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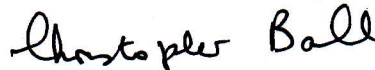
An Investigation of the Autobiographical Memory Biases
of Socially Anxious Individuals

A thesis submitted in partial fulfillment of the requirement
for the degree of Bachelor of Arts in Psychology from
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by

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Accepted for Honors



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Running Head: SOCIAL ANXIETY AND AUTOBIOGRAPHICAL MEMORY

An Investigation of the Autobiographical Memory Biases of Socially Anxious Individuals

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Abstract

The current study investigated the autobiographical memory biases of socially anxious individuals by examining the properties of recalled memories. Socially anxious individuals tend to recall specific kinds of autobiographical memories that are more negative, more vivid, and more significant, as well as recalled from an observer perspective. These known biases should be stronger in anxiety-provoking settings, such as in the presence of others. In this study, individuals who received high scores and individuals who received low scores on the mini-Social Phobia Inventory were compared. Participants either completed the study alone or in small groups. Participants completed a word-cued autobiographical memory retrieval task that included individual situation word cues (e.g. “study”) and social situation word cues (e.g. “discussion”). Participants rated their memories on a series of scales measuring emotional impact, vividness, personal significance, and perspective. Participants also reported their current affective states. The findings of this study revealed that running participants in small groups was not an anxiety-provoking situation, though a subtle effect on participants' affective states (levels of upset and cheerfulness) was found. The findings also revealed that memories recalled to individual situation word cues did not differ greatly from those recalled to social situation word cues. However, there were relationships found between mini-SPIN score and several properties of the memories recalled to social situation word cues such that these memories were more negative and recalled from an observer perspective. These results suggest that there are particular kinds of autobiographical memory biases for socially anxious individuals. Results also emphasize the need for future research.

An Investigation of the Autobiographical Memory Biases of Socially Anxious Individuals

Memory is a significant part of every person's life. Our memory allows us to recognize the face of an old friend, to recall the lyrics of a favorite song, to remember our first kiss. Autobiographical memory, the system of memories recollected from our own individual lives, is composed of particular kinds of episodic memories: memories of the specific experiences of a person's life (Conway, 1990). Typically, these memories are complex and represent personally significant events from a person's life. They contain detailed sensory and perceptual information about an experienced event, such as the particular time and place in which the event occurred, as well as reflective information, such as personal feelings about the event (Rubin, 1996). Conway and Pleydell-Pearce's (2000) self-memory system (SMS) model represents what is considered the most influential theory of autobiographical memories. Conway and Pleydell-Pearce proposed that autobiographical memories are not discrete units residing in long-term memory but rather temporary mental representations that are stored in a network of interconnected nodes and reconstructed through levels of autobiographical knowledge residing in what they consider an autobiographical knowledge base. They proposed that at least three levels of autobiographical knowledge reside here.

At the highest level of the SMS structure are *lifetime periods* which represent the goals, plans, and themes of the self during particular periods across your life. For example, high school is a lifetime period frequently characterized by the goal to go to college. At the next level are *general events*, which include both general, repeated and extended events as well as specific, singular events. For example, submitting the online

application to the College of William & Mary, a specific one-time event, and waiting to receive a decision every day after school for two weeks, a repeated and extended event, are both general events from the high school lifetime period. At the lowest level of the structure is *event-specific knowledge* that represents the sensory and perceptual information as well as specific facts about an event. For example, the details about leaving school early in a hurry to open the large, embossed envelope containing the acceptance letter that your father informed you via text had arrived are all represented within the event-specific knowledge of a general event from the high school lifetime period.

The SMS model describes the retrieval of autobiographical memories as based on activation that occurs as we interact with both internal and external cues. These cues cause activation that spreads both upwards and downwards through the structure's network connections in a cyclical way. That is, if activation causes a search through the highest level, the lifetime period level, that activation is then channelled by the information available at this level to related general events in the next level and event-specific knowledge in the lowest level. The information accessed at this point typically results in the activation of many memories, and thus it is evaluated and assessed by whether the memories are appropriate and satisfy current goals and intentions. Memories that are considered appropriate will reach conscious awareness. If the activated memories are evaluated as unsatisfactory or inappropriate based on current goals and intentions, the retrieval process can either be terminated or the information channelled back through to begin the search again.

Conway and Pleydell-Pearce (2000) emphasize the relationship between autobiographical memory and the self, including current self-perceptions as a contributing factor to how we store and retrieve autobiographical memories. Accordingly, Conway, Singer, and Tagini (2004) introduced two competing demands that are essential in the construction of autobiographical memories: adaptive correspondence and self-coherence. They define adaptive correspondence as the need to keep a record of ongoing activity and experiences as they occur in reality. They define self-coherence as the need to maintain a coherent and stable image of the self as you interact with reality. These authors argue that a critical function of autobiographical memory is to maintain an integrated personal life story that, to the best of an individual's ability, also reflects reality. The SMS model proposes that the need for self-coherence will amplify the availability of memories that support and confirm our current self-perceptions while also diminishing the availability of memories that disconfirm our current ideas of the self. This premise is the basis of autobiographical memory biases.

Autobiographical memory biases are specific kinds of cognitive biases that serve to either enhance or impair the recall of certain kinds of memories and the properties of those memories (Schacter, 1999). There are many different types of these biases. For example, the self-serving bias, where individuals tend to view themselves as responsible for positive outcomes but not responsible for negative outcomes in order to bolster self-esteem (Campbell & Sedikides, 1999), and the egocentric bias, where individuals tend to recall past events that make them look better than what they really are in order to boost the ego (Ross & Sicoly, 1979). The recall of certain kinds of memories can be affected by

these biases in terms of whether specific memories will be recalled at all and how long it takes for a memory to be recalled. For example, an individual exhibiting the egocentric bias may take significantly longer to recall the time they failed a course than the time they got an A on a paper. Autobiographical memory biases also shape the properties and content of memories, both in how they are originally stored and how they are reported later on. For example, an individual exhibiting the egocentric bias may report a better grade than what was actually received in a class.

Autobiographical memory biases are linked to general cognitive biases such that current perceptions of the self, including the goals and desires of the ideal self, help determine the types of autobiographical memory biases that individuals develop and utilize. Similarly, these autobiographical memory biases help produce and maintain current perceptions of the self (Greenwald, 1980). For example, the perception of being a great student and the goal of always achieving good grades in school may result in a general cognitive bias of how an individual views herself. From this, an autobiographical memory bias may result, such as in a memory distortion of what grade was actually received or the impairment of recalling failing a course. Since both the event-specific knowledge of the actual grade received and the general event of failing a course do not fit the current perception of the self, the memories of these events are subject to an autobiographical memory bias such as the egocentric bias. This kind of bias of an individual's memories then serves to maintain the current perception of being a great student and achieving in school.

Past research on autobiographical memory biases has examined a variety of

characteristics of autobiographical memories in relation to psychological conditions that affect the perceptions of the self. For example, individuals suffering from post-traumatic stress disorder (PTSD) stemming from battling cancer report more negative memories and more trauma-related memories than individuals without PTSD (Kangas, Henry & Bryant, 2005). This bias is thought to result from a discrepancy between one's current self and the ideal self (Sutherland & Bryant, 2008). Further, individuals with major depression take significantly longer to retrieve autobiographical memories and have reduced specificity of these memories upon retrieval than individuals without major depression (Williams et al., 2007). Additionally, individuals with high self-esteem report favorable past experiences as more recent and unfavorable past experiences as more distant while individuals with low self-esteem do not show this bias (Ross & Wilson, 2002). This bias is thought to result from the high self-esteem individuals' desire to maintain positive views of the self. These studies suggest that current views of the self, whether they are views that seemingly bolster or undermine an individual's sense of character, influence what memories we recall. This supports the premise that autobiographical memory plays a critical role in regulating self-perceptions, and vice versa. The cyclical nature of this relationship has significant implications for the maintenance and treatment of psychological disorders.

Autobiographical memory biases associated with anxiety disorders were first reported by Richards and Whittaker (1990). They found that upon increasing participants' anxiety levels, individuals with high anxiety were faster to recall specific autobiographical memories in response to anxiety-related cue words (e.g. "nervous") than

happiness-related cue words (e.g. “happy”) while individuals with low anxiety did not show a difference in response based on type of cue word. A similar study by Burke and Mathews (1992) found that individuals with generalized anxiety disorder recalled more autobiographical memories associated with anxiety more quickly than non-anxious controls. From these studies, the idea that certain types of memories are more salient to anxious individuals than non-anxious individuals spawned interest in the possibility of autobiographical memory biases across a variety of anxiety disorders.

This thesis focuses on the autobiographical memory biases associated with social anxiety disorder. Social anxiety disorder, also known as social phobia, is the third most common mental disorder in the United States, with an estimated 19 million Americans suffering from this condition and a 12-month prevalence rate of nearly 7% (Kessler, Chiu, Demler & Walters, 2005). Signs of social phobia typically begin in adolescence but occasionally start as early as childhood and as late as adulthood. Social anxiety disorder is marked by the persistent fear of social or performance situations (DSM-IV, American Psychiatric Association, 1994). This fear can lead to constant anticipation or avoidance of these situations as well as severe distress upon being placed in these situations. This distress and anxiety typically comes from concerns about humiliating or embarrassing the self in front of other people as well as receiving negative evaluations from those people.

The most common and effective treatment for social anxiety disorder is cognitive behavioral therapy (CBT). The goal of CBT for socially anxious individuals is to help them recognize and guide their thoughts in a more rational way when experiencing anxiety-provoking social and performance situations. This may allow these individuals to

face situations they would have previously avoided as well as react more typically to these situations (Hope, Heimberg & Turk, 2006). Research has shown that individuals with social anxiety disorder show many general biases in their cognitive processing. For example, compulsive monitoring and careful observation of the self during social situations (Clark & Wells, 1995) and excessive rumination characterized largely by self-scrutiny after experiencing social situations (Clark & McManus, 2002). These marked biases in cognitive processing suggest that individuals with social anxiety disorder should also show specific biases in the recall of certain autobiographical memories.

Given the tendency of individuals with social anxiety disorder to focus their attention and thought on themselves and any perceived threat in social situations, several researchers have investigated how social anxiety relates to autobiographical memory biases in the recall of threatening social and performance events (social-threat memories). Researchers have examined three major questions: (1) Do socially anxious individuals have greater recall of social situations, specifically social-threat memories (Rapee et al., 1994; Wenzel, Jackson & Holt, 2002; Wenzel, Werner, Cochran & Holt, 2004)?; (2) Do these memories have specific properties that distinguish them from more neutral, non-social, memories (Wenzel, Pinna & Rubin, 2004; D'Argembeau, Van der Linden, d'Acremont & Mayers, 2006; Anderson, Goldin, Kurita & Gross, 2008)?; (3) Does the perspective from which these memories are recalled differ between socially anxious individuals and non-socially anxious individuals (Wells, Clark & Ahmad, 1998; Wells & Papageorgiou, 1999; Coles, Turk, Heimberg & Fresco, 2001)? Unfortunately, previous research has not found consistent answers to these questions. The aims and findings of

the current thesis are relevant to all three questions.

In looking at the association between social anxiety and the recall of social-threat memories, several studies have used cueing procedures in an attempt to activate memories associated with various cue types. Rapee et al. (1994) instructed participants to describe the first memory that came to mind following the presentation of cue words related to social situations (e.g. “talk” and “interview”) and neutral cue words, unrelated to social situations (e.g. “key” and “river”). One group of participants had been previously diagnosed with social anxiety disorder and the other group consisted of non-anxious control participants. Participants were assigned to either a “self” condition or an “other” condition. Participants in the “self” condition were asked to describe memories from their own lives in which they were directly involved, and participants in the “other” condition were asked to describe memories that involved another person such as a sibling or close friend. These memories were then read back to the participants who were asked to rate how much anxiety was associated with each memory. The results of this study revealed that the memories recalled to the social situation cue words were consistently associated with higher anxiety than those recalled to the non-social cue words. But surprisingly, there were no differences in anxiety ratings found between the socially anxious group and the non-anxious control group to these different cues.

Wenzel et al. (2002) compared participants with social anxiety disorder and non-anxious controls on their first specific personal memories that came to mind following the presentation of social-threat cue words and neutral cue words. In this study, participants were not asked to rate the memories but rather trained independent coders

rated each memory for specificity and affective tone (i.e. positive or negative). The results of this study showed no differences between groups in the specificity of memories, but there was a significant difference between groups regarding affective tone. A greater number of memories cued by the social-threat cue words were reported as having a negative tone by the socially anxious group when compared with the non-anxious control group. However, only 8% of participants in the socially anxious group described memories that were considered to have a negative tone, and consequently the researchers deemed this effect was not of practical significance. A similar procedure was used again, with the inclusion of positive cue words in addition to social-threat and neutral cue words (Wenzel et al., 2004a). Again, after controlling for levels of depression across participants, the researchers reported no significant difference in the affective content of social-threat memories for socially anxious participants and non-anxious controls.

Unfortunately, the findings of these studies suggest only weak support for the relationship between social anxiety disorder and autobiographical memory biases. One explanation for these limited findings is the affective state of the participants when they completed the study tasks. Research on the relationship between social anxiety disorder and word recall shows a strong connection between the affective state of socially anxious individuals and the kinds of words these individuals recall (Breck & Smith, 1983; Smith, Ingram & Brehm, 1983). In their study, Breck and Smith (1983) asked high and low socially anxious female participants to recall and rate personality trait words. Half the participants were given information leading them to believe that they would have to

interact with a stranger later in the experiment (a threatening situation for the socially anxious individuals) and the other half were given no additional information. The results of this study revealed that when anticipating the social-threat situation, high socially anxious participants recalled more negative traits and fewer positive traits attributed to themselves than the low socially anxious participants. By contrast, when the threat of interacting with the stranger did not exist, high and low socially anxious participants did not differ in what was recalled.

In their study, Smith et al. (1983) asked high and low socially anxious participants to recall and rate a series of personality trait words on a number of measures including private self-reference and public self-reference. Again, half the participants experienced a social-threat induction and the other half did not. This time, the social-threat induction involved participants giving a speech prior to the task and being told they would give another speech later in the experiment. The results of this study revealed that socially anxious participants who went through the social-threat induction recalled more public self-referent words than both the socially anxious participants who did not receive the social-threat induction and the low anxious control participants in both conditions.

Based on this research, arguments have been made that to truly get at the relationship between autobiographical memory biases and social anxiety disorder, socially anxious individuals need to feel anxious during the study in order to activate their general cognitive processing biases (Hirsch & Clark, 2004). The activation of these cognitive biases by establishing a state level of social anxiety would ensure that autobiographical memory biases are occurring under conditions that resemble the way

information is processed in the actual threatening social situations. Consequently, one novel aim of the present study was to examine whether the presence of autobiographical memory biases of socially anxious individuals can be affected by manipulating the social setting. In the current study, half of the participants were tested alone and the other half of the participants were tested in small groups in a confined space.

One hypothesis of the present study is that this setting manipulation will cause a change in the affective state of participants. Specifically, it will cause socially anxious individuals to feel more anxious, upset, and stressed, as well as less cheerful and relaxed in the anxiety-provoking setting (completing the task in small groups) when compared to the non-anxiety-provoking setting (completing the task individually). Non-anxious individuals should show no differences in affective state based on this manipulation. Further, contingent on this manipulation being successful, it is predicted that socially anxious individuals will show greater autobiographical memory biases in the recall of certain memories when in the anxiety-provoking situation than in the non-anxiety provoking situation. Again, non-anxious individuals should show no differences. The addition of a setting manipulation in this study allows us to better examine and validate the existence and properties of the autobiographical memory biases of socially anxious individuals.

In addition to looking at whether autobiographical memory biases related to social anxiety disorder actually exist, researchers in the past have been interested in looking at the specific properties of social-threat memories that distinguish them from neutral memories. Wenzel et al. (2004b) instructed undergraduate students to retrieve

three memories associated with five separate emotional experiences (panic, trauma, worry, social anxiety, and feeling content) for a total of fifteen memories. Participants then answered a series of questions about the properties of each memory, including vividness and perceived accuracy, as well as the experiences of retrieving each memory, including emotional impact and amount of anxiety felt. Trained researchers also coded the memories for specificity and affective tone. The results showed that all anxiety-related memories (i.e. panic, trauma, worry, and social anxiety) were characterized by a more negative tone than the non-anxiety-related memories (i.e. feeling content). They also found that panic- and trauma-related memories were more specific and vivid than all other memories. The findings of this study suggest that certain types of anxieties are related to enhanced memory and biases in the retrieval of the properties of some memories.

D'Argembeau et al. (2006) were also interested in the properties of anxious memories and how these differ from other memories. In their study, participants with generalized social phobia and non-anxious control participants were asked to recall four types of events: one positive social event; one negative social event; one positive non-social event; and one negative non-social event. Participants were instructed to write down brief descriptions of the events and then rate the memories on a series of scales, including ratings of various sensory and contextual details (visual, sounds, smell/taste, location, time of day, etc.) as well as various self-referential details (e.g. what they said and what they were thinking) and other-referential details (e.g. what other people were doing). The results showed that socially anxious participants' memories of social

situations contained more self-referential details and less sensory details than non-anxious participants. The two groups did not differ across their memories of non-social situations. Anderson et al. (2008) found similar results when looking at the linguistic content of autobiographical narratives of prompted memories between individuals with social anxiety disorder and non-anxious controls. These findings suggest not only that there are differences in the properties of social-threat memories but also a bias for socially anxious individuals in retrieving these memories differently.

In the current study, several properties of the memories of socially anxious individuals are examined, including emotional impact, vividness, and significance. One hypothesis of the present study is that socially anxious individuals in the anxiety-provoking setting will show the greatest amount of autobiographical memory biases in the recall of social memories. This should be reflected in the aforementioned properties. Based on previous research, the hypotheses regarding the specific properties of the memories recalled by socially anxious individuals in the anxiety-provoking setting are that these memories will be more negative, more vivid, and more significant than the memories recalled by socially anxious individuals in the non-anxiety provoking setting. Non-anxious individuals should show no differences in these properties.

One specific property that has been of great interest to researchers looking at the autobiographical memory differences of socially anxious individuals is the perspective from which social-threat memories are recalled. Given the cognitive bias of socially anxious individuals to carefully monitor and shift focus onto the self in social-threat situations (Clark & Wells, 1995), it follows that recalling these events would tend to be

from an observer perspective, one in which individuals actually view themselves from an external point of view, rather than a field perspective, one in which individuals view the situation looking out from their own eyes. Wells et al. (1998) found just this result when asking individuals with social phobia and non-anxious individuals to imagine social and non-social situations. Participants were asked to close their eyes and imagine two events: one in which they felt anxious and uncomfortable in a social situation, and one in which they felt anxious and uncomfortable in a non-social situation. Participants were then asked to rate the perspective from which they were recalling the memory. The results of the study showed that socially anxious participants were more likely to take an observer perspective in social situations than non-anxious participants. The two groups did not differ in the perspective taken in recalling non-social situations.

Wells and Papageorgiou (1999) looked at this phenomenon across individuals with other types of phobias in addition to social phobia, including agoraphobia and blood/injury phobia. In this study, they asked participants in each of these three condition groups as well as a non-anxious control group to recall and imagine an anxiety-provoking social situation and a non-anxiety provoking non-social situation and then rate the perspective of each memory. The results showed that only participants in the social phobia and agoraphobia groups reported recalling the anxiety-provoking social situation from an observer perspective. Further, only participants in the social phobia group showed a shift from the observer perspective in the social situation to the field perspective in the non-social situation. Coles et al. (2001) compared individuals with social anxiety disorder and non-anxious individuals across three types of recalled social

situations: low, medium, and high anxiety events. They found that socially anxious participants were more likely to take an observer perspective than non-anxious participants when recalling high anxiety social situations. There were no differences between the groups for medium or low anxiety social situations, as both groups tended to recall these events from a field perspective. The findings of these three studies suggest that social anxiety may be associated with at least one specific type of autobiographical memory bias – a memory perspective bias.

In the present study, the perspective of the memories recalled by participants is examined. Based on the previous research, the hypothesis is that socially anxious individuals in the anxiety-provoking setting will exhibit a greater memory perspective bias in the recall of social memories than socially anxious individuals in the non-anxiety-provoking setting. Non-anxious individuals should show no differences. While previous studies interested in the relationship between social anxiety disorder and autobiographical memory have generally looked at one or two properties of recalled memories in isolation, one novel aim of the current study is to examine multiple properties of the memories of socially anxious individuals together in order to better investigate the possibility of autobiographical memory biases. This will allow us to better understand the relationship between social anxiety disorder and autobiographical memory.

An additional novel aim of this study was looking at whether replacing neutral word cues with individual situation word cues in the cued autobiographical memory procedure would result in differences between the types of recalled memories. The hypothesis is that this stimulus manipulation will result in a more robust difference

between the autobiographical memory biases of socially anxious individuals and non-anxious individuals, such that socially anxious individuals will show the greatest amount of autobiographical memory biases, as reflected in the properties of the recalled memories, for the social situation word cues and the least amount of autobiographical memory biases for the individual situation word cues. Non-anxious individuals should show no significant differences based on this stimulus manipulation. The addition of a stimulus manipulation as well as a setting manipulation in this study allows us to better examine and validate the existence of autobiographical memory biases of socially anxious individuals and the properties of the memories that define such biases.

Method

Participants

Participants were 78 undergraduate students from the College of William and Mary in the introductory psychology class research pool who completed the experiment voluntarily and gave their written consent. Participants received research participation credit in exchange for their participation in the experiment. The participants for this experiment were selected from a larger pool of undergraduate students who completed the mini-Social Phobia Inventory (mini-SPIN) created by Connor et al. (2001). Participants were invited to participate in the experiment on the basis of their scores on the mini-SPIN from the psychology department mass testing. Three participants were excluded from the analyses because their mini-SPIN scores failed to put them in either condition group (high-SA or low-SA). The remaining 75 participants (24 male and 51 female) were all over 18 years old with an average age of 18.67 years.

Materials

Eighteen (18) stimulus words including nine (9) social situation word cues and nine (9) individual situation word cues formed the target prompts for the autobiographical memory retrieval task. The social situation word cues used were the following:

AIRPORT, AUDIENCE, CAFETERIA, CLASS, CROWD, DISCUSSION, SHOPPING

MALL, TEAM, THANKSGIVING. The individual situation word cues used were the

following: *BEDROOM, BICYCLE, CAR, DIARY, HOMEWORK, LAUNDRY, SHOWER,*

SOLO, STUDY. Both the social situation and individual situation word cues were selected

based on a pilot study that established that these words differ in whether people are more likely to retrieve events that involved other people or events they experienced alone, respectively.

The mini-SPIN created by Connor et al. (2001) was used to determine the participants for this experiment. The items on this scale are the following: 1. *Fear of embarrassment causes me to avoid doing things or speaking to people*; 2. *I avoid activities in which I am the center of attention*; 3. *Being embarrassed or looking stupid are among my worst fears.* These items were measured on 5-point Likert scales ranging from 1 = “*not at all*” to 5 = “*extremely*”. The mini-SPIN is scored by summing the item ratings. Scores greater than 6 on this measure indicate possible problems with social anxiety.

A word-cued autobiographical memory retrieval task was created for this experiment. Three booklets were created, each with an instructions page, followed by eighteen (18) target pages, and then a final page. Each of the three versions of the booklet

had a randomized order of the target pages, but the instructions page was always the first page, and the final page was always the last page of every booklet. The target pages all had the same design, with a stimulus word cue at the top of the page, followed by a space for the participants to write in, followed by five questions with five scales measuring the dependent variables of interest. The dependent variables measured were five properties of the participants' retrieved memories: past emotional impact, current emotional impact, vividness, personal significance, and perspective. These variables were measured on 7-point Likert scales, ranging from 1 = “*very negative*” to 7 = “*very positive*” for both emotional impact scales, 1 = “*not vivid at all*” to 7 = “*very vivid*” for the vividness scale, 1 = “*not at all important*” to 7 = “*very important*” for the personal significance scale, and 1 = “*1st-person (like you were experiencing it again)*” to 7 = “*2nd-person (like you were watching yourself in the event)*” for the perspective scale. An example of a target page can be found in the Appendix.

The final page of the booklet had a current affective state grid measuring the dependent variables of interest as well as demographic questions. The dependent variables measured were five attributes of the participants' current affective state: how anxious, cheerful, stressed, upset, and relaxed they felt at the time of completion. All of these variables were measured together in a grid on 5-point Likert scales ranging from 1 = “*not at all*” to 5 = “*extremely*”. The demographic questions included age, gender, and student identification number (which was used to match participants to their mini-SPIN scores). The final page can be found in the Appendix.

Design

A 2 x 2 x 2 mixed design experiment with three independent variables and ten (10) dependent variables was utilized in this study. There were two levels of the independent grouping variable Social Anxiety: high social anxiety (high-SA) and low social anxiety (low-SA). These groups were determined on the basis of each participant's scores on the mini-SPIN from mass testing, with high-SA being defined as scores of 11 and above, and low-SA as scores of 6 and below. The cut-off levels represented the scores of approximately the top third and bottom third of all individuals who completed the mini-SPIN. The mini-SPIN score breakdown was 37 high-SA score participants and 38 low-SA score participants. There were two levels of the independent social context variable Setting Manipulation: group and individual. The setting breakdown was 37 group participants and 38 individual participants. Further breakdown of the participants into groups can be seen in Table 1. Both of these variables were between-subjects. There were two levels of the independent variable Stimulus Type: social situation word cues and individual situation word cues. Each participant received both sets of words and this variable was within-subjects.

Procedure

Upon being invited to the experiment via email, each participant was self-assigned to one of the two setting scenarios: group or individual. Participants in the group setting were run in small groups (ranging from n=4 to n=7) in a private research lab. These participants all sat around one table in the middle of the room. Participants in the individual setting were run alone in a small one-person room adjacent to the private

research lab. Participants were told that they were participating in a study examining the factors affecting autobiographical memory retrieval. Participants were randomly assigned to one of the three booklets. Participants were instructed before the task began to examine each individual word cue and to write down the first specific memory that came to mind. They were given the definition of a specific memory and examples of what a specific memory is and what a specific memory is not. Participants were also instructed to answer the five questions on the five scales following the completion of writing down the entire memory description. Additionally, participants were instructed to work through the booklet in order and to complete the entire booklet in one sitting. Participants were told that they had as long as they needed to complete the task. These instructions were both said out loud by the experimenter and provided on the instructions page of every booklet.

In both setting conditions, the experimenter informed the participants when fifteen (15) minutes had passed. In the individual setting, this was the only time the experimenter interrupted the participant. In the group setting, the experimenter also entered the room at two other times (~8 minutes into the task and ~24 minutes into the task, respectively) to watch the participants for one-minute intervals. A note at the bottom of the final page of the booklet instructed the participants to turn the booklet into the experimenter when they finished. Upon turning the booklet in, participants were debriefed on the true nature of the experiment including the purpose, hypothesis, and characteristic of interest (i.e. social anxiety) as well as asked if they had any questions or concerns about the experiment or experimental design.

Results

Effect of Manipulation on Affective State

To examine the effects of the Setting Manipulation (group vs. individual) and the level of Social Anxiety grouping (high-SA vs. low-SA) on each attribute of the participants' current affective states (anxious, cheerful, stressed, upset, and relaxed) a series of 2-way univariate analyses of variance (ANOVAs) was conducted. The means and standard deviations for all measures are presented in Table 2.

A 2-way ANOVA run on participants' level of upset revealed a marginally significant main effect of the setting manipulation, $F(1, 71) = 3.90, p = .052$. Participants in the individual setting ($M = 1.50, SD = .893$) rated their level of upset as higher than participants in the group setting ($M = 1.19, SD = .569$). This analysis also revealed a significant interaction effect between the social anxiety group and the setting manipulation, $F(1, 71) = 13.12, p = .001$. A simple main effects analysis revealed that participants in the high-SA group in the individual setting ($M = 1.89, SD = 1.10$) rated their level of upset as higher than participants in the low-SA group in the individual setting ($M = 1.11, SD = .315$), $t(36) = -3.01, p = .005$. There was no difference between high-SA participants in the group setting ($M = 1.00, SD = .00$) and low-SA participants in the group setting ($M = 1.37, SD = .761$). This interaction effect can be seen in Figure 1.

A 2-way ANOVA run on participants' level of cheerfulness revealed a marginally significant interaction effect between the social anxiety group and the setting manipulation, $F(1, 71) = 3.17, p = .079$. A simple main effects analysis revealed that participants in the high-SA group in the individual setting ($M = 2.26, SD = 1.10$) rated

their level of cheerfulness as lower than participants in the low-SA group in the individual setting ($M = 3.11$, $SD = 1.05$), $t(36) = 2.42$, $p = .021$. There was no difference between high-SA participants in the group setting ($M = 2.72$, $SD = 1.02$) and low-SA participants in the group setting ($M = 2.68$, $SD = 1.11$). This interaction effect can be seen in Figure 2.

No other results from the series of analyses on participants' affective states trended towards significance, *ns*.

Effect of Manipulations on Memory Properties

To examine the effects of the Setting Manipulation (group vs. individual), the level of Social Anxiety grouping (high-SA vs. low-SA), and the Stimulus Type (social situation word cues vs. individual situation word cues) on each property of the participants' retrieved memories, a series of 2 x 2 x 2 repeated-measures ANOVAs was conducted. For these analyses, the setting manipulation and the social anxiety group were both between-subjects factors and the stimulus type was a within-subjects factor. The means and standard deviations of all variables are presented in Table 3.

A 3-way repeated-measures ANOVA run on participants' ratings of past emotional impact revealed a significant main effect of stimulus type, $F(1, 71) = 30.02$, $p = .000$. Memories recalled to social situation word cues ($M = 4.55$, $SD = .83$) were rated as more positive than memories recalled to individual situation word cues ($M = 4.00$, $SD = .82$). This analysis also revealed a significant main effect of social anxiety group, $F(1, 71) = 4.86$, $p = .031$. Participants in the high-SA group ($M = 4.09$, $SD = .81$) rated recalled memories as more negative than participants in the low-SA group ($M = 4.45$, $SD = .80$).

A 3-way repeated-measures ANOVA run on participants' ratings of current emotional impact revealed a significant main effect of stimulus type, $F(1, 71) = 17.61$, $p = .000$. Memories recalled to social situation word cues ($M = 4.77$, $SD = .73$) were rated as more positive than memories recalled to individual situation word cues ($M = 4.40$, $SD = .67$).

A 3-way repeated-measures ANOVA run on participants' ratings of vividness revealed a significant interaction effect between the setting manipulation and the stimulus type, $F(1, 71) = 5.67$, $p = .02$. Participants in the group setting rated the memories recalled to individual situation word cues ($M = 5.35$, $SD = .97$) as more vivid than the memories recalled to social situation word cues ($M = 5.21$, $SD = .93$). Participants in the individual setting rated the memories recalled to individual situation word cues ($M = 5.23$, $SD = .69$) as less vivid than the memories recalled to social situation word cues ($M = 5.43$, $SD = .80$). This interaction effect can be seen in Figure 3.

A 3-way repeated-measures ANOVA run on participants' ratings of personal significance revealed a significant main effect of stimulus type, $F(1, 71) = 15.27$, $p = .000$. Memories recalled to social situation word cues ($M = 3.68$, $SD = 1.15$) were rated as more significant than memories recalled to individual situation word cues ($M = 3.28$, $SD = 1.03$). This analysis also revealed a significant main effect of the setting manipulation, $F(1, 71) = 15.64$, $p = .000$. Participants in the individual setting ($M = 3.88$, $SD = 1.07$) rated recalled memories as more significant than participants in the group setting ($M = 3.07$, $SD = .95$). This analysis also revealed a significant interaction effect between the social anxiety group and the stimulus type, $F(1, 71) = 5.37$, $p = .023$.

Participants in the low-SA group rated memories recalled to social situation word cues ($M = 3.94, SD = 1.06$) as more significant than participants in the high-SA group ($M = 3.42, SD = 1.19$). This interaction effect can be seen in Figure 4. This analysis also revealed a marginally significant interaction effect between the setting manipulation and the social anxiety group, $F(1, 71) = 3.24, p = .076$. High-SA participants in the individual setting ($M = 3.92, SD = 1.03$) rated recalled memories as much more significant than high-SA participants in the group setting ($M = 2.74, SD = .88$). Low-SA participants in the individual setting ($M = 3.84, SD = 1.12$) rated recalled memories as only slightly more significant than low-SA participants in the group setting ($M = 3.40, SD = .92$). This interaction effect can be seen in Figure 5.

A 3-way repeated-measures ANOVA run on participants' ratings of perspective revealed a significant main effect of stimulus type, $F(1, 71) = 7.20, p = .009$. Memories recalled to social situation word cues ($M = 2.67, SD = 1.31$) were rated from less of an observer perspective than memories recalled to individual situation word cues ($M = 2.97, SD = 1.26$). This analysis also revealed a significant main effect of social anxiety group, $F(1, 71) = 7.44, p = .008$. Participants in the high-SA group ($M = 3.19, SD = 1.26$) rated recalled memories from more of an observer perspective than participants in the low-SA group ($M = 2.45, SD = 1.20$).

No other results from the series of analyses on the properties of participants' memories trended towards significance, *ns*.

Relationships between Social Anxiety and Memory Properties

To examine the relationships between each participants' mini-SPIN score and each

property of the participants' retrieved memories for both levels of Stimulus Type (social situation word cues and individual situation word cues), a series of correlations was conducted. The correlation coefficients are presented in Table 4.

Mini-SPIN score was shown to be correlated with participants' ratings of past emotional impact of social situation word cues, $r(74) = -.309, p = .007$. Mini-SPIN score was also shown to be correlated with participants' ratings of current emotional impact of social situation word cues, $r(74) = -.234, p = .043$. The analysis also revealed that mini-SPIN score is correlated with participants' ratings of personal significance of social situation word cues, $r(74) = -.297, p = .010$. Additionally, the analysis revealed that mini-SPIN score is correlated with participants' ratings of perspective of social situation word cues, $r(74) = .310, p = .007$. Finally, the analysis revealed that mini-SPIN score correlated marginally with participants' ratings of perspective of individual situation word cues, $r(74) = .211, p = .069$.

No other results from this series of correlations trended towards significance, *ns*.

Discussion

The present study marked an investigation of the autobiographical memory biases of socially anxious individuals. The main hypothesis of this study was that high-SA participants run in the anxiety-provoking setting, who completed the task in small groups in a confined space, would show a marked change in affective state based on this setting manipulation. The findings of this study do not support this hypothesis as predicted, though a subtle effect of the setting manipulation was found. As seen in the results, the high-SA participants in the group setting did not feel more anxious, stressed, or upset nor

less cheerful or relaxed. On the contrary, high-SA participants in the individual setting reported feeling more upset and less cheerful than high-SA participants in the group setting. These participants also reported feeling more upset and less cheerful than the low-SA control participants in the individual setting. What this suggests is perhaps the individual setting, and not the group setting, was the anxiety-provoking setting for high-SA participants.

To try and understand the reversal that may have happened with this setting manipulation, it is important to consider two things: one, the mini-SPIN items; and two, the experiences of the participants in each setting. The mini-SPIN items (Connor et al., 2001) focus on two main, well-accepted criteria for social anxiety and what makes someone a socially anxious individual. One, socially anxious individuals avoid situations in which they are the center of attention and/or have to speak to people. Two, for it to be considered social anxiety, this avoidance must be out of fear of embarrassment and/or being perceived as less intelligent or competent. Taking that into account, participants in this study who were run individually were required, by nature of the study, to interact one-on-one with an experimenter, a stranger in the majority of these cases, including speaking to the experimenter. In contrast, participants in this study who were run in small groups were not required to interact with the experimenter or each other and instead could choose to not interact with or speak to anyone at all. Given these circumstances, it suggests that the high-SA participants could see the individual setting, which entailed one-on-one interaction with the experimenter, as a situation in which they were the center of attention and thus this could be seen as an anxiety-provoking situation for them. This

explanation is one possibility as to why the setting manipulation turned out the way it did. This possibility is based both on the findings of this study, which showed a slight reversal of the setting manipulation, as well as on the accepted definitions of social anxiety disorder (American Psychiatric Association, 1994) and the determining characteristics of socially anxious individuals (Connor et al., 2000).

However, another possibility is that the manipulation itself was too subtle, with neither situation proving to be truly anxiety-provoking enough to cause high-SA participants to be in a similar affective state to how they feel during actual social situations that cause them anxiety (i.e. social-threat situations). This possibility is also based on the findings of this study, which overall showed a general lack of mood differences between the participants in all setting conditions, whether they were in the high-SA or the low-SA group. Namely, there were no differences in participants' ratings of how relaxed, stressed or anxious they felt. These affective qualities would likely be better indicators of the amount of anxiety felt in the situation than how cheerful or upset the participants felt. Future research should aim to solidify a setting manipulation that provides a robust anxiety-provoking situation and a contrastive non-anxiety provoking situation. An example of this kind of manipulation would include having some participants complete the autobiographical memory retrieval task by themselves with zero interaction (e.g. online) as the non-anxiety provoking situation and having some participants complete the task with forced interaction (e.g. in small groups where they must interact with other individuals and the experimenters) as the anxiety-provoking situation. Such a manipulation, if successful, should result in an increase in the

autobiographical memory biases of socially anxious individuals compared to non-anxious controls.

In the current study, there was only one interaction between the setting manipulation and the social anxiety group, such that high-SA participants who were in the individual setting rated their retrieved memories as more personally significant than high-SA participants who were in the group setting. If the setting manipulation of running participants individually is considered more anxiety-provoking than running participants in small groups, then this suggests that provoked high-SA participants recall memories that are more significant. One possibility is that these memories are from experiences where these participants were the center of attention, and thus they viewed the situation as more significant, and this general cognitive bias then translated into an autobiographical memory bias. Overall, though, a lack of findings supporting the relationship between the autobiographical memory biases of socially anxious individuals and the anxiety-provoking situation may further contribute to the conclusion that the setting manipulation of this study was unsuccessful. Future research will be able to better determine the relationship between current affective state and autobiographical memory biases through the use of a successful setting manipulation.

A secondary hypothesis of this study was that exposure to social situation word cues in contrast to individual situation word cues in the autobiographical memory retrieval task would result in the greatest autobiographical memory biases for high-SA participants. The findings of this study do not show strong support for this hypothesis. As revealed in the results, social situation word cues tended to result in memories seen as

more positive by participants, both in the past and in the present, than those recalled from individual situation word cues. The memories retrieved from social situation word cues were also seen as more significant and more likely to be perceived from a 1st person/field perspective. These were true across all participants. There was only one interaction effect between the stimulus type and the social anxiety group, such that socially anxious individuals rated the memories retrieved from social situation word cues as less significant than the non-anxious control participants. This possibly suggests that the relatively high frequency of social-threat situations for socially anxious individuals results in a cognitive bias such that each individual experience is less significant, and this cognitive bias is then translated into an autobiographical memory bias. Once again, though, an overall lack of findings supporting the relationship between autobiographical memory biases and the social situation word cues suggests that the stimulus type did not have a large effect on participants' retrieved memories.

While the main hypotheses of this study concerning the manipulations of autobiographical memory biases as predicted were not strongly supported by the findings of this study, there were findings that still suggest that specific autobiographical memory biases of socially anxious individuals do exist. As revealed in the results, high-SA participants recalled memories that were rated as more negative than the low-SA control participants. This supports previous research on autobiographical memory biases in individuals with social anxiety disorder (e.g. D'Argembeau et al., 2006) and contributes to the idea that individuals with social anxiety attend more to negative information about situations and their experiences (Clark & McManus, 2002). Additionally, high-SA

participants in this study were more likely to retrieve memories from a 2nd person/observer perspective than the low-SA control participants. This also supports previous research on the topic of autobiographical memory biases, specifically the memory perspective bias (e.g. Wells et al., 1998) and contributes to the idea that individuals with social anxiety focus their attention and observation more on the self (Clark & Wells, 1995).

Further, participants' levels of social anxiety, as measured by their mini-SPIN scores, were shown to be correlated with several properties of the participants' retrieved memories for memories that were cued by the social situation word cues. The scores were negatively correlated with past and current emotional impact, suggesting that individuals with higher levels of social anxiety retrieve more negative memories when cued with social situation words. Also, the scores were positively correlated with perspective, suggesting that individuals with higher levels of social anxiety retrieve more memories from a 2nd person/observer perspective when cued with the social situation words. Again, these findings support previous research that has looked at the autobiographical memory biases of socially anxious individuals, including the specific memory perspective bias. These findings also support the idea from the previous research that says these autobiographical memory biases reveal themselves most severely in the recall of social-threat situations (Wenzel et al., 2002), during which the cognitive biases of socially anxious individuals are the most extreme (Clark & Wells, 1995).

Future research should focus on different types of autobiographical memory retrieval tasks in an attempt to better access the general cognitive biases and the more

specific memory biases of socially anxious individuals. For example, a task that uses phrases such as “*a time when I felt very anxious*” to trigger different types of autobiographical memories has been more successful in the past (e.g. Wells et al., 1998). Additionally, arguments have been made against using a word-prompted autobiographical memory cueing procedure that requires participants to write descriptions of their memories in favor of mental imagery cueing procedures requiring participants to use pictures (Holmes, Arntz & Smucker, 2007; Holmes, Mathews, Mackintosh & Dalgleish, 2008). Holmes et al. (2008) found that mental imagery is both more effective and more accurate in terms of accessing and evaluating the affective qualities of emotional memories. These studies show support for better methods to use in the investigation of autobiographical memory biases. There is also support for the use of linguistic content analyses of autobiographical memory narratives (Anderson et al., 2008) as a better way to examine the data concerning autobiographical memory biases.

Conclusions

Overall, the findings of this study are important as they contribute to the way that we think about social anxiety disorder and the characteristics of socially anxious individuals, including the properties of their general cognitive processes including autobiographical memories. The findings add support to the idea that the general cognitive biases of socially anxious individuals translate into specific autobiographical memory biases that are concrete, such that they occur in specific situations, as well as noticeable, such that they can be observed in contrast to non-anxious individuals, and thus perhaps even manipulatable. The awareness of the autobiographical memory biases

of any mood disorder has significant implications for therapeutic treatment through the use of CBT, as does the ability to manipulate the settings and conditions in which these biases are the most or least active. Future studies should continue to examine autobiographical memory biases in an effort to validate their existence and pinpoint the properties associated with them and also in an attempt to manipulate them, varying the settings and task types, and perhaps mitigate them.

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References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders*. Washington, D.C.: APA.
- Anderson, B., Goldin, P.R., Kurita, K., & Gross, J.J. (2008). Self-representation in social anxiety disorder: Linguistic analysis of autobiographical narratives. *Behaviour Research and Therapy*, *46*, 1119-1125.
- Breck, B.E., & Smith, S.H. (1983). Selective recall of self-descriptive traits by socially anxious and nonanxious females. *Social Behavior and Personality*, *11*, 71-76.
- Burke, M., & Mathews, A. (1992). Autobiographical memory and clinical anxiety. *Cognition and Emotion*, *6*, 23-35.
- Campbell, W.K., & Sedikides, C. (1999). Self-threat magnifies the self-serving bias: A meta-analytic integration. *Review of General Psychology*, *3*, 23-43.
- Clark, D.M., & McManus, F. (2002). Information processing in social phobia. *Biological Psychiatry*, *51*, 92-100.
- Clark, D.M., & Wells, A. (1995). A cognitive model of social phobia. *Social phobia: Diagnosis, assessment, and treatment*, 69-92. New York, NY: Guilford Press.
- Coles, M.E., Turk, C.L., Heimberg, R.G., & Fresco, D.M. (2001). Effects of varying levels of anxiety within social situations: Relationship to memory perspective and attributions in social phobia. *Behaviour Research and Therapy*, *39*, 651-665.
- Connor, K.M., Davidson, J.R., Churchill, L.E., Sherwood, A., Foa, E., & Weisler, R.H. (2000). Psychometric properties of the Social Phobia Inventory (SPIN). New self-rating scale. *The British Journal of Psychiatry*, *176*, 379-386.

- Connor, K.M., Kobak, K.A., Churchill, L.E., Katzelnick, D., & Davidson, J.R. (2001). Mini-SPIN: a brief screening assessment for generalized social anxiety disorder. *Depression and Anxiety, 14*, 137-140.
- Conway, M.A. (1990). *Autobiographical memory: An introduction*. Milton Keynes, England: Open University Press.
- Conway, M.A., & Pleydell-Pearce, C.W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review, 107*, 261-268.
- Conway, M.A., Singer, J.A., & Tagini, A. (2004). The self and autobiographical memory: Correspondence and coherence. *Social Cognition, 22*, 491-529.
- D'Argembeau, A., Van der Linden, M., d'Acremont, M., & Mayers, I. (2006). Phenomenal characteristics of autobiographical memories for social and non-social events in social phobia. *Memory, 14*, 637-647.
- Greenwald, A.G. (1980). The totalitarian ego: fabrication and revision of personal history. *American Psychology, 35*, 603-618.
- Hirsch, C.R., & Clark, D.M. (2004). Information-processing bias in social phobia. *Clinical Psychology Review, 24*, 799-825.
- Holmes, E.A., Arntz, A., & Smucker, M.R. (2007). Imagery rescripting in cognitive behaviour therapy: Images, treatment techniques and outcomes. *Journal of Behavior Therapy and Experimental Psychiatry, 38*, 297-305.
- Holmes, E.A., Mathews, A., Mackintosh, B., & Dalgleish, T. (2008). The casual effect of mental imagery on emotion assessed using picture-word cues. *Emotion, 8*, 395-409.

- Hope, D.A., Heimberg, R.G., & Turk, C.L. (2006). *Managing social anxiety: A cognitive behavioral therapy approach (therapist guide)*. New York: Oxford University Press.
- Kangas, M., Henry, J.L., & Bryant, R.A. (2005). A prospective study of autobiographical memory and posttraumatic stress disorder following cancer. *Journal of Consulting and Clinical Psychology, 73*, 293-299.
- Kessler, R.C., Chiu, W.T., Demler, O., & Walters, E.E. (2005). Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry, 62*, 617-627.
- Rapee, R.M., McCallum, S.L., Melville, L.F., Ravenscroft, H., & Rodney, J.M. (1994). Memory bias in social phobia. *Behaviour Research and Therapy, 31*, 89-99.
- Richards, A., & Whittaker, T.M. (1990). Effects of anxiety and mood manipulation in autobiographical memory. *British Journal of Clinical Psychology, 29*, 145-153.
- Ross, M., & Sicoly, F. (1979). Egocentric biases in availability and attribution. *Journal of Personality and Social Psychology, 37*, 322-336.
- Ross, M., & Wilson, A.E. (2002). It feels like yesterday: Self-esteem, valence of personal past experiences, and judgments of subjective distance. *Journal of Personality and Social Psychology, 82*, 792-803.
- Rubin, D.C. (1996). *Remembering our past: Studies in autobiographical memory*. Cambridge, England: Cambridge University Press.
- Schacter, D.L. (1999). The Seven Sins of Memory: Insights from psychology and cognitive neuroscience. *American Psychology, 54*, 182-203.

- Smith, T.W., Ingram, R.E., & Brehm, S.S. (1983). Social anxiety, anxious self-preoccupation and recall of self-relevant information. *Journal of Personality and Social Psychology, 44*, 1276-1283.
- Sutherland, K., & Bryant, R.A. (2008). Autobiographical memory and the self-memory system in post-traumatic stress disorder. *Journal of Anxiety Disorders, 22*, 555-560.
- Wells, A., Clark, D.M., & Ahmad, S. (1998). How do I look with my mind's eye? Perspective taking in social phobic imagery. *Behaviour Research and Therapy, 36*, 631-634.
- Wells, A., & Papageorgiou, C. (1999). The observer perspective: Biased imagery in social phobia, agoraphobia, and blood/injury phobia. *Behaviour Research and Therapy, 37*, 653-658.
- Wenzel, A., Jackson, L.C., & Holt, C.S. (2002). Social phobia and the recall of autobiographical memories. *Depression and Anxiety, 15*, 186-189.
- Wenzel, A., Pinna, K., & Rubin, D.C. (2004). Autobiographical memories of anxiety-related experiences. *Behaviour Research and Therapy, 42*, 329-341.
- Wenzel, A., Werner, M.M., Cochran, C.K., & Holt, C.S. (2004). A differential pattern of autobiographical memory retrieval in social phobic and nonanxious individuals. *Behavioural and Cognitive Psychotherapy, 32*, 1-13.
- Williams, J.M.G., Barnhofer, T., Crane, C., Hermans, D., Raes, F., Watkins, E., & Dalgleish, T. (2007). Autobiographical memory specificity and emotional disorder. *Psychological Bulletin, 133*, 122-148.

Table 1

Number of Participants by Gender, Setting Manipulation, and Social Anxiety Group

Group	Setting	Male	Female	Total
Low-SA	Group	8	11	19
	Individual	8	11	19
	Total	16	22	38
High-SA	Group	4	14	18
	Individual	4	15	19
	Total	8	29	37
Total	Group	12	25	37
	Individual	12	26	38
	Total	24	51	75

Table 2

*Mean Mood Attribute Ratings (with Standard Deviations) as a Function of Setting**Manipulation and Social Anxiety Group*

Group	Setting	ANXIOUS	CHEERFUL	STRESSED	UPSET	RELAXED
Low-SA	Group	1.84 (.765)	2.68 (1.108)	2.26 (.991)	1.37 (.761)	2.53 (1.073)
	Individual	1.84 (.898)	3.11 (1.049)	2.11 (1.049)	1.11 (.315)	2.84 (1.015)
	Total	1.84 (.823)	2.89 (1.085)	2.18 (1.010)	1.24 (.590)	2.68 (1.042)
High-SA	Group	1.67 (.970)	2.72 (1.018)	2.00 (1.283)	1.00 (.000)	3.11 (1.231)
	Individual	2.05 (.780)	2.26 (1.098)	2.32 (1.157)	1.89 (1.10)	2.63 (1.065)
	Total	1.86 (.887)	2.49 (1.070)	2.16 (1.214)	1.46 (.900)	2.86 (1.159)
Total	Group	1.76 (.863)	2.70 (1.051)	2.14 (1.134)	1.19 (.569)	2.81 (1.175)
	Individual	1.95 (.837)	2.68 (1.141)	2.21 (1.094)	1.50 (.893)	2.74 (1.032)
	Total	1.85 (.849)	2.69 (1.090)	2.17 (1.107)	1.35 (.762)	2.77 (1.098)

Note. N = 75.

Table 3

Mean Memory Property Ratings (with Standard Deviations) as a Function of Stimulus Type, Setting Manipulation, and Social Anxiety Group

Group	Setting	Stimulus	Past E. I.	Current E.I.	Vividness	Significance	Perspective
Low-SA	Group	Social	4.71 (.769)	4.85 (.681)	5.30 (1.10)	3.75 (.975)	2.37 (1.28)
		Individual	4.09 (.559)	4.37 (.564)	5.36 (1.03)	3.04 (.865)	2.49 (1.21)
	Individual	Social	4.83 (.980)	4.97 (.893)	5.45 (.916)	4.12 (1.14)	2.12 (.905)
		Individual	4.18 (.878)	4.44 (.624)	5.27 (.652)	3.56 (1.09)	2.86 (1.39)
	Total	Social	4.77 (.871)	4.91 (.785)	5.37 (1.00)	3.94 (1.06)	2.25 (1.10)
		Individual	4.13 (.727)	4.41 (.588)	5.31 (.851)	3.30 (1.00)	2.67 (1.30)
High-SA	Group	Social	4.28 (.663)	4.53 (.589)	5.12 (.713)	2.91 (1.07)	3.05 (1.63)
		Individual	3.86 (.785)	4.47 (.682)	5.35 (.930)	2.56 (.689)	3.23 (1.32)
	Individual	Social	4.35 (.813)	4.70 (.695)	5.41 (.677)	3.91 (1.12)	3.16 (1.11)
		Individual	3.89 (1.01)	4.30 (.836)	5.18 (.746)	3.93 (.942)	3.31 (1.02)
	Total	Social	4.31 (.734)	4.62 (.643)	5.27 (.701)	3.42 (1.19)	3.10 (1.37)
		Individual	3.87 (.894)	4.38 (.760)	5.26 (.833)	3.26 (1.07)	3.27 (1.16)

Note. $N = 75$. *E.I.* = “emotional impact”.

Table 4

Correlation Coefficients for mini-SPIN Scores and Memory Property Ratings by Stimulus

Type

	Stimulus	mini-SPIN Score
Past Emotional Impact	Social	-.309**
	Individual	-.187
Current Emotional Impact	Social	-.234*
	Individual	-.031
Vividness	Social	-.136
	Individual	-.062
Significance	Social	-.297**
	Individual	-.099
Perspective	Social	.310**
	Individual	.211

Note. $N = 75$. * $p < .05$. ** $p < .01$.

Figure Captions

Figure 1. Participants' mean ratings of upset as a function of Social Anxiety group and level of Setting Manipulation.

Figure 2. Participants' mean ratings of cheerfulness as a function of Social Anxiety group and level of Setting Manipulation.

Figure 3. Participants' mean ratings of vividness of recalled memories as a function of Stimulus Type and level of Setting Manipulation.

Figure 4. Participants' mean ratings of personal significance of recalled memories as a function of Stimulus Type and level of Social Anxiety group.

Figure 5. Participants' mean ratings of personal significance of recalled memories as a function of Social Anxiety group and level of Setting Manipulation.

Note. Error bars indicate 95% confidence intervals.

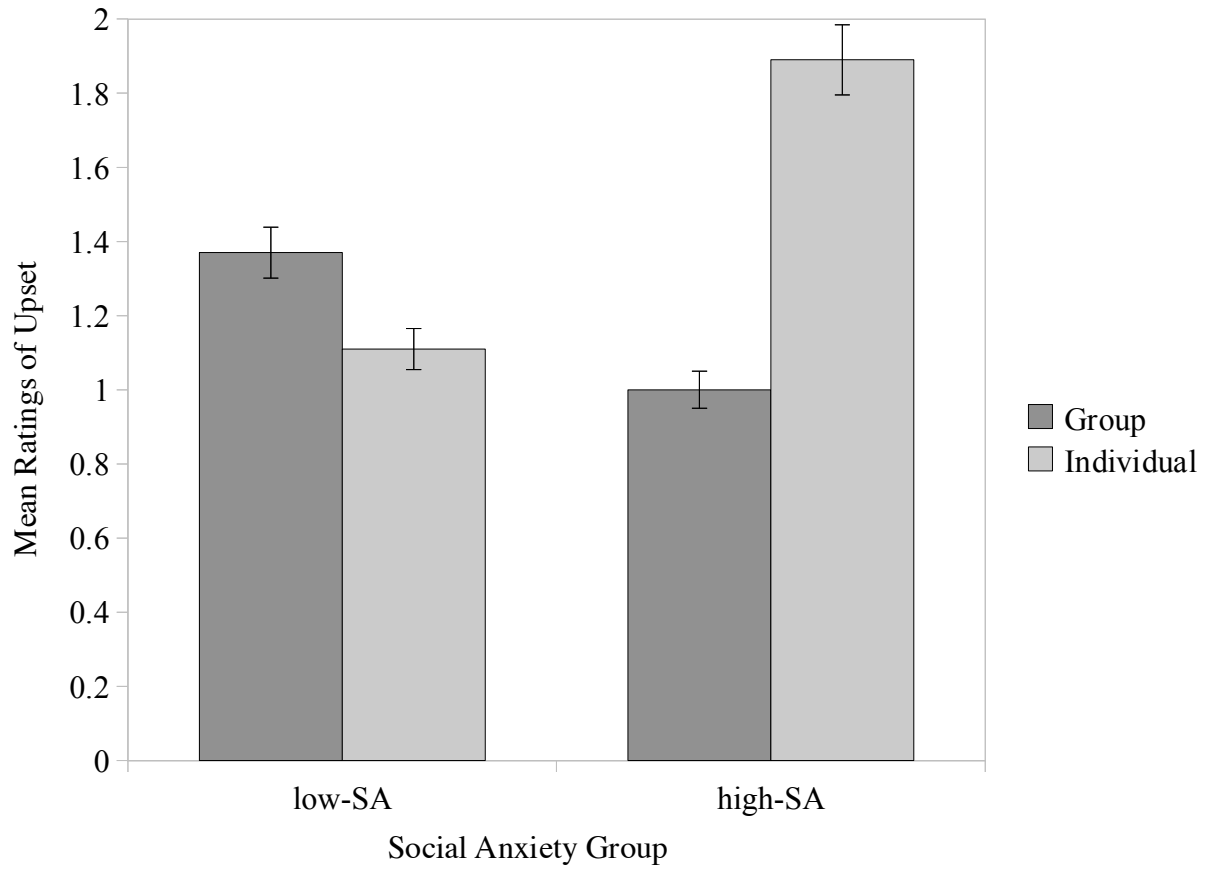


Figure 1.

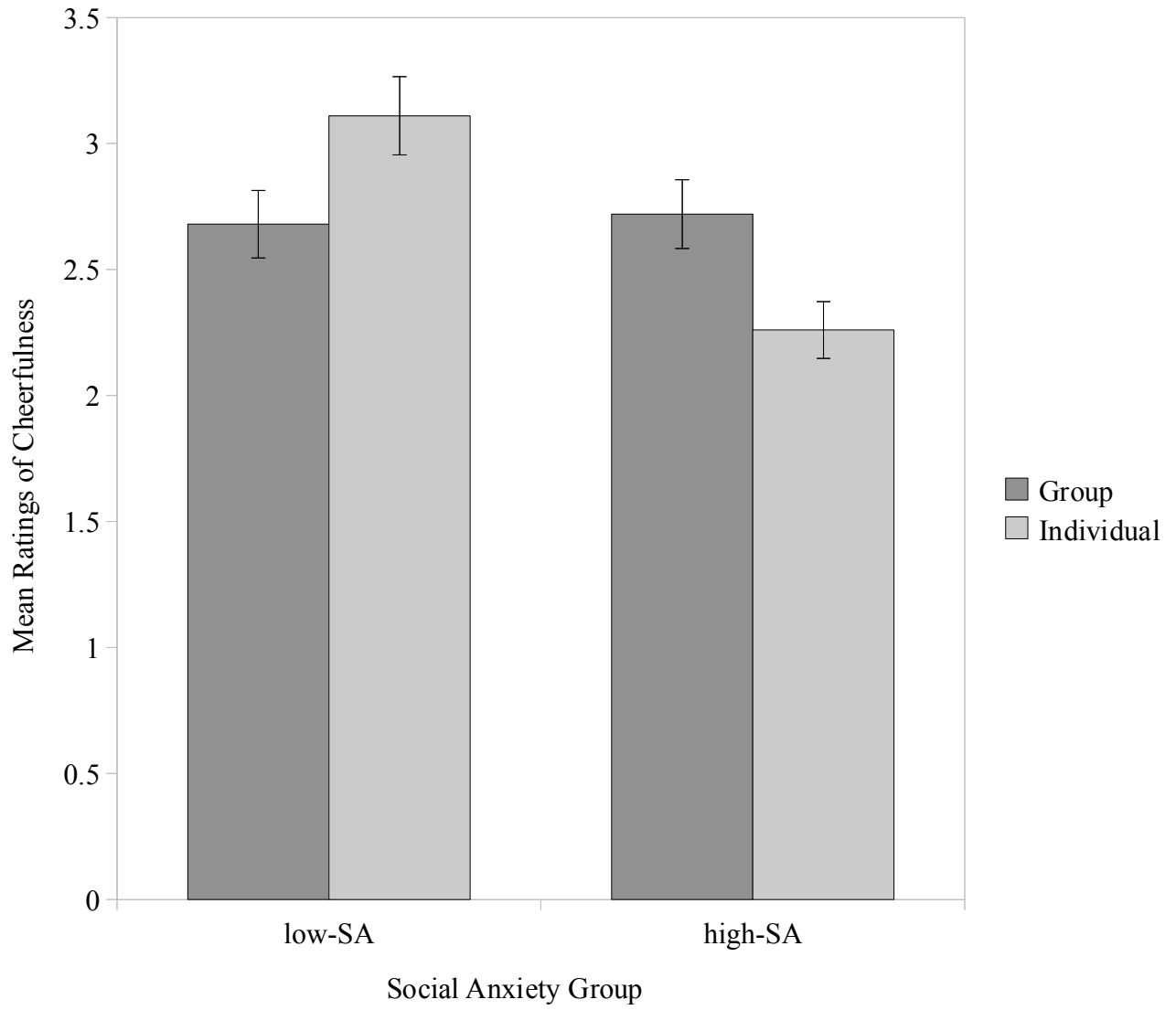


Figure 2.

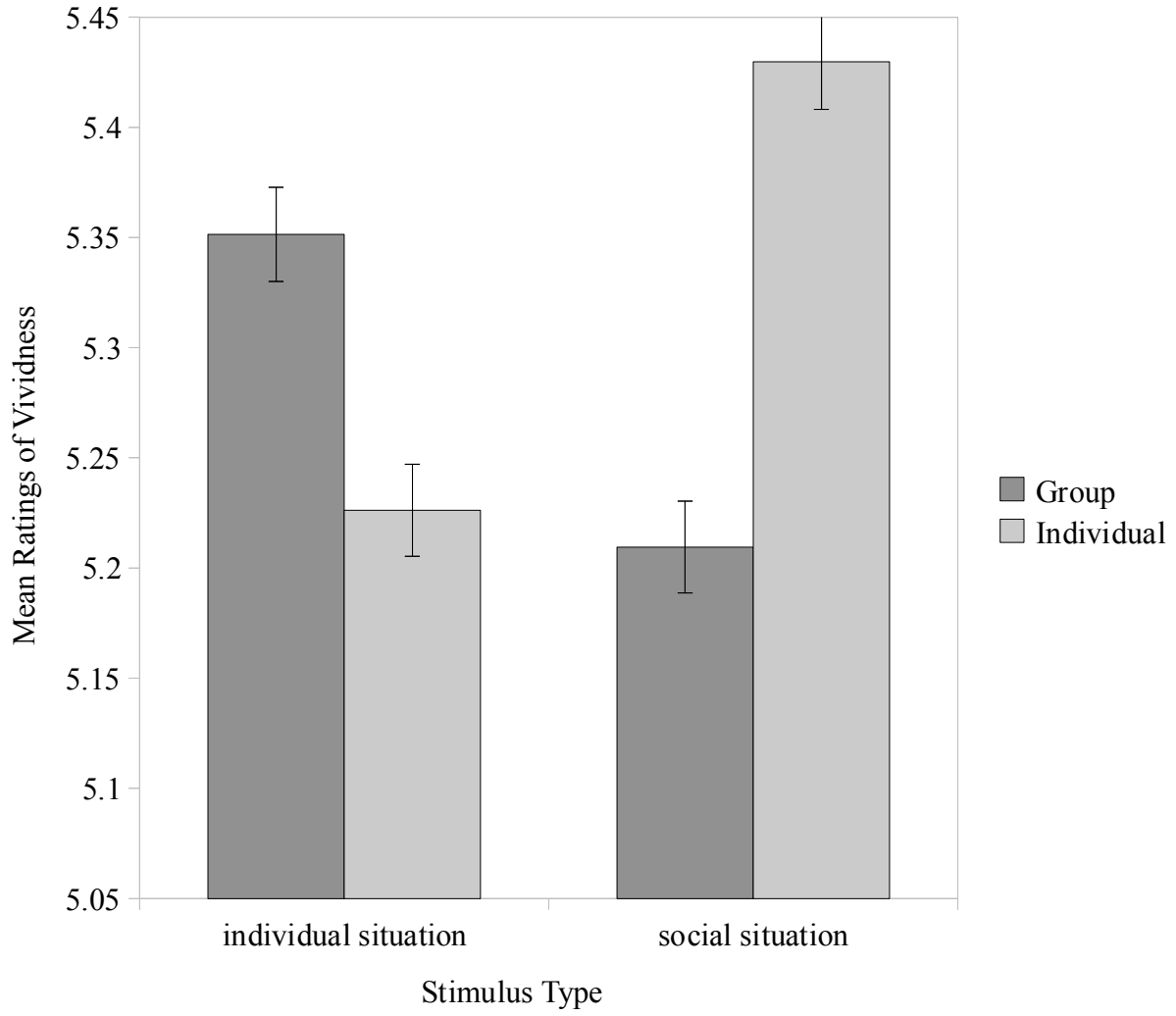


Figure 3.

