

**ATTACHMENT WORKING MODELS AND FALSE RECALL:
A CATEGORY STRUCTURE APPROACH**

A Dissertation

by

CAROL LEIGH WILSON

Submitted to the Office of Graduate Studies of
Texas A&M University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

August 2006

Major Subject: Psychology

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Co-Chairs of Committee,	Jeffry A. Simpson W. Steven Rholes
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ABSTRACT

Attachment Working Models and False Recall:

A Category Structure Approach. (August 2006)

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Two studies were conducted to test the central hypothesis that internal working models of attachment will influence false memory in a model-congruent pattern. Participants in both studies were first primed with a relationship-specific attachment model by writing about a person with whom they shared a secure, anxious, or avoidant relationship. Next participants viewed attachment-relevant and non-relevant stimuli presented in either a word list or vignette format. Afterwards they completed a brief distracter task followed by a category cued-recall memory test. Study 2 participants also reported confidence ratings for each word recalled. Results from both studies demonstrated interactive effects between chronic attachment and relationship-specific models in predicting false memories. Effects were found primarily for attachment stimuli relevant to social isolation and hate/rejection themes. Both model-congruent and model-incongruent effects emerged depending on stimuli set and chronic attachment style. Notably, no attachment-based differences in false memories occurred for non-attachment stimuli. Finally, a consistent association was found between confidence in false recall and congruence between participants' chronic and relationship-specific working models; specifically, greater confidence was associated with congruency, and lower confidence with incongruence. This pattern occurred for both attachment-relevant and non-relevant stimuli. The results of this research provide

further support for a key proposition of attachment theory; namely, that relationship working models influence how individuals process relationship-relevant information in general. In addition, this research contributes new knowledge regarding the generation of false memories in particular.

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INTRODUCTION

According to attachment theory (Bowlby, 1969; 1973; 1980), systematic differences in how individuals process relationship-relevant information stem from *internal working models* of attachment – hypothetical, affective-cognitive structures generated as a result of an individual’s interaction experiences and perceptions of experiences with caregivers during social development. These mental representations are theorized to influence information processing by guiding attention and memory processes including encoding, elaboration, and retrieval (Bowlby, 1980; Collins & Read, 1994). Recently attachment theorists have proposed that working models should influence not only what people accurately recall, but also their relationship-relevant *false memories* – that is, the recall or reconstruction of happenings that never actually occurred (Collins & Allard, 2001; Collins, Guichard, Ford, & Feeney, 2004). Given that memories often serve as the basis for judgments and decision making, falsely generated memories that cast a partner or relationship event in a negative light may have deleterious effects on one’s relationship quality and outcomes. In addition, a chronic tendency to misremember relationship experiences as affectively negative may have long-term health effects (see Diamond & Hicks, 2004). Yet almost no research to date has tested the influence of working models on memory errors. Rather, attachment researchers have focused on issues of selective attention (Kirsh & Cassidy, 1997), biographical memories (Mikulincer & Orbach, 1995), concept accessibility (Mikulincer, Birnbaum, Woddis, & Nachmias, 2000), encoding selectivity (Miller & Noirot, 1999; Fraley, Garner, & Shaver, 2000), rates of forgetting (Fraley et al., 2000), or memory for actual events (e.g., Belsky, Spritz, & Crnic, 1996; Kirsh & Cassidy, 1997). The current research was conducted to address this gap in knowledge.

This dissertation follows the style of *Personality and Social Psychology Bulletin*.

Objectives

The current dissertation research has two objectives. The first objective is to test the central hypothesis that individuals will falsely recall relationship information most closely related to the content and concerns of their internal working models. Specifically, this should result in attachment insecurity being linked to false memories for negative or threatening relationship-relevant stimuli. The second objective is to examine the differential influence of global versus relationship-specific attachment on false memory generation. To accomplish these goals, a category structure false memory paradigm was used to assess false memories for relationship-relevant and non-relationship relevant sets of words in two laboratory studies¹.

Background

Attachment Theory

According to attachment theory (Bowlby, 1969; 1973; 1980), emotional ties develop between infants and their primary caregiver(s) that serve to maintain caregiver proximity. This ensures infants' needs for safety, comfort, and security are met, thus enhancing their chances of survival. Because not all caregivers are equally willing or able to meet their infant's attachment needs, the quality of the emotional bond formed can vary leading to different patterns of attachment (Ainsworth, Blehar, Waters, & Wall, 1978). For instance, infants whose primary attachment figure(s) are consistently available and responsive to their needs tend to develop a secure attachment style characterized by trust in attachment figures and reliance on them when the infant is distressed. Infants with consistently inattentive, unavailable, or unresponsive attachment figures tend to develop an avoidant attachment style characterized by self-reliance and avoidance of attachment figures when distressed. And when the primary attachment figure provides inconsistent care, sometime behaving responsively and appropriately to the infant's

¹ This work follows completion of a pilot study in which preliminary support for the central hypothesis was obtained.

needs yet at other times being inattentive or unavailable, infants tend to form an anxious (also referred to as anxious/ambivalent or preoccupied) attachment style. These infants showed hyper vigilance, anger, and conflicted tendencies to approach and avoid attachment figures when infants were distressed. Similar styles of secure, avoidant, and anxious attachment also characterize adult romantic attachment relationships (see Hazan & Shaver, 1994).

Regardless of the attachment pattern that is formed, early attachment experiences come to be represented mentally as internal working models. Such models contain information about how relationship partners are likely to respond to the individual and how worthy (or unworthy) of love the individual is perceived to be (Bowlby, 1973; Bretherton, 1985). Working models continue to develop as the child grows older and has experiences with new attachment figures, allowing new cognitive and affective material to be added to existing models. In essence, working models are hypothetical structures that influence information processing in future relationship contexts. They are theorized to contain the following components: (1) memories of attachment-related experiences, (2) generalized beliefs, attitudes, and expectations regarding the self and attachment figures, (3) attachment goals and needs, and (4) strategies to achieve those goal and needs (Collins & Read, 1994; Collins & Allard, 2001). Based on differences in their unique histories of experiences with attachment figures, the working models of secure, avoidant, and anxious individuals should vary in patterned ways with regard to these components. In the current research, the primary interest is in how working models may guide memory processes in particular. More specifically, the central hypothesis – that individuals should falsely recall information that is most closely related to the content and concerns of their working models – will be examined. This hypothesis is based on two lines of work.

Attachment and Memory

First, prior research on attachment and memory for actual events has generally shown working model-congruent effects. For example, a study of memory for social events in male infants (Belsky et al., 1996) demonstrated that securely attached children more accurately recognized positive compared to negative events whereas insecurely attached infants more accurately recognized negative compared to positive events. In a college student sample, Mikulincer and Orbach (1995) found attachment-based differences in the recall of emotional, autobiographical memories. Although there were no significant between-group differences in the numbers of emotional memories recalled, anxiously attached people displayed the shortest retrieval times for memories of sadness and anxiety relative to both secure and avoidant individuals. This finding suggests that negative, emotional, model-congruent relational information is highly accessible for anxiously attached individuals, as expected. Supporting this contention, results from a follow-up study (Mikulincer, 1998a) demonstrated that securely attached participants retrieved positive memories of relationship trust-episodes more quickly than did anxious or avoidant participants, whereas both insecure groups retrieved negative memories of trust violations with relationship partners more quickly than did securely attached individuals. In addition, both secure and anxious participants reported more intense positive affect than did avoidant people for the positive memories they did retrieve. In contrast, anxious people reported more intense negative affect upon retrieving negative trust memories compared to secure and avoidant individuals.

In a more recent study of memory and attachment designed to untangle encoding versus retrieval effects (Fraley et al., 2000), participants listened to an audiotape interview of a woman discussing her relationship with her twin sister who had died prematurely. Less avoidant (i.e., more secure) participants demonstrated greater recall of interview details than did more avoidant

participants, suggesting that avoidant people did not encode the interview content to the same extent that less avoidant people did. We might have expected more avoidant people to preferentially recall details from the negative, emotionally themed interview because such information would presumably be model-consistent. However the results are likely a reflection of avoidant people's heightened defensiveness (Mikulincer & Orbach, 1995), relative to secure and anxious people, when encountering new and threatening information. Such evidence is consistent with other research demonstrating a tendency for avoidant people to pay less attention to attachment-relevant stimuli in an effort to forgo activation of their attachment systems if at all possible (e.g., Kirsh & Cassidy, 1997). However, as the previously cited research shows (Belsky et al., 1996; Mikulincer, 1998a; Mikulincer & Orbach, 1995), once material is encoded it is liable to be retrieved in a model-consistent manner.

Whereas the aforementioned studies provide evidence for model-congruent information processing in terms of global attachment, recent work by Rowe and Carnelley (2003) investigated memory patterns from a relationship-specific attachment perspective. Participants who had been primed with a specific secure attachment representation prior to learning lists of attachment and non-attachment words recalled significantly more positive attachment words than did primed avoidant participants. Participants with a global anxious attachment also tended to recall more negative attachment words compared to globally secure participants, although this effect was marginally significant. A longitudinal study of adolescent-parent attachment conducted by Feeney and Cassidy (2003) also demonstrated relationship-specific, attachment-schematic information processing. Six weeks after interacting with their mother or father in a laboratory discussion, adolescents with secure representations of that parent recalled having had significantly more positive and less negative interactions than they had initially reported immediately after the discussion. Conversely, adolescents with insecure attachments to their

parent recalled having had significantly less positive and more negative discussion interactions than they had originally reported six weeks earlier.

Collectively, prior research investigating attachment and memory has provided converging evidence that working models direct the processing and recall of relationship information in a model-consistent manner. However, with one exception (described below), no research has examined the issue of attachment-based differences in *false memories* – that is, the recall or reconstruction of happenings that never actually occurred (Collins & Allard, 2001; Collins et al., 2004).

In a prior study that touched on the issue of memory errors, Mikulincer and Horesh (1999) conjectured that avoidant working models are construed around the projection of the unwanted self and the negative traits associated with that self onto others (defensive projection) as a means of establishing psychological distance. In contrast, they hypothesized that anxious models are construed around the projection of one's actual self onto others in an effort to establish empathic connection. For targets that resembled the participant's *unwanted* self, avoidant participants showed more false-positive memory (i.e., higher confidence ratings) of representation-consistent traits than did either secure or anxious participants. Similarly, for targets that resembled participants' actual self, anxious participants showed more false-positive memory for representation-consistent traits compared to secure and avoidant participants. These findings provide initial evidence for attachment-based memory errors in terms of self-descriptive projection. However, whereas this study examined participants' confidence in their recognition memories of traits, the actual incidence of falsely remembered traits was not examined. More importantly, attachment working models are theorized to influence the processing of not only self-relevant information, but also information relating to the major issues and concerns of each

model (Collins & Read, 1994; Collins & Allard, 2001; Collins et al., 2004). These hypotheses, to our knowledge, have not been addressed in past research.

The second line of work supporting the central hypothesis comes from knowledge consistency studies within the cognitive memory literature. These studies have shown that long-term knowledge structures such as categories or schemas can guide recall in an expectation-consistent manner, producing intrusions consistent with those expectations (e.g., Srull & Wyer, 1989). Such intrusions are most often the product of semantic confusion errors (Smith, Tindell, Pierce, Gilliland, & Gerken, 2001) and, based on a spreading activation framework (Collins & Loftus, 1988), are thought to occur as the result of the activation of associative networks organized by semantic similarity. In such systems, activating a schema or node through presentation of a stimulus will subsequently activate links to associated nodes closely connected to the original. This in turn can lead to the retrieval of “extra-list” items that were not presented within the original stimulus but which were instead activated in memory due to their close associations with the activated node. Such retrieval-based false intrusions have been demonstrated in cognitive research with categorized lists of words in a “category structure” false memory paradigm (Smith, Gerken, Pierce, & Choi, 2002; Smith, Ward, Tindell, Sifonis, & Wilkenfeld, 2000). Attachment working models have been likened to semantic memory networks (Shaver & Mikulincer, 2002) and are essentially long-term relationship knowledge structures of attachment experiences from an individual’s lifetime of interactions with relationship partners. Thus working models are expected to guide recall in a manner consistent with model-expectations, producing intrusions consistent with these expectations and confirming of model concerns.

Working Model Concerns

But what particular expectations or concerns are central to insecure and secure attachment working models, and should subsequently influence the types of memory errors generated? Typically working models are measured in terms of two continuous dimensions of attachment anxiety and avoidance (Brennan, Clark, & Shaver, 1998; Fraley & Waller, 1998). The anxiety dimension represents an individual's monitoring of attachment figures' availability and responsiveness, reflecting sensitivity to cues signaling rejection by the partner, partner absence, or separation from the partner. The importance of these issues for individuals with anxious working models stems from early experiences with unreliable, inconsistently supportive relationship partners who were frequently unavailable or unresponsive to their intimacy, protection, and comfort needs (Collins & Read, 1994)². Subsequently anxiously attached individuals crave relational intimacy but worry excessively about losing relationship partners and their support, and suspect that their partners don't really love them. Anxious people also harbor and ruminate about overly negative emotional reactions to relationship partners and events, including distrust, jealousy, hostility, and anger (Mikulincer, 1998a, 1998b; Mikulincer & Orbach, 1995). The concept of death is also relevant to the working models of anxious individuals as it represents the ultimate separation from one's attachment figures and thus should be a source of concern, worry, and rumination. Prior research has shown that anxious individuals display a higher fear of death relative to more securely attached individuals, and that they attribute their death fear to loss of their social identity (Mikulincer & Florian, 1998; Mikulincer, Florian, & Tolmacz, 1990).

Thus the concerns of relational loss and separation from partners, lack of support, potential rejection, death, lack of intimacy, and the negative emotional and affective reactions

² Anxious working models are associated with high scores on the attachment anxiety dimension and low scores on the avoidance dimension.

associated with these should be central to anxious working models of close relationships. A history of interaction experiences in which relationship partners and events were repeatedly associated with these concerns, and in which these concerns were elaborated upon via rumination processes, should have facilitated development of associative networks organized around these concerns and themes. The working models of anxiously attached individuals should have semantic, associative networks containing many and stronger associations to these relational themes relative to less anxious models. In turn these networks should predispose anxious individuals toward generating retrieval-based false memories consistent with these associative knowledge structures.

The continuous dimension of attachment avoidance assesses an individual's regulation of intimacy versus psychological and emotional distance from attachment figures, also reflecting sensitivity to rejection (Brennan et al., 1998; Fraley & Waller, 1998). Attachment avoidance typically develops in response to consistently unavailable, unresponsive care giving from early attachment figures (Collins & Read, 1994)³. Thus rejection should be a central component of avoidant working models. Avoidant individuals, in response to being ignored, rebuffed, or even punished by previous partners after making their needs for comfort, protection, or intimacy known, seek to establish emotional distance within close relationships rather than pursuing intimacy. They are not comfortable with relationship partners depending on them and instead value psychological independence from partners. Due to a lack (or perceived lack) of interaction experiences involving relationship intimacy, avoidant working models are not expected to contain a well-developed associative network regarding emotional intimacy compared to less avoidant or more anxious models. Although on the surface avoidant individuals often report low levels of negative emotions regarding relationship events and early memories (e.g., Mikulincer

³ Avoidant working models are associated with low scores on the attachment anxiety dimension and high scores on the avoidance dimension.

& Orbach, 1995), they tend to show evidence of dissociated negative responses. For instance, avoidant people make inappropriately hostile attributions to both ambiguous and non-hostile interpersonal situations, and show physical signs of negative arousal and hostility which contrast with their own self-reports (Mikulincer, 1998b).

Similar to anxious individuals, avoidants also display a higher fear of death relative to securely attached individuals although fear in this case is due primarily to the unknown nature of death (Mikulincer et al., 1990). Unlike anxious individuals, however, avoidant individuals have not been found to ruminate and worry over negative events and therefore they may not have elaborated on death concerns and subsequent associations with death. Furthermore, there is no expectation that avoidant individuals should have a richer experience of death (e.g., through loss of relationship partners or close others) relative to non-avoidant individuals. For avoidantly attached individuals, then, the concerns of relationship rejection, control, and the negative affective and emotional responses associated with these issues should be central to their working models of attachment. A history of interaction experiences in which attachment figures and relationship events were repeatedly associated with these issues should have facilitated development of associative networks relevant to these concerns. Therefore avoidant working models should predispose individuals toward model-consistent false memories for relationship events relating to relational rejection, psychological independence and control.

In contrast to anxious and avoidant working models, secure working models are based on positive relationship experiences in which relationship partners were consistently available and responsive to the individual during times of need (Collins & Read, 1994)⁴. Securely attached individuals develop a positive view of partners as trustworthy, reliable others and are comfortable being interdependent within relationships. Secure attachment has been associated

⁴ Secure working models are associated with low scores on both the attachment anxiety and avoidance dimensions.

with symbolic immortality and subsequently a lower fear of death relative to insecure attachment (Mikulincer & Florian, 1998; Mikulincer et al., 1990). Because the experience of relational rejection or abandonment (and associated affective responses), and the fear of death, are not primary concerns or experiences central to secure working models, securely attached individuals are less likely to have developed semantic associative networks relevant to these issues.

Subsequently secure individuals should be less likely to generate false memories relevant to relational rejection, abandonment, separation, and death compared to anxious and avoidant individuals. In contrast, securely attached people have likely accumulated many instances of relationship intimacy, trust, and acceptance with relationship partners and therefore should have developed extensive associative networks relevant to these issues. Thus secure working models should be associated with false memories related to intimacy, trust, love, and acceptance information.

However, the current research focuses on false memories for negatively rather than positively themed stimuli to test the central hypothesis. This focus was chosen for several reasons. First, a critical difference in the relationship histories of insecure versus secure people is the prevalence of negative or negative perceptions of interactions with close others regarding attachment needs. Therefore, false memories related to negatively themed attachment stimuli may be most likely to differentiate between insecurely and securely attached individuals. Second, negative information processing biases have been linked to markers of poor physical and emotional health (see Diamond & Hicks, 2004) which suggests that a chronic tendency to generate false memories of negatively themed material may also have long-term health impacts. Finally, combining both negative and positive word sets into one stimulus set would lengthen presentation and recall task durations which could cause participants to lose interest in the task and become inattentive to the stimuli. Therefore it was desirable to focus on negatively themed

stimuli in the current studies, and to examine false memories for positively themed stimuli in future work.

Category Structure Paradigm

To summarize thus far, the current research tests the prediction that insecure working models of attachment are associated with false memories of negative attachment-relevant themes (objective 1). Specifically, high scores on attachment anxiety and avoidance should predict false memories for information pertaining to relationship rejection, separation, abandonment, and death. Low scores on anxiety and avoidance (i.e. greater security) should be associated with fewer false memories for these negative relational themes. These predictions will be tested by utilizing a category structure false memory paradigm based on the previously discussed findings that long-term knowledge structures or categories facilitate intrusions consistent with that knowledge (Smith et al., 2002; Smith et al., 2000). In this paradigm, participants are typically exposed to categorized lists of words containing exemplars of each category (e.g., cardinal, sparrow, eagle for the Bird List; desk, table, sofa for the Furniture List). The word that is the best exemplar of each category (e.g., robin; chair) is intentionally omitted as a list item and labeled the “critical word” for that category. The critical word represents the word participants will be most likely to falsely recall when they are asked to remember all the words from each list. As they retrieve their knowledge of each category, activation of that category node in long-term memory should subsequently activate links to the closest associates in memory. Recall of the critical word or any other word that was activated in memory but was not presented on the categorized lists constitutes a false memory. Categorized sets of attachment-relevant and non-attachment words were developed in a prior pilot study as discussed in the methods section below.

Relationship-Specific Working Models

In addition to testing the central hypothesis, the second objective of the current research is to examine the differential impact of global attachment working models versus relationship-specific working models on false memories. Prior research supports the contention that attachment models likely exist at different levels of specificity and are organized in a top-down, hierarchical fashion (Overall, Fletcher, & Friesen, 2003). For example, an individual likely has a working model of his/her relationship with a specific relationship partner which is subsumed under a slightly less specific working model of romantic partners in general, which is in turn subsumed beneath an abstract, global working model of relationship partners in general (e.g., romantic partners, parents, best friends). A growing number of attachment studies have demonstrated the influence of relationship-specific working models on information processing (e.g., Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Feeney & Cassidy, 2003; Mikulincer & Shaver, 2001; Rowe & Carnelley, 2003). Past studies that have examined both global attachment and relationship-specific working models have typically found main effects rather than interactions between the two types of attachment. For example, Mikulincer & Shaver (2001) demonstrated that priming a secure base reduces participants' negative reactions to outgroups without regard to their chronic attachment styles. Rowe & Carnelley (2003), as previously discussed, found that primed security was associated with greater recall of positive attachment stimuli whereas global attachment security was associated with recall of fewer negative attachment stimuli. However no interactions between global and primed attachment style were found. These results suggest that chronic and relationship-specific working models may influence information processing independently of one another. To differentiate global versus relationship-specific attachment effects on false memories in the current research, both global measures and relationship-specific primes were used as described in more detail below.

Hypotheses

From the proceeding discussion of attachment and memory, the following hypotheses can be articulated:

Hypothesis 1A: Attachment insecurity (i.e. higher scores on attachment anxiety or attachment avoidance) should be associated with greater false recall of words from the Abandoned word list and vignette which connote social isolation and aloneness. In addition, insecurity should be associated with greater confidence that the falsely recalled items had actually been presented.

Hypothesis 1B: A prime effect is expected such that participants in the insecure prime condition should falsely recall more abandonment-related words, and report higher confidence that they actually saw those words, than should those in the secure prime condition (i.e. a main effect of contrast code C1).

Hypothesis 2A: Higher scores on attachment anxiety should be associated with greater false recall and greater confidence in the false recall of words from the Death word list and vignette, which represent the concept of a permanent separation from attachment figures.

Hypothesis 2B: A prime effect is expected such that participants in the insecure prime condition should falsely recall more death-related words, and report higher confidence in their false recall, than should those in the secure prime condition (i.e. a main effect of contrast code C1).

Hypothesis 3A: Higher scores on attachment anxiety should be associated with greater false recall and greater confidence in false recall of words from the Separated word list and vignette, which contain targets connoting loss and separation from attachment figures.

Hypothesis 3B: A prime effect is expected such that participants in the insecure prime condition should falsely recall more separation-related items, and report higher confidence in their false recall of such items, than should those in the secure prime condition (i.e. a main effect of contrast code C1).

Hypothesis 4A: Attachment insecurity (i.e. higher scores on attachment anxiety or attachment avoidance) should be associated with greater false recall and greater confidence in the false recall of words from the Hated word list and vignette, which contain targets relating to interpersonal rejection and distance.

Hypothesis 4B: A prime effect is expected such that participants in the insecure prime condition should falsely recall more hate-related items, and report higher confidence in their false recall of those items, than should those in the secure prime condition (i.e. a main effect of contrast code C1).

Hypothesis 5A: Global attachment should *not* predict differences in false memories from the non-attachment lists and vignettes (i.e. Code and Nature), or confidence in false recall from these lists and vignettes. Because these stimuli are not relational in nature and are not related to any primary attachment concerns, no attachment-based differences in memory are expected. Furthermore, the general memory processes of secure, avoidant, and anxious individuals should not differ.

Hypothesis 5B: Prime condition is not expected to predict differences in false memories or confidence in false memories from the non-attachment lists and vignettes. For similar reasons mentioned under hypothesis 5A, priming a specific attachment relationship should not affect false memories for non-relational stimuli that are unrelated to central working model concerns. Furthermore, the recall abilities of secure, avoidant, and anxious individuals should not generally differ.

Overview of Current Studies

To test these hypotheses, two laboratory studies employing the category structure paradigm were conducted. In both studies, participants were first primed to think about either a secure, anxious, or avoidant relationship with a close other. Then they were shown attachment-

relevant and non-attachment relevant word sets presented in either a word list or a vignette format. Afterwards participants took a category cued-recall task and recalled each word set. The vignette format allowed the stimuli to be presented within a more social context and thus false memories generated using this procedure may more closely approximate memory errors resulting from “real-life” situations. The purpose of the priming task was to allow for assessment of the differential impact of global versus relationship-specific working models on memory errors. The priming task in Study 1 was modified slightly for Study 2 as discussed in the Study 2 Methods section.

False memory cued-recall data was collected in both studies whereas confidence ratings of the memory data were collected only in Study 2. Because prior research has shown that recall can be influenced by both positive and negative affect inductions (e.g. Gasper & Clore, 2002; Pereg & Mikulincer, 2004; Storbeck & Clore, 2005), mood was assessed after the priming task in both studies for use as a control variable.

STUDY 1

Method

Participants

Three hundred and two Texas A&M students (183 women, 119 men) completed both sessions of a two-part study of “relationships, personality, and memory” in exchange for course credit. Another 23 student participated but were not included in the data analyses due to failure to follow instructions. Participants ranged in age from 17 to 50 years with a mean age of 20.9 years for females and 20.1 years for males. One hundred fifty-three participants were assigned to the word list condition (95 females, 58 males) and 149 participants were assigned to the vignette condition (88 females, 61 males). Approximately half of each group received a different list order. Within the group receiving the word list format, 29.4% of the participants were assigned to the anxious prime condition, 27.5% to the avoidant prime condition, and 43.1% to the secure prime condition. Within the group assigned to receive the vignette format, 27.5% of participants were assigned to the anxious writing prime, 27.5% to the avoidant prime, and 44.3% to the secure prime condition.

Procedure

Participants arrived for part one of the experiment in mixed-sex groups of up to 6 individuals. They initially completed a set of demographic questions and the Experiences in Close Relationships Questionnaire (ECR: Brennan et al., 1998). Next participants read the three attachment paragraphs originated by Hazan and Shaver (1987) which depict prototypical anxious-ambivalent, avoidant, and secure relationship partners⁵. Participants were asked to consider their past and current relationship partners and to identify the one person, for each paragraph, with whom they shared a relationship most closely approximating the one described.

⁵ Paragraph wording was adjusted to reflect an attachment relationship between the reader/participant and the subject of the paragraph. Paragraphs were written in the 2nd person.

This resulted in participants identifying up to three different relationship partners – one with whom they shared an anxious relationship, one with whom they shared an avoidant relationship, and one with whom they shared a secure relationship. Participants wrote down each relationship partner’s initials and categorized the partner as being a parent, sibling, friend, or romantic partner. Finally, they rated on a 7-point Likert scale (1 = not at all like my partner, 7 = exactly like my partner) how closely the respective Hazan & Shaver (1987) description actually characterized their relationship with the identified person. Descriptions rated as a 5 or higher were judged by the experimenter to depict a prototypical attachment relationship (i.e., secure, avoidant, or anxious-ambivalent)⁶.

Approximately 1 week after completing part 1, participants returned to the lab to complete part 2 of the study which was administered via computer using Media Lab software. Students arrived in mixed-sex groups of up to 5 individuals and were seated at cubicles containing a Pentium I computer. They completed preliminary measures of personality and relationships as well as a time 1 mood measure. Next they completed a bogus “word frequency task” in which they rated words in terms of their usage in everyday conversation. The actual purpose of this task was to expose participants to all 12 of the critical words (embedded within a number of distracters) prior to presentation of the categorized, to-be-remembered word sets appearing later in the study. Similar incidental task procedures have been demonstrated in prior research to boost participants’ overall incidence of critical word false memories (e.g., Smith et al., 2002)⁷.

⁶ In prior work by Rowe and Carnelley (2003) ratings of 4 and higher were used to signify paragraph prototypicality. More stringent criterion was used in the current study because a rating of 4, the scale median, may not necessarily reflect the paragraph being a truly representative description. A criterion of 6 or 7 was not used due to the potential for fewer prototypical partners being identified which would limit random assignments to prime conditions.

⁷ Pilot testing of the attachment stimuli demonstrated low incidences of critical word intrusions for several word sets, making statistical analyses difficult. To address this, the current study incorporated the incidental task procedures in order to boost the overall number of intrusions.

After completing all initial tasks, participants were assigned to one of three prime conditions (i.e. primed secure, primed avoidant, primed anxious-ambivalent) based on their time 1 paragraph ratings. Specifically, they were randomly assigned to write a short description of one of the relationship partners they had identified at time 1 and had rated as a 5 or higher on the corresponding paragraph. Participants were given a slip of paper containing the relationship partner's initials and category (e.g., romantic partner), and were informed that they had 10 minutes to write a "brief and confidential description" of this partner. They were then instructed to answer the following questions in their essay responses:

How has this person typically responded to you at times when you needed them the most (when you really needed them to "be there" for you)? What specific thoughts and feelings did you have as a result of their responses? How has this affected your overall view of your relationship? Please include as many details as possible (whether positive, negative, or both) in your description.

Immediately following the prime manipulation (i.e., writing task) participants answered a short set of questions assessing time 2 mood. Then the experimenter randomly assigned participants to view the experimental word sets presented in one of two format conditions (i.e. as word lists or as vignettes) and in one of two presentation orders. Each word set contained 12 capitalized words and was presented using Microsoft PowerPoint. Participants were instructed to remember not just the words, but also the specific list/vignette from which each word would be presented.

After the word set presentation, participants completed a 2-minute mental rotation task that served as a non-verbal distracter exercise to purge their short-term memory. Then participants were given a 2 minute/list recall task in which they were instructed to recall as many words as possible from the categorized word sets seen earlier. The computer prompted participants to recall each word set in the same order in which the sets had been originally

presented. In this manner the time delay between presentation and recall of each set was held constant. Participants typed their remembered words into the computer when prompted and then, once the 2 minute recall period had expired, the computer prompted participants to recall the next word set. This process was repeated until each word set had been recalled. Following the recall task, participants completed time 3 measures of mood. Then they were debriefed and thanked for their participation.

Word List/Vignette Stimuli

Attachment-thematic word sets were developed in a prior pilot study by having approximately 100 undergraduate psychology students free associate to words representing core working model concerns (i.e., abandonment, separation, hate, death). Instructions for the free association task directed students to “list as many related words as come to mind” upon reading each of the thematic items. Items generated for the abandoned list include “lonely”, “homeless”, “orphan”, and “lost” and connote social isolation and aloneness. This word set may be particularly relevant to avoidant individuals given the psychological and emotional distance from partners that characterize their attachment relationships, and given avoidant individuals’ self-reliance and independence from attachment figures. Items generated for the separated list include “fighting”, “break-up”, “apart”, and “split” and connote relationship dissolution. This word set is likely to be particularly relevant to anxiously attached individuals given their tendency to be hyper vigilant to cues of abandonment by relationship partners (e.g., Kobak & Sceery, 1988). The hate list contained items such as “unloved”, “unwanted”, “evil”, and “resentment”. These items connote an intense level of social rejection and should be relevant to both types of insecure working models. Finally, items generated for the death word set include “coffin”, “funeral”, “gone”, and “depressed”. This word set involves mortality salience issues which should be relevant to both types of insecurity as previously discussed. However, anxious

individuals' tendency to ruminate over worries and negative events, resulting in elaboration of associative connections, should result in death stimuli being particularly relevant to anxious working models.

For each theme, the most frequently generated word from participants' aggregated responses was designated as the *critical word* (e.g., the word "alone" from the free associations to the abandonment theme; "divorce" for the separated theme; "sad" for the death theme; "anger" for the hate theme). The next twelve most frequently generated words for each theme were used to form categorized lists containing 12 items each. The critical word was intentionally omitted from the categorized word lists, making it the most likely false intrusion that participants should make when recalling a particular list. In order to distinguish attachment-based false memories for negative, relationship-relevant information from non-relational information, two additional words sets were chosen. Specifically, two non-negative, non-relational word lists (i.e., Nature and Code) were selected from published free association norms from the University of South Florida (Nelson, McEvoy, & Schreiber, 1998). The most highly associated word for each category was omitted from the word sets given to participants and was designated as the critical word (e.g. "tree(s)" for the nature theme; "secret" for the code theme). The next 12 most highly associated words for each category were selected as the word set for that category. Six additional lists were also chosen from this database and included as part of the stimulus set to (a) provide filler items between the attachment-relevant stimuli, and (b) disguise the study's true focus on attachment-relevant words.

All vignettes were written by the experimenter in the first person point of view. The purpose of the vignettes was to add social relevance to the stimuli by embedding the to-be-remembered words within relationship-relevant vignettes and non-relational vignettes based on the category theme. Participants who viewed a given vignette saw the same word set as did

participants who saw the analogous categorized word list. The primary difference was that word sets in the vignette condition were presented as to-be-remembered words embedded within 5-6 sentence stories. The ordering of words in each word set was identical between the word list and paragraph conditions. (See the study materials section of the appendices for word list and vignette stimuli sets.)

For each word set in the word list condition, participants first saw a title at the top of the screen (e.g., Abandoned List) followed by each capitalized word appearing one by one below the title. Each word was presented on-screen for 3 seconds prior to the next word appearing below it. Once all 12 words were displayed on the screen and the last word had been displayed for 3 seconds, the entire list disappeared and participants saw the message “That concludes the _____ list.” The procedure was repeated for the next word list until all 12 lists had been presented.

For the vignette condition, participants saw the title (e.g., Abandoned Paragraph) at the top of the screen and a 5-6 sentence paragraph vignette missing 12 words which were represented by blanks. Every 3 seconds a capitalized word appeared, one by one, to fill in the blanks in a sequential order until the vignette was completed. Each word was presented on-screen for 3 seconds prior to the next missing word appearing. Once all 12 missing words appeared on screen and the last word had been displayed for 3 seconds, the entire paragraph disappeared and participants saw the message “That concludes the _____ paragraph.” This procedure was repeated for the next vignette until all 12 vignettes had been presented.

Measures

The 36-item Experiences in Close Relationships Inventory (ECR; Brennan et al., 1998) is a measure of global attachment and was reworded to reflect global romantic attachment rather than relationship-specific attachment or attachment to non-romantic partners. The 18-item anxiety subscale includes items such as “I need a lot of reassurance that I am loved by my

partner” and was rated using a 7-point Likert scale (1=strongly disagree, 7=strongly agree). The 18-item avoidance subscale contains items such as “I try to avoid getting too close to my partner”. Coefficient alphas for the anxiety and avoidance subscales were .89 and .93, respectively, for the word list condition, and .90 and .93, respectively, for the vignette condition.

The Big Five Inventory (John & Srivastava, 1999) was included in order to control for the effect of neuroticism, which is associated with higher scores on attachment anxiety (Karney & Bradbury, 1997). The 7-item neuroticism subscale, which includes items such as “I worry a lot” and “I am emotionally stable, not easily upset” (reverse scored), was answered on 5-point Likert scales (1=disagree strongly, 5=agree strongly). Coefficient alpha was .78 for the word list condition, and .83 for the vignette condition.

The 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1979) was included to control for self-esteem because highly anxious individuals often report lower self-esteem (Shaver & Hazan, 1993) and lower global self-worth than do more secure individuals (Collins & Read, 1990). Participants used a 9-point Likert scale (1=strongly disagree, 9=strongly agree) to rate items such as “I feel that I have a number of good qualities” and “I take a positive attitude toward myself.” Coefficient alpha was .91 for the word condition, and .92 for the vignette condition.

Mood was assessed prior to the writing prime (Time 1), immediately following the prime and prior to word list presentation (Time 2), and immediately following recall (Time 3). Participants rated pictorial stimuli on the Self-Assessment Manikin scale (SAM; Lang, 1980) using a 9-point Likert scale to indicate their mood valence (1 item with pictures ranging from 1=positive to 9=negative) and arousal level (1 item with pictures ranging from 1=excited to 9=calm). Use of this scale was intended to minimize participant exposure to extraneous verbal content between the writing prime and exposure to the word stimuli.

A revised version of Hazan, Hutt, Sturgeon, & Bricker's (1991) WHOTO scale (Fraley & Davis, 1997) was administered at the beginning of Time 2 to assess whether or not the relationship partner whom participants described in the writing task constituted an actual "attachment" relationship. This scale contains 2 items tapping each of three attachment-related components: namely, the use of the partner as a secure base, a safe haven, and a target of proximity-seeking behavior. Example items include: "How much time do you typically spend in contact with this person?" (1=very little, 7= a great deal), "To what extent do you count on this person for advice?" (1=not at all, 7=a great deal), and "How likely is this person to be the first person you want to tell if you achieve something good?" (1=not at all, 7 = very likely). Coefficient alpha for the WHOTO scale was .90 for the word list condition, and .87 for the vignette condition.

In the incidental Word Frequency Task, participants used a 7-point Likert scales (1 = very uncommon, 7 = very common) to rate the frequency with which each of 36 words is generally used by the typical A&M undergraduate student in daily conversations. Words included the 12 critical words from the to-be-remembered word sets plus 24 additional distracter words. The purpose of this task, as explained previously, was to boost the overall incidence rate of critical word false memories.

The Mental Rotation Task consisted of 30 sets of figures (alphabetic characters and symbols). For each set, participants were shown a target figure enclosed in a box at the top of the computer screen with three other figures below it. Participants' task was to examine each of the three figures to determine which one was an exact duplicate of the target, only rotated. The remaining two figures had actually been flipped and could not be rotated to match the target figure. The purpose of this task was to serve as a nonverbal distracter and occupy the

participants for several minutes prior to recall in order to minimize memory primacy and recency effects.

Dependent and Control Variables

The dependent variable assessed from each to-be-remembered target set (i.e., word list or vignette items) consists of the total number of words falsely recalled per set. In other words, the false memory criterion is the critical word plus any additional words that were not in the original stimuli set⁸. Given that the prime condition contains three levels (i.e. secure, avoidant, and anxious), contrast codes will be utilized. Specifically, both insecure prime conditions will be contrasted with the secure prime condition in contrast C1. Secondly the two insecure prime groups will be contrasted with each other in contrast C2. Because prior research has found that females are generally more attuned to relational and emotional material than are males (see Brehm, 1992), main effects of sex and potential interactions between sex and the attachment predictors will be examined in relation to false recall. Main effects of word order presentation, if they occur, will be controlled for in all analyses. As previously discussed, mood also will be utilized as a control variable. Neuroticism and self-esteem, which have both been associated with attachment anxiety in past research, will be examined to ensure that any significant predicted effects are independent of these variables.

Poisson Regression Strategy

The numbers of words falsely recalled from a given stimuli set represents non-negative, integer count data in which larger counts (i.e., more words recalled) are an infrequent occurrence, resulting in a positively skewed distribution. Application of ordinary least squares (OLS) regression to such nonlinear distributions, even when transformations are used, is

⁸ Due to a low incidence of falsely recalled critical words per list, analyses of false memories focus on the total number of items incorrectly recalled rather than on the subset of falsely recalled critical items.

problematic⁹. The statistical method recommended for analysis of counts of rare events is Poisson regression (Cohen, Cohen, West, & Aiken, 2003; Gardner, Mulvey, & Shaw, 1995). Because count distributions rarely display a perfect Poisson distribution in which the dependent variable mean is equal to its variance, a scaling factor was applied in all Poisson regression analyses to correct for instances of overdispersion (i.e. in which case the variance exceeds the mean) which typically lead to over inflated significance tests of parameter estimates¹⁰. All Poisson regressions assessing false memories contained an offset variable equal to the total number of target items recalled from a given word list or vignette. In this manner the number of items falsely recalled was assessed after controlling for the total number of items recalled (including both correct and incorrect items).

Poisson regressions were conducted using the typical procedure of stepwise, backwards elimination in which the most inclusive model of predictors that was theoretically relevant served as the baseline model. Predictor variables were then removed from this model, beginning with those of secondary importance, and discarded if their removal did not impair model goodness of fit as determined by calculation of partial deviances following each removal step (Neter, Kutner, Nachtsheim, & Wasserman, 1996). Model simplification continued in this manner until a significant partial deviance was encountered, halting the backwards elimination process and resulting in a final model. In the following two studies, the baseline Poisson model contained all control variables (i.e., sex, order of target words, contrast codes C1 and C2, mood arousal, mood valence), attachment main effects (avoidance and anxiety), the attachment

⁹ Use of OLS regression with count data can result in negative predicted values, violation of the heteroscedasticity assumption concerning residuals, distorted estimates of the variances of the regression coefficients, and perhaps most importantly, inflation of the values of t-tests associated with the values of regression coefficients (Gardner, Mulvey, & Shaw, 1995). Transformation of count data does not address the heteroscedasticity issue and also changes the scale, adding interpretation difficulties as well.

¹⁰ The scaling factor also corrects for cases of underdispersion in which case the variance is less than the mean, although such distributions produce more conservative tests of significance relative to overdispersed distributions.

interaction (i.e. Anxiety x Avoidance), and 2-way and 3-way interactions between attachment and contrast codes (i.e., C1 x Anxiety, C1 x Avoidance, C2 x Anxiety, C2 x Avoidance, C1 x Anxiety x Avoidance, C2 x Anxiety x Avoidance). Finally, the base-line model also contained 2-way and 3-way interactions between sex and attachment orientations (i.e. Sex x Anxiety, Sex x Avoidance, Sex x Anxiety x Avoidance).

In step 1 of the backwards elimination procedure, all sex interactions were removed from the baseline model beginning first with the sex 3-way interaction, and then testing removal of each 2-way sex interaction independently. Because no sex interactions with attachment were hypothesized, these terms were of secondary importance and were initially included only to detect any possible gender effects that might exist. In step 2, the interactions involving C2 and attachment were removed and their partial deviances tested. Again, the 3-way C2 interaction was removed and tested first. If its partial deviance was non-significant, then each 2-way interaction was subsequently removed and tested. In step 3 a similar process was followed to first remove and test the 3-way interaction involving C1 and attachment. If the partial deviance was non-significant, the C1 x Anxiety and C1 x Avoidance interaction terms were then removed and tested individually. In all Poisson regression analyses, C2 interaction effects were removed prior to C1 interaction effects because the distinction between secure and insecure writing prime (the C1 contrast) was expected to impact memory more strongly than the distinction between the two insecure prime conditions (the C2 contrast). In step 4 of the procedure the Anxiety x Avoidance interaction was removed from the model. Main effects of anxiety and avoidance were removed as a block in step 5. Finally, contrast codes C1 and C2 were removed as a block in the final simplification step such that only the control variable model remained.

Results

Prime Manipulation Check

To verify the nature of the paragraphs written by participants assigned to the secure, avoidant, and anxious prime conditions, 4 independent coders rated these written responses along 9 different dimensions. Inter-rater reliabilities ranged from .67 to .92 for 7 of the dimensions. Two dimensions were dropped due to low reliabilities. A principal components analysis of the 7 rated items using varimax rotation resulted in a 2 factor solution. The first factor, labeled supportiveness, contained 5 items and explained 77.3% of the variance. Example items included: “To what extent was (is) the relationship partner available to the participant (whether physically or emotionally) when the participant needed them the most?” (1=never, 7=always), and “To what extent does the participant report being able to count on this relationship partner when the participant needed them the most?” (1=not at all, 7= a great deal). Item loadings ranged from .94 to .98 for factor 1 and coefficient alpha for the summed items was .98 for both the word list and the vignette conditions. The second factor contained 1 item that explained 16.7% of the variance and consisted of “To what extent is the paragraph written in vague, non-specific terms versus detailed, specific terms concerning the relationship partner and the participant’s reaction to him/her?” (1=vague, 7=detailed)¹¹.

Regressing factor 1 onto the predictor variables of sex, time 1 mood valence and arousal, prime condition, attachment anxiety and avoidance resulted in significant main effects of contrast code C1 for both the word list ($\beta = -.59$, $t(140) = -9.48$, $p < .001$) and the vignette conditions ($\beta = -.58$, $t(132) = -8.30$, $p < .001$). Consistent with the intended manipulation, paragraphs written by individuals in the secure prime condition were rated significantly higher in supportiveness than paragraphs written by participants in the insecure prime condition.

¹¹ The remaining item cross-loaded onto both factors and thus was dropped from further analyses.

Surprisingly, a main effect of attachment anxiety ($\beta = -.16$, $t(140) = -2.42$, $p < .05$) also emerged for the word list participants. It revealed that individuals who had higher anxiety scores wrote paragraphs rated less supportive than did those who had lower anxiety scores, even after controlling for the prime condition to which they had been assigned.

A similar regression analysis was conducted for factor 2. No attachment or priming effects emerged. Instead, a main effect of sex was found for both the word list ($\beta = .32$, $t(144) = 4.01$, $p < .001$) and the vignette conditions ($\beta = .38$, $t(136) = 4.80$, $p < .001$). Paragraphs written by women were rated more detailed and less vague than were paragraphs written by men.

Finally, paragraphs written in response to the priming instructions were also assessed in terms of their length. Regression analyses revealed a significant main effect of sex for both the word list ($\beta = .26$, $t(140) = 3.15$, $p < .01$) and the vignette conditions ($\beta = .37$, $t(132) = 4.63$, $p < .001$). In both cases, women wrote longer paragraphs in response to the writing prime than men did. Unexpectedly a main effect of attachment anxiety ($\beta = .24$, $t(140) = 2.79$, $p < .05$) also emerged for the word list participants. Individuals with higher anxiety scores wrote longer paragraphs than did those with lower anxiety scores.

Preliminary Analyses

Table 1 contains the means and standard deviations from all study 1 predictor variables. As the table indicates, participants in the word and vignette format condition did not differ in terms of attachment, mood, or personality variables. Table 2 contains the means and standard deviations of false memories from each word/vignette target set. As the table indicates, participants who received the word list format reported significantly higher false recall of items from the Nature list relative to participants who received the vignette format. First-order correlations among the predictor variables are shown in Tables 3 and 4 for the word list and vignette formats, respectively. For individuals in both format conditions, higher anxiety scores

were associated with a more negative mood following the writing prime, higher scores on neuroticism, and lower self-esteem. Scoring higher on anxiety was also associated with being assigned to the insecure prime condition for word list participants, whereas lower scores on anxiety were associated with the secure prime condition. For vignette participants, higher anxiety scores were associated with being in the anxious prime relative to the avoidant prime condition.

Higher avoidance scores were associated with lower self-esteem in both conditions, and with higher neuroticism in the word list format. Being assigned to the insecure vs. secure prime condition (i.e. C1 contrast) was associated with a more negative mood state and less reported attachment to the subject of the written essay as indicated on the WHOTO scale for all participants, and to lower self-esteem for the word list participants. For all participants, the C2 contrast was correlated with lower scores on the WHOTO, indicating that individuals in the anxious prime condition reported a greater attachment to the subject of their essays than did individuals in the avoidant prime condition.

Correlations between the predictor variables and false recall of word list and vignette target sets, respectively, are presented in Tables 5 and 6. For participants presented with word lists, higher scores on anxiety were associated with greater false recall of Death and Hate vignette words. For participants who viewed the vignettes, higher anxiety scores were associated with fewer false memories for Abandoned and Hate list words. No other significant correlations between anxiety, avoidance, or prime were found.

Primary Analyses

The results of the Poisson regression models assessing false memories are presented first for the attachment-relevant stimuli and then for the non-attachment stimuli. For each stimuli set, vignette results will be discussed first, followed by the analogous word list results.

Abandoned Vignettes

Hypothesis 1A proposed that higher scores on anxiety and avoidance would be associated with greater false recall of abandonment-related words, whereas hypothesis 1B predicted that participants in the insecure prime condition would show higher false recall of abandoned words relative to those in the secure prime condition. Whereas attachment and prime main effects were predicted, a contrast by attachment interaction was found. Specifically, analysis of falsely recalled words from the Abandoned vignette was halted at step 3A when removal of the C1 x Anxiety x Avoidance interaction resulted in a significant partial deviance ($\chi^2(1) = 5.03, p < .05$), indicating the 3-way interaction to be a significant contributor to the model that should be retained. A chi square test of the overall model deviance ($\chi^2(125) = 89.56, p = .99$) was non-significant indicating a good fit between the specified regression model containing this interaction and the observed data. The Wald test of the estimated regression coefficient for the 3-way interaction ($\beta_{\text{estimated}} = .31, SE = .12, \chi^2(1) = 6.12, p < .05$) was also significant. The 3-way interaction was plotted as 2-way interactions between C1 and anxiety for both low avoidance (1 standard deviation below the mean) and high avoidance (1 standard deviation above the mean) scores. Examination of the interaction pattern for low avoidant participants (see Figure 1A) shows high scores on global anxiety were associated with greater false recall in the secure prime rather than the insecure prime condition. In contrast, low scores on global anxiety were associated with greater false memories in the insecure prime rather than the secure prime condition. Thus for participants with more secure working models (i.e. low scores on both avoidance and anxiety), false memory errors occurred in a model-congruent pattern in that greater false recall for negative attachment stimuli occurred in the insecure prime condition, as predicted. However the false memory errors of chronically anxious participants (i.e. low scores on avoidance, high scores on anxiety) demonstrated a model-incongruent pattern in that greater

false recall of items relating to social isolation and aloneness was associated with a secure relationship-specific prime, contrary to expectations. The pattern of the interaction for high avoidant participants (see Figure 1B) shows that fearful avoidant working models (i.e. high scores on both avoidance and anxiety) were associated with greater false recall of abandonment-related items in the insecure rather than the secure prime condition. Thus false recall was model-congruent with respect to the relationship-specific prime condition, as expected. However the pattern of memory errors for participants with dismissive-avoidant working models (i.e. high scores on avoidance, low scores on anxiety) showed no difference between prime conditions. Finally, Figures 1A and 1B also show that increases in global anxiety were associated with greater false recall of abandonment items as expected in hypothesis 1A, but only for low avoidant participants. Participants high in avoidance showed fewer false memories as anxiety scores increased.

Abandoned Word Lists

Similar to the results from the vignette condition, backwards elimination of predictors was halted at step 3 when removal of the 3-way interaction between C1, anxiety, and avoidance resulted in a significant partial deviance for ($\chi^2(1) = 3.92, p < .05$), indicating that the interaction term should be retained. A chi square test of the model deviance ($\chi^2(136) = 119.42, p = .84$) was non-significant indicating a good fit between the specified regression model and the observed data. The Wald test of the interaction term's estimated regression coefficient was also significant ($\beta_{\text{estimated}} = -.28, SE = .13, \chi^2(1) = 4.25, p < .05$). The 3-way interaction was plotted as 2-way interactions between C1 and anxiety for both low avoidance and high avoidance scores. In contrast to the vignette results, participants holding more chronically anxious working models reported greater false recall in the insecure rather than the secure prime condition – a model congruent pattern of recall that is consistent with hypothesis 1B (see Figure 2A). No differences

in recall were found for those with chronically secure models. The pattern for high avoidant participants also contrasted with the analogous vignette results (see Figure 2B). Fearful-avoidant working models were associated with greater false recall in the secure rather than the insecure prime condition, a model-incongruent effect. However dismissive-avoidant models were associated with a slight increase in false memories for the insecure prime over the secure prime condition, consistent with predictions. Finally, increasing scores on attachment anxiety were associated with greater false recall for abandonment items, consistent with hypothesis 1A, but for individuals with high avoidant scores in contrast with the vignette findings. Low avoidant individuals showed the opposite pattern as scores on anxiety increased.

Although the pattern of the C1 x Anxiety x Avoidant interaction in the word list condition illustrates an opposite pattern of false recall than the results from the vignette condition, these results should be viewed with caution. As described in more detail in the Study 1 discussion of potential confound variables, controlling for participants' scores on the WHOTO reduced this 3-way interaction to non-significance. In contrast, controlling for WHOTO scores did not alter the significance of the analogous interaction found for the vignette condition.

Sex also emerged as a significant predictor in the 3-way interaction model ($\beta_{\text{estimated}} = -.30$, $SE = .13$, $\chi^2(1) = 5.51$, $p < .05$) and indicated that males displayed significantly more false memories for social isolation words relative to females. No other significant effects were found.

Death Vignettes

Hypothesis 2A predicted that higher anxiety scores would be associated with greater false recall of death-related targets. Hypothesis 2B predicted a main effect for insecure versus secure prime. Backwards elimination of predictors resulted in a significant partial deviance at step 2. Only the partial deviance for removal of the C2 x Anxiety interaction was significant ($\chi^2(1) = 6.94$, $p < .01$), which supported inclusion of this term in the final model. Thus the final

model contained the C2 x Anxiety term, all C1 interaction terms, the Anxiety x Avoidance interaction, and all main effects and control variables. The chi square test of the overall model deviance ($\chi^2(127) = 147.71, p=.10$) indicated a good fit between the specified regression model and the observed data. The Wald test of the interaction term's estimated regression coefficient was significant ($\beta_{\text{estimated}} = .63, SE = .25, \chi^2(1) = 6.27, p<.05$). In addition, a significant main effect of anxiety emerged in the final model ($\beta_{\text{estimated}} = -.27, SE = .10, \chi^2(1) = 7.58, p<.01$). Contrary to hypothesis 2A, higher anxiety scores were associated with fewer false memories for death items. However this effect must be interpreted in light of the 2-way interaction (see Figure 3). Individuals who scored lower on global anxiety falsely recalled more death-related words when in the anxious prime rather than the avoidant prime condition. In contrast, individuals who scored higher in global anxiety tended to falsely recall more death items in the avoidant prime rather than the anxious prime condition. However, as Figure 3 shows, the primary difference in false recall was a result of the low global anxiety participants in the anxious prime condition who falsely recalled more death items relative to all participants who experienced the avoidant prime as well as all participants with high scores on global anxiety. No other effects were significant¹², and no support was found for hypothesis 2B.

Death Word Lists

No significant partial deviances were found from removal of attachment and priming terms. Therefore the final model was the control variable model which had a non-significant overall deviance ($\chi^2(144) = 163.79, p=.12$) indicating a good fit to the data. The only significant predictor was valence ($\beta_{\text{estimated}} = .12, SE = .04, \chi^2(1) = 10.04, p<.01$) which indicated that more

¹² The C1 x Anxiety and C1 x Avoidance interaction terms were included in the model (in addition to the C1 and C2 main effects) and did not have significant parameter estimates. Therefore it can be inferred that the anxious and avoidant prime conditions did not significantly differ from the secure prime condition in this analysis, and thus the C2 x Anxiety interaction effect should be a true reflection of differences between the anxious and avoidance primes.

negative mood state was associated with greater false recall of death-related targets whereas a more positive mood state was associated with fewer death-related false memories. Thus no support for either hypothesis 2A or 2B was found for the word list condition.

Separated Vignettes

No significant partial deviances were found from removal of attachment and priming terms. Therefore the final model was the control variable model. Although overall model fit was good ($\chi^2(137) = 74.94, p=.99$), no predictors were significant. Thus no support for hypothesis 3A, that higher scores on attachment anxiety would be associated with greater false recall of separation-related targets, was found. Likewise no evidence was found for hypothesis 3B which predicted a main effect of insecure prime condition.

Separated Word List

No significant partial deviances were found from removal of attachment and priming terms. Therefore the final model was the control variable model. Although overall model fit was good ($\chi^2(144) = 83.494, p=.99$), no predictors were significant. Thus no support was found for hypotheses 3A or 3B.

Hated Vignettes

No significant partial deviances were found from removal of attachment and priming terms. Therefore the final model was the control variable model; however no predictors were significant. Thus no support was found for hypothesis 4A which predicted that higher scores on either anxiety or avoidance would be associated with greater false recall of hate-related targets. Likewise no evidence was found for hypothesis 4B which predicted a main effect of insecure prime condition.

Hated Word List

A significant partial deviance did not result until the set of contrast codes was removed from the model in the final simplification step ($\chi^2(2) = 6.21, p < .05$) indicating that C1 and C2 should be retained. Overall model deviance indicated a good fit to the data ($\chi^2(142) = 102.45, p = .99$). Unexpectedly only C2 had a significant parameter estimate ($\beta_{\text{estimated}} = .50, SE = .19, \chi^2(1) = 7.03, p < .01$) indicating that participants in the avoidant prime condition falsely recalled significantly more hate-related words than did those in the anxious prime condition. Thus no evidence was found in support of either hypothesis 4A or 4B for the word list condition.

Code Vignette

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Code Word List

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Nature Vignette

Backwards elimination of parameters produced no significant partial deviances and therefore the final model contained only the control variables. The overall model deviance indicated a good fit to the data ($\chi^2(137) = 153.23, p = .16$). Significant parameter estimates resulted for valence ($\beta_{\text{estimated}} = -.10, SE = .05, \chi^2(1) = 3.83, p = .05$), suggesting that a more positive mood was associated with increased false memories, and for vignette order ($\beta_{\text{estimated}} = .56, SE = .20, \chi^2(1) = 7.77, p < .01$). Viewing the Nature stimuli later rather than earlier in the

order was associated with a greater incidence of false memories. Consistent with hypotheses 5A and 5B, no attachment or priming effects on false recall were found.

Nature Word List

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Potential Confounds

As noted previously, higher scores on attachment anxiety and on avoidance were significantly correlated with higher neuroticism and lower self-esteem. In addition, more anxious participants wrote longer and less supportive paragraphs in response to the priming instructions compared with less anxious participants. Women also wrote longer and more detailed paragraphs than did men. In order to ensure that these additional personality and paragraph variables do not account for the attachment and priming condition effects found in Study 1, all significant results were re-calculated while controlling for each of the above variables (i.e., neuroticism, self-esteem, paragraph supportiveness, paragraph detail, paragraph length) in separate regression analyses. WHOTO scores were also used as a control variable to verify that differences in strength of attachment did not alter the effects of prime condition and attachment on false recall. With one exception, all significant Study 1 effects remained significant. In the case of false recall on the Abandoned word list, the 3-way interaction between C1, anxiety, and avoidance became marginally significant ($p < .07$) with WHOTO scores entered into the model. Higher neuroticism ($\beta_{\text{estimated}} = .27$, $SE = .12$, $\chi^2 = 4.75$, $p < .05$) and lower self-esteem ($\beta_{\text{estimated}} = -.18$, $SE = .07$, $\chi^2 = 7.75$, $p < .01$) emerged as independent predictors of greater false recall for Death vignette items. No other main effects of these control variables were found.

Summary of Study 1 False Memories

Hypotheses 1A and 1B predicted main effects for attachment insecurity (i.e., avoidance and anxiety) and insecure prime, respectively, on false memories for abandonment-related items. However interactive effects of C1, anxiety, and avoidance were found. For the vignette condition, partial support was found for hypothesis 1A in that higher scores on global anxiety led to greater false recall, but only for low avoidant individuals primed with a secure relationship-specific model. The opposite trend occurred for high avoidant individuals primed with attachment security. Partial support was also found for hypothesis 1B in that greater false memory errors occurred in the insecure prime condition relative to the secure prime condition, but only for individuals with chronically secure working models and individuals with chronic models of fearful-avoidance. An opposite patterns of findings resulted for the word list condition. Specifically, higher scores on attachment anxiety led to greater false recall, consistent with hypothesis 1A, but only for 2 groups: low avoidant participants primed with an insecure relationship-specific model, and high avoidant participants primed with a secure relationship-specific model. Partial support was also found for hypothesis 1B in that greater false memory errors occurred in the insecure prime condition relative to the secure prime condition. However, in contrast to the vignette results, this occurred only for individuals with chronically anxious working models and for those with chronically dismissive-avoidant models.

Hypotheses 2A and 2B predicted that higher global anxiety scores and insecure prime, respectively, would lead to greater false memories for death-related targets. Contrary to expectations, false memories for Death vignette items decreased as global anxiety increased for participants primed with an anxious relationship-specific attachment model. Participants primed with an avoidant relationship-specific model showed fewer false memories in general, and did not differ in false recall as a function of global anxiety. No evidence was found for a main effect

of secure versus insecure prime, contrary to hypothesis 2B, and no significant results emerged for the Death word list. No evidence was found for hypotheses 3A and 3B, which predicted attachment and priming differences in false memories for the Separated target set. Hypotheses 4A and 4B, which predicted effects for anxiety and avoidance and for insecure prime, respectively, on Hate false memories, were also not supported. However, in the word list condition, primed avoidant participants did display greater false recall of hate-targets than did primed anxious participants. Finally, hypotheses 5A and 5B were supported in that no attachment or priming differences were found for either of the 2 non-attachment target sets (the Code and Nature lists). With one exception noted previously, the significant findings from Study 1 could not be explained by participants' scores on neuroticism or self-esteem, attachment strength, or to differences in the paragraphs participants wrote in response to priming instructions (i.e. length, detail, or supportiveness).

STUDY 2

Method

Study 2 was designed as a general replication of Study 1 while improving upon two design issues. First, Study 1 did not include an assessment of participants' certainty (or uncertainty) in their recalled memories. Based on prior research demonstrating attachment differences in memory confidence ratings (Mikulincer & Horesh, 1999), Study 2 was designed to include the collection of confidence ratings for each recalled word. Second, 26% of the participants in Study 1 were unable to identify more than one relationship partner with whom they shared a prototypical attachment relationship. Therefore these participants could not be randomly assigned to a prime condition but instead were placed into a condition based on a single prototype. To address this issue, the priming instructions in Study 2 were modified to increase the likelihood that participants would identify multiple relationship partners matching the attachment descriptions and thus facilitate random assignment to the prime condition.

Participants

Three hundred sixty-eight Texas A&M students (256 females, 111 males, 1 unidentified) participated in a two-part study of "relationships, personality, and memory" in exchange for course credit. Participants ranged in age from 17 to 26 years with a mean age of 18.6 years for females and 19.0 years for males. One hundred eighty-eight participants were assigned to the word list condition (129 females, 59 males) and 180 participants were assigned to the vignette condition (127 females, 52 males, 1 unidentified). Approximately half of each group received a different list order. Within the group receiving the word list format, 19.7% of the participants were assigned to the anxious prime condition, 27.7% to the avoidant prime condition, and 52.7% to the secure prime condition. Within the group assigned to receive the vignette format, 17.2%

of participants were assigned to the anxious writing prime, 28.9% to the avoidant prime, and 53.9% to the secure prime condition.

Procedure

The same general procedure used in Study 1 was replicated in Study 2 with two primary changes. First, the priming instructions were modified in Study 2. Participants at time 1 were asked to identify by initials relationship partners with whom they likely shared an attachment relationship (e.g., parents, current dating partner, previous dating partner whom they dated the longest, non-romantic same-sex best friend). Consistent with methodologies used in prior research (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996; Rowe & Carnelley, 2003), participants were also asked to think of the “10 significant relationships that have had the most impact, *whether positive or negative*, on your life up to this point” and to identify these relationship partners by initials if they had not already done so. Next, participants read the three Hazan and Shaver (1987) attachment paragraphs depicting prototypical anxious-ambivalent, avoidant, and secure relationship partners¹³. They were then asked to indicate for each of their previously identified relationship partners which paragraph best described their relationship with that person. After selecting paragraphs for all potential attachment figures, participants were instructed: “Taking into consideration ALL of the relationship partners whom you just identified, indicate below which ONE relationship is the VERY BEST EXAMPLE of each paragraph description.” After selecting their three “best fit” relationship partners, participants categorized each of the three partners (i.e. as parent, sibling, best friend, close friend, or romantic partner) and rated how closely the Hazan & Shaver (1987) description actually characterized their relationship with the identified person using a 7-point Likert scale (1 = not at all like my partner, 7 = exactly like my partner). As in Study 1, descriptions rated as a 5 or higher were

¹³ Paragraph wording was adjusted to reflect an attachment relationship between the reader/participant and the subject of the paragraph. Paragraphs were written in the 1st person.

judged by the experimenter to depict a prototypical attachment relationship (i.e., secure, avoidant, or anxious-ambivalent).

The second procedural change was the inclusion of confidence ratings during the recall task. In Study 2, participants were asked to rate using 7-point Likert scales (1 = not at all, 7 = very) how confident they were that each recalled word has actually been presented earlier for that categorized word set. They made these ratings at the end of each 2-minute recall period, prior to beginning their recall of the next word set.

Measures

The same measures used in Study 1 were also used in Study 2 with one major addition. Because participants were likely to identify and write about non-romantic relationship partners (e.g., parents, best friends) as well as romantic ones in response to the priming task instructions, the ECR (Brennan et al., 1998) was adapted to assess participants' attachments to close others generally rather than to romantic partners specifically. Participants received this modified version of the ECR at Time 1. Coefficient alphas for the modified ECR anxiety and avoidance subscales were .91 and .93, respectively, for the word list condition, and .91 and .92 for the vignette condition. Coefficient alphas for the neuroticism subscale were .81 and .80 for the word list and vignette conditions, respectively. For the self-esteem scale, alphas were .89 and .88. The 6-item WHOTO scale had alphas of .90 and .89.

Poisson and OLS Regression Strategies

Identical procedures as described in Study 1 were used to conduct Poisson regression analyses of the Study 2 false recall data. In addition, hierarchical linear regression analyses consisting of six steps were conducted on all confidence rating dependent variables. For all analyses, step 1 contained the control variables [i.e. sex, order of target words, contrast codes C1 and C2, and mood at time 2 prior to recall (arousal & valence)] and step 2 contained scores on

attachment avoidance and anxiety entered together. In a preliminary set of analyses, Sex x Avoidance and Sex x Anxiety were entered together in step 3. The Avoidance x Anxiety interaction was entered next followed by the sex three-way interaction. Unless otherwise noted in the results, sex did not generally interact with attachment and therefore the sex interaction terms were removed from the model prior to conducting further analyses.

In the primary analyses, step 3 contained the C1 x Anxiety and C1 x Avoidance interactions. Anxiety x Avoidance was reentered into the model followed by the C1 three-way interaction in step 4. Finally, the C2 x Anxiety and C2 x Avoidance interactions were tested in step 5 followed by the C2 three-way interaction in step 6. The ordering of the C1 interactions before the C2 interactions in the model is based on the expectation that the prime effect should rest largely on the distinction between secure and insecure conditions (the C1 contrast) rather than between the two types of insecure conditions (the C2 contrast). Thus after accounting for any effects between secure vs. insecure prime and attachment scores, this model tests whether or not any additional effect(s) of avoidant vs. anxious prime and attachment are predictive.

False Memory Results

Prime Manipulation Check

Despite the change in priming instructions, 21.8% of participants assigned to view word lists and 23.3% of participants assigned to view vignettes only selected one prototypical attachment relationship. Because these participants could not be randomly assigned to a prime condition, they were assigned to write their brief essay about the one prototypical attachment partner whom they had identified.

The written paragraphs were coded by 4 independent raters who rated the descriptions based on 11 dimensions using 7-point Likert scales. Inter-rater reliabilities ranged from .75 to .96 for 10 of the dimensions. One dimension was dropped due to low reliability. A principal

components analysis of the 10 rated items resulted in 2 factors similar to those found in Study 1. The first factor, labeled supportiveness, contained 7 items including the 2 described previously in the Study 1 description and explained 75.8% of the variance. Item loadings ranged from .95 to .98 and coefficient alpha for the summed items was .99 for both the word list and the vignette conditions. The second factor contained 1 item that explained 13.2% of the variance and consisted of “To what extent is the paragraph written in vague, non-specific terms versus detailed, specific terms concerning the relationship partner and the participant’s reaction to him/her?” (1=vague, 7=detailed)¹⁴.

Regressing factor 1 onto the predictor variables of sex, time 1 mood valence and arousal, prime condition, attachment anxiety and avoidance resulted in significant main effects of contrast code C1 for both the word list ($\beta = -.59$, $t(175) = -10.33$, $p < .001$) and the vignette conditions ($\beta = -.65$, $t(170) = -12.33$, $p < .001$). Consistent with the intended manipulation, paragraphs written by individuals in the secure prime condition were rated significantly higher in supportiveness than were paragraphs written by participants in the insecure prime condition. A marginal main effect of contrast code C2 emerged for the word list condition ($\beta = -.10$, $t(175) = -1.93$, $p < .06$) and was significant in the vignette condition ($\beta = -.19$, $t(175) = -3.68$, $p < .001$). Participants primed with attachment anxiety wrote descriptions rated more supportive and positive than did participants in the primed avoidant condition. No effects were found for chronic attachment, although a valence main effect was found for both the word list ($\beta = -.19$, $t(175) = -3.34$, $p < .01$) and the vignette conditions ($\beta = -.17$, $t(170) = -3.21$, $p < .01$). Participants who began the study in a more positive mood also wrote more positive, supportive descriptions, regardless of their primed condition or chronic attachment style.

¹⁴ Two additional items cross-loaded onto both factors and thus were dropped from further analyses.

Similar to Study 1, sex main effects also emerged for the prediction of factor 2 in both the word list ($\beta = .34, t(173) = 4.78, p < .001$) and vignette ($\beta = .18, t(168) = 2.42, p < .05$) conditions. Paragraph descriptions written by women were again rated more detailed and specific and less vague than were descriptions written by men. No significant chronic attachment or prime effects were found. Sex was also a significant predictor of the length of paragraph descriptions in both the word list ($\beta = .33, t(173) = 4.77, p < .001$) and the vignette conditions ($\beta = .17, t(168) = 2.33, p < .05$), with women providing lengthier descriptions. As in Study 1, an unexpected main effect of anxiety also emerged for the word list participants ($\beta = .22, t(173) = 3.03, p < .01$). It indicated that more anxious participants wrote longer paragraphs. A mood arousal main effect was also found for vignette participants ($\beta = -.19, t(168) = -2.53, p < .05$), suggesting that participants who began the study in a more aroused, excited state generated longer descriptions than participants who were calmer at the outset of the study.

Preliminary Analyses

Table 7 contains the means and standard deviations from all Study 2 predictor variables. As the table indicates, participants in the word and vignette format condition did not differ in attachment, mood, or personality variables. Table 8 contains the means and standard deviations of false memories from each word/vignette target set. As the table indicates, participants who received the vignette format reported significantly higher false recall of items from the Abandoned, Hate, and Separated target sets relative to participants who received the word list format. Zero-order correlations among the predictor variables are shown in Tables 9 and 10 for the word list and vignette formats, respectively. For individuals in both format conditions, higher anxiety scores were associated with higher arousal and more negative mood following the writing prime, higher scores on neuroticism, and lower self-esteem. Scoring higher on avoidance was also associated with more negative mood, higher neuroticism, and lower self-

esteem in both conditions. In addition, avoidance was associated with a more aroused state, weaker attachment to the subject of the prime paragraph as reported on the WHOTO, and being assigned to the insecure prime condition for participants who viewed word lists.

Being assigned to the insecure vs. secure prime condition (i.e., C1 contrast) was associated with more negative mood state and weaker reported attachment to the subject of the written essay as indicated on the WHOTO scale for all participants. For word list participants, assignment to the insecure prime was also associated with increased arousal. As in Study 1, the C2 contrast was correlated with lower scores on the WHOTO for all participants, indicating that individuals in the anxious prime condition reported stronger attachment to the subject of their essays than did individuals in the avoidant prime condition.

Table 11 and Table 12 show correlations between the predictor variables and false recall of word list and vignette target sets, respectively. For participants presented with word lists, higher scores on avoidance were unexpectedly associated with fewer false memories for Code List items. Assignment to the insecure versus secure prime condition was associated with fewer false memories for hate-related, separation-related, and code-related words. No other significant correlations between anxiety, avoidance, and prime were found. For participants who viewed the vignettes, no significant zero-order correlations between false memories and attachment or prime were found.

Primary Analyses

Similar to Study 1, results of the Poisson regression models assessing false memories are presented first for the attachment-relevant stimuli and then for the non-attachment stimuli. For each stimuli set, vignette results will be discussed first, followed by the analogous word list results. OLS regression results from analyses of the confidence ratings data will then be

presented following the Poisson regression results. Confidence ratings will be presented first for the attachment-relevant stimuli, and then for the non-attachment stimuli.

Abandoned Vignettes

Hypothesis 1A proposed that higher scores on anxiety and avoidance would be associated with greater false recall of abandonment-related words, whereas hypothesis 1B predicted that participants in the insecure prime condition would show higher false recall of Abandoned words relative to those in the secure prime condition. Partial support was found for both of these hypotheses. Whereas removal of the 3-way interaction between C2 and attachment was justified in step 1, a significant partial deviance occurred upon removal of the 2-way C2 x Avoidance interaction with C2 x Anxiety still in the model ($\chi^2(1) = 3.90, p < .05$). Therefore both 2-way interactions were retained in the final model along with all C1 interaction terms, Anxiety x Avoidance, all main effects and control variables. The overall model deviance showed a good fit ($\chi^2(161) = 97.39, p = .99$) and the estimated regression coefficient for the C2 x Avoidant interaction was significant ($\beta_{\text{estimated}} = -.36, SE = .16, \chi^2(1) = 5.10, p < .05$). Three other parameter estimates were also significant: a 2-way interaction between C1 and anxiety ($\beta_{\text{estimated}} = -.22, SE = .08, \chi^2(1) = 7.77, p < .01$), a main effect of anxiety ($\beta_{\text{estimated}} = -.10, SE = .05, \chi^2(1) = 4.46, p < .05$), and a main effect of contrast code C1 ($\beta_{\text{estimated}} = -.22, SE = .09, \chi^2(1) = 5.91, p < .05$). Contrary to hypothesis 1A, the anxiety main effect suggests that higher global anxiety is associated with fewer false memories for abandonment stimuli. The C1 main effect indicates that being primed with an insecure relationship-specific model is associated with fewer false memories relative to primed security, contrary to hypothesis 1B. However both these effects must be interpreted in light of the C1 x Anxiety interaction (see Figure 4). Similar to the Study 1 findings for low avoidant participants, individuals who scored higher on global anxiety falsely recalled more abandonment items in the secure prime rather than the insecure prime condition,

contrary to expectations. However no differences in false recall were found for participants low in global anxiety as a function of prime.

Examination of the C2 x Avoidance interaction (see Figure 5) shows partial support for hypothesis 1A with regard to avoidance. Specifically, greater false recall of abandonment-related targets was associated with higher scores on global avoidance but only in the anxious prime condition. Participants primed with an avoidant relationship-specific model showed a gradual decline in false memories as global avoidance increased.

Abandoned Word Lists

A significant partial deviance was encountered during step 3. Follow-up analyses justified removal of both the C1 3-way interaction and the C1 x Avoidance 2-way interaction. However the C1 x Anxiety was retained after its removal produced a significant partial deviance ($\chi^2(1) = 4.12, p < .05$). The model overall deviance indicated a good fit to the data ($\chi^2(172) = 96.71, p = 1.0$) and the Wald test of the parameter estimate for the interaction was significant ($\beta_{\text{estimated}} = -.19, SE = .08, \chi^2(1) = 5.60, p < .05$). Mood arousal was also significant ($\beta_{\text{estimated}} = .05, SE = .02, \chi^2(1) = 7.82, p < .01$), indicating that participants who reported being more highly aroused displayed fewer memory errors than did those who reported feeling more calm. Similar to the vignette condition, the interaction pattern (see Figure 6) shows that individuals who scored higher on global anxiety falsely recalled more abandonment-related words in the secure rather than the insecure condition, contrary to predictions. In contrast, those who scored lower on global anxiety falsely recalled more Abandoned words in the insecure rather than the secure prime condition, providing partial support for hypothesis 1B. No support was found for hypothesis 1A, that higher global anxiety and higher global avoidance would be associated with greater false recall of Abandoned words.

Death Vignette

Backwards elimination of predictors produced no significant partial deviances and therefore the final model contained only the control variables. However no significant predictors emerged. Thus no support for hypotheses 2A and 2B were found.

Death Word List

Backwards elimination of predictors produced no significant partial deviances and therefore the final model contained only the control variables. However no significant predictors emerged. Thus no support for hypotheses 2A and 2B were found.

Separated Vignette

Backwards elimination of predictors produced no significant partial deviances and therefore the final model contained only the control variables. However no significant predictors emerged. Thus no support for hypotheses 3A and 3B were found.

Separated Word List

Backwards elimination of predictors produced no significant partial deviances and therefore the final model contained only the control variables. However no significant predictors emerged. Thus no support for hypotheses 3A and 3B were found.

Hated Vignette

A significant partial deviance resulted in step 1 after removal of the sex interactions. Follow-up analyses indicated that only removal of the Sex x Anxiety interaction was significant ($\chi^2(1) = 6.05, p < .05$). The model overall deviance indicated a good fit to the data ($\chi^2(159) = 129.81, p = .96$) and the Wald test of the parameter estimate for the interaction was significant ($\beta_{\text{estimated}} = .16, SE = .06, \chi^2(1) = 6.84, p < .01$). No other significant parameters emerged. The interaction pattern (see Figure 7) shows that more anxious females falsely recalled more hate-related targets relative to less anxious females. The opposite pattern was true of males, such that

more anxious males recalled fewer Hate targets compared to low anxious males. Thus, partial support for hypothesis 4A (that greater attachment anxiety would predict more false memories for hate target items) was found with regard to women's false memories. However, this hypothesis was not supported with regard to men's memory mistakes. No support was found for hypothesis 4B which posited a priming main effect.

Hate Word List

A significant partial deviance resulted in step 2 after removal of the C2 x Anxiety interaction ($\chi^2(1) = 4.86, p < .05$). The model overall deviance indicated a good fit to the data ($\chi^2(169) = 132.38, p = .98$) and the Wald test of the parameter estimate for the interaction was significant ($\beta_{\text{estimated}} = .42, SE = .18, \chi^2(1) = 5.43, p < .05$). The parameter estimate for the Anxiety x Avoidance interaction was also significant ($\beta_{\text{estimated}} = .20, SE = .07, \chi^2(1) = 9.17, p < .01$). The pattern of effects for the C2 x Anxiety interaction (see Figure 8) shows that participants low in global anxiety falsely recalled more Hate targets when primed with an anxious relationship-specific model rather than an avoidant relationship-specific model. Participants high in global anxiety showed no differences in false recall based on prime condition. The Anxiety x Avoidant interaction (see Figure 9) indicates that individuals with more globally secure working models displayed greater false recall of Hate words relative to individuals with more globally dismissive-avoidant working models. Thus no support was found for hypothesis 1A which predicted a main effect of global anxiety, or for hypothesis 4B which predicted a main effect of insecure versus secure prime.

Code Vignette

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Code Word List

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Nature Vignette

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Nature Word List

None of the models incorporating attachment, priming, or control variables constituted a good fit to the data based on the chi square test of overall model deviance. Therefore consistent with hypotheses 5A and 5B, no significant effects for attachment or prime condition were found.

Potential Confounds

As in Study 1, higher scores on attachment anxiety and on avoidance were significantly correlated with higher neuroticism and lower self-esteem. More anxious participants wrote longer paragraphs compared with less anxious participants. Women also wrote longer and more detailed paragraphs than did men. In addition, lower WHOTO scores (i.e. less strength of attachment) were associated with higher avoidance scores. With two exceptions, all Study 2 false memory findings remained significant after separately controlling for each of the potential confound variables. In the case of false recall for abandoned vignette items, the main effects of C1 ($p=.08$) and anxiety ($p=.07$) became marginally significant after scores on the WHOTO and neuroticism, respectively, were entered into the model. However the 2-way interactions between C1 and anxiety and between C2 and avoidance remained significant. Paragraph length emerged as a significant predictor of hate-related false recall for the vignette condition ($\beta_{\text{estimated}} = .0013$,

SE = .0006, $\chi^2 = 4.70$, $p < .05$). Longer paragraphs were associated with greater false memories. No other main effects emerged for these control variables.

Summary of Study 2 False Memories

Consistent with Study 1 and with hypotheses 5A and 5B, no attachment or priming differences in false memories were found for the non-attachment stimuli sets. Regarding the attachment-relevant stimuli, no evidence for attachment or priming effects on false memories were found for either the Death List/Vignette (hypotheses 2A and 2B) or the Separated List/Vignette (hypotheses 3A and 3B). Contrary to hypotheses 1A and 1B, higher scores on anxiety and assignment to the insecure prime condition were both associated with *fewer* rather than more false recall of abandonment-related vignette items.

A similar pattern emerged in the word list condition, with higher anxiety scores being associated with decreasing false memories in the insecure prime condition, but a slight increase in false memories in the secure prime condition. Consistent with expectations, higher avoidance scores were associated with increasing false memories from the abandoned vignette, but only in the anxious prime condition. Partial support was found for hypothesis 4A in that more anxious women falsely recalled more hate-related items from the vignette than did less anxious women. However, men showed the opposite pattern, with more anxious men displaying fewer hate-related false memories relative to low anxious men. In the word list condition, less globally anxious individuals displayed greater false recall of hate-related targets if they were assigned to the anxious rather than the avoidant prime condition. Those holding more secure working models falsely recalled more hate items than did those who had more dismissive-avoidant working models. Similar to Study 1, the results from Study 2 could not be explained by differences in other personality variables (i.e. neuroticism, self-esteem), attachment strength, or

discrepancies in the written paragraph descriptions (i.e. paragraph length, detail, or supportiveness).

Confidence Rating Results

Preliminary Analyses

Means and standard deviations of the false memory confidence ratings are shown in Table 13. As the table indicates, confidence in false memories from the Separated Word List were significantly higher than confidence in false memories from the Separated Vignette. No other significant differences between word and vignette conditions were found.

Tables 14 and 15 contain zero-order correlations between the Study 2 predictor variables and the confidence ratings for the word list and vignette conditions, respectively. Higher avoidance scores were associated with lower confidence in falsely recalled words from the Separated target set, regardless of word list or vignette format, whereas lower avoidance scores were associated with higher confidence in memory mistakes. For participants who viewed the vignettes, higher avoidance scores were also associated with lower confidence in falsely recalled items from the Death and Nature vignettes. Higher anxiety scores were associated with lower confidence in falsely recalled items from the Abandoned vignette, whereas lower anxiety scores predicted higher confidence. Being assigned to the insecure prime condition was associated with lower confidence in falsely recalled items from the Nature word list, whereas being assigned to the secure prime condition was associated with higher confidence in Nature word list mistakes. No other significant effects were found for attachment or prime conditions.

Primary Analyses

Abandoned Vignette

Hypothesis 1A and 1B predicted main effects for chronic attachment anxiety and avoidance and for primed insecurity, respectively, on confidence ratings of falsely recalled

abandonment items. For participants who experienced the vignette format, a main effect for anxiety emerged ($\beta = -.20$, $t(147) = -2.29$, $p < .05$). However, contrary to expectations, higher anxiety scores predicted lower confidence in memory mistakes, whereas lower anxiety scores predicted the opposite. This main effect, however, was qualified by significant 2-way interactions between sex and anxiety ($\beta = .19$, $t(146) = 2.45$, $p < .05$) and C1 and anxiety ($\beta = .21$, $t(146) = 2.47$, $p < .05$). The anxiety main effect remained significant when Sex x Anxiety was entered into the model. However, anxiety became non-significant when the C1 x Anxiety interaction was included. Examination of the interaction pattern for the C1 x Anxiety effect (see Figure 10) shows that participants with higher global anxiety scores reported less confidence in their false memories of abandonment-related targets when they experienced the secure prime versus the insecure prime. These individuals also reported less confidence relative to all participants in the insecure prime condition, who reported higher confidence in false memories over a wide range of anxiety scores. This provides partial support for hypothesis 1B. The Sex x Anxiety interaction (see Figure 11) indicates that men who scored higher on global anxiety reported less confidence in their false memory errors for abandoned-related targets relative to women with higher global anxiety scores and to all participants low in global anxiety.

Abandoned Word List

A significant 2-way interaction between C2 and avoidance emerged for the word list condition ($\beta = .18$, $t(158) = 2.19$, $p < .05$). The interaction pattern (see Figure 12) reveals that, for participants who scored higher on global avoidance, being in the avoidant prime condition was associated with higher confidence in abandonment-related memory errors than being in the anxious prime condition. In contrast, participants who had lower avoidant scores reported higher confidence in their memory mistakes in the anxious versus the avoidant prime condition.

Death Vignette

Hypotheses 2A and 2B predicted that higher anxiety scores and primed insecurity respectively would be associated with greater confidence in false memories of death-related targets. No attachment or priming effects were found for participants in the vignette format.

Death Word List

In the word list condition, significant interactions emerged for both C1 x Avoidance ($\beta=.20$, $t(120) = 2.18$, $p<.05$) and Sex x Anxiety ($\beta=.28$, $t(120) = 2.69$, $p<.01$). Both effects remained significant when entered into the model simultaneously. The pattern of the C1 x Avoidance interaction, shown in Figure 13, indicates that participants with higher global avoidance scores reported greater confidence in their death-related false memories if they were in the insecure prime versus the secure prime condition. In contrast, participants who scored lower in global avoidance reported greater confidence in their memory mistakes if they were in the secure prime versus the insecure prime condition. Examination of the Sex x Anxiety interaction in Figure 14 indicates that, contrary to expectations, men with higher scores on global anxiety reported less confidence in their death-related false memories than did men with lower global anxiety scores. In contrast, women who had higher anxiety scores reported slightly greater confidence in their false memories than did women with lower anxiety scores.

Separated Vignette

A main effect for avoidance emerged for participants in the vignette condition ($\beta = -.17$, $t(153) = -2.18$, $p<.05$). Contrary to hypothesis 3A, however, higher scores on avoidance were associated with lower confidence in separation-related false memories, whereas lower scores on avoidance were associated with greater confidence. A main effect of order was also found ($\beta = .24$, $t(153) = 3.15$, $p<.01$). Participants who saw the Separated Vignette earlier in the list order

rather than later reported greater confidence in their memory errors. No support was found for hypothesis 3B, which predicted a main effect of primed insecurity on confidence in false recall.

Separated Word List

No significant attachment or priming effects were found for participants who saw the word lists.

Hate Vignette

A significant interaction between contrast C1 and anxiety was found for the vignette format ($\beta = .25$, $t(106) = 2.52$, $p < .05$). The interaction pattern (see Figure 15) shows that higher scores on global anxiety were associated with increased confidence in falsely recalled hate items in the insecure prime condition versus the secure prime condition. In contrast, individuals who had lower scores on global anxiety reported greater confidence in false memories in the secure prime condition relative to the insecure prime condition. No other significant effects were found.

Hate Word List

No attachment or priming effects were found for participants who saw Hate words in the list format.

Code Vignette

Consistent with hypotheses 5A and 5B, no attachment or priming effects were found for confidence ratings in the vignette condition.

Code Word List

Contrary to expectations, a significant C2 x Avoidance interaction emerged for the Code word list ($\beta = .33$, $t(79) = 2.89$, $p < .01$). The pattern of the interaction (see Figure 16) shows that individuals who had higher scores on avoidance reported greater confidence in their false memories for Code targets if they were in the avoidance prime versus the anxious prime

condition. In contrast, lower scores on avoidance were associated with greater confidence in memory errors in the anxious prime versus the avoidant prime condition.

Nature Vignette

Consistent with hypotheses 5A and 5B, no significant attachment or priming effects emerged for participants who viewed the Nature vignette.

Nature Word List

Whereas hypothesis 5A predicted no attachment-based differences in false memories for non-attachment relevant stimuli, a significant 2-way interaction between anxiety and avoidance emerged ($\beta = .28$, $t(129) = 3.32$, $p < .01$) for confidence in false recall from the Nature word list. The interaction pattern (see Figure 17) reveals that participants who were lower in both anxiety and avoidance (i.e., those with prototypically secure working models) reported greater confidence in their Nature false memories than did those with lower scores on anxiety and higher scores on avoidance (i.e., those with prototypically dismissive-avoidant working models). Those with higher scores on both anxiety and avoidance (i.e., fearful-avoidant working models) reported higher confidence than those with higher scores on anxiety, but lower scores on avoidance.

Potential Confounds

With two exceptions, all Study 2 confidence rating results remained significant after separately controlling for each of the potential confound variables. In the case of confidence in false recall for Abandoned vignette items, controlling separately for WHOTO scores and for supportiveness of the paragraph description reduced the main effect of C1 to non-significance ($p > .10$). However both the Sex x Anxiety and C1 x Anxiety interactions remained significant. In the case of confidence in false recall for Abandoned word list items, controlling for paragraph length reduced the C2 x Avoidance interaction to marginal significance ($p < .06$). Paragraph

supportiveness emerged as a significant predictor of confidence in death-related false memories for the word list condition ($\beta = -.47$, $t(118) = -3.35$, $p < .01$). More supportive paragraphs were associated with lower confidence in Death false memories. No other main effects emerged for these control variables.

Summary of Study 2 Confidence Ratings

Hypotheses 1 through 4 generally predicted that chronic attachment anxiety and/or chronic avoidance would be associated with increased confidence in individuals' memory mistakes for the attachment-relevant stimuli, all of which pertained to core concerns of highly anxious or highly avoidant working models. In addition, primed insecurity was expected to be associated with increased confidence in memory errors relative to primed security. Almost no evidence supporting these predictions was found. Instead, the data suggests that individuals' confidence in their memory mistakes may depend on the match between their prime condition and their chronic attachment style. Specifically, participants who viewed the Hate and Abandoned vignettes reported higher confidence ratings in the insecure prime condition if they themselves scored higher in attachment anxiety. On the other hand, they reported greater confidence in the secure prime condition if they scored lower in anxiety (i.e., were more secure persons). Similarly, individuals who had higher avoidant scores reported greater confidence in their false recall from the Death word list if they were in the insecure prime condition, whereas those who had lower avoidance scores (i.e., more secure persons) reported greater confidence if they were in the secure prime condition. Participants higher in avoidance also reported higher confidence ratings in Abandoned and Code word lists if they were assigned to the avoidant rather than the anxious prime condition, whereas those lower in avoidance reported higher confidence in the anxious rather than the avoidant prime condition. Finally, two sex differences emerged, indicating that highly anxious men were less confident in their false recall of

Abandonment and Death items than highly anxious women were. The Study 2 confidence ratings results could not be explained by differences in neuroticism, self-esteem, attachment strength, or paragraph variables such as length, supportiveness, or detail.

DISCUSSION

Overview

The primary aim of this research was to test the hypothesis that attachment working models – both chronic and relationship-specific – would lead to model-congruent patterns of false recall. Implicit in this hypothesis are two separate ideas: (1) that attachment style should influence false recall in the first place, and (2) that this influence should occur in a model-congruent fashion. The findings from 2 separate studies offer evidence that false memory, like other forms of information processing (e.g. accurate memory, attribution, perception) is in fact influenced by both chronic and relationship-specific models. Contrary to the central hypothesis, however, this influence did not consistently occur in a model-congruent fashion, nor did it occur in the form of main effects as predicted. Instead, a more complicated pattern of results emerged involving interactive effects of chronic and relationship-specific working models.

Attachment-based false memories were found primarily for words related to social isolation concerns (i.e. the Abandoned word list/vignette) and to hate/rejection concerns (i.e. the Hate word list/vignette). Attachment differences in confidence ratings of false memories were found for both attachment stimuli (i.e., Death, Abandonment, Separation, and Hate word list/vignette) and non-attachment stimuli (i.e. Code and Nature word list/vignette). Notably, no attachment-based differences in false recall were found for either set of non-attachment stimuli which suggests that differences between secure, anxious, and avoidant working models (whether chronic or relationship-specific) were not associated with general decrements or advantages in memory processes. With only a few exceptions, all significant attachment effects on memory and confidence ratings remained significant after controlling for potential confounds such as neuroticism, self-esteem, attachment strength, and differences in participants' written relationship descriptions (i.e. paragraph length, detail, and supportiveness). In the case of the

exceptions, all but one effect remained marginally significant after controlling for the confounding variable. This provides further support for attributing the false memory and confidence rating effects found in Studies 1 and 2 to differences in attachment working models rather than to correlates of attachment and prime condition.

False Recall

The most consistent pattern of false recall findings occurred with respect to the Abandoned stimuli set. Specifically, a similar pattern emerged in both Study 1 and Study 2 vignette conditions and in the Study 2 word list condition: participants with chronically anxious working models displayed greater false memories for abandonment-related items after being primed with a secure attachment relationship rather than an insecure attachment relationship. In 2 of the 3 conditions chronically secure participants showed the opposite pattern by falsely recalling more Abandonment items after being primed with attachment insecurity rather than attachment security. In one condition no differences in false recall were found. For chronically secure participants, model congruent memory errors emerged with respect to the relationship-specific prime in that greater false recall of negative attachment items was associated with primed insecurity in the majority of findings. For chronically anxious participants, however, memory errors were incongruent with the relationship-specific prime in that greater false recall of negative attachment stimuli was associated with primed security. How can this discrepancy be explained?

One possibility lies with the affect-as-information approach described by Clore and colleagues in explaining information-processing differences. Gasper and Clore (2002) recently demonstrated that positive affect/mood experienced as task-relevant promotes global processing and the use of general knowledge structures to process novel stimuli. In contrast, negative affect/mood promotes local processing and a focus on the specific details of a new stimulus.

Storbeck and Clore (2005), reasoning that negative affective cues should promote item-specific processing at the expense of more global processing, documented reductions in false memories of un-presented critical words using the Deese-Roediger-McDermott paradigm following a negative mood induction (Storbeck & Clore, 2005). This effect was shown to occur primarily at encoding in that negative mood led to fewer associative thoughts related to word list items during study, thereby resulting in a reduced tendency to think of and falsely remember the critical lures. Although false memories produced using the category structure paradigm occur primarily as a result of retrieval rather than encoding processes, Clore and colleagues' findings may be relevant to participants' reliance on their associative network of relationship knowledge during the category structure recall task of the current research.

Specifically, to the extent that being primed with a secure relationship-specific attachment put participants into a positive mood state, they may have been more inclined to rely on their general relationship knowledge structures to retrieve categorical information during the recall task¹⁵. Thus chronically anxious individuals primed with security (and thus in a positive mood) should rely on their anxious global working models of attachment during recall. As discussed previously, anxious models should contain well-developed networks of associations with social isolation and aloneness concerns in addition to concerns about separation from partners and abandonment. Such networks were predicted to predispose the globally anxious individual to making more false memory mistakes on abandonment stimuli, consistent with the results. In contrast, chronically anxious participants primed with insecurity should have experienced a negative affective state. According to the affect-as-information approach, this should have led them to focus on the specific details of the word lists/vignettes during study and to rely less on

¹⁵ Main effects for C1 were found in predicting post-prime mood for all four conditions: i.e., Study 1 word list ($\beta = .18$, $t(142) = 3.46$, $p < .01$), Study 1 vignette ($\beta = .17$, $t(133) = 2.69$, $p < .01$), Study 2 word list ($\beta = .24$, $t(173) = 5.16$, $p < .001$), and Study 2 vignette ($\beta = .24$, $t(168) = 4.36$, $p < .001$). Insecure and secure prime conditions were associated with more negative and more positive post-prime moods, respectively.

their global relationship working models. Thus chronically anxious participants primed with insecurity should have been more accurate and less prone to false memory errors during recall, consistent with the results.

The same reasoning can be applied to the findings for chronically secure participants. Chronically secure individuals primed with security (and thus in a positive mood) should rely on their secure global working models of attachment during recall. Globally secure models, as previously discussed, are generally based on a history of interactions with available and responsive attachment figures and thus should not contain well-developed associations regarding social isolation and aloneness. Therefore reliance on globally secure working models should result in a reduced tendency to produce Abandonment false memories. In contrast, globally secure participants primed with attachment insecurity should experience a negative mood state. According to the affect-as-information approach, they should be less likely to rely on their general relationship models and more likely to focus on the specifics of the stimulus, which in this case are negative attachment-relevant words. Attending to the details of the word lists and vignettes should typically improve accuracy and also lead to fewer errors. However, in this case the memory error comparison is between two conditions that should both inhibit false memory errors – i.e. a focus on the negative stimuli produced by the insecure prime, and reliance on a positive associative network produced by a globally secure working model. It is difficult to predict which effect may have inhibited false memory production the most. This may explain why no significant differences resulted for globally secure participants' memory errors between the primed secure and primed insecure conditions in 2 of the 4 conditions from Studies 1 and 2 (the Study 1 word list condition also showed this effect, although the interaction was only marginally significant after controlling for WHOTO scores). In the remaining 2 conditions, false memory errors were slightly greater in the insecure prime relative to the secure prime condition,

possibly because local processing of the negative stimuli may have succeeded in activating a few negative associations relative to almost no associations being activated from reliance on the globally secure model.

One potential problem in applying the affect-as-information explanation to the current results is that post-prime mood was used as a control variable in all regression analyses. Therefore, differences in post-prime mood valence between participants in different prime conditions should have been accounted for. However, if mood valence indeed affected a third variable, such as the tendency to process information globally versus locally, it is possible that controlling for mood (assuming that mood valence and the 3rd variable were not perfectly correlated) did not entirely account for the effect of such a 3rd variable on false memory.

The second cluster of false recall findings from both studies involves the Hate word list/vignette. Unfortunately the pattern of results from the Study 1 word list (i.e. C2 main effect), Study 2 word list (i.e. C2 x Anxiety), and Study 2 vignette (Anxiety x Avoidance, Sex x Anxiety) conditions are inconsistent and difficult to interpret. One consistency did occur between the Study 2 Hate word list and the Study 1 Death Vignette conditions. Specifically, significant C2 x Anxiety interactions emerged in both cases with nearly identical patterns of recall. Namely, for participants primed with anxiety, false memories for Death and Hate items decreased as global anxiety scores increased, contrary to predictions. Thus globally anxious participants tended to falsely recall fewer memories related to death – the ultimate separation from one’s attachment figure – and hate/rejection after writing about a relationship partner with whom they shared an anxious attachment. This effect was in contrast to the results of primed avoidant participants’ whose false memories (1) did not change as a function of global anxiety scores and (2) were generally fewer in number relative to the primed anxiety case, particularly when global anxiety was low. A somewhat similar interaction pattern also emerged between C2

and avoidance for the Study 2 Abandoned vignette. Participants primed with avoidance generally did not differ in false recall as a function of their global avoidance scores. However participants primed with anxiety increased in false memories as a function of increasing global avoidance. From these 3 interactions involving contrast C2 we can conclude that (1) primed avoidance and primed anxiety do not always produce uniform effects on false memories in terms of an insecure prime condition, contrary to expectations, and (2) participants who wrote about an anxious relationship-specific attachment showed significant differences in false recall as a function of their global anxiety scores whereas those who wrote about an avoidant relationship-specific model did not.

A third set of false memory findings resulted from analyses of the Separated word list and vignette. Across both conditions in two studies no significant effects of either global attachment or relationship-specific prime were found, contrary to expectations. This is surprising considering that the Separated stimuli connoted relationship dissolution and therefore should have been highly attachment relevant, particularly for anxious working models. One possible explanatory factor may lie with the nature of the Separated word items. Many of the terms included in the stimuli set (e.g. “frustrated”, “hard”, “empty”, “different”) arguably convey less negative feeling/emotion compared with similar terms from the Abandoned (e.g. “scared”, “lonely”, “confused”, “rejected”) or Hate (e.g. “despises”, “loathing”, “unloved”, “resentment”) item sets. Attachment-based differences in false memory may be more predominant using stimuli sets that convey more negative, relationship-relevant emotion. If true, a similar explanation may account for the scarcity of findings with the Death stimuli which also contained fewer terms connoting strong negative feeling (e.g. “depressed”, “crying”, “grief”, “dark”) than the Abandoned and Hate stimuli, but more such items than the Separated item set.

Confidence Ratings

The most consistent set of findings from the current research emerged for the confidence rating data collected in Study 2. As with the false recall findings, few main effects were found with regard to chronic attachment and relationship-specific prime condition. However a number of 2-way prime x chronic attachment interactions emerged to show one primary pattern of results. Contrary to predictions, participants reported greater confidence in their false memory errors when their relationship-specific prime condition matched their chronic attachment style (e.g. globally secure participant in the secure prime condition, globally anxious participant in the primed anxious condition). In contrast, they reported lower confidence when a mismatch occurred between chronic and relationship-specific attachment models (e.g. globally secure participant in the anxious prime condition, globally avoidant participant in the anxious prime condition). What explanation can account for these findings? One possibility is that participants who wrote about a specific relationship partner who exemplified their chronic working model of attachment experienced a sense of validation. In other words, their worldview of relationships may have been legitimated as a result of describing a specific partner who matched their expectancies. The result of such a validating experience may have been to increase participants' certainty in their own judgments – in their ability to accurately map their relational experience. Such certainty may have subsequently overlapped into their confidence ratings such that participants expressed more confidence that the false memories they had recalled were in fact accurate. In contrast, participants who described a relationship partner who did not match their chronic working model may have experienced uncertainty. Becoming aware of a discrepancy between one's current relationship expectations and one's actual experience with a particular relationship partner may have brought into question whether the global working model was in

fact accurate. If so, such uncertainty may have subsequently overlapped onto participants' confidence ratings, leading them to be less confident in the accuracy of their memory mistakes.

Two additional findings resulted from the confidence rating data that were unexpected: namely, significant Sex x Anxiety interactions predicting confidence in false recall for Abandoned vignette and Death word list items. In both cases more globally anxious men reported the lowest confidence in their false memories relative to less anxious men and to all women. One post-hoc explanation for gender differences in these 2 stimuli sets may be related to social norms regarding vulnerability. Both the Abandoned item set (e.g. "lost", "lonely", "confused", "fear") and Death item set (e.g. "tears", "crying", "grief", "mourning") contain words associated with feeling vulnerable and weak, sentiments less typically associated with agency and masculinity than with communality and femininity (Williams & Best, 1990). Thus men may have been less apt to confidently endorse false memories relevant to personal vulnerability than were women given that such information would be less relevant to agency and a more masculine self-image. However, why should more globally anxious men rather than all men in general show fewer false memories for such items? Future research should examine whether a relationship between attachment anxiety and an orientation toward agency or more traditional gender roles exists.

Caveats and Future Directions

Results of the current research should be interpreted with respect to several limitations and caveats. First, it was not possible to randomly assign all participants in each study to a prime condition. Despite an attempt to improve the Study 2 priming instructions, approximately 22% of participants in Study 2 and 26% of participants in Study 1 selected only 1 prototypical attachment relationship and therefore were asked to write about that particular relationship partner. This situation resulted in the majority of participants writing about a secure rather than

an anxious or avoidant relationship-specific attachment, which may have reduced our ability to accurately detect insecure prime effects.

A second caveat is that some of the relationship partners described by participants in response to the priming instructions may not have been actual attachment figures. For example, some participants described roommates, siblings, or cousins in their prime paragraphs rather than romantic partners or parents who are more typically thought of as attachment figures. In an attempt to address this issue, all significant results were controlled for participants' WHOTO scores in order to account for the extent to which a given relationship constituted an "attachment". Results were also controlled for the length of paragraph descriptions to account for participants who had less to write about a given partner (or who were less inclined to write about the partner) and therefore may have been less engaged in the priming task. However, future studies should consider employing prime instructions that reduce the potential for generating relationship partners who are not true attachment figures. One solution may be use of a subliminal prime relevant to attachment security or insecurity (see Mikulincer & Shaver, 2001). This would also ensure that all participants were exposed to the same prime in equal measure. Use of a prime that the participants themselves generate (i.e. paragraph descriptions in the current study) introduces complexity in that attachment style differences may affect the extent to which certain individuals fully experience the prime.

A third caveat pertains to the number of regression models analyzed, particularly with respect to the Poisson analyses of memory data, which may have contributed to Type 1 errors. One means of addressing this issue is to employ a more conservative significance level such as an alpha of .01 or .001. Unfortunately this standard could not be adopted in the current research without losing many of the significant findings. However, the consistent pattern of false recall results across 2 studies and 4 conditions for the Abandoned stimuli, and the consistency in

confidence rating results found in Study 2, offer evidence against Type 1 errors. In these cases, the consistency of results seems to suggest evidence of real, interactive effects of chronic attachment and prime on memory and confidence judgments. Additional studies would help clarify whether more isolated and inconsistent results from the current research are spurious or whether they replicate.

A fourth caveat is that only a few selected sets of negative, attachment-relevant words were studied in the current research. Additional attachment-relevant stimuli – particularly stimuli with positive attachment themes – should also be examined to obtain a more complete picture of how working models may influence false memories. Revision of the Separated and Death stimuli sets to include more emotional or affect-laden terms should also be considered in light of the scant effects found using the current item sets.

A related caveat is that the current studies employed only visual presentation of stimuli. However, false memories may also occur with respect to auditory information such as information gleaned from conversations with relationship partners. Some preliminary evidence of attachment-based differences in false memories for orally presented material was found by the author in an earlier pilot study (Wilson, Simpson, & Smith, 2005). However this research utilized a less sophisticated design and priming instructions that confounded chronic and relationship-specific attachment models. Future studies should examine whether patterns of attachment-based recall similar to those found in the current research occur when modality changes from visual to auditory.

An interesting outcome of the present research is that similar patterns of false memories did not always emerge across the word list and vignette format conditions. In at least one instance, the interaction pattern was reversed. One possible explanation for this discrepancy is that negative attachment-relevant words presented within a social context containing references

to the partner and relationship may have been perceived as more threatening than the same words presented without a context. Thus the pattern of effects found using the vignette format may represent a stronger case for the influence of working models on false memories. This distinction highlights the importance of conducting relationships research using socially-relevant stimuli. Future research should consider the examination of false memories using more realistic stimuli such as descriptions of attachment-based scenarios, transcripts of conversations, recorded conversations, and videotaped interactions between relationship partners.

SUMMARY AND CONCLUSIONS

The present research demonstrated the influence of both chronic and relationship-specific working models of attachment on false memories. Furthermore, these general and specific models were shown to interact in predicting individuals' memory errors rather than influencing false memory independently. In contrast to prior work examining both types of attachment models with respect to other forms of information processing (e.g. accurate recall, negative reactions to outgroups), the current research demonstrated numerous interactive effects rather than main effects on false recall. In addition, both model-congruent and model-incongruent patterns of memory errors were found. The affect-as-information approach suggests a possible explanatory factor for this seeming inconsistency; however future research will need to test the validity of this explanation. Finally, the results suggest that confidence in one's attachment-relevant memory mistakes is a function of the congruency between one's chronic attachment model and the relationship-specific working model that is currently activated. Importantly, the actual incidence of false memory errors and confidence in false memory errors were not predicted by the same pattern of variables. This distinction suggests that researchers should be cautious in using confidence ratings as indicators of false memory incidence (see Mikulincer & Horesh, 1999).

In conclusion, the results of this research corroborate a core tenet of attachment theory – that working models of attachment influence how individuals process relationship-relevant information – and also extend our knowledge of these processes to the domain of false memories. Because our memories often serve as the basis for judgments and future actions, attachment-based differences in how we misremember negative relationship information has implications for affecting relationship outcomes such as perceptions of our partners and relationship satisfaction.

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APPENDIX A

TABLES

Table 1: Study 1 Predictor Means and Standard Deviations

	<u>Word Lists</u>		<u>Vignettes</u>		<u>t(300)</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Anxiety	3.73	1.00	3.81	1.04	-0.71
Avoidance	2.84	1.04	2.86	1.03	-0.22
Mood Arousal ^a	6.59	2.10	6.68	2.07	-0.35
Mood Valence ^a	3.28	2.01	3.29	2.01	-0.06
WHOTO	5.04	1.49	5.15	1.32	-0.62
Self-Esteem ^a	7.40	1.37	7.28	1.51	0.75
Neuroticism ^b	2.73	0.78	2.72	0.86	0.11

^a Scale range is 1 to 9. ^b Scale range is 1 to 5.

Table 2: Study 1 Means and Standard Deviations of False Memories

<u>Variable</u>	<u>Word Lists</u>		<u>Vignettes</u>		<u>t(300)</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
<i>Attachment Stimuli</i>					
Abandoned	1.67	1.49	1.90	1.55	-1.28
Death	1.27	1.54	1.36	1.42	-0.55
Hate	1.05	1.34	1.15	1.35	-0.66
Separated	2.09	1.75	2.36	1.73	-1.32
<i>Non-attachment Stimuli</i>					
Code	0.76	1.21	0.65	1.13	0.84
Nature	1.54	1.67	0.98	1.44	3.13**

* $p < .05$, ** $p < .01$

Table 3: Correlations Among Predictor Variables for Study 1 Word Lists

Variable	1	2	3	4	5	6	7	8	9	10
1. Anxiety	----									
2. Avoidance	.05	----								
3. C1	.22**	-.02	----							
4. C2	-.09	.00	-.02	----						
5. Sex	-.15	.10	-.08	-.06	----					
6. Order	.15	-.02	.00	.01	.73	----				
7. Arousal	-.05	-.15	.06	.13	.78	.11	----			
8. Valence	.35**	.14	.29**	-.02	-.20*	.06	-.15	----		
9. WHOTO	-.08	.02	-.47**	-.18**	.21**	-.11	-.06	-.37**	----	
10. Neurot	.39**	.17*	-.00	-.02	.17*	.05	-.06	.19*	.47	----
11. Self-Est	-.36**	-.18*	-.18*	.13	.15	-.13	.10	-.40**	.10	-.29**

* $p < .05$, ** $p < .01$

Table 4: Correlations Among Predictor Variables for Study 1 Vignettes

Variable	1	2	3	4	5	6	7	8	9	10
1. Anxiety	----									
2. Avoid	-.02	----								
3. C1	.05	.01	----							
4. C2	-.17*	.02	.00	----						
5. Sex	.07	-.05	-.01	.04	----					
6. Order	.02	.14	-.10	.02	-.06	----				
7. Arousal	-.15	-.13	-.12	.02	-.12	-.05	----			
8. Valence	.28**	.10	.26**	.04	-.03	.12	-.35**	----		
9. WHOTO	-.03	-.07	-.41**	-.27**	.11	-.01	-.00	-.22**	----	
10. Neurot	.48**	.02	.07	-.06	.39**	.05	-.37**	.34**	-.03	----
11. Self-Est	-.36**	-.19*	-.11	.13	.15	-.07	.37**	-.51**	.15	-.47**

* $p < .05$, ** $p < .01$

Table 5: Correlations Between Predictor Variables and False Memories for Study 1 Word Lists

Predictor	Anx	Avd	C1	C2	Sex	Order	Arou	Valen	WHO	SE	Neur
<i>Attachment</i>											
Abandoned	.10	-.06	.01	.03	-.14	-.05	-.01	.01	.02	-.01	.03
Death	.23**	.06	.13	-.03	-.08	-.00	-.12	.23**	-.09	-.19*	.12
Hated	.18*	-.05	-.04	.07	-.02	.14	.15	.04	.06	-.07	.14
Separated	.16	-.06	.03	-.11	.07	.19*	.01	.05	-.05	-.06	.14
<i>Non-attachment</i>											
Code	.11	.16	.08	-.07	-.02	.03	.00	.04	-.15	-.16	.07
Nature	.15	.03	-.10	-.06	-.06	.08	-.11	.01	.03	-.10	.13

Note: N=153. * $p < .05$, ** $p < .01$

Table 6: Correlations Between Predictor Variables and False Memories for Study 1 Vignettes

Predictor	Anx	Avd	C1	C2	Sex	Order	Arous	Valen	WHO	SE	Neur
<i>Attachment</i>											
Abandoned	-.17*	-.05	-.02	-.04	.02	-.08	-.01	-.18*	.11	.03	-.02
Death	-.13	-.12	-.05	.01	.16	-.08	-.04	-.05	-.02	-.07	.10
Hated	.02	-.04	-.10	.11	.10	.17*	-.12	.03	.15	.01	.03
Separated	-.14	-.07	.04	.02	.19*	.20*	-.05	-.01	-.11	-.01	.13
<i>Non-attachment</i>											
Code	.04	-.10	-.12	.00	.13	-.01	-.20*	.03	.05	-.02	.10
Nature	-.09	.01	-.12	-.07	.07	.24**	-.17*	-.02	.08	.05	.07

Note: N=149. * $p < .05$, ** $p < .01$

Table 7: Study 2 Predictor Means and Standard Deviations

	<u>Word Lists</u>		<u>Vignettes</u>		<u>t(366)</u>
	<u>Mean</u>	<u>SD</u>	<u>Mean</u>	<u>SD</u>	
Anxiety	3.83	1.10	3.75	1.12	0.66
Avoidance	2.86	1.06	2.80	1.02	0.47
Mood Arousal ^a	6.07	2.41	6.37	2.08	-1.27
Mood Valence ^a	3.28	2.31	3.30	2.02	-0.07
WHOTO	5.09	1.49	5.10	1.48	-0.01
Self-Esteem ^a	7.35	1.34	7.32	1.32	0.24
Neuroticism ^b	2.81	0.85	2.92	0.88	-1.30

^a Scale range is 1 to 9. ^b Scale range is 1 to 5.

Table 8: Study 2 Means and Standard Deviations of False Memories

<u>Variable</u>	<u>Word Lists</u>		<u>Vignettes</u>		<u>t(366)</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
<u>Attachment Stimuli</u>					
Abandoned	1.99	1.26	2.47	2.19	-2.55*
Death	1.36	1.31	1.65	1.65	-1.86
Hate	1.17	1.53	1.62	2.00	-2.40*
Separated	2.18	1.44	2.77	2.33	-2.91**
<u>Non-attachment Stimuli</u>					
Code	1.02	1.43	1.08	1.87	-0.39
Nature	1.87	2.03	1.61	2.35	1.14

* $p < .05$, ** $p < .01$

Table 9: Correlations Among Predictor Variables for Study 2 Word Lists

Variable	1	2	3	4	5	6	7	8	9	10
1. Anxiety	----									
2. Avoidance	.14	----								
3. C1	.12	.19**	----							
4. C2	-.02	.06	.12	----						
5. Sex	.08	.07	.02	.06	----					
6. Order	-.04	.01	-.05	.05	-.02	----				
7. Arousal	-.19**	-.16*	-.16*	-.10	-.20**	.14	----			
8. Valence	.26**	.21**	.51**	.11	.10	-.07	-.29**	----		
9. WHOTO	-.06	-.19*	-.59**	-.24**	.10	.04	.10	-.40**	----	
10. Neurot	.51**	.24**	.12	.12	.26**	-.03	-.26**	.33**	-.06	----
11. Self-Est	-.41**	-.25**	-.07	-.06	-.03	-.04	.19**	-.37**	.04	-.48**

* $p < .05$, ** $p < .01$

Table 10: Correlations Among Predictor Variables for Study 2 Vignettes

Variable	1	2	3	4	5	6	7	8	9	10
1. Anxiety	----									
2. Avoidance	-.12	----								
3. C1	.14	.00	----							
4. C2	-.08	.00	.19*	----						
5. Sex	.06	-.04	.07	-.02	----					
6. Order	.06	.09	.06	.06	.02	----				
7. Arousal	-.33**	-.05	-.08	-.04	.02	.07	----			
8. Valence	.34**	.17*	.42**	.03	.04	-.04	-.39**	----		
9. WHOTO	-.13	-.13	-.64**	-.26**	-.04	-.12	.03	-.46**	----	
10. Neuroticism	.50**	.17*	.12	.06	.27**	.08	-.24**	.21**	-.10	----
11. Self-Esteem	-.41**	-.33*	-.01	.11	-.04	-.08	.21**	-.33**	.06	-.46**

* $p < .05$, ** $p < .01$

Table 11: Correlations Between Predictor Variables and False Memories for Study 2 Word Lists

Predictor	Anx	Avd	C1	C2	Sex	Order	Arou	Valen	WHO	SE	Neur
<u>Attachment</u>											
Abandoned	.10	-.01	-.05	.04	.02	-.11	.13	-.09	-.02	-.07	.06
Death	.09	.05	-.12	.02	.08	-.05	-.03	-.04	.16*	-.06	.10
Hated	.02	-.01	-.15*	-.04	.10	-.02	.00	-.07	.13	-.18*	.11
Separated	.02	.02	-.15*	.03	.11	.22**	.00	-.08	.13	-.05	.08
<u>Non-attachment</u>											
Code	.11	-.15*	-.14*	.00	.02	-.04	-.05	.00	.03	-.01	.03
Nature	.09	.02	-.10	-.06	-.02	-.01	.09	-.10	.10	-.04	.07

Note: N=153. * $p < .05$, ** $p < .01$

Table 12: Correlations Between Predictor Variables and False Memories for Study 2 Vignettes

Predictor	Anx	Avd	C1	C2	Sex	Order	Arous	Valen	WHO	SE	Neur
<u>Attachment</u>											
Abandoned	-.05	.08	-.14	.03	.11	-.14	.00	.01	.07	.01	.08
Death	.10	.09	-.09	-.02	.00	-.12	-.15*	-.15*	.06	-.05	.07
Hated	.09	.12	-.09	.02	.14	.13	.02	.01	-.01	-.06	.06
Separated	.03	-.01	-.13	-.02	.16*	.03	-.08	-.03	.03	.03	.07
<u>Non-attachment</u>											
Code	.04	.06	-.09	.04	-.02	-.18*	.08	-.12	.07	-.01	.10
Nature	.07	.04	-.12	.01	-.01	-.04	-.06	.09	.11	-.08	.06

Note: N=149. * $p < .05$, ** $p < .01$

Table 13: Study 2 Means and Standard Deviations of False Memory Confidence Ratings

<u>Variable</u>	<u>Word Lists</u>		<u>Vignettes</u>		<u>t-value</u>	<u>df</u>
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
<u>Attachment Stimuli</u>						
Abandoned	5.06	1.68	4.81	1.61	1.35	330
Death	5.14	1.62	4.93	1.69	1.06	266
Hate	4.31	1.85	4.06	1.78	1.04	232
Separated	5.42	1.50	4.80	1.77	3.46 ^{**}	333
<u>Non-attachment Stimuli</u>						
Code	4.21	2.03	4.15	1.95	0.19	176
Nature	4.79	1.72	4.80	1.82	-0.04	263

^{**} $p < .01$

Table 14: Correlations Between Predictor Variables and False Memory Confidence Ratings for Study 2 Word Lists

Predictor	Anx	Avd	C1	C2	Sex	Order	Arou	Valen	WHO	SE	Neur
<u>Attachment</u>											
Abandoned	.05	-.08	.12	.04	-.11	-.19*	.03	-.01	-.03	.10	-.01
Death	.00	.05	.04	-.10	.02	-.02	-.04	-.08	.02	.10	-.11
Hated	.06	-.02	-.13	-.06	-.11	.07	-.14	-.10	.25**	-.03	.05
Separated	-.10	-.16*	.00	-.01	-.10	-.10	-.09	-.06	-.01	.18*	-.09
<u>Non-attachment</u>											
Code	-.12	.02	.04	-.06	-.10	.29**	.14	-.10	.12	-.02	.00
Nature	.04	-.11	-.18*	-.01	.00	-.04	-.14	-.08	.09	.05	.03

Note: N=153. * $p < .05$, ** $p < .01$

Table 15: Correlations Between Predictor Variables and False Memory Confidence Ratings for Study 2 Vignettes

Predictor	Anx	Avd	C1	C2	Sex	Order	Arou	Valen	WHO	SE	Neur
<u>Attachment</u>											
Abandoned	-.18*	-.12	.03	-.14	.05	.02	.04	-.08	.12	.14	-.08
Death	-.04	-.18*	-.11	-.07	.09	-.11	.16	-.19*	.16	.12	-.12
Hated	.00	.02	-.02	.13	-.12	.13	-.10	-.06	.06	-.01	-.04
Separated	-.04	-.17*	-.08	.07	.08	.24**	.04	-.12	.13	.06	-.06
<u>Non-attachment</u>											
Code	-.09	-.15	.20	.17	-.01	.16	-.07	.03	-.01	-.03	.07
Nature	-.14	-.20*	-.05	.03	.07	.06	.02	-.15	.11	.17	-.20*

Note: N=153. * $p < .05$, ** $p < .01$

APPENDIX B

FIGURES

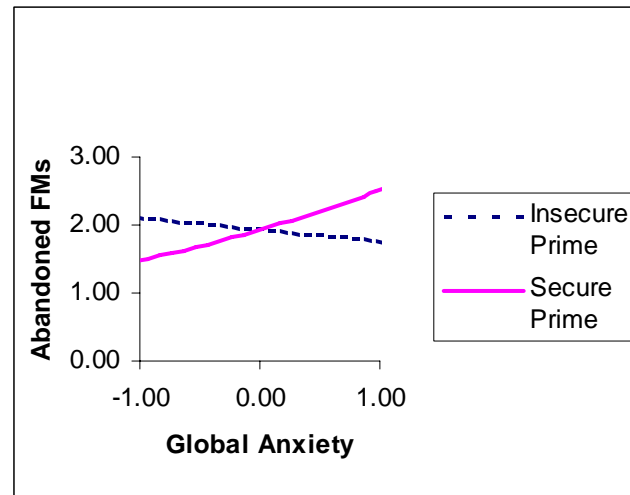


Figure 1A: C1 prime by global anxiety predicting Abandoned vignette false memories for low globally avoidant participants (Study 1)

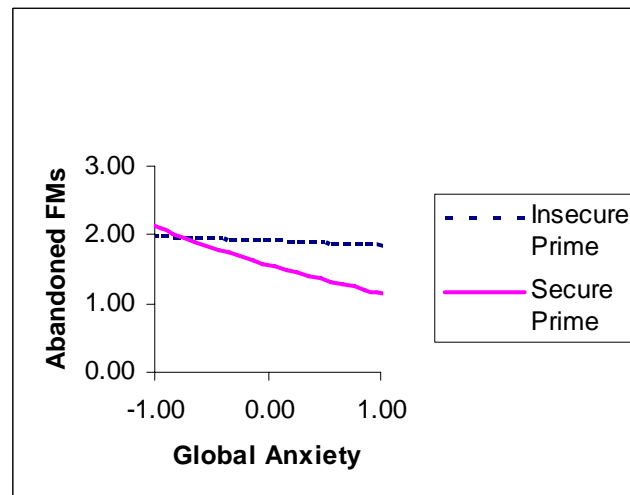


Figure 1B: C1 prime by global anxiety predicting Abandoned vignette false memories for high globally avoidant participants (Study 1)

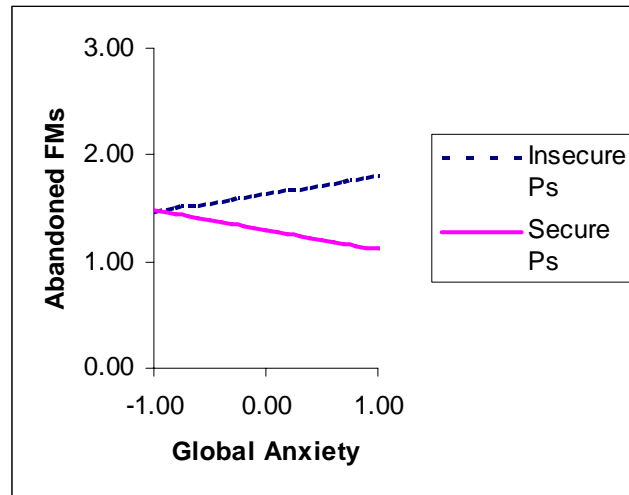


Figure 2A: C1 prime by global anxiety predicting Abandoned word list false memories for low globally avoidant participants (Study 1)

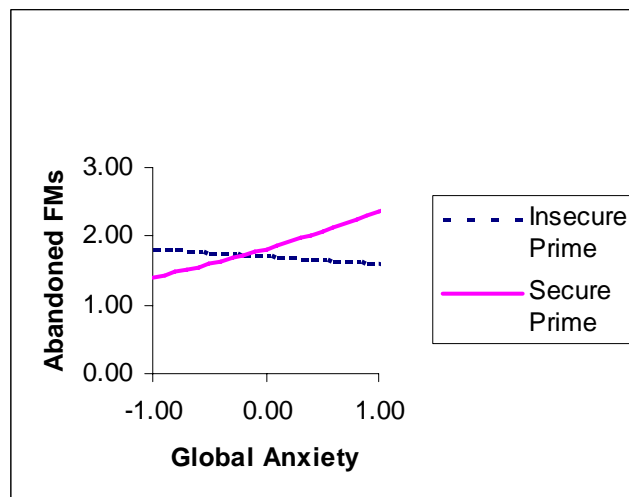


Figure 2B: C1 prime by global anxiety predicting Abandoned word list false memories for high globally avoidant participants (Study 1)

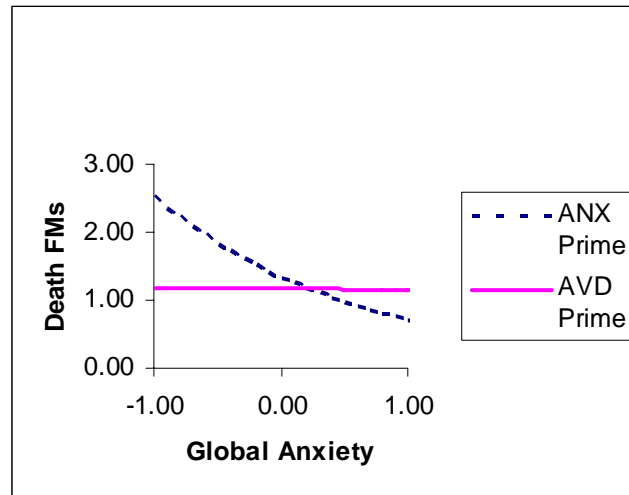


Figure 3: C2 prime by global anxiety predicting Death vignette false memories (Study 1)

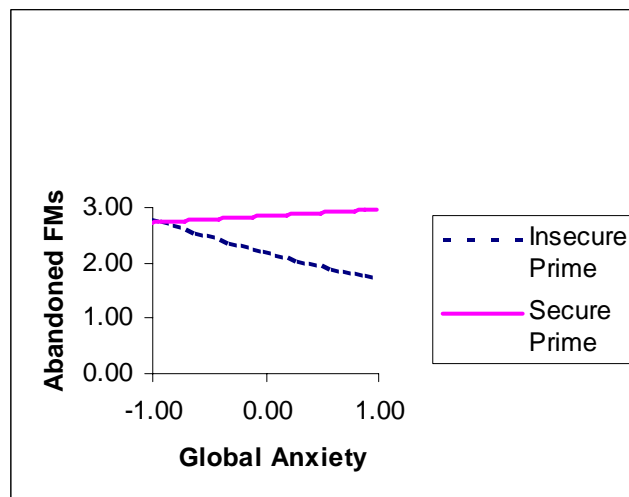


Figure 4: C1 prime by global anxiety predicting Abandoned vignette false memories (Study 2)

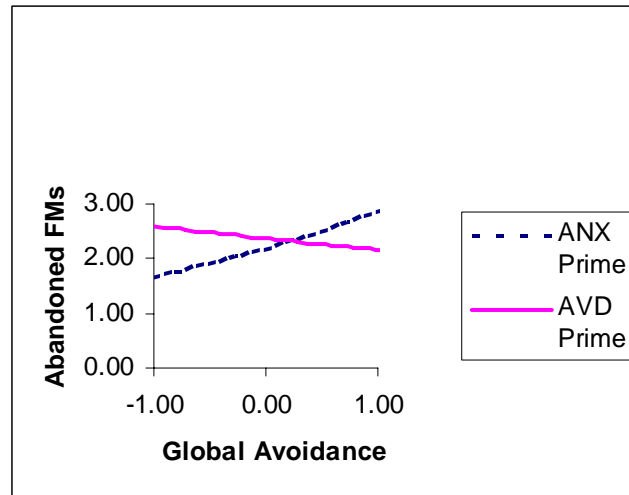


Figure 5: C2 prime by global avoidance predicting Abandoned vