis that participants' anxiety would be a factor in the amount and type of audience behavior that was recalled after the speech.

In comparing participant ratings to those made by the coder, only the main effect of rater was significant. On the PSP negative subscale, the coder's scores reflect a tendency to rate participants' speeches as less negative and their anxiety symptoms as less evident than participants rated themselves. This does not reflect the predicted interaction, which was expected to show that high anxious persons in the negative audience condition would demonstrate the greatest discrepancy between themselves and an objective rater. Also, on the AAB subscales, the coder rated audience behaviors (both positive and negative) as less frequent than the participants did, regardless of the audience condition or participant's anxiety. This too is contrary to study hypotheses, which suggested that high anxious persons in the negative audience condition would be most likely to over-report negative audience behaviors.

Examination of the study's correlation matrix generally failed to yield evidence of a possible link between participants' internal experiences during the speech and what they detected in the environment. It was predicted that self-reported audience behaviors on the AAB would be correlated with measures of cognition, imagery, and sense of performance throughout the speech. However, exploratory analyses of the high anxiety group suggest that there was a significant negative correlation between the number of audience-focused cognitions reported and how negative participants' images were. Also in the high anxiety group, image vividness was significantly correlated with scores on the PSP. However, this correlation was also negative, but

less intuitive, suggesting that participants with more critical ratings of their performance and higher ratings of how anxious they appeared were *less* likely to rate their image as vivid.

Consideration of Primary Findings

Altogether, the findings of this study do not offer clear evidence in support of one cognitive behavioral model over another. In terms of cognition, high anxiety persons in the positive audience condition generally reported the most self-focused cognition. The main effect that the high anxious persons reported more negative cognition than low anxious individuals is not surprising, and this is consistent with the findings of Stopa and Clark (1993) and Dodge et al. (1988) that point to the negative aspects of cognition in socially anxious individuals. However, unfortunately, the current study was not able to elucidate how this might differ given more or less negative environmental data available to socially anxious persons. Even the more fine-grained analyses that included both direction and valence did not offer further support of hypotheses.

The findings related to imagery and speech performance also do little to advance the literature toward better clarification of the differences between the Clark and Wells (1995) and Rapee and Heimberg (1997) models. Again, main effects indicate that higher levels of anxiety are associated with negative imagery, low self-ratings of performance, and a tendency to take the observer perspective. These findings are consistent with those of Hirsch et al. (2006b). Further, if either model has earned support in these findings, it may be Clark and Wells'. Specifically, the nonsignificant interaction effect related to imagery and perspective may suggest that anxious persons in the study were indeed over-engaged with internal imagery and did not respond differentially to negative or positive audiences. Accordingly, engagement with internal cues

would preclude the modulation of imagery, perception of performance, and estimations of anxiety visibility based on the type of audience response.

The study also did not find support for an attentional bias to external threat. Rather, persons in each audience condition happened to notice/recollect the predominant set of evaluative behaviors presented by the audience. Because there is no evidence for high anxious persons in the high threat condition overestimating the threat present, there is little direct support for Rapee and Heimberg (1997). This is also not consistent with the findings of Veljaca and Rapee (1998), a study which clearly supports the claims of Rapee and Heimberg. In their study, Veljaca and Rapee trained confederates in a range of positive and negative behaviors in a manner similar to the current study. However, Veljaca and Rapee's evaluative behaviors (e.g., yawning) were perhaps not as *clearly* evaluative as those in the present study (e.g., eye-rolling). Yawning behavior is ambiguous and potentially innocuous (possibly indicative of a poor night's sleep rather than definitely indicative of boredom with the speaker). The behaviors affected by the present study's confederates were chosen to be more *decidedly* evaluative (e.g., an audience member shaking his head at the speaker). The current study's behaviors may have been more salient to all participants, and thus more difficult for low anxious persons to disregard, as they may have disregarded yawning in Veljaca and Rapee's experiment. The behaviors of the current study may also be unlikely to arise in most social situations, as such blatant evaluation from strangers may be unusual. Therefore, Veljaca and Rapee may have chosen behaviors that are more easily misinterpreted by persons inclined toward attentional and interpretation bias than those in the present study.

