

**COGNITIVE BIASES IN SOCIAL ANXIETY: AN EXPERIMENTAL
STUDY OF THE CLARK/WELLS MODEL**

by

TANNA MARLANE BOUCHER MELLINGS

B.Sc., The University of Victoria, 1993

M.Sc., Central Washington University, 1995

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF**

MASTER OF ARTS

IN

THE FACULTY OF GRADUATE STUDIES

(Department of Psychology; Clinical Psychology)

**We accept this thesis as conforming
to the required standard**

THE UNIVERSITY OF BRITISH COLUMBIA

April 1998

© Tanna Marlane Boucher Mellings, 1998

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of Psychology

The University of British Columbia
Vancouver, Canada

Date July 22, 1998

Abstract

This study examined cognitive processing of internal and external sources of information during social interactions. Socially anxious (N=58) and nonanxious (N=58) male and female students participated in a social interaction with a confederate and then completed measures of attentional focus, social judgment, memory for various types of social information, and rumination. Compared to nonanxious participants, socially anxious participants selectively attended to self versus partner information, displayed greater judgmental biases, recalled less partner-related and more self-related information, and displayed greater post-interaction rumination. State anxiety did not significantly affect memory. The results suggested that socially anxious subjects displayed selective attention and encoding rather than selective retrieval of social information.

Table of Contents

Abstract	ii
List of Tables.....	v
Acknowledgements	vi
CHAPTER I Introduction	1
1.1 Social Phobia	1
1.2 Clark & Wells Cognitive Model.....	1
1.3 Cognitive Processes.....	4
1.4 Selective Attention and Judgmental Biases in Social Anxiety.....	6
1.5 Selective Memory	8
1.6 Selective Encoding and Retrieval	13
1.7 Summary	14
1.8 Overview of Current Study	15
CHAPTER II Method	16
2.1 Subjects.....	16
2.2 Personnel	17
2.3 Procedure.....	18
2.4 Measures.....	20
CHAPTER III Results	25
3.1 Manipulation Checks and Supplemental Analyses	25
3.2 Main Analyses	26
CHAPTER IV Discussion	28
References.....	34
Appendix A Social Avoidance and Distress Scale	39
Appendix B Experimenter and Confederate Protocols.....	40
Appendix C Experimenter and Observer Rating Sheets	42
Appendix D Consent Form.....	44
Appendix E Measures Used in the Study.....	45
Appendix F Debriefing	59

Appendix G Open-ended Description Categories 61

List of Tables

Table 1	Means and standard deviations for scores on the State Anxiety Inventory .	62
Table 2	Means and standard deviations for partner and setting-related information, open-ended description, behaviour ratings, and rumination	63
Table 3	Means and standard deviations for the Focus of Attention Questionnaire and the behaviour measure	64

Acknowledgements

I would like to thank my supervisor, Dr. Lynn Alden, for her tremendous support and patience throughout the past two years. Her guidance and expertise on this project were invaluable. I would also like to acknowledge the support and encouragement of my husband and parents, without whose caring this project could not have been completed. Finally, I would like to thank my committee members for the time and effort they put into polishing the research methods and written draft for this project.

Social Phobia

According to the DSM-IV, the essential features of social phobia are:

1. A marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others.
2. Marked anxiety upon exposure to the feared social situation.
3. Recognition that the fear is excessive or unreasonable.
4. Feared situations are avoided or endured with intense anxiety or distress.
5. Significant impairment of occupational functioning, social activities or relationships, and/or normal routine due to avoidance, anxious anticipation or distress (APA, 1994, pp. 416-417).

Typically, people with social phobia are hypersensitive to criticism, negative evaluation or perceived rejection. They are nonassertive, have low self-esteem, and have small social networks. Many do not marry (APA, 1994). Although social phobia was identified as a distinct condition by Marks and Gelder (1966), relatively few empirical studies were conducted until a decade later (Heimberg, 1989). It is now recognized that social phobia can cause significant social and occupational impairment (Heimberg, 1989).

Early models of social phobia emphasized social skill deficits and conditioned anxiety. However, more recent models have incorporated cognitive elements (Heimberg & Juster, 1995). In fact, some writers have asserted that cognitive factors are more central to social phobia than the other anxiety disorders (e.g. Butler, 1985).

Clark and Wells (1995) Cognitive Model

Clark and Wells (1995) recently proposed a model of social phobia that combines cognitive processes with the notion of safety behaviours. Briefly, these

writers suggest that as a result of past experiences, social phobics have developed negative beliefs about themselves and their social worlds that lead them to expect negative social outcomes. Such beliefs and perceptions activate an "anxiety program," a constellation of cognitive, somatic, and behavioural changes designed to protect themselves from negative outcomes. Unfortunately, however, these changes maintain or exacerbate social anxiety and even produce the very outcomes that the phobic person fears. According to Clark and Wells, this "anxiety program" also prevents the disconfirmation of phobics' inaccurate beliefs. They distinguish four processes that are involved in preventing disconfirmation.

1. Self-focused attention and emotional reasoning. When social phobics perceive social danger (e.g., impending scrutiny, rejection, or criticism), they focus their attention on detailed monitoring of themselves. Unfortunately, this increases the salience of interoceptive cues (i.e., anxiety-related internal sensations) and negative self-related thoughts, which then figure heavily in the person's judgments about his or her performance. The preoccupation with interoceptive cues reduces the phobic person's attention to others' responses. Moreover, people rarely provide non-ambiguous cues as to their reactions to those with whom they interact, so the phobic person misses the subtle cues that may demonstrate acceptance and liking. As a result, phobics base their judgments about interactions on their preconceived ideas and their emotional reactions, rather than objective information about the interaction. In support of this notion, several researchers found evidence that socially anxious people base their judgments about others' responses more on their own arousal than do nonanxious controls (Arntz, Rauner & van den Hout, 1995; McEwan & Devins, 1983).

2. Safety Behaviours. Social phobics adopt safety-behaviours in an attempt to reduce the likelihood of a feared event occurring. Some examples are avoiding eye contact, trying not to attract attention, and censoring one's own speech.

Unfortunately, safety behaviour may lead directly to the occurrence of the event they fear and are trying to prevent. For example, a woman who was afraid of people observing her hand shake when she drank, grasped the glass as tightly as possible. However, she failed to realize that this action caused her hand to shake more. Social phobics may believe that it is the use of the safety behaviour that prevents the feared event from occurring. This reduces the opportunity to discover that the feared event would not have occurred anyway. Wells, Clark, Salkovskis, Ludgate, Hackmann, and Gelder (1995) demonstrated the importance of safety behaviour in the maintenance of social phobia. They found that exposure to feared situations plus instructions not to perform a safety behaviour reduced anxiety and unrealistic beliefs significantly more than exposure alone. This suggests that the presence of a safety behaviour prevents the disconfirmation of negative beliefs.

3. Anxiety-induced Performance Deficits. Anxiety and self-focused attention can disrupt social performance. In this same vein, safety behaviours, such as avoiding eye contact and not speaking can make social phobics appear less friendly and produce negative interaction patterns that perpetuate phobic avoidance.

4. Anticipatory and Post event Processing. Prior to social interactions, social phobics may imagine themselves behaving poorly in the situation and recollect past failures. This can lead to negative predictions about social outcomes. At times, anticipatory anxiety will cause the person to avoid the event completely, other times they will attend the event in a self-focused processing mode. Leaving the situation

does not rid social phobics of their distress because they tend to ruminate about how they performed.

Clark and Wells (1995) seem to suggest that these processes also lead to biases in the recall of social events. Since the reactions of others are not obvious and phobic people selectively attend to self-related information, when they reflect on the event, they are most likely to recall their anxiety and negative self-thoughts. It is not clear whether such biases in recall would be due to selective encoding or selective retrieval of self-related information. However, either process leads to a sense of shame that stays with phobics for a long period of time and prompts them to remember other failures, which in turn strengthens their sense of social inadequacy.

The Clark and Wells model is unique in its emphasis on an information-processing perspective and its delineation of the role of interoceptive information, safety behaviours, and the suggestion of two possible cognitive processes in perpetuating social phobia. I will investigate several aspects of the Clark and Wells (1995) model, including self-focused attention, judgmental biases, and selective memory. I will devote particular attention to memory since it is the least studied aspect of the model. Before beginning a detailed discussion of the literature, it is important to distinguish the cognitive processes to be considered.

Cognitive Processes

Clark and Wells allude to a number of different cognitive processes in their theory, and it is necessary to make distinctions between them. When examining the cognitive factors that contribute to social anxiety, it is useful to distinguish three cognitive processes: attention, judgment and memory. Distortions in attention and judgment have been linked to anxiety disorders. In the cognitive literature, the term

attentional bias refers to selective attention to or processing of specific types of information. Judgment refers to appraisals or assessments of events. Judgmental biases are said to occur when an individual's appraisal differs significantly from those of objective observers. Memory refers to the recall or recognition of information about previously experienced events. As we have seen, selective memory refers to systematic distortions in recollections of information about events.

In the empirical literature, attention and memory are characterized by distinct methods of assessment and have been shown to have distinct patterns of cognitive and emotional correlates. The distinction between judgment and memory is less well established. One possible distinction is that memory involves the recollection of specific pieces of information about an event, whereas judgment involves the way that this information is weighed and combined to arrive at an assessment of the event. Presumably information that an individual is able to recollect can be given little or no weight when arriving at a judgment about a situation. The distinction between judgment and memory is particularly blurred when one considers internal states. Typically, memory is studied by providing subjects with objective information and then examining their recall or recognition for that information. Thus, there is an external marker of the information to which the subject was exposed. In the case of memory for internal phenomena, such as anxiety or other physical sensations, there is no clear objective referent to which the subject's recollections can be compared. Here, subjects make judgments about internal events, such as the intensity of their fear or the frequency and strength of negative thoughts in a situation and then later make a similar judgment. Although changes in judgment are often interpreted as reflecting changes in memory, it is also possible that the individual, for various

reasons, has simply changed the weights assigned to the various types of information.

This discussion reveals the complications in distinguishing some cognitive processes, both conceptually and methodologically. Despite the difficulties, researchers often define their research in terms of the cognitive process addressed. Each of the three processes discussed will now be reviewed in turn and the supporting literature will be presented.

Selective Attention and Judgmental Biases in Social Anxiety

Attentional biases occur when individuals selectively attend to certain stimuli, which are believed to draw on attentional resources and interfere with processing other types of information (Williams, Mathews, & MacLeod, 1996). Biased attention is often studied using the Stroop task, a method that examines the interference effects of the thematic content of words on a colour naming task. The Stroop has been used to investigate attentional biases in individuals with generalized anxiety disorder, panic disorder, simple phobias, obsessive-compulsive disorder, and post-traumatic stress disorder (Williams, et al., 1996). This research reveals that anxiety disordered patients selectively attend to information related to their specific fears (Daggleish & Watts, 1990; Mathews & MacLeod, 1994). Several studies found empirical evidence for attentional biases toward social threat information in social phobic and socially anxious populations (e.g., Hope, Rapee, Heimberg, & Dombeck, 1990; Lundh, & Ost, 1996b). Interestingly, selective attention toward certain material does not necessarily result in biases in memory for that information (Daggleish & Watts, 1990).

Another form of attentional allocation that has been studied is self-focused attention, a tendency to make oneself the focus of one's awareness. Empirical

studies often manipulate self-focus by positioning subjects in front of an audience, a camera, or a mirror. Socially anxious subjects generally report focusing more on themselves than on their partners during interactions, a factor that in one study was judged partially responsible for their poor recall of partner-related information (Hope, Rapee, Heimberg, & Dombeck, 1990). Self-focused attention has been shown to increase anticipated and observed anxiety for social phobic subjects under some conditions (Woody, 1996). The association between self-focused attention and selective memory has not been clearly established. However, some writers clearly believe that increased self-focus contributes to memory biases (e.g., Hope, Heimberg, & Klein, 1990; Clark & Wells, 1995).

As noted earlier, judgmental biases are measured by comparing subjects' judgments with those of other observers. Empirical studies reveal that social phobics tend to underestimate their performance relative to objective observers, a phenomenon referred to as discounting (e.g., Alden & Wallace, 1995; Rapee & Lim, 1992; Stopa & Clark, 1993). They also overestimate the visibility of their anxiety (e.g., McKewan & Devins, 1983). As well, social phobics rate the probability and cost of negative social events to be higher than nonanxious controls (Foa, Franklin, Perry, & Herbert, 1996). Finally, socially anxious individuals underestimate their ability to cope with negative situations (Lucock & Salkovskis, 1988). All of these studies suggest that socially anxious individuals display a negative distortion in their appraisals of themselves and their predictions about social events. As noted earlier, the relation between judgment and memory is unclear and the extent to which judgmental biases reflect or contribute to selective memory has not been established.

Selective Memory

Social phobia and social anxiety. As noted earlier, I will devote particular attention to the notion from the Clark and Wells (1995) model of selective processing of social information. To summarize, Clark and Wells (1995) suggested that internal anxiety-related cues and negative self-thoughts may be processed in greater depth and hence be either more strongly encoded into memory or more readily recalled. Few studies have examined selective memory in social phobia and the results of those studies are inconsistent.

Rapee, McCallum, Melville, Ravenscroft, and Rodney (1994) were one of only two teams of researchers to examine memory in social phobic patients. They conducted four studies that examined implicit and explicit memory in a variety of tasks. Study one examined direct recall and recognition of words presented on an overhead. Four types of word content were included: social threat, physical threat, positive and neutral words. Social phobics did not recall more threat information than controls. In study two, subjects were given a word and asked to imagine and rate the pleasantness of a scene about themselves. An indirect word completion task was used to assess memory. Subjects were given three letter stems of words that were or were not seen before and were asked to write down the first word they could think of to complete the word stems. Once again, social phobics did not show a memory bias toward threat information. In study three, subjects were given feedback after a hypothetical speech and were asked to imagine the feedback as being either for themselves or for the experimenter in order to create either a self or other focused condition. After thirty minutes, subjects were unexpectedly given a recall task for the elements of the feedback. Social phobics did not differ from control subjects in their memories for negative versus positive feedback. Study four

involved an autobiographical memory task in which subjects were presented with stimulus words that concerned social or neutral situations and were asked to report the first memory that came to mind. A self versus other manipulation was again included by asking subjects to either report a memory about themselves or about a close family member or friend. Although social phobics experienced more anxiety for memories related to the social words, they did not recall more threat-related memories than controls.

In contrast to Rapee et al. (1994), Lundh and Ost (1996a) found evidence for selective memory in generalized social phobic patients. Subjects examined 20 black and white photographs of faces. They were then asked to judge whether they perceived the person as critical or accepting from their first impression. Following a word stem completion distractor task, subjects looked at 80 photographs, including the original 20 photographs, and reported which faces they recognized. Social phobics recognized more critical than accepting faces and the faces they recognized were rated as more critical than those not recognized. Social phobic subjects displayed a memory bias for critical faces, whereas the control group displayed biases in the opposite direction.

Three other studies found evidence for selective memory in socially anxious students. O'Banion and Arkowitz (1977) had socially anxious female students engage in an interaction with a confederate and receive feedback supposedly provided by the confederate. Feedback consisted of a booklet of eighty adjectives in which fourteen negative and fourteen positive were marked. Following the interactions, subjects rated their social skill, social anxiety, and the confederate's response. Subjects were then asked to recall the marked adjectives. Both high and low socially anxious groups remembered more negative information and less

positive information than was given. However, there was a trend for socially anxious women to remember more negative information than did control subjects.

Hope, Heimberg, and Klein (1990) studied memory for objective information about a conversation, physical descriptions of the confederate, and the extent of self-focused attention in a social interaction. State anxiety was manipulated by telling half the subjects they were being evaluated. The other subjects were told that the confederate was being evaluated. The anxious women reported more overall anxiety in both conditions, recalled fewer partner self-disclosures, and made more recall errors compared to controls. The state manipulation did not produce the predicted effects in that anxious women in the evaluation condition displayed only a trend toward a total recall deficit.

Daly, Vangelisti, and Lawrence (1989) studied male and female students with public speaking anxiety. Subjects prepared and delivered a speech following which the audience rated the subjects' anxiety, speaking ability, and performance. Subjects completed memory protocols that included spontaneous descriptions of their feelings, perceived effectiveness, audience reactions, setting characteristics, and performance evaluation. Their recall for objective characteristics of the environment was also measured. Finally they rated their nervousness, enjoyment, competency, and audience's liking of the speech. Anxious subjects performed more poorly than low-anxious subjects and rated themselves as doing so. Moreover, anxious people showed poorer recall for environmental characteristics and greater recall for (i.e. they reported more) negative self-focused thoughts than did low-anxious controls.

Overall then, evidence for selective memory in socially anxious people is inconsistent. This may be due to procedural differences between studies yielding

positive and negative results. The studies that support the existence of biased memory in socially anxious individuals used actual social interactions or photographs of people, whereas studies that showed little or no memory biases used more artificial verbal memory tasks. These studies also used different types of dependent measures. Some researchers measured recall of word lists and memories (Rapee et al, 1994), whereas other researchers measured memory for objective features of the environment or the conversation (O'Banion & Arkowitz, 1977; Daly et al., 1989; Hope, Heimberg, & Klein, 1990; Lundt & Ost, 1996a) or "judgments" about internal events (e.g., negative self-statements, self-focused attention) (Daly et al., 1989; Hope, Heimberg, & Klein, 1990). Considering the limited literature available on this topic, evidence for selective memory was shown in the context of actual interactions, in social phobic patients and socially anxious students, and for memories of faces and object aspects of the external environment.

Selective memory is not only an issue in social phobia. Researchers have investigated this phenomenon in people with other anxiety disorders and mood disorders with varied results. I will briefly outline some of these studies.

Generalized anxiety disorder (GAD). Researchers have presented positive or threatening and non-threatening negative words on audiotape and asked GAD or control subjects to decide if the words described themselves or other people (Mogg, Mathews, & Weinman, 1987; Mogg & Mathews, 1990) or to imagine a scene including themselves and the word (Mathews, Mogg, May, & Eysenck, 1989). These studies produced mixed results. Some studies reported that there was a slight trend for GAD subjects to recall significantly more threatening words (Mathews, et al., 1989). Other studies rejected the idea of selective memory for negative self-referent information and reported that anxious subjects actually

showed poorer memory for threat information (Mogg, et al., 1987). Still other studies reported greater recall of both self-referent information and anxiety words separately, but not in conjunction, suggesting the possibility of a response bias instead of selective memory (Mogg & Mathews, 1990). Overall, these studies provide only limited support for the existence of selective memory in generalized anxiety disorder.

Panic disorder and agoraphobia. Here, researchers have presented subjects with positive, threatening, and neutral words and have had them perform lexical decision tasks followed by recall and recognition tests. These studies revealed a recall bias for threatening words in general in panic disordered subjects (McNally, Foa, & Donnell, 1989; Cloitre & Liebowitz, 1991), as well as a self-referent recall bias for threatening words when arousal was increased (McNally, et al., 1989). The possibility of these effects being due to a response bias was ruled out in all studies. On the other hand, one study of agoraphobic patients using a similar phobic and neutral word presentation followed by a recall test revealed no recall bias for phobic words (Pickles & van den Broek, 1988).

Mood and depression. Although it is beyond the scope of this project, it should be noted that evidence of biased memory has been found in studies examining clinically depressed subjects, sub-clinically depressed subjects, and subjects with induced dysphoric mood (Daggleish & Watts, 1990). The two main phenomena that have been studied are "state-dependent learning" and "mood congruency" (Daggleish & Watts, 1990). The former phenomenon is usually studied by having subjects recall word lists after mood induction procedures or when naturally different moods occur, or by using an interference paradigm (Daggleish & Watts, 1990). Results of these studies typically do not support the idea of state-

dependent learning (Daggleish & Watts, 1990). Mood congruency effects are generally studied by providing neutral words, asking subjects to retrieve personal memories relating to the words, and measuring how fast they think of negative memories when in more or less depressed moods (Clark & Teasdale, 1982; Daggleish & Watts, 1990). Results for both clinically depressed subjects and induced mood subjects typically show biased memory for events consistent with the current mood of the subject (Clark, & Teasdale, 1982; Daggleish & Watts, 1990).

Some researchers believe that the negative memory biases found in depression also occur in anxiety (McNally, et al., 1989; Hope, Heimberg, & Klein, 1990; Cloitre & Liebowitz, 1991). Other researchers believe that selective memory is specific to depression and that the phenomenon found in anxiety reflects an attentional bias or response bias instead of selective memory (Mogg, et al., 1987; Daggleish & Watts, 1990; Mathews & MacLeod, 1994).

Selective Encoding and Retrieval

Although Clark and Wells allude to biases in recall of social events, it is not clear from their writings whether such biases are due to selective encoding or selective retrieval of negative self-related information. Studies that found evidence for biased memory did not address which of these processes distinguish socially anxious individuals. This may be due in part to difficulties distinguishing the effects of biased encoding and selective retrieval as the two processes are intertwined. In particular, retrieval is dependent on encoding, i.e., information that is not encoded cannot be retrieved. One way to begin to distinguish these processes may be to assess subjects' appraisals at the time of the social event and again after some delay. If socially anxious subjects engage only in selective encoding of negative self-related information, one would expect to observe biases in judgments made at

the time of the event. However, once information is encoded, no further distortions would be expected to emerge at the delayed recall period. On the other hand, according to Clark and Wells (1995), rumination and anticipatory anxiety lead to further processing of negative information and to distortions in memory. In this case, one would expect differences between judgments made at delayed recall and those made during or immediately following an interaction.

In the current study, encoding and retrieval biases will be distinguished. Selective encoding will be said to occur if cognitive distortions are displayed immediately after the interaction in the form of judgmental biases, and these judgments are accurately recalled at a delayed time period. Selective retrieval will be said to occur if anxiety ratings taken at a delayed time period indicate that subjects remember themselves as more anxious than they reported in the situation.

Summary

Clark and Wells' (1995) model proposes that because social phobics focus on interoceptive information and pre-existing self-related beliefs, this information is processed in detail. This process leads to one of two results, either the information is more strongly encoded into memory and is correctly recalled, or phobic's memories of social situations are negatively skewed by the selective recall of interoceptive information and pre-existing self-related beliefs. However, empirical studies of selective memory in social phobia have produced mixed results. It seems premature to dismiss the idea without directly examining Clark and Wells' specific proposals- particularly the two competing notions that phobics display either selective encoding or selective retrieval for the level of anxiety they experienced in social situations. It also seems valuable to examine this issue in the context of an actual social interaction as that is where the strongest evidence for selective

memory has emerged. It is prudent to begin examining this question with socially anxious students in order to determine the plausibility of the hypotheses and refine the research procedures before collecting data from a clinical sample of social phobics.

Overview of Current Study

In this study, I aimed to assess a number of aspects of the Clark and Wells model. Specifically, I was interested in studying self-focused attention and judgmental biases with particular attention paid to memory biases. Socially anxious students participated in a social interaction with an opposite sex confederate and then completed measures of self-focused attention, judgment, memory measures of anxiety-related sensations, objective information, and behavioural performance, and rumination measures. The following five hypotheses were tested:

1. Socially anxious subjects will report more self-focused attention, particularly on anxiety-related phenomena, and less other-focused attention than nonanxious subjects.
2. Socially anxious subjects will display greater biases in their self-related judgments than nonanxious subjects.
3. Socially anxious subjects will display memory biases. Socially anxious subjects will recall less information about their partner and the setting than nonanxious subjects. If selective encoding is the process responsible for the memory biases, socially anxious subjects will display biased judgment immediately after the interaction compared to nonanxious controls, but will accurately recall these judgments at delayed recall. If selective retrieval is the process at work in socially anxious individuals, after a delay, socially anxious subjects will remember

themselves as more anxious than they were during the interaction, whereas control subjects will display accurate recall.

4. There will be a mood congruence effect for recall. Selective retrieval of information will be dependent on the subjects' emotional state at the time of delayed recall. Subjects in a state of high anxiety will show biased recall of a social interaction compared to subjects in a state of low anxiety. Subjects in a state of high anxiety will remember more anxiety-related information about a social interaction than subjects in a state of low anxiety.

5. Socially anxious subjects will ruminate more in the period between the interaction and the recall test than nonanxious subjects.

Method

Subjects

A total of 116 male and female students from undergraduate psychology classes received extra credit to participate in the study. Six of the original 122 subjects were dropped from the analysis due to incomplete data, language difficulties, or suspicion of the confederate. Subjects completed a set of questionnaires in class prior to the interview and were selected on the basis of their scores on the Social Avoidance and Distress scale (SAD; Watson & Friend, 1969).

The pre-assessment package contained a questionnaire regarding personal information (e.g., age, country of birth, first language), the Beck Depression Inventory (BDI; Beck & Beamesderfer, 1974), and the SAD (see Appendix A). The SAD contains 28 true-false items measuring social anxiety and distress. Scores range from 0 to 28 where higher scores represent a greater degree of social avoidance and distress. The mean point-biserial item-total correlation reported by

Watson and Friend (1969) was .77, KR-20 was .94, with a one-month test-retest reliability of .68.

Subjects were assigned to either high (scores half a standard deviation or more above the mean) or low (scores at or below the mean) social anxiety groups. The 58 socially anxious subjects ranged in age from 17 to 35 ($M=19.81$, $SD=2.93$) and had a mean SAD score of 19.06. There were 32 females and 26 males in the anxious group. The 58 nonanxious subjects ranged in age from 16 to 23 ($M=19.07$, $SD=1.37$) and had a mean SAD score of 3.87. There were 41 females and 17 males in the nonanxious group. Within each group, subjects were randomly assigned to the high and low state-anxiety conditions.

Personnel

Experimenters

Experimenters were one female graduate student and one male undergraduate student who followed a scripted protocol (see Appendix B). Their duties included: (1) administering questionnaires, (2) conducting laboratory procedures, (3) rating subject and confederate behaviour (see Appendix C), and (4) conducting the debriefing.

Confederates

Two undergraduate research assistants (one man and one woman) served as confederates. These confederates were trained to behave in a consistent manner across subjects. The assistants' duties were to interact with subjects in accordance with the scripted information (see Appendix B). The assistants were blind to the hypotheses of the study and to the group assignment of each subject.

Observers

One female graduate student, one female undergraduate student, and two male undergraduate students acted as observers in order to establish reliability for ratings of subject and confederate behaviour. Observers were trained to use the same measures used by the experimenter. The observer's duty was to observe and rate subject and confederate behaviour during the interaction.

Procedure

Session one

After completing informed consent procedures (see Appendix D) and the Body Sensations Questionnaire (see Appendix E) the subjects participated in an unstructured ten minute interaction with the confederate, presented as another research participant. During the interaction, subjects rated their anxiety three times on a scale from 0 to 100 (see Appendix E). The experimenter's instructions were as follows:

During your conversation I will be behind the one-way mirror. Three times during your conversation I will knock on the mirror. I will knock before you begin, half way through, and at the end of your conversation. Each time you hear a knock I would like you to rate on the appropriate paper how anxious or nervous you felt immediately before the knock. Use a 0 to 100 scale to make the rating where 0 is not at all anxious and 100 is extremely anxious.

The subjects then read an instruction sheet which provided examples of how to use the scale (see Appendix E). The experimenter left the room and knocked on the one-way mirror to indicate the beginning of the interaction.

After the interaction, the subject and confederate were separated to complete questionnaires independently. The subject completed a behaviour questionnaire, the Focus of Attention Questionnaire, and the Body Sensations Questionnaire (see Appendix E).

Session two

The following day, subjects completed several questionnaires in a different research room. Subjects were randomly assigned to state manipulation conditions prior to their arrival. High or low state anxiety was manipulated through the experimenter's instructions before completion of the questionnaires as follows:

High state anxiety condition: In a few moments we will move to our large conference room where you will interact with your partner again. This interaction will take place in front of an audience who will be rating your performance. Just before you go in, I would like you to think back to the conversation you had with your partner and answer these questions.

Low state anxiety condition: There is one last part to the study. As soon as you finish this part of the study, you may leave. Just before you leave, I would like you to think back to the conversation you had with your partner and answer these questions. Subjects then completed the anxiety-related and objective memory measures, rumination questionnaire, the Body Sensations Questionnaire in a scrambled order, and the State Anxiety Inventory (see Appendix E). Finally, subjects were debriefed and thanked for their participation (see Appendix F).

Deception

A check on the believability that the confederate was another participant was necessary to ensure that subject ratings were not tainted by suspicion. During the debriefing, the experimenter asked subjects what they thought of their partner and if

they believed that the confederate was simply another student (see Appendix F). The data from two subjects who expressed suspicion about the confederate were not used.

Measures

Dependent Measures

Subjects completed three types of dependent measures: (1) focus of attention, (2) memory, and (3) rumination.

Focus of attention. Focus of attention was measured immediately after the interaction with the Focus of Attention Questionnaire (FAQ; Woody, 1996). This 10-item scale includes two 5-item subscales: self-focused attention and other-focused attention (see Appendix E). Self-focused attention refers to directing attention to one's own behaviour and feelings of anxiety. A sample item from the self-focused attention subscale is: "I was focusing on what I would say or do next." Other-focused attention refers to directing attention to the interaction partner or the environment. A sample item from the other-focused attention subscale is: "I was focusing on the other person's appearance or dress." Five additional self-focused attention items pertaining to anxiety were added using the same format. Subjects rated each item on a 5-point scale ranging from not at all (one) to very much (five), depending on how strongly the subject attended to the item. Items were averaged to yield two focus of attention scores- self-focus and other-focus.

Woody, Chambless, and Glass (1997) reported that the self-focus and other-focus subscales are independent ($r = -0.07$). Private self-consciousness was found to correlate significantly with the self-focus subscale ($r = .29$, $p < .03$), but not with the other-focus subscale ($r = .14$, $p > .30$). Cronbach's alpha was .76 for the self-focus subscale and .72 for the other-focus subscale. A factor analysis with a varimax

rotation resulted in high loadings ($>.42$) for all items on their respective subscales, a finding supporting the validity of the subscales (Woody, et al., 1997). In this sample, Cronbach's alpha was .87 for the self-focus subscale, and .49 for the other-focus subscale.

Memory scales. Memory was assessed with the following measures:

1. Semi-structured recall of partner- and setting-related information. This measure consists of 16 questions asking for specific information related to the partner and the setting (e.g., "Describe the shirt your partner was wearing." or "How many lamps were in the room?") (see Appendix E). Two scores were calculated: total partner-related items correctly recalled (total partner recall) and total setting-related items correctly recalled (total setting recall).

Interrater reliability was established for scoring of partner and setting information to ensure agreement about the correctness of answers. Two raters scored each of the partner and setting recall tests and kappas were calculated on each of the 16 items and then averaged. The average kappa was .99 with a range from .92 to 1.00.

2. Open-ended description. Subjects described aspects of the interaction in paragraph form (see Appendix E). This free recall written description was content analyzed for references to: (a) negative self-related feelings, (b) negative self behaviour, (c) negative partner observations, and (d) negative setting-related observations which resulted in four categories (see Appendix G). Two proportional measures were calculated from the open-ended description by totalling the number of responses in related categories and dividing by the total number of responses - negative self-related information and negative partner and setting-related

information. Proportional measures were used to control for the different lengths of subject's paragraph answers.

Subjects' open-ended descriptions were rated by two trained judges. These judges first reviewed the protocols to determine general categories and their content, and then categorized the subjects' phrases into one of four established categories (see Appendix G). A score was computed for each category by totalling the number of items placed in that category by the rater. Interrater reliability was established for the categorization of phrases from the free-recall, open-ended paragraph description. Pearson correlations for the total number of phrases in each composite category were calculated for the two composite scores. The significant correlations were $r = .99$, $p < .001$ for negative self-related information and $r = .73$, $p < .001$ for negative partner and setting-related information.

3. Recall of anxiety-related sensations. (a) Level of anxiety. Subjects rated their level of anxiety on a 0 to 100 scale before, during and at the end of the interaction. Subjects recalled all three ratings. The three initial ratings and the three recall ratings were each averaged to create two scores - average anxiety and average anxiety recall. (b) Body sensations were measured immediately before and after the interaction and recalled later on a scrambled version of the Body Sensations Questionnaire. The Body Sensations Questionnaire originally contained 17 items referring to sensations associated with autonomic arousal. We added three items referring to sensations typically experienced by social phobics (e.g. muscle tension and feeling hot in the face (blushing)). Each item is rated on a 9-point scale ranging from "experienced sensation not at all" (one) to "experienced sensation very much" (nine). Investigators reported an internal consistency rating for the original 17 item Body Sensations Questionnaire of .87, and a one month test-retest reliability of .67

(Chambless, Caputo, Bright, & Gallagher, 1984). Cronbach's alpha for the current sample was .95 for the 20 item Body Sensations Questionnaire. We averaged totals on the two questionnaires given the first day to create a time one score. The recall score consisted of totals obtained on the third questionnaire.

4. Recall of anxiety-related behaviours. Subjects recalled three specific behaviours related to anxiety: (a) number of pauses during the interaction, (b) appropriateness of their eye contact, and (c) fidgeting (see Appendix E). These behaviours were rated on 7-point scales. The ratings by subjects and experimenters were each averaged at time one and subject ratings were averaged at time two. Subjects' recollections at delayed recall were compared to subject ratings of these behaviours immediately after the interaction. To assess judgmental biases, subject ratings at time one were compared to experimenter ratings of these same subject behaviours.

The experimenter and the observer rated subject behaviour (pauses, eye contact, and fidgeting) during the interaction using the same operational definitions (see Appendix C). Interrater reliability was established on the average of the three behaviour ratings. Pearson correlations revealed good interrater reliability between the experimenter's and observer's average behaviour ratings ($r = .93$, $p < .001$). Cronbach's alpha was .51 for time one subject behaviour ratings and .56 for time two subject behaviour ratings.

Rumination Questionnaire. Rumination was measured by ratings on five 7-point Likert-type scales (e.g., To what extent did you think about the conversation with your partner in the time since you had the conversation? and To what extent did you criticize yourself about not handling the interaction well?) (see Appendix E). The five items were summed to yield a total rumination score. Cronbach's alpha was .70 for the total score.

Supplemental Measures

State anxiety manipulation check. Subjects completed the State Anxiety Inventory (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) after all other measures to ensure that the state anxiety manipulation was effective. The State Anxiety Inventory is a twenty item questionnaire that evaluates how subjects feel "right now" or "at this moment." A total score was reported for each subject. Investigators reported internal consistency reliability of KR20 alpha coefficients for college students to be .91 for males and .93 for females, while one month test-retest reliability coefficients were .54 for males and .27 for females (Spielberger, et al., 1983). Cronbach's alpha was .44 for this sample.

Beck Depression Inventory. The BDI was included in the pre-assessment questionnaire battery. The BDI is a widely used measure of depressive symptoms. The revised BDI (Beck, Rush, Shaw, & Emery, 1979) includes 21 items that are meant to assess the severity of depression for both adolescents and adults during the past week. Subjects rate each item on a 4-point scale ranging from 0 to 3. Items are summed to yield a total depression score (minimum 0 and maximum 63). Investigators have reported internal consistency ratings of .86 and test-retest reliability ratings between .48 and .86 (Beck, Steer, & Garbin, 1988). Concurrent validity with the Hamilton rating scale for depression was .73, while concurrent validity with the MMPI depression scale was .76 (Beck, et al, 1988). In the present study BDI scores were used as covariates in supplementary analyses to determine if the results were primarily due to dysphoria rather than social anxiety.

Results

Manipulation Checks and Supplemental Analyses

Confederate Behaviour

It was important to the study to ensure consistency in confederate behaviour across subjects. This check was obtained by having the experimenter rate the confederate's performance on one 7-point Likert-type scale and one open-ended question (see Appendix C). A one-way (group) multivariate analysis of variance (MANOVA) conducted on experimenter ratings of confederate behaviour revealed no significant difference between high and low social anxiety groups ($F(2,97) = 2.61, p > .05$). In order to establish reliability, Pearson correlation coefficients were computed between observer and experimenter ratings of confederate behaviour. Pearson correlations computed between the two sets of scores revealed adequate interrater reliability for confederate friendliness ($r = .68, p < .001$) and percentage of the conversation the confederate talked ($r = .94, p < .001$). Checks were also done by the experimenter to ensure that the confederates included all the necessary information in each session.

