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A DIFFERENTIAL PATTERN OF AUTOBIOGRAPHICAL MEMORY RETRIEVAL IN SOCIAL PHOBIC AND NONANXIOUS INDIVIDUALS

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Abstract. The present study examined characteristics of autobiographical memories retrieved by individuals with social phobia ($n = 15$) and nonanxious individuals ($n = 17$). Participants were presented with social threat, positive, and neutral cue words and instructed to retrieve the first specific personal memory that came to mind. Memories were coded for retrieval latency, overgenerality (vs. specificity), and affective tone. Nonanxious individuals, rather than social phobic individuals, demonstrated a bias toward the retrieval of specific negative memories when cued by social threat words. Significant omnibus results were attenuated when self-reported depression was included as a covariate in analyses. These results suggest that memories cued by social threat words are particularly salient for nonanxious individuals but not for individuals with social phobia and that depressive symptoms must be accounted for in studies examining cognitive biases toward threat.

Keywords: Social phobia, autobiographical memory, cognitive bias.

Cognitive theories of anxiety suggest that individuals with anxiety disorders are characterized by a number of information processing biases toward threat that serve to maintain and

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exacerbate their symptomatology (e.g. Williams, Watts, MacLeod, & Mathews, 1997). A large amount of empirical data have been amassed substantiating that anxious individuals indeed demonstrate some prominent biases, such as the allocation of attention toward threat at the expense of neutral information (e.g. MacLeod, Mathews, & Tata, 1986) and the interpretation of ambiguous stimuli as threatening (e.g. MacLeod & Cohen, 1993). A number of recent cognitive theories also posit that anxious individuals should demonstrate memory biases toward threat (Beck & Clark, 1997; Eysenck, 1997; Rapee & Heimberg, 1997). Although these theories indicate that attentional and interpretation biases are the predominant information processing distortions in anxiety disorders, they suggest that memories of experiences with threat play a large role in forming negative schemata that drive these other biases. Based on these theories, it can be reasoned that anxious individuals should exhibit biased recall of threatening material.

A large portion of the research examining memory biases toward threat in anxiety disorders adopts traditional explicit and implicit memory procedures. To date, these investigations have yielded equivocal results that call into question the notion that anxiety disorders are characterized by a memory bias toward threat. For example, studies using samples of individuals with generalized anxiety disorder (GAD) and social phobia generally find no bias toward the recall of threatening stimuli (e.g. Mogg, Mathews, & Weinman, 1987; Rapee, McCallum, Melville, Ravenscroft, & Rodney, 1994). On the other hand, studies using samples of individuals with panic disorder and posttraumatic stress disorder (PTSD) generally do report a bias toward the recall of threatening stimuli (e.g. McNally, Foa, & Donnell, 1989; Paunovic, Lundh, & Ost, 2002), although there is some evidence that these results may be attributed to the presence of depression (Becker, Roth, Andrich, & Margraf, 1999) or to the number experiences with anxiety-related words. Nevertheless, the current literature suggests that individuals with panic disorder and with PTSD, but not with GAD or with social phobia, are characterized by the tendency to recall more stimuli associated with their domain of fear than nonanxious individuals.

One explanation for the lack of clear memory biases in anxiety disorders is that explicit and implicit memory tasks do not adequately capture the threat that is experienced by some types of anxious individuals (cf. Burke & Mathews, 1992). Threat stimuli are specified a priori in these memory tasks with the assumption that they will be relevant to the samples of anxious individuals that are tested. However, some anxiety disorders, such as GAD, are characterized by diffuse anxious apprehension, and concrete, single-word threat stimuli may or may not activate fear structures that drive cognitive biases in these anxious individuals. Thus, explicit and implicit memory paradigms may not be sensitive enough to detect memory biases toward threat in some anxiety disorders. To address this concern, some researchers have examined autobiographical memory in anxious individuals. Autobiographical memory is the recollection of one's personal events that can be placed in a specific period of time (Rubin, 1982). Because performance is evaluated for the recall of idiographic personal experiences rather than of artificial stimuli learned in the laboratory, results from autobiographical memory studies are thought to reflect memory that occurs in everyday life (Neisser, 1978). However, it is also important to recognize that autobiographical memory methods are associated with unique confounds of their own, such as the possibility that individuals could have different levels of experience with material with which they are cued.

Despite putative ecological validity, recent studies have reported mixed evidence for autobiographical memory distortions in anxious individuals. Three variables – retrieval latency,

overgenerality (versus specificity), and affective tone – appear to be important indicators of autobiographical memory bias in some, but not all studies. *Retrieval latency* reflects the amount of time required by individuals to generate an autobiographical memory. Results from two studies suggest that anxious individuals retrieved threat-related memories more quickly than nonanxious individuals (Burke & Mathews, 1992; Richards & Whitaker, 1990), but Levy and Mineka (1998) did not replicate this. *Overgenerality* refers to the tendency of individuals to retrieve ambiguous autobiographical memories that are unable to be placed in a particular time or location. This variable has been useful in characterizing autobiographical memories in depression, as depressed individuals have difficulty retrieving specific memories when cued by positive words (e.g. Williams & Broadbent, 1986; Williams & Dritschel, 1988). Overgenerality has been most useful in characterizing PTSD, as work by McNally and his colleagues has shown that individuals with PTSD have difficulty retrieving specific positive memories in much the same manner as depressed individuals (McNally, Litz, Prassas, Shin, & Weathers, 1994; McNally, Lasko, Macklin, & Pitman, 1995). Finally, *affective tone* is coded by classifying the content of autobiographical memories as positive or negative in valence. Participants with GAD in Burke and Mathews' (1992) study classified their autobiographical memories as "nervous" to a greater degree than nonanxious individuals, although others have not replicated this finding (Levy & Mineka, 1998; Rapee et al., 1994).

Overall, it appears that the autobiographical memories retrieved by at least some types of anxious individuals are different to those retrieved by nonanxious individuals when cued with either threatening or positive stimuli. However, the nature of the differences varies between studies, and particular biases found in one study often are not replicated in others that use samples of individuals with a different anxiety disorder. Moreover, usually only one or two of the dependent variables reviewed above is considered in a single study, and some studies include threatening and neutral stimuli (e.g. Richards & Whittaker, 1990), whereas others include positive and negative stimuli (e.g. McNally et al., 1994). It can be argued that the inclusion of *both* threatening and positive stimuli are important in studies that examine autobiographical memory in anxiety disorders to investigate context-dependent abnormalities associated with threatening stimuli as well as to consider the extent to which anxious individuals exhibit context-independent abnormalities (i.e. overgeneral positive memories). Two studies have been conducted to examine the nature of autobiographical memory in individuals with social phobia (Rapee et al., 1994; Wenzel, Jackson, & Holt, 2002), but they also failed to examine all relevant autobiographical memory variables. Thus, the present study was designed to expand the literature in two ways: (1) by eliciting autobiographical memories using threatening, positive, and neutral stimuli, and (2) by considering the three dependent variables most commonly considered in autobiographical memory studies – retrieval latency, overgenerality, and affective tone – within the same experimental design.

Because cognitive theories of social phobia suggest that individuals with this pathology should exhibit highly salient memories of threatening experiences (e.g. Rapee & Heimberg, 1997), it was expected that individuals with social phobia would demonstrate enhanced memory when cued with social threat words. We predicted that this memory bias would be reflected in shorter retrieval latencies, fewer responses categorized as general, and more memories characterized by negative affect than memories elicited by social threat words in nonanxious individuals. However, there is also evidence that individuals with anxiety disorders, like depressed individuals, have difficulty retrieving specific memories cued by positive words (e.g. McNally et al., 1994). It is logical to predict such a bias in social phobia, as this

pathology is the anxiety disorder that is most closely related to depression (cf. Mineka, Clark, & Watson, 1998). Thus, it was expected that individuals with social phobia would demonstrate a memory bias against positive stimuli by exhibiting longer retrieval latencies, more responses categorized as general, and fewer memories characterized by positive affect than nonanxious individuals.

Method

Participants

Two samples were used in the present study: 15 individuals meeting DSM-IV criteria for social phobia and 17 nonanxious individuals with no history of psychopathology. Participants were undergraduate introductory psychology students who received course credit for completing the study. All participants spoke English as their first language. Participants had a mean age of 19.2 ($SD = 1.2$), 53% were female, and 100% were Caucasian. Demographic variables did not differ between groups. The following is a description of an extensive screening process used to obtain the diagnosed social phobic participants.

In two group testing sessions, participants ($n = 1{,}367$) were administered the Fear of Negative Evaluation Scale (FNE; Watson & Friend, 1969) and the Social Avoidance and Distress Scale (SAD; Watson & Friend, 1969). Two screening measures were used to ensure that individuals would score in a range reflecting social anxiety on a later occasion despite regression to the mean. Individuals scoring at least one standard deviation above the mean on both of these inventories (FNE $\geqslant 21$; SAD $\geqslant 12$) and nonanxious individuals scoring at least one standard deviation below the mean on these inventories (FNE $\leqslant 5$; SAD $= 0$) were invited to participate in the study. Individuals identified as socially anxious ($n = 134$; 9.8% of the total sample) had a mean FNE score of 26.8 ($SD = 2.2$) and a mean SAD of 18.0 ($SD = 4.8$). Individuals identified as nonanxious ($n = 74$; 5.4% of the total sample) had a mean FNE score of 2.1 ($SD = 1.8$) and a mean SAD of 0.

Forty-eight individuals identified as socially anxious and 31 individuals identified as nonanxious attended the experimental session. Reasons for eligible research participants declining participation included having already completed their course requirement, scheduling difficulties, having dropped the introductory psychology class, and failing to report for an experimental session. At the time of the experimental session, all participants completed the anxiety and major depression sections of the Structured Clinical Interview for DSM-IV Mental Disorders-Nonpatient Version (SCID-NP; First, Spitzer, Gibbon, & Williams, 1994). Exclusion criteria for the social phobia group included current or past history of major depression and current difficulties with panic disorder, agoraphobia, PTSD, obsessive compulsive disorder, and GAD. Exclusion criteria were similar for the nonanxious group, with the additional requirement that they could not endorse symptoms of social anxiety that caused avoidance and/or life interference. Twenty-four individuals identified as socially anxious endorsed one or more exclusion criteria, and an additional nine of these individuals did not meet full diagnostic criteria for social phobia. Seven individuals identified as nonanxious endorsed symptoms associated with one or more exclusion criteria, and an additional seven of these individuals reported avoidance and/or life interference associated with symptoms of social anxiety. Interviewers obtained a percentage agreement of 91.3% for a diagnosis of social phobia, resulting in a kappa of .64. Thus, this study reports results from

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Table 1. Properties of autobiographical memory cues

	Social threat ($n = 10$)	Positive ($n = 10$)	Neutral ($n = 10$)
Relation to a social or evaluative situation	6.18 (0.35)[a,b]	2.85 (0.50)	2.93 (0.55)
Pleasantness	4.01 (0.92)	5.77 (0.45)[b,c]	3.33 (0.66)
Imageability	3.76 (1.07)	3.57 (1.40)	4.23 (1.48)

Note: All categories are rated on a 1–7 likert-type scale (1 = low; 7 = high). Values in parentheses are standard deviations. [a]Significantly different than positive stimuli ($p < .05$); [b]Significantly different than neutral stimuli ($p < .05$); [c]Significantly different than social threat stimuli ($p < .05$).

15 individuals with social phobia and 17 nonanxious control individuals with no other symptoms of psychopathology.

Stimuli

Stimuli were identified through a complex selection procedure. Undergraduate research assistants generated a pool of single words related to social or evaluative situations (e.g. conversation, speech), termed "social threat" words. Each potential social threat word was matched with a number of additional single words that had similar lengths and frequencies in the English language according to the formula described by Kucera and Francis (1967). Two to three potentially neutral and potentially positive words matched to each social threat word were selected for further norming, resulting in a total pool of 187 potential social threat, positive, and neutral single word stimuli. Undergraduate research participants ($n = 16$) rated each of these stimuli on a 1–7 Likert-type scale (1 = low; 7 = high) for imageability (cf. Paivio, Yuille, & Madigan, 1968), pleasantness, and relation to a social or an evaluative situation. Imageability reflects the ease with which individuals can evoke a mental image in response to a single word, which is related to its degree of abstractness. The 10 words most related to social or evaluative situations were chosen as social threat stimuli (mean relation to a social or evaluative situation = 6.2). Of the words that were matched to these social threat stimuli for length and frequency in the English language, the word with the highest pleasantness rating and the most similar imageability rating was identified as a matched positive stimulus, and the word with the most neutral pleasantness rating (i.e. 3.5) and the most similar imageability rating was identified as a matched neutral stimulus. In all, there were 10 words relating to a social or evaluative situation (e.g. conversation, speech), 10 positive words (e.g. satisfaction, safe), and 10 neutral words (e.g. combination, glass).

Table 1 presents the properties of these stimuli. There was a significant difference among the types of stimuli in terms of their relation to social or evaluative situations (F [2, 29] = 124.92; $p < .001$). Follow-up analyses revealed that the social threat words were significantly more related to social or evaluative situations than were the positive and neutral words (ps $< .001$), but the positive and neutral words did not differ from each other. In addition, there was a significant difference among the three types of cue words on the pleasantness dimension (F [2, 29] = 32.24; $p < .001$). The positive words were significantly more pleasant than the social threat words and the neutral words (ps $< .001$), but the social threat and neutral

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words did not differ from each other. Finally, there were no differences among the three types of cue words on the dimension of imageability.

For the purposes of counterbalancing, the 30 words were grouped randomly into 6 chunks of 5 words each, with the exception that three or more words from the same group could not fall in the same chunk. The six chunks were arranged into six orders using a Latin Square counterbalancing scheme. Participants were randomly assigned to one of the six orders. In all, approximately four participants in each group completed each of the six orders.

Procedure

The autobiographical memory cueing task is one in which participants are presented with single-word stimuli and asked to generate the first specific memory that comes to mind (Williams & Broadbent, 1986; Williams & Dritschel, 1988). In the present study, experimenters read each word aloud and began to time on a stopwatch once the word was indicated. Participants subsequently indicated the first memory that came to mind, at which time the experimenter stopped the stopwatch. The experimenter provided minimal coaxing in order to elicit memories as free of influence as possible. Unlike some other studies examining this issue (e.g. McNally et al., 1994, 1995), we evaluated participants' first memory regardless of whether a specific or general memory was retrieved instead of requiring participants to generate a specific memory in order to focus on the properties of the first memory that came to mind. In the event that participants were unable to generate a memory within 30 seconds of the stimulus onset, participants moved onto the next cue word (cf. Williams & Dritschel, 1988). Participants were given five practice trials, and during these trials they were given feedback on their responses so that they clearly understood what was meant by a specific memory. Responses were audio-taped for the purposes of later coding. At the end of the session, participants completed the SCID-NP and several self-report inventories to characterize the samples, including the FNE, SAD, State-Trait Anxiety Inventory-Trait Version (STAI-T; Spielberger, Gorsuch, & Lushene, 1970), and Beck Depression Inventory (BDI; Beck, Ward, Mendelsohn, Mock, & Erbaugh, 1961).

Data coding

Participants' responses were categorized into two categories: specific and general. A "specific" memory referred to a discrete event that occurred during a period of time of no more than one day (e.g. McNally et al., 1995). A memory categorized as "general" may have had one of the following attributes: (1) not enough information provided to discern that the person is referring to a discrete event that occurred in a one day period (e.g. "grandma's house"); (2) an event that took place over the course of more than one day (e.g. "Last year, I stayed at grandma's house for a week"); or (3) a recurrent event (e.g. "Every summer I went to grandma's house on the Fourth of July"). The coder was one of two individuals who was trained on 17 cases associated with another autobiographical memory study (Wenzel, Jackson, Brendle, & Pinna, 2003). A reliability of .71 was obtained using a kappa statistic. Discrepancies on cases coded by two individuals were resolved by consensus.

Furthermore, memories were coded on several dimensions of affect. A well-established coding scheme to capture affect in mother-child interactions (Kochanska, 1997; Kochanska, Coy, Tjebkes, & Husarek, 1998) was modified for the purpose of the present study. This coding

scheme was adopted because it has established guidelines and data supporting its efficacy in measuring the affective tone of verbal expressions. A coder who was naïve to diagnostic status of participants rated the content of autobiographical memories for the presence or absence of the following affects: anxiety, fear, high positive affect, sadness, and irritability/anger. It was required that participants specifically referred to an affect in the context of their response in order to be coded for the presence of these variables (e.g. "I thought I was having a heart attack, and I was scared to death.") In the event that participants did not refer to a particular affect in their responses, they were given one of three codes: positive tone, negative tone, or neutral. The number of each of these ratings was tallied for each type of stimulus.

For the purpose of the present study, two variables were compiled: (1) weighted positive affect and (2) weighted negative affect. The value for the weighed positive affect variable was computed by adding high positive affect and half the value of positive tone. The value for weighted negative variable was computed by adding anxiety, fear, irritability/anger, sadness, and half the value of negative tone (Katherine Coy, personal communication, May 1999). Memories reflecting individual affect ratings were not analyzed separately because there were few responses in any one category. The coder was one of three individuals who was trained on 37 cases associated with another autobiographical memory study (Wenzel, 2001). A reliability of .70 was obtained using a kappa statistic. Discrepancies on cases coded by two individuals were resolved by consensus.

Results

Measures of psychopathology

Table 2 presents group responses on self-report inventories. A series of independent groups *t*-tests revealed significant differences between groups on the BDI (t [31] = 3.87; $p = .001$), FNE (t [31] = 9.48; $p < .001$), SAD (t [31] = 8.28; $p < .001$), and STAI-T (t [31] = 6.25; $p < .001$). Overall, these results confirm that the participants in the social phobia group were experiencing high levels of social anxiety. It is also noteworthy that they reported more trait anxiety and depressive symptomatology than the nonanxious control individuals, although the group's mean BDI score did not reach the clinical range (Beck et al., 1961). Five of the 15 individuals with social phobia had BDI scores above 10, and the

Table 2. Group differences on measures of psychopathology

	Social phobia group ($n = 15$)	Nonanxious group ($n = 17$)	t	p
BDI	9.2 (5.1)	3.4 (3.3)	3.87	.001
FNE	24.2 (6.4)	3.9 (5.7)	9.48	.000
SAD	15.4 (4.4)	0.6 (0.9)	8.28	.000
STAI-T	50.1 (8.3)	31.7 (8.3)	6.25	.000

Note: BDI = Beck Depression Inventory; FNE = Fear of Negative Evaluation Scale; SAD = Social Avoidance and Distress Scale; STAI-T = State-Trait Anxiety Inventory-Trait Version. Values in parentheses are standard deviations.

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Table 3. Autobiographical memory performance

	Social phobia group ($n = 15$)	Nonanxious group ($n = 17$)
Latency to retrieve first memory (sec)		
Social threat cues[a]	8.04 (3.08)	5.31 (4.35)
Positive cues	8.46 (4.64)	7.63 (4.78)
Neutral cues	11.38 (4.52)	10.79 (5.82)
Number of general memories retrieved		
Social threat cues	3.79 (2.61)	2.83 (1.38)
Positive cues	3.64 (2.31)	4.88 (2.23)
Neutral cues	4.29 (2.64)	4.41 (2.58)
Weighted positive affect		
Social threat cues	1.96 (1.26)	1.88 (1.40)
Positive cues	3.94 (2.17)	4.38 (1.71)
Neutral cues	0.93 (1.45)	0.74 (0.83)
Weighted negative affect		
Social threat cue	2.14 (1.89)	3.09 (2.06)
Positive cue	2.04 (1.73)	1.65 (1.64)
Neutral cue	2.89 (1.73)	2.47 (1.86)

Note: Values in parentheses are standard deviations. Weighted Positive Affect = High Positive Affect + (Neutral Positive/2). Weighted Negative Affect = Anxiety/Worry + Fear + Irritability/Anger + Sadness + (Neutral Negative/2). [a]Significantly different than nonanxious group ($p < .05$).

highest score in this group was a 16. Two nonanxious individuals had BDI scores of 10, and the remainder of the BDI scores in this group were 9 or below.

Autobiographical memory performance

Table 3 displays autobiographical memory performance as a function of group for each of the dependent variables.

Retrieval latency. Values of 30 seconds, the total amount of time allowed for each trial, were entered for trials in which participants were unable to identify an autobiographical memory (cf. Goddard, Dritschel, & Burton, 1996). A logarithmic transformation (base 10, $y + 1$) was made on the data to achieve a normal distribution because untransformed values were negatively skewed (Kirk, 1995).