The lack of interaction effects in comparisons of coder and participants does not seem to point to the Clark and Wells (1995) model, *per se*. Specifically, participants did not differ from

one another in their recollection of audience behaviors, as participants in each cell were likely to report an exaggerated estimation of audience behaviors, whether positive or negative. If Clark and Wells' "anxiety programme" (p. 70) were indeed responsible for the lack of interaction effect predicted for hypotheses related to coder versus participant ratings, one would expect to see a group by rater interaction, similar to the effect seen in imagery tests, such that anxious persons would be more inaccurate than nonanxious persons, possibly because they were more engaged with their own internal imagery than with what they could see in the audience.

Planned correlations offer no significant results and thus related hypotheses go unsupported as well. Exploratory analyses offer data that very tentatively point to some evidence of a link between internal and external attentional processes in social anxiety. In the high anxiety group, the link between the number of audience-focused cognitions and the valence of self-imagery suggests that preoccupation with the audience is in some way related to poorer internal representations of the self. This appears to be directly supportive of the Rapee and Heimberg (1997) model, offering a small clue about the interactions of internal and external attentional focus.

The lack of support for the study's predictions may be attributed to a number of alternative hypotheses. However, first, it must be considered that the proposed link between internal self-focus and focus on the external environment does not exist or does not operate in the manner prescribed by Rapee and Heimberg (1997; and further asserted by Veljaca & Rapee, 1998, and Schultz & Heimberg, 2008). However, only modest data from this study seem to indicate that this hypothesis should be rejected, namely those associated with imagery. The other analyses in this study simply indicate main effects supportive of previous studies that demonstrate that social anxiety is associated with negative cognitions and poor ratings of oneself.

Also, it is possible that the instruments that served as the study's dependent variables were not sufficiently sensitive to detect differences among the study's four cells. The Imagery and Perspective Questionnaire asks relatively broad questions about the vividness of the image, the perspective with which it was experienced, as well as overall valence. Similarly, the AAB asked respondents to make ratings that are only estimates of behaviors that they noticed within a specific range. More fine-tuned analysis of audience behaviors may have allowed for clearer differences to be observed between groups. For example, Veljaca and Rapee (1998) allowed their participants to make ratings of audience behavior online. Participants were trained to operate an electronic switch when they noted a positive or a negative behavior in the audience. Although some (e.g., Mansell et al., 2003) have claimed that *directing* anxious persons to locate cues of evaluation in the environment may make research participants unnaturally attentive to these cues, there are likely to be significant advantages to the assessment of attention to social evaluation *as it happens*. These data may suffer less from revisions and reconstructions of the social situation post-mortem, which is an important distinction to be made among persons high in social anxiety (see Brozovich & Heimberg, 2008 for a review of post-event processing in social anxiety).

Clinical Implications

The findings of the present study confirm that socially anxious individuals indeed experience higher peak levels of anxiety during social situations than non-anxious individuals. Cognitive behavioral therapy for social anxiety typically indicates that exposure exercises are very helpful in reducing anxiety and improving sense of mastery in patients. Although they have higher levels of anxiety than are likely experiences as very aversive, socially anxious persons would likely benefit from exposures to endure until habituation of anxiety is achieved. Without

such achievement, the fear structure is unlikely to be changed meaningfully, and clients will not alter their schema to understand their fears as unreasonable (Foa & Kozak, 1986).

The demonstration of more negative cognition among the higher anxiety group suggests that socially anxious individuals do indeed experience negative thinking, most likely about themselves and their abilities in social situations. Therefore, cognitive behavioral therapy would likely be most effective if therapists focus on helping clients detect, challenge, and correct these negative cognitions, using evidence to bring their beliefs more in line with reality.