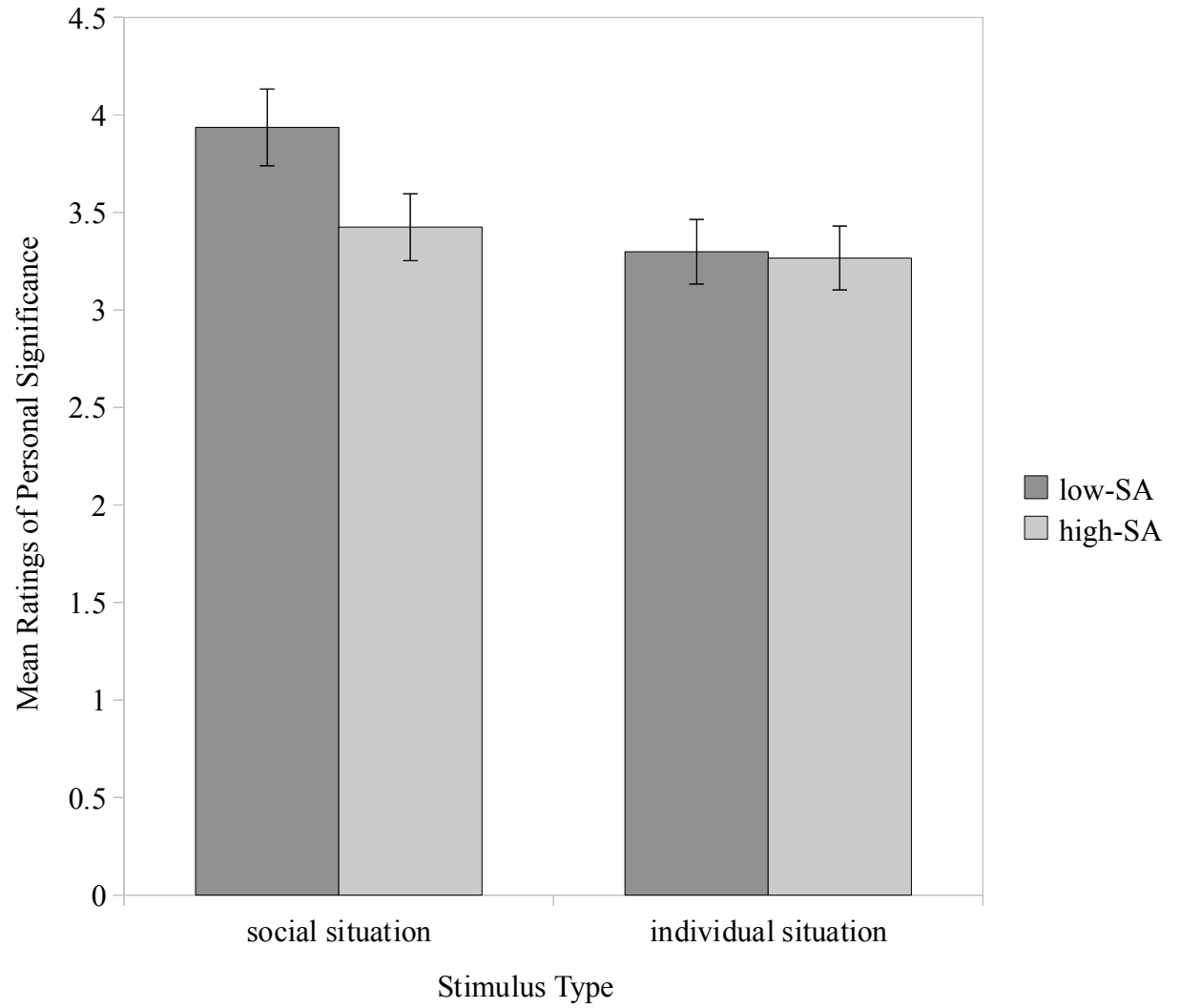


Figure 4.

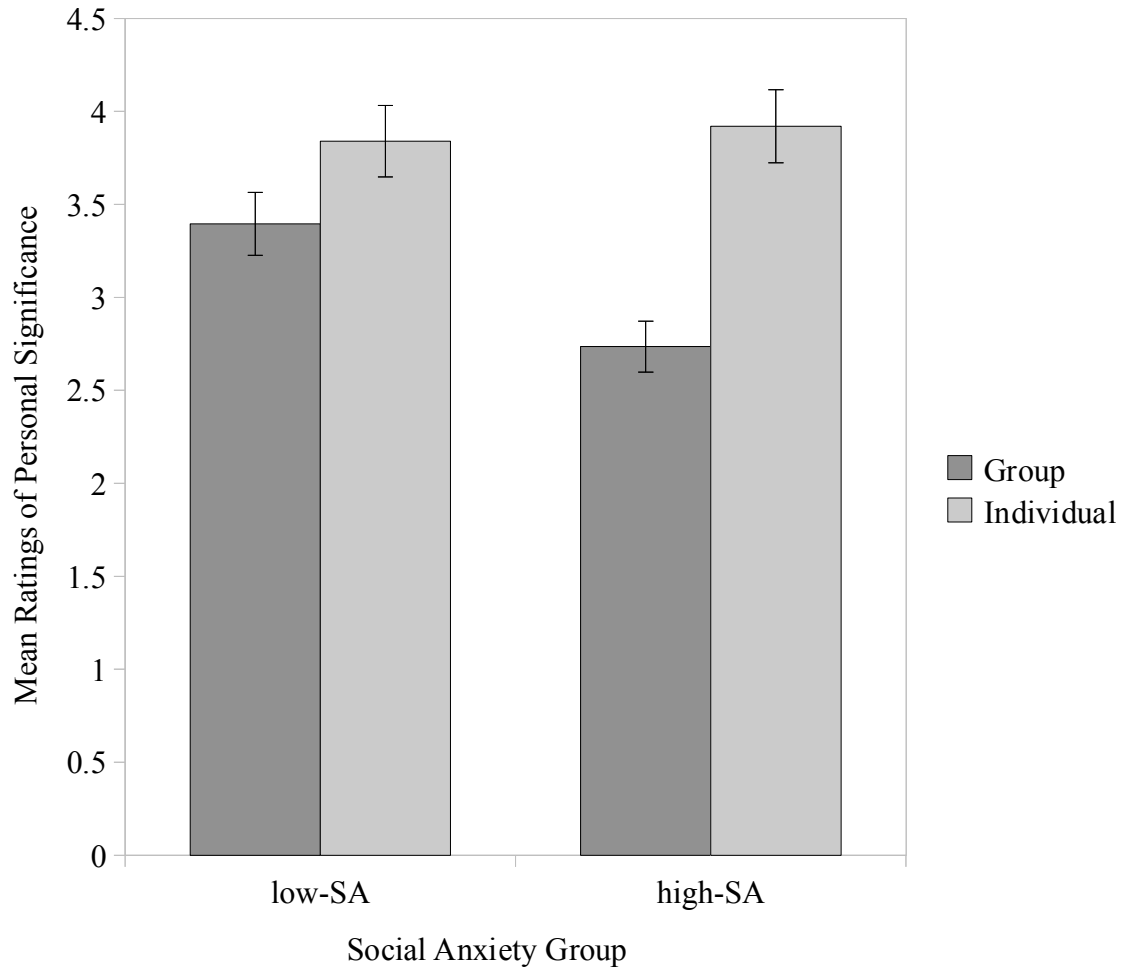


Figure 5.

Appendix

Pages of the autobiographical memory retrieval task booklets.

Example of target page.

DISCUSSION

In the space below, please write the first specific memory that comes to mind:

How would you rate the emotional impact of this event at the time you experienced it?

very negative | | very positive

How does recalling this event now make you feel?

very negative | | very positive

How vivid was the memory that came to mind?

not vivid at all | | very vivid

How personally significant was this event in your life?

not at all important | | very important

In what perspective did the memory come to mind?

1st-person (like you were experiencing it again) | | 2nd-person (like you were watching yourself in the event)

Final page.

Please rate your current emotional state by completing the following; select the appropriate box for each adjective to give an indication of your mood at this moment.

	not at all	a little	moderately	very	extremely
ANXIOUS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CHEERFUL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
STRESSED	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
UPSET	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RELAXED	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate your gender:

Male

Female

Age:

Student ID (930)#:

You have reached the end of the booklet. Please turn your booklet into the experimenter.