A 2 (group) × 3 (cue type) mixed ANOVA on the transformed data revealed a main effect for cue type (F [2, 58] = 28.20; $p < .001$) that was qualified by a group by cue type interaction (F [2, 58] = 5.30; $p = .008$). Follow-up tests revealed that nonanxious participants retrieved memories cued by social threat words faster than participants with social phobia (t [31] = 2.68; $p = .012$). There was no difference between groups in the latency to retrieve memories cued by positive and neutral words. Within-group follow-up analyses indicated that participants with social phobia retrieved autobiographical memories equally as fast when cued with all three types of stimuli. In contrast, nonanxious control participants retrieved memories cued by social

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threat stimuli faster than they retrieved memories cued by neutral stimuli (t [16] = −3.34; $p = .004$).

Overgenerality. Although pervious studies have examined either the number of specific memories (e.g. McNally et al., 1995) or the number of general memories (e.g. McNally et al., 1994), we chose the latter because overgenerality more directly reflects psychopathological processes (cf. Williams, 1996). A 2 (group) × 3 (cue type) mixed ANOVA revealed a main effect for cue type (F [2, 58] = 4.85; $p = .011$) that was qualified by a group by cue type interaction (F [2, 58] = 4.38; $p = .017$). Follow-up analyses revealed that there were no between-groups differences in the number of general memories retrieved when cued with any of the three types of stimuli. However, within-group analyses showed that the nonanxious control group retrieved fewer general memories when cued with social threat stimuli than when cued with positive stimuli (t [16] = −2.06; $p = .001$) and neutral stimuli (t [16] = −1.59; $p = .02$). In contrast, there were no significant within-group differences for the participants with social phobia in the number of general memories they retrieved as a function of cue type.

Affect. A logarithmic transformation (base 10, y + 1) was made on the data to achieve a normal distribution because untransformed values were negatively skewed (Kirk, 1995). The 2 (group) × 3 (cue type) mixed ANOVA for transformed weighted positive affect scores yielded a main effect for cue type (F [2, 58] = 76.97; $p < .001$) but no main effect for group or group by cue type interaction. As expected, participants in both groups retrieved a greater number of memories cued by positive stimuli than social threat or neutral stimuli that reflected positive affect. The 2 (group) × 3 (cue type) mixed ANOVA for weighted negative affect revealed a main effect for cue type (F [2, 58] = 4.33; $p = .018$) that was qualified by a significant group by cue type interaction (F [2, 58] = 3.29; $p = .044$). There were no significant between-groups differences in the number of memories characterized by negative affect as a function of cue type. However, nonanxious participants retrieved a greater number of memories characterized by negative affect when cued with social threat stimuli than when cued with positive stimuli (t [16] = 3.00; $p = .009$). Participants with social phobia retrieved memories characterized by equal amounts of negative affect when cued with all three types of stimuli.

Depression effects. Because participants with social phobia reported significantly higher levels of depressive symptoms than nonanxious participants, the three 2 (group) × 3 (cue type) mixed ANOVAs that yielded significant group by cue type interactions were re-run including BDI scores as a covariate. All three significant findings became non-significant in this series of analyses: (1) retrieval latency: (F [2, 56] = 2.33), (2) number of general memories (F [2, 56] = 2.13), and (3) weighted negative affect (F [2, 56] = 1.33). Thus, analyses including BDI scores as a covariate suggest that depressive symptoms, at least in part, account for the significant results obtained in this study.

Discussion

The present study investigated the nature of autobiographical memories in individuals with social phobia and nonanxious individuals when cued with three types of stimuli: single words relating to social or evaluative situations (social threat), single positive words, and single

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neutral words. Analyses of the three major variables to measure the nature of autobiographical memory in clinical samples – retrieval latency, overgenerality, and affective tone – yielded a similar pattern of results. Specifically, we obtained the expected group by cue type interactions for retrieval latency, number of general memories retrieved, and weighted negative affect. However, follow-up analyses revealed that means for each of these autobiographical memory variables were not in the hypothesized direction. Participants with social phobia responded with similar types of autobiographical memories regardless of whether they were cued with social threat, positive, or neutral stimuli. In contrast, nonanxious participants responded to social threat stimuli faster than participants with social phobia and faster than they did to neutral stimuli. Additionally, nonanxious participants retrieved fewer general memories when cued with social threat stimuli than when cued with neutral stimuli and more memories characterized by negative affect when cued with social threat stimuli than when cued with positive stimuli. Thus, it was the nonanxious individuals, rather than the individuals with social phobia, who demonstrated selective recall for socially-relevant memories.

Several explanations could account for these results. First, because an experimenter read the cue words, perhaps the presence of another individual inhibited participants with social phobia from providing memories that were particularly negative for them. It is possible that individuals with social phobia are embarrassed by past negative experiences in social or evaluative situations and, in the present study, were not comfortable sharing those with the experimenter. Such a response bias could have masked exaggerated verbal recall of negative social experiences that are otherwise particularly salient for them. We chose to implement the oral autobiographical memory protocol because it is consistent with established protocols from the depression literature (e.g. Williams & Broadbent, 1986). However, future researchers might consider examining autobiographical memory in social phobia using a procedure in which the experimenter is not present (cf. Wenzel, 2001, for a computer administration). Another explanation is that individuals with social phobia simply have fewer experiences with social and evaluative situations than nonanxious individuals due to avoidance of them. Thus, the lack of experience with situations these cue words represented could have created a limited pool of memories from which the participants with social phobia could have drawn in the autobiographical memory cueing task.

Results from this study did not replicate those found with samples of individuals with PTSD (McNally et al., 1994, 1995) with regard to the biased recall of autobiographical memories elicited by positive cues. This finding is surprising given that social phobia is the only anxiety disorder that is characterized by low levels of positive affectivity in much the same manner as is depression (Mineka et al., 1998). That is, theoretical work suggests that both depressed and social phobic individuals lack enthusiasm, energy, and a general positive engagement with their environment. Thus, it would be logical to predict that individuals with social phobia, like depressed individuals, would have difficulty retrieving positive memories. It is important to note that most individuals in McNally et al.'s (1994) PTSD sample were diagnosed with comorbid major depression, although their statistical analyses associated overgenerality with symptoms of PTSD rather than depressive symptomatology. Perhaps the difficulty retrieving specific positive memories was not obtained in the present study because we excluded individuals with a current or past history of major depression. On the other hand, it is important to note that all significant findings in this study could be attributed to the presence of depressive symptoms, even if those symptoms were not necessarily in the clinical range.

Several limitations of the present study must be acknowledged. First, it could be argued that both samples of participants had unique characteristics, making the generalizability of results questionable. Although an extensive screening procedure was used to ensure that socially anxious participants met diagnostic criteria for social phobia, it is possible that more compelling results would have been obtained with a treatment-seeking sample. Moreover, great care was taken to ensure that the social phobic participants did not endorse any comorbid psychiatric illness. This was a deliberate design choice to enhance the internal validity of the study. However, because comorbidity between social phobia and other anxiety and depressive disorders is more the rule that the exception (Wenzel & Holt, 2001), it is possible that our social phobia sample was highly atypical. Additionally, the nonanxious sample scored significantly below average on the self-report inventories of social anxiety, raising the possibility that their performance was not representative of the normal population of individuals who are not diagnosed with social phobia. In fact, perhaps they demonstrated a bias toward the retrieval of vivid socially-related memories because they are highly extroverted, skilled individuals who enjoy interacting in social situations.

Another limitation is that we did not include a mood manipulation to enhance level of state anxiety at the time of the experiment. In their seminal review paper, Mathews and MacLeod (1994) suggested that cognitive biases toward threat, especially in nonclinical samples, are observed only when there is a congruent mood state. We cannot rule out the possibility that we would have obtained enhanced autobiographical memories of negative social situations if we had included a manipulation to induce high levels of state anxiety in our participants. A final limitation was that effect sizes were small, making their practical significance questionable. On a related note, it is possible that more significant differences between groups or within groups would have been observed with larger sample sizes. For example, the retrieval latency means seem to follow a similar pattern in the social phobia and nonanxious samples, but within-group differences were only significant within the nonanxious group.

In all, this study provided no evidence for an autobiographical memory bias in social phobia, but it raised the possibility that they exhibit a different pattern of autobiographical memory recall than nonanxious individuals. It is unlikely that exaggerated memories of negative social experiences play a role in maintaining other cognitive biases in individuals with social phobia, as cognitive theories (e.g. Rapee & Heimberg, 1997) would suggest. As has been evidenced in previous studies, all significant effects were attenuated when depressive symptoms were controlled. This study contributes to an increasingly large literature suggesting that depressive symptoms must be carefully documented in studies examining cognitive processes in anxiety disorders.

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