State Anxiety

To examine the effectiveness of the state anxiety manipulation, total scores on the State Anxiety Inventory were analyzed in a 2 (group) X 2 (condition) analysis of variance (ANOVA). The group by condition interaction was significant ($F(1,112) = 3.96, p < .05$). Follow-up analyses revealed a significant difference between the two conditions for high anxious subjects ($F(1,112) = 22.42, p < .001$), but not for low anxious subjects ($F(1,112) = 3.69, p > .05$) (see Table 1 for means). Thus, the anxiety manipulation was effective only with the socially anxious subjects.

Depression

In order to control for the potential effects of depression on the results, the analyses were repeated using analyses of covariance with BDI scores as the covariate. The results indicate that depression scores were not a concern as a biasing factor in the analyses, so these supplemental analyses are not reported in detail.

Main Analyses

The level of .05 was used as the significance level for all analyses. Means and standard deviations for all dependent measures can be seen in tables 2 and 3.

Self-focused Attention

The two scores from the focus of attention questionnaire were analyzed in a one-way (group) MANOVA. The group effect was significant ($F(2,113) = 23.14$, $p < .001$). Univariate analyses of variance revealed that anxious subjects endorsed significantly more self-focused attention items ($F(1,114) = 37.61$, $p < .001$) than nonanxious subjects. There was no significant between-group difference for other-focused attention ($F(1,114) = .80$, $p > .10$).

Judgment

A 2 (group) X 2 (rater) between-within ANOVA was conducted on the average behavioural rating scores and revealed a significant main effect for group that was modified by a significant group by rater interaction ($F(1,97) = 4.41$, $p < .05$). Follow-up analyses revealed a significant difference between raters for both high ($F(1,97) = 35.48$, $p < .001$) and low anxious subjects ($F(1,97) = 8.58$, $p < .01$). Inspection of the means revealed that anxious and non-anxious subjects overestimated their anxiety-related behaviour when compared to experimenter

ratings, however, the discrepancy between subject and experimenter ratings was greater for socially anxious subjects than for non-anxious subjects.

Recall

Partner and setting-related information. The two total scores from the partner and setting-related information test were analyzed in a 2(group) X 2 (condition) MANOVA. The group effect was significant ($F(2,111) = 5.10, p < .01$). The condition ($F(2,111) = 1.90, p > .10$) and the group by condition interaction effects ($F(2,111) = .42, p > .10$) were not significant. Follow-up univariate ANOVA's revealed that anxious subjects recalled significantly less partner-related information ($F(1, 112) = 9.98, p < .01$) than nonanxious subjects. The effect for total setting recall ($F(1,114) = 2.05, p > .10$) was not significant.

Open-ended description. The scores for negative self-related and negative partner and setting-related information were analyzed in a 2 (group) X 2 (condition) multivariate analysis of variance (MANOVA). The group effect displayed a trend toward significance ($F(2,111) = 2.97, p = .055$). The condition ($F(2,111) = 1.29, p > .05$) and interaction effects ($F(2,111) = 1.89, p > .05$) were not significant. An inspection of means indicated that the high anxious subjects recalled more negative self-related information than low anxious subjects, and this difference resulted in a trend toward significance ($F(1,112) = 2.19, p = .142$). There was no significant between-groups difference for negative partner and setting-related information ($F(1,112) = 1.19, p = .279$).

Anxiety-related sensations. Recall on the anxiety thermometer and body sensations questionnaire was investigated with a 2 (group) X 2 (condition) multivariate analysis of covariance with time one measures as the covariates. The

group ($F(2,109) = .39, p > .10$), condition ($F(2,109) = .53, p > .10$), and interaction effects ($F(2,109) = .60, p > .10$) were not significant.

Anxiety-related behaviours. Average subject behaviour rating scores were analyzed in a 2 (group) X 2 (condition) analysis of covariance with time one scores as the covariate. Results revealed no significant group ($F(1,95) = .03, p > .05$), condition ($F(1,95) = 1.47, p > .05$), or interaction effects ($F(1,95) = .03, p > .05$).

Rumination

The total rumination score was analyzed in a 2 (group) X 2 (condition) ANOVA. Anxious subjects reported ruminating more about the interaction in the intervening period between the interaction and recall ($F(1,112) = 20.18, p < .001$) than nonanxious subjects. The condition ($F(1,112) = 2.28, p > .05$) and interaction effects ($F(1,112) = .09, p > .05$) were not significant.

Discussion

In general, these results suggest that socially anxious individuals display selective attention to and encoding of negative self-related information in an interaction. There was no evidence of selective retrieval regardless of the subjects' level of anxiety at the time of recall. These results are consistent with Clark and Wells' (1995) cognitive model of social phobia and also suggest a possible resolution of the apparent discrepancies in the selective memory literature.

As hypothesized, socially anxious individuals focused their attention more on themselves and their interoceptive anxiety-related feelings than on their partner during the social interaction. Perhaps as a result, they displayed negative biases in their self-related judgments immediately after the interaction. Specifically, they over-estimated the presence of anxiety-related behaviours relative to the judgments of objective observers. This is consistent with earlier studies of self-focused

attention and judgmental biases in social phobic individuals. For example, Woody (1996) demonstrated that social phobic individuals display self-focused attention and suggested that this may contribute to social anxiety in these individuals. The current results suggest that, as hypothesized by Clark and Wells (1995), self-focused attention increases the salience of anxiety-related behaviours and leads to distortions in socially anxious individuals' self-related judgments. Thus, the current results offer one explanation for the discounting effect found in social phobic individuals (Alden & Wallace, 1995; Rapee & Lim, 1992; Stopa & Clark, 1993).

As expected, anxious subjects ruminated more about the conversation after it was over than did nonanxious subjects. According to Clark and Wells' (1995) theory, these negative, self-critical thoughts would be expected to help maintain anxiety. Anxious people not only focused more on their own anxiety-related feelings and behaviour during the conversation, they continued this focus in their thoughts after the conversation.

In terms of memory, subjects displayed evidence of memory distortions, but the pattern of these distortions was inconsistent with some of Clark and Wells' (1995) predictions. Specifically, subjects recalled less partner-related information and they displayed a tendency to recall more negative self-related information than nonanxious subjects. Because these measures were given only at the delayed recall assessment, it is impossible to determine whether the preference given to self-related information stemmed from selective encoding of this information, further processing, or selective retrieval.

Socially anxious subjects' reports of their subjective anxiety, anxiety-related body sensations or anxiety-related behaviours did not change between the immediate and delayed recall assessment points. The same pattern occurred

whether the socially anxious subjects were in a state of heightened anxiety at the time of delayed recall or not. This is inconsistent with the theory of Clark and Wells which proposes that rumination and anticipatory anxiety should lead to further processing and further distortions in memory. One way to interpret these data is that selective attention resulted in selective encoding of negative self-related information at the expense of partner-related information. This is seen in their distorted judgments at the time of the event. However, once the information was encoded, there were no further distortions. In other words, processes such as rumination and anticipatory anxiety did not lead to selective retrieval of negative information. Overall, the data are consistent with the notion of selective encoding but not selective retrieval.

In the literature, some studies find evidence of memory biases (e.g. Daly, et al., 1989; Hope, et al., 1990; Lundt & Ost, 1996a) whereas others do not (Rapee, et al., 1994). Distinguishing encoding and retrieval biases would resolve these inconsistencies in the literature. The studies cited above did not make a distinction between selective encoding and selective retrieval. However, perhaps the semantic memory studies by Rapee et al. (1994) examined a retrieval bias, whereas studies like the current one, which involve more realistic social information, demonstrate an encoding bias. The activities involved in semantic memory studies are very different from those involved in social interactions. In semantic memory studies, subjects are presented with all the stimuli that will be recalled. Participation in a complex social interaction results in selective attention to some information over other information. These differences may result in semantic memory studies picking up retrieval effects and social interaction studies picking up encoding effects. The current study agrees with the seemingly conflicting results of these two types of

studies by providing evidence for selective encoding and no evidence for selective retrieval of negative information.

I predicted that anxious subjects' recall biases would be most pronounced under conditions of high state-anxiety. The data did not support this hypothesis. Although socially anxious subjects were more anxious in the high state anxiety condition, this did not lead to more negative delayed recall ratings of their performance in the conversation. Interestingly, Hope, Heimberg, and Klein (1990) also failed to find effects on recall measures with a manipulation of social-evaluative threat. In the current study, selective retrieval did not occur whether or not the subjects were in anxious apprehension of another interaction. This finding is consistent with the semantic studies conducted by Mathews and MacLeod (1994). These researchers suggested that state anxiety may interact with trait anxiety to create a negative attentional bias, but not a retrieval bias.

It is easy to see how selective attention and encoding may cause an increase in a socially anxious person's anxiety during a conversation. Since social phobics focus on their own anxiety and disregard their partner's reactions during a conversation, they may construct negative images in their minds of how their behaviour must look to others. These inaccurate images may cause anxious people to feel more negative about the interaction and more anxious about the situation than would be appropriate according to an objective observer. The social phobic then ruminates about these anxious feelings after the interaction, cementing them into memory and making it more likely that negative feelings will be remembered when another interaction is anticipated. Thus, consistent with the theory of Clark and Wells (1995), the social phobic is set up to think negatively and feel anxious about an interaction before it even starts.

These encouraging results must be tempered with a reminder that the study had some limitations. These included an inability to provide gold standard comparisons for subject recall of internal sensations. It was not possible to accurately measure subjects' interpretations of their internal sensations, so the researchers were forced to rely on self-reports of internal body sensations. Given the limitations in measurement, it was not possible to determine whether internal sensations of anxiety were distorted and if so, when distortions occurred. Only explicit memory measures were used in this study. One could argue that implicit memory measures may provide different information. However, Rapee and colleagues (1994) included both implicit and explicit memory measures in some of their studies and they found that the results did not differ. The laboratory situation may have resulted in lower levels of anxiety during the conversation than would have occurred in a natural social situation. Finally, since the present study used an analogue subject population, generalization to patients with social phobia remains to be established.

Despite these limitations, this study provides support for certain treatment techniques for social phobic individuals. First, interventions that decrease self-focused attention are likely to lead to more accurate judgments of situations. A change in attentional focus away from the self during an interaction would alter the experience for social phobics and perhaps increase the likelihood of more positive feedback from their partners as well. Consistent with this suggestion, Woody, Chambless, and Glass (1997) found that social phobics' self-focused attention decreased after treatment. Second, interventions that reduce the negative thoughts typically experienced after an interaction might also be useful. A decrease or adjustment of these thoughts might allow social phobics to look more positively on

their next interaction, thus halting the negative cycle before it starts. This suggestion is also consistent with current treatments such as the group cognitive-behavioural treatment program developed by Heimberg and his colleagues in which structured exercises are used to dispute and modify problematic thoughts (Heimberg, 1989; Heimberg, Dodge, and Becker, 1987).

References

Alden, L. E., & Wallace, S. T. (1995). Social phobia and social appraisal in successful and unsuccessful interactions. Behaviour Research and Therapy, 33, 497-506.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: Author.

Arntz, A., Rauner, M., & Van den Hout, M. A. (1995). "If I feel anxious, there must be danger": Ex-consequentia reasoning in inferring danger in anxiety disorders. Behaviour Research and Therapy, 33, 917-925.

Beck, A. T., & Beamesderfer, A. (1974). Assessment of depression: The depression inventory. In P. Pichot (Ed.), Modern problems in pharmacopsychiatry, 7, 15-169. Basel, Switzerland: Karger Press.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). Cognitive therapy of depression. New York: Guilford Press.

Beck, A. T., Steer, & Garbin. (1988). Psychometric properties of the BDI: Twenty-five years of evaluation. Clinical Psychology Review, 8, 77-100.

Butler, G. (1985). Exposure as a treatment for social anxiety: Some instructive difficulties. Behaviour Research and Therapy, 23, 651-657.

Chambless, D. L., Caputo, G. C., Bright, P., & Gallagher, R. (1984). Assessment of fear of fear in agoraphobics: The body sensations questionnaire and the agoraphobic cognitions questionnaire. Journal of Consulting and Clinical Psychology, 52, 1090-1097.

Clark, D. M., & Teasdale, J. D. (1982). Diurnal variation in clinical depression and accessibility of memories of positive and negative experiences. Journal of Abnormal Psychology, 91, 87-95.

Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), Social Phobia: Diagnosis, Assessment and Treatment. New York: Guilford Press.

Cloitre, M., & Liebowitz, M. R. (1991). Memory bias in panic disorder: An investigation of the cognitive avoidance hypothesis. Cognitive Therapy and Research, 15, 371-386.

Dalgleish, T., & Watts, F. N. (1990). Biases of attention and memory in disorders of anxiety and depression. Clinical Psychology Review, 10, 589-604.

Daly, J. A., Vangelisti, A. L., & Lawrence, S. G. (1989). Self-focused attention and public speaking anxiety. Personality and Individual Differences, 10, 903-913.

Foa, E. B., Franklin, M. E., Perry, K. J., & Herbert, J. D. (1996). Cognitive biases in generalized social phobia. Journal of Abnormal Psychology, 105, 433-439.

Heimberg, R. G. (1989). Cognitive and behavioral treatments for social phobia: A critical analysis. Clinical Psychology Review, 9, 107-128.

Heimberg, R. G., Dodge, C. S., & Becker, R. E. (1987). Social phobia. In L. Michelson & M. Ascher (Eds.), Anxiety and stress disorders: Cognitive-behavioral assessment and treatment (pp. 280-309). New York: Guilford Press.

Heimberg, R. G., & Juster, H. R. (1995). Cognitive-behavioral treatments: Literature review. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), Social Phobia: Diagnosis, Assessments and Treatment. New York: Guilford Press.

Hope, D. A., Heimberg, R. G., & Klein, J. F. (1990). Social anxiety and the recall of interpersonal information. Journal of Cognitive Psychotherapy, 4, 185-195.

- Hope, D. A., Rapee, R. M., Heimberg, R. G., & Dombeck, M. J. (1990). Representations of the self in social phobia: Vulnerability to social threat. Cognitive Therapy and Research, 14, 177-189.
- Lucock, M. P., & Salkovskis, P. M. (1988). Cognitive factors in social anxiety and its treatment. Behaviour Research and Therapy, 26(4), 297-302.
- Lundh, L., & Ost, L. (1996a). Recognition bias for critical faces in social phobics. Behaviour Research and Therapy, 34(10), 787-794.
- Lundh, L., & Ost, L. (1996b). Stroop interference, self-focus and perfectionism in social phobics. Personality and Individual Differences, 20(6), 725-731.
- Marks, I. M., & Gelder, M. G. (1966). Different ages of onset in varieties of phobia. American Journal of Psychiatry, 123, 218-221.
- Mathews, A., & MacLeod, C. (1994). Cognitive approaches to emotion and emotional disorders. Annual Review of Psychology, 45, 25-50.
- Mathews, A., Mogg, K., May, J., & Eysenck, M. (1989). Implicit and explicit memory bias in anxiety. Journal of Abnormal Psychology, 98, 236-240.
- McEwan, K. L., & Devins, G. M. (1983). Is increased arousal in social anxiety noticed by others? Journal of Abnormal Psychology, 92, 417-421.
- McNally, R. J., Foa, E. G., & Donnell, C. D. (1989). Memory bias for anxiety information in patients with panic disorder. Cognition and Emotion, 3, 27-44.
- Mogg, K., & Mathews, A. (1990). Is there a self-referent mood-congruent recall bias in anxiety? Behaviour Research and Therapy, 28, 91-92.
- Mogg, K., Mathews, A., & Weinman, J. (1987). Memory bias in clinical anxiety. Journal of Abnormal Psychology, 96, 94-98.

O'Banion, K., & Arkowitz, H. (1977). Social anxiety and selective memory for affective information about the self. Social Behavior and Personality, 5(2), 321-328.

Pickles, A. J., & van den Broek, M. D. (1988). Failure to replicate evidence for phobic schemata in agoraphobic patients. British Journal of Clinical Psychology, 27, 271-272.

Rapee, R. M., & Lim, L. (1992). Discrepancy between self and observer ratings of performance in social phobics. Journal of Abnormal Psychology, 101, 728-731.

Rapee, R. M., McCallum, S. L., Melville, L. F., Ravenscroft, H., & Rodney, J. M. (1994). Memory bias in social phobia. Behaviour Research and Therapy, 32(1), 89-99.

Spielberger, C. D., Gorsuch, R. L., Lushene, R. E., Vagg, P. R., & Jacobs, G. A. (1983). Manual for the state-trait anxiety inventory. Palo Alto, CA: Consulting Psychologists Press.

Stopa, L., & Clark, D. M. (1993). Cognitive processes in social phobia. Behaviour Research and Therapy, 31, 255-267.

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. Journal of Consulting and Clinical Psychology, 33, 448-457.

Wells, A., Clark, D. M., Salkovskis, P. M. S., Ludgate, J., Hackmann, A., & Gelder, M. (1995). Social phobia: The role of in-situation safety behaviors in maintaining anxiety and negative beliefs. Behavior Therapy, 26, 153-161.

Williams, J. M. G., Mathews, A., & MacLeod, C. (1996). The emotional stroop task and psychopathology. Psychological Bulletin, 120(1), 3-24.

Woody, S. R. (1996). Effects of focus of attention on anxiety levels and social performance of individuals with social phobia. Journal of Abnormal Psychology, 105, 61-69.

Woody, S. R., Chambless, D. L., & Glass, C. R. (1997). Self-focused attention in the treatment of social phobia. Behaviour Research and Therapy, 35(2), 117-129.

Appendix A

Social Avoidance and Distress (SAD) Scale
(Watson & Friend, 1969)

(The scoring key is given after each item.)

1. I feel relaxed even in unfamiliar social situations. (F)
2. I try to avoid situations which force me to be very sociable. (T)
3. It is easy for me to relax when I am with strangers. (F)
4. I have no particular desire to avoid people. (F)
5. I often find social occasions upsetting. (T)
6. I usually feel calm and comfortable at social occasions. (F)
7. I am usually at ease when talking to someone of the opposite sex. (F)
8. I try to avoid talking to people unless I know them well. (T)
9. If the chance comes to meet new people, I often take it. (F)
10. I often feel nervous or tense in casual get-togethers in which both sexes are present. (T)
11. I am usually nervous with people unless I know them well. (T)
12. I usually feel relaxed when I am with a group of people. (F)
13. I often want to get away from people. (T)
14. I usually feel uncomfortable when I am in a group of people I don't know. (T)
15. I usually feel relaxed when I meet someone for the first time. (F)
16. Being introduced to people makes me tense and nervous. (T)
17. Even though a room is full of strangers, I may enter it anyway. (F)
18. I would avoid walking up and joining a large group of people. (T)
19. When my superiors want to talk with me, I talk willingly. (T)
20. I often feel on edge when I am with a group of people. (T)
21. I tend to withdraw from people. (T)
22. I don't mind talking to people at parties or social gatherings. (F)
23. I am seldom at ease in a large group of people. (T)
24. I often think up excuses in order to avoid social engagements. (T)
25. I sometimes take the responsibility for introducing people to each other. (F)
26. I try to avoid formal social occasions. (T)
27. I usually go to whatever social engagements I have. (F)
28. I find it easy to relax with other people. (F)

Appendix B

Experimenter and Confederate Protocols

Experimenter protocol

1. The confederate will arrive 2 minutes after the subject.
2. They will be introduced and will complete the consent form.
3. The subject and confederate will be told that their task is to get to know each other for ten minutes.
4. The experimenter will explain the anxiety rating scale.
5. The experimenter will go behind the one-way mirror while the subject and confederate interact and will rate the subject's behaviour.
6. The confederate will wait in the hallway while the subject is given the post-interaction questionnaires.
7. The next day, the appropriate state manipulation instructions will be given to the subject.
9. The subject will complete the remaining questionnaires.
10. The subject will be debriefed

Confederate Protocol

1. The confederate will watch through the one-way mirror for the subject to arrive then will arrive one to two minutes later apologizing for being late.
2. During the interaction, the confederate will act in a neutral but positive manner toward the subject.
3. The confederate will be sure to mention the eight items about his/ her scripted life that are on the subjects' objective recall measure.

Confederate's scripted life story information

Born: Vancouver

Siblings: 1 brother

Year of university: 2nd

Major: Psychology

Job: Occupational Therapist in a hospital

Extracurricular activity: Volleyball

Music: Top 40, U2

Appendix C
 Experimenter and Observer Rating Sheets
 Rating Sheet of Subject Behaviour

Subject #

Confederate name

How many pauses were there during the interaction, in which both of you did not know what to do or say?

1	2	3	4	5	6	7
none						11 or more

To what extent did the subject show appropriate eye contact during the interaction?

1	2	3	4	5	6	7
avoided eye contact a lot						appropriate eye contact

To what extent did the subject display shakiness or trembling?

1	2	3	4	5	6	7
not at all						noticeably

To what extent did the subject fidget?

1	2	3	4	5	6	7
not at all						a lot

Rating Sheet of Confederate Behaviour

Date

Subject #

Confederate name

Confederate hair colour

Confederate shirt

How warm and friendly did the confederate seem?

1	2	3	4	5	6	7
not at all						a lot

What percentage of the conversation was taken up by the confederate talking?

Appendix E

Measures Used in the Study

Demographic Sheet

Gender:

Age:

Country of birth:

Number of years in Canada:

First language:

If not English, how many years have you been speaking English?:

BSQ

Several types of body sensations are described below. Please indicate to what extent you are experiencing these sensations right now. To answer, circle an alternative from (1) "not at all" to (9) "very much", or any one of the alternatives between 1 and 9 that accurately describes your experience.

1. Pressure in chest.

1	2	3	4	5	6	7	8	9
Not at all								very much

2. Trembling hands.

1	2	3	4	5	6	7	8	9
Not at all								very much

3. Heart pounding.

1	2	3	4	5	6	7	8	9
Not at all								very much

4. Tingling in finger tips.

1	2	3	4	5	6	7	8	9
Not at all								very much

5. Knot in stomach.

1	2	3	4	5	6	7	8	9
Not at all								very much

6. Numbness in arms or legs.

1	2	3	4	5	6	7	8	9
Not at all								very much

7. Numbness in another part of your body.

1	2	3	4	5	6	7	8	9
Not at all								very much

8. Feeling disconnected from your body.

1	2	3	4	5	6	7	8	9
Not at all								very much

9. Blurred or distorted vision.

1	2	3	4	5	6	7	8	9
Not at all								very much

10. Nausea (upset stomach).

1	2	3	4	5	6	7	8	9
Not at all								very much

11. Dry throat.

1	2	3	4	5	6	7	8	9
Not at all								very much

12. Feeling short of breath.

1	2	3	4	5	6	7	8	9
Not at all								very much

13. Butterflies in stomach.

1 2 3 4 5 6 7 8 9

Not at all

very much

14. Lump in throat.

1 2 3 4 5 6 7 8 9

Not at all

very much

15. Sweating.

1 2 3 4 5 6 7 8 9

Not at all

very much

16. Feeling disoriented and confused.

1 2 3 4 5 6 7 8 9

Not at all

very much

17. Feeling hot in the face (blushing).

1 2 3 4 5 6 7 8 9

Not at all

very much

18. Wobbly or rubber legs.

1 2 3 4 5 6 7 8 9

Not at all

very much

19. Dizziness.

1 2 3 4 5 6 7 8 9

Not at all

very much

20. Muscle tension.

1 2 3 4 5 6 7 8 9

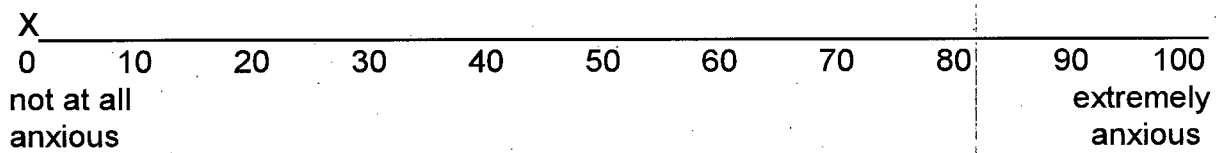
Not at all

very much

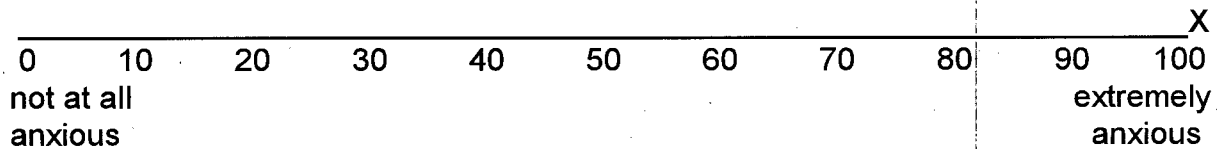
Anxiety Thermometer Instructions

Use the 100 point scales provided to rate how anxious or nervous you felt just before you heard the knock. Place an X over the place where you rate your anxiety to fall as in the examples below.

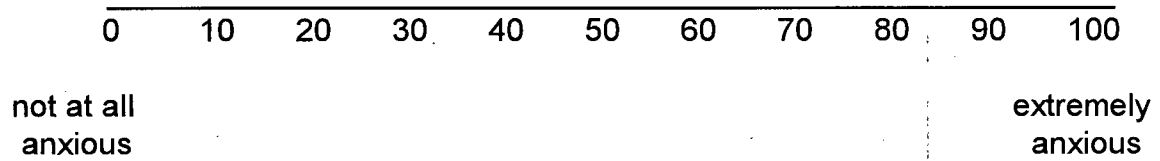
For example, you might rate your anxiety level very low when you are sitting home alone watching TV.



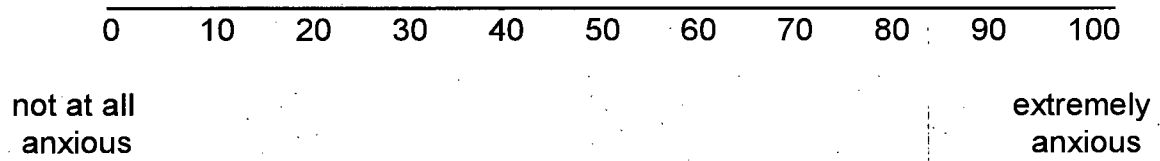
On the other hand, you might rate your anxiety level very high if you had just made a social mistake in a group and everyone was staring at you.



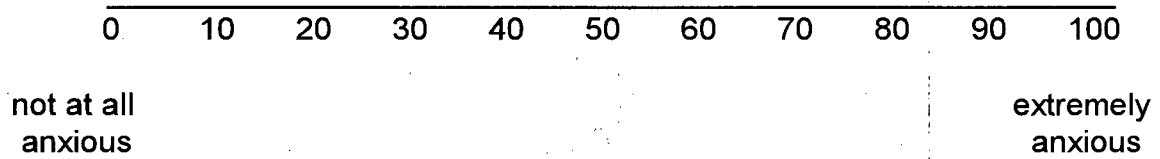
Anxiety Thermometer 1



Anxiety Thermometer 2



Anxiety Thermometer 3



Focus of Attention Questionnaire

1. I was focusing on the other person's appearance or dress.

1	2	3	4	5
not at all		somewhat		very much
2. I was focusing on the butterflies in my stomach.

1	2	3	4	5
not at all		somewhat		very much
3. I was focusing on the features or conditions of the physical surroundings (eg. appearance, temperature).

1	2	3	4	5
not at all		somewhat		very much
4. I was focusing on what I would say or do next.

1	2	3	4	5
not at all		somewhat		very much
5. I was focusing on the impression I was making on the other person.

1	2	3	4	5
not at all		somewhat		very much
6. I was focusing on how the other person might be feeling about himself/herself.

1	2	3	4	5
not at all		somewhat		very much
7. I was focusing on the tension in my body.

1	2	3	4	5
not at all		somewhat		very much
8. I was focusing on what I thought of the other person.

1	2	3	4	5
not at all		somewhat		very much
9. I was focusing on my level of anxiety.

1	2	3	4	5
not at all		somewhat		very much
10. I was focusing on what the other person was saying or doing.

1	2	3	4	5
not at all		somewhat		very much

11. I was focusing on my shaky speech.

1	2	3	4	5
not at all		somewhat		very much

12. I was focusing on my internal bodily reactions (for example, heart rate).

1	2	3	4	5
not at all		somewhat		very much

13. I was focusing on past social failures.

1	2	3	4	5
not at all		somewhat		very much

14. I was focusing on my shaking or trembling.

1	2	3	4	5
not at all		somewhat		very much

15. I was focusing on my feelings of discomfort.

1	2	3	4	5
not at all		somewhat		very much

Behaviour Questionnaire 1

1. How many pauses were there during the interaction, in which you did not know what to do or say?

1	2	3	4	5	6	7
none						a lot

2. To what extent did you fidget during the interaction (e.g. touch clothing, etc.)?

1	2	3	4	5	6	7
not at all						a lot

3. To what extent did you show appropriate eye contact during the interaction?

1	2	3	4	5	6	7
avoided eye contact completely						did not avoid eye contact at all

Instructions for Session Two

Low State Manipulation Instructions

Before you leave, please complete each of these questions as completely as possible. For questions with a number scale, please circle only one number.

High State Manipulation Instructions

Before the next interaction, please complete each of these questions as completely as possible. For questions with a number scale, please circle only one number.

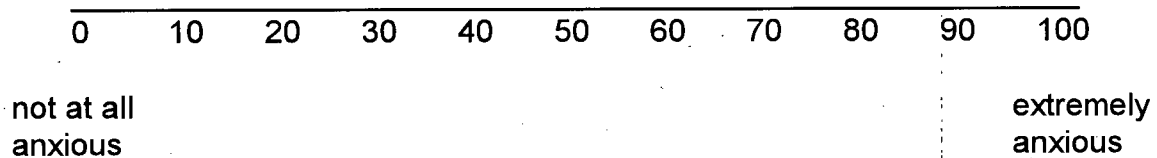
Open-ended Question

Please write down everything that you remember about the interaction you had with your partner. (You may write on the back of the page as well).

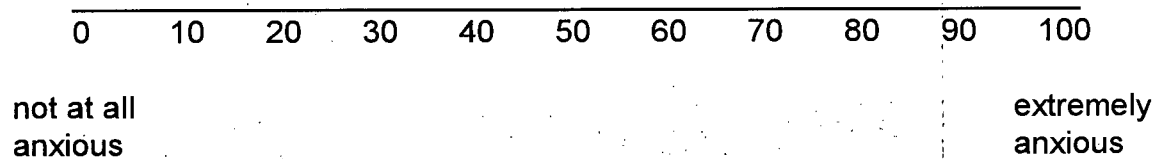
Anxiety Thermometer Recall

Instructions: Think back to the interaction you had yesterday with your partner and try to remember how you felt.

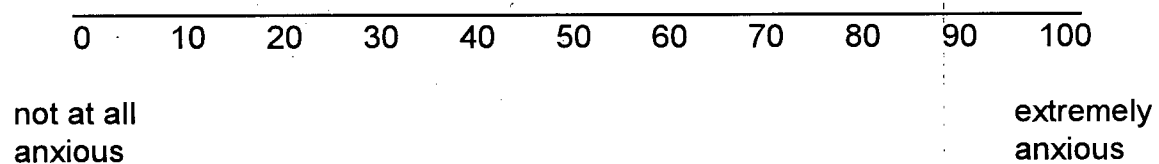
1. How nervous or anxious did you feel before the interaction began? (Rate your anxiety on the anxiety thermometer below).



2. How nervous or anxious did you feel during the interaction? (Rate your anxiety on the anxiety thermometer below).



3. How nervous or anxious did you feel immediately after the interaction? (Rate your anxiety on the anxiety thermometer below).



Behaviour Questionnaire 2

1. How many pauses were there during the interaction, in which you did not know what to do or say?

1 2 3 4 5 6 7

none

a lot

2. To what extent did you show appropriate eye contact during the interaction?

1 2 3 4 5 6 7

avoided eye
contact completely

did not avoid
eye contact at all

3. To what extent did you fidget during the interaction (e.g. touch clothing, etc.)?

1 2 3 4 5 6 7

not at all

a lot

Objective Information

1. What is your partner's name?
2. What colour was your partner's hair?
3. Describe the shirt your partner was wearing.
4. What city is your partner from?
5. How many siblings does your partner have?
6. What year of university is your partner in?
7. What is your partner's major?
8. What kind of job would your partner like to do after graduation?
9. What extracurricular activity did your partner say he/she enjoyed?
10. What is your partner's favourite type of music?
11. How many small end tables were in the room?
12. How many lamps were in the room?
13. Were there pictures on the walls?
14. What colour was the metal cabinet in the room?
15. What colour were the recliners in the room?
16. List as many items as you can remember that were sitting on the end table(s).

Rumination Questionnaire

1. To what extent did you think about the conversation with your partner in the time since the interaction?

1	2	3	4	5	6	7
not at all						more than four times

2. Were your thoughts about the interaction positive, negative or neutral?

1	2	3	4	5	6	7
negative						positive

3. To what extent did you criticize yourself about not handling the interaction well?

1	2	3	4	5	6	7
not at all						very much

4. How much did you think about other past conversations or interactions?

1	2	3	4	5	6	7
not at all						very much

5. To what extent did you think about the anxiety you felt during the interaction?

1	2	3	4	5	6	7
not at all						very much

Appendix F

Debriefing

So, that's the end of the study. I'd like to tell you more about it in just a minute, but first, I'm interested in your reactions. What did you think of the study?

What did you think of your partner?

Well, what we are interested in studying here is memory for social interactions. We are interested in learning what people remember from a conversation when they are anxious and when they are not anxious. However, in order to study these conversational patterns and the different effects of anxiety we need to control this situation somewhat. What this means for you is that your partner today is actually part of our research team. How do you feel about that?

We don't do this to make people feel badly or to trick them in any way. We are just interested in people's honest reactions to different social situations and states of anxiety. Most of the things that X said about his/her life were made up by the research team so you would have consistent information to remember. If we told you that X was a research assistant you may have changed your responses in some way.

Do you have any questions or concerns?

Here is your extra credit.

Please do not talk about the study to any of your classmates as they may be participating later.

Appendix G

Open-ended Description Categories

Negative Self-related Feelings: any negative feeling the subject reports having about the conversation (Eg. I felt anxious).

Negative Self Behaviours: negative behaviours performed by the subject during the conversation (Eg. I tended to avoid his eyes. I played with my hair the whole time.).

Negative Partner Observation: negative judgments about the partner or any negative observation about the partner's appearance or behaviour (Eg. He was uncomfortable. We were both looking at the clock. He wore an ugly shirt.).

Negative Setting-related Observation: any negative judgment about the setting, conversation, or research procedures (Eg. it was a weird situation, there were awkward silences, I wanted him to keep talking, we were thinking when will this end).

Table 1
Means and Standard Deviations for Scores on the State Anxiety Inventory

Variable	High socially anxious		Low socially anxious	
	High state	Low state	High state	Low state
<u>State Anxiety Inventory</u>				
Total score	48.93 (10.24)	36.45 (10.54)	37.72 (10.15)	32.66 (9.15)

Table 2
Means and Standard Deviations for Partner and Setting-Related Information, Open-ended Description, Behaviour Ratings, and Rumination

Variable	High socially anxious		Low socially anxious	
	High state	Low state	High state	Low state
<u>Partner and setting-related information</u>				
Total partner recall	6.83 (1.26)	7.24 (1.27)	7.52 (1.35)	8.00 (1.04)
Total setting recall	3.62 (1.59)	3.48 (1.77)	3.79 (2.02)	4.28 (1.89)
<u>Open-ended description</u>				
Negative self--related information	.07 (.21)	.03 (.07)	.04 (.06)	.03 (.06)
Negative partner and setting-related information	.09 (.21)	.07 (.17)	.06 (.14)	.08 (.13)
<u>Behaviour ratings</u>				
Average subject recall	3.96 (.84)	3.74 (1.06)	2.86 (.96)	3.10 (.99)
<u>Rumination</u>				
Total rumination	19.72 (5.85)	18.08 (4.89)	15.35 (3.27)	14.24 (5.29)

Table 3
Means and Standard Deviations for the Focus of Attention Questionnaire and the Behaviour Measure

Variable	High socially anxious	Low socially anxious
<u>Focus of Attention Questionnaire</u>		
Average Other-focus information	2.60 (.55)	2.69 (.58)
Average Self-focus information	2.48 (.71)	1.79 (.48)
<u>Behaviour Ratings</u>		
Average subject ratings at time one	4.06 (.99)	3.10 (.80)
Average experimenter ratings	3.31 (1.02)	2.76 (.59)