This study also confirms that socially anxious persons experience generally more negative imagery than nonanxious counterparts. Therefore, video feedback (see Rapee & Hayman, 1996) exercises would likely be useful in the alteration of the negative images. In these procedures, therapists videotape their patients engaging in an exposure exercise and then provide their clients with objective feedback on their appearance and performance. This ostensibly breaks the anxiety program prescribed by Clark and Wells (1995).

The exploratory correlations of the present study suggest that cognitive focus on audience members may be related to more negative imagery, overall. Therefore, cognitive behavioral therapy may best benefit clients with social anxiety if therapists recognize particular patterns of cognitive preoccupation and help clients to attend to useful self-related data as well.

Limitations of the Current Study

A significant limitation to the current study is the nonsignificant difference between maximum (SUDS) anxiety level experienced between the high anxiety group speaking to negative audiences and the high anxiety group speaking to positive audiences. This difference was predicted to be significant, as it was hypothesized that, in line with Rapee and Heimberg's (1997) model, anxious individuals would be aware of their external environment and attentive to

negative cues (i.e., negative audience behaviors) that would then induce greater subjective levels of anxiety. Clark and Wells (1995) do not make such clear predictions about the potential effects of the external environment's influence on socially anxious persons' internal experience. In the current study, it is possible that the main manipulation (confederates' evaluative behaviors) were not strong enough to prompt the differences in anxiety that were expected between the study's cells. This particular finding may speak to the general lack of study results. The predictions of the study were contingent upon the audience's behaviors having particularly strong emotional meaning to the participants; high anxiety participants in the negative audience condition were expected to become more preoccupied with self-imagery and self-focused cognition, as they would be monitoring themselves for signs of weakness or internal threat (in the face of external threat). However, if the audience behaviors were not sufficiently strong or realistic, this process would be less likely to occur.

It is also possible that the SUDS scale was not a sufficiently sensitive method for assessing anxiety. For example, participants were only given 2 anchors (0 and 100) with the highest pole being defined as "the worst anxiety you have ever experienced." Establishing and defining personally relevant anchors with each participant may have been desirable. Also, use of a psychometrically-sound assessment device, such as the Brief State Anxiety Measure (Berg, Shapiro, Chambless, & Ahrens, 1998) may have offered the assessment of anxiety improved validity and reliability.

Many of the measures developed for this study were untested and too new to merit confidence in their psychometric strength. The items contained in Image and Perspective Questionnaire provided single-item assessments of some relevant dimensions, which have limited reliability and validity. Perhaps a more significant limitation applies to the study's aim to

assess the mental representation of the self as seen by the audience. For the current study, cognition (in a free writing task) and imagery (with the PSP and the untested IPQ) were chosen. However, the internal aspects of the self that are theoretically foci of attention in social anxiety are obviously complex and may not have been adequately captured here.

For the purposes of studying attentional processes in a relatively uninterrupted fashion, a retrospective rating task was adopted for this study, rather than an online task in which participants were directed to count or record evaluative audience behaviors. Online tasks yield useful data regarding attentional process; however, they may also distract participants and change the nature of the processes under study. One could argue (as do Perowne & Mansell, 2002) that *directing* persons to attend to the cues in the environment may prime them to expect and remain vigilant for behaviors that they may have disregarded under more natural circumstances. Schultz and Heimberg (2008) argue that asking socially anxious persons to be vigilant for audience behaviors may be no more unnatural than asking them to give a speech (as they are likely to attend to audience behaviors automatically). Nevertheless, asking participants to reconstruct the behaviors of the audience retrospectively may be problematic as well. There are major disadvantages to assessing attention off-line. Rapee and Heimberg (1997) and Clark (2001) outline the manner in which socially anxious persons reflect on social situations, which is influenced not only by attentional but also interpretation/inferential bias (also see Brozovich & Heimberg, 2008). Therefore, in the short time between the end of the speech and making ratings on the AAB, participants may not only have recalled clearly evaluative/trained social behaviors but also random, ambiguous behaviors that they may or may not have construed to be evaluative/relevant to the task. A major advantage of the Veljaca and Rapee (1998) study was that they directed their participants to code audience behaviors as they happened.

No assessment was made of the study's overall success in recreating the potentially challenging task of delivering a speech to an apparently evaluative audience. In other words, the extent to which participants actually believed that they were speaking to unbiased (and of course untrained) strangers was not assessed and is not known. This is an important, potentially confounding variable. It is suggested here that the present study is an improvement over computer-based paradigms, given its ecological validity; however, there is still something somewhat unnatural about being directed to deliver a speech to strangers in a psychology clinic. It is likely that at least some of the participants had some doubt about the behaviors that they noticed as they spoke. During the post-experiment debriefing session, some participants did indeed comment on the apparent artificial nature of the task and noted that they were aware the audience was instructed to act according to a script. However, other participants commented that, although they were aware of the audience's clearly evaluative behaviors, they did not realize they were not genuine reactions to the speech. No participants stated that they were aware of the study's hypotheses.

The purpose of this study was to offer data that might clarify the potential interplay of internal and external self-focus in social anxiety, particularly as these attentional processes are prescribed in the Rapee and Heimberg (1997) cognitive behavioral model of social anxiety. However, the current study would offer more to the literature if it had recruited a clinical sample of individuals with social anxiety disorder. Thus, a significant and obvious limitation was the recruitment of an analog sample. The present study was conducted at Temple University, which requires that students taking introductory psychology classes participate in research. Thus the participants comprised a sample of convenience. This makes the conclusions of the current study difficult to translate to a clinical population.

Directions for Future Research

The overall findings of this study do not offer the predicted support for Rapee and Heimberg (1997). Further, some data presented above seem to support Clark and Wells (1995) and the possibility that socially anxious persons, when their fear is activated, engage in an anxiety program that consists of negative self-images and cognitions (however, only images are indicated here). However, despite the lack of support for Rapee and Heimberg (1997) in this study, many experimental data do support the notion of attentional bias to external threat and these findings have been replicated many times across several experimental paradigms (e.g., Asmundson & Stein, 1994; Mattia et al., 1993; Mogg & Bradley, 2002). A major hurdle for the field has been to bring together a precise study of the complex construct of attention in the context of a truly threatening social situation. In the literature, either precision/experimental control or ecological validity has been compromised. Therefore, future research must move toward experimental designs that account for each. Eye tracking technology and virtual reality paradigms may allow for more tightly controlled study of attentional process while a socially anxious person is engaged with a relatively realistic threat situation.

In social anxiety, threat may be evident not only in another's face but also in self-imagery and other self-relevant cues from moment to moment, and sensitive measurement of these internal cues was likely a problem in this study. Hackmann et al. (1998) recognized the importance of the idiosyncratic nature of imagery in social anxiety, as individuals with social anxiety disorder often reexperience images that may have been relevant to the development or exacerbation of their disorder. Capturing the complexity of internal representations of anxiety will also be critical to the advancement of the field of attentional focus in social anxiety.

Conclusions

Although this study cannot offer clarity to the differences between the predominant models of social anxiety, it does underscore the presence of negative cognition, negative imagery, and underestimation of self-appraisals in elevated anxiety in social situations. The overall message to be taken from this study is that both models were generally supported, and social anxiety indeed can be understood as a disorder of skewed, negative cognition, and biased self-imagery. With more sophisticated assessment of attentional deployment to the environment, a better understanding of attentional bias, both internal and external, will follow. Clinical experience with socially anxious persons tells us that internal and external foci do interact. Evolutionary models of social anxiety (e.g., Trower and Gilbert, 1989) tell us that mammals, including humans, measure external threat and behave in ways to escape or reduce it. Clark and Wells (1995) do not adequately address this issue in their model of social anxiety, and future research must work to reconcile this model with existent and growing bodies of literature.

Overall, the models of social anxiety must be clarified. Better understanding of social anxiety disorder will be particularly useful in as much as it informs effective psychosocial interventions. Clark and colleagues implement video feedback and other interventions aimed at altering the mental representations of the self (see Clark et al., 2003). Heimberg and colleagues aim to address both these internal representations as well as socially anxious persons' attributions of apparent audience behavior (see Hope, Heimberg, Juster, & Turk, 2000; Hope, Heimberg, & Turk, 2006). Improved understanding of the likely interplay of these attentional processes will likely result in important treatment refinements.

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APPENDIX A
MEASURES OF INTERNALLY DIRECTED ATTENTION

Free Recall of Speech

Imagery and Perspective Questionnaire

Free Recall of Speech

Instructions: Now that you have recalled your speech, please think back to the images that you saw, the sounds that you heard, and the thoughts that came to your mind while you reviewed yourself speaking to the audience. Describe below these images, sounds, and thoughts in as much detail as necessary to convey your experience. What did you see in your mind? What did you hear in your mind? What thoughts occurred to you while you were speaking?

Imagery and Perspective Questionnaire

Instructions: Each item below is related to your speech. Please think back to what came to mind when you recalled speaking to the audience and respond to each item based on that recollection. Specifically, consider what you saw with your mind's eye during the time that you recalled yourself speaking to the audience as you answer the following questions.

1. How positive or negative were the images that came to your mind while you were speaking to the audience?

0	1	2	3	4	5	6	7	8
Very Negative		Moderately Negative		Neutral		Moderately Positive		Very Positive

2. How vivid were the images that you saw while you were speaking to the audience?

0	1	2	3	4	5	6	7	8
Not at all vivid		Slightly vivid		Moderately vivid		Very vivid		Extremely Vivid

3. How realistic or true did the images in your mind seem while you were speaking to the audience?

0	1	2	3	4	5	6	7	8
Not at all realistic		Slightly Realistic		Moderately realistic		Very realistic		Extremely Realistic

4. How clear were the sounds of the images that you heard while you were speaking to the audience?

0	1	2	3	4	5	6	7	8
Not at all clear		Slightly clear		Moderately clear		Very clear		Extremely Clear

5. In the images that came to mind while you were speaking to the audience, how much did you find you were looking out at the audience through your own eyes and how much did you find you were watching yourself speak as if through someone else's eyes?

-3	-2	-1	0	1	2	3
Entirely looking out through my eyes						Entirely observing myself from an external point of view

6. How typical were the images you experienced during your speech compared to images that come to mind during other social situations (like speaking up at a meeting?)

0	1	2	3	4	5	6	7	8
Not at all typical		Slightly typical		Moderately typical		Very typical		Extremely typical

APPENDIX B
MEASURE OF EXTERNALLY DIRECTED ATTENTION

Assessment of Audience Behaviors

Assessment of Audience Behaviors

Instructions: Each item below is related to your speech. Please think back to what came to mind when you delivered your speech to the audience and respond to each item based on that recollection. Specifically, consider what you saw while you were speaking to the audience as you answer the following questions.

A. How positive or negative was your audience while you were speaking?

0	1	2	3	4	5	6	7	8
Very Negative		Moderately Negative		Neutral		Moderately Positive		Very Positive

B. How often did you notice audience members engaging in the following behaviors while you were speaking to them?

		Never Occurred	1-3 times	4-6 times	7-10 times	More than 10 times
1. Nodding head up and down	0	1	2	3	4	
2. Rolling their eyes	0	1	2	3	4	
3. Looking around room	0	1	2	3	4	
4. Scratching their nose	0	1	2	3	4	
5. Frowning	0	1	2	3	4	
6. Pointing in agreement	0	1	2	3	4	
7. Crossing their legs	0	1	2	3	4	
8. Shaking their head from side to side	0	1	2	3	4	
9. Smiling	0	1	2	3	4	
10. Shifting in their seat	0	1	2	3	4	
11. Laughing along with you	0	1	2	3	4	
12. Taking notes as you speak	0	1	2	3	4	
13. Sighing loudly	0	1	2	3	4	

	Never Occurred	1-3 times	4-6 times	7-10 times	More than 10 times
14. Yawning	0	1	2	3	4
15. Listening carefully	0	1	2	3	4
16. Nodding off to sleep	0	1	2	3	4
17. Leaning forward	0	1	2	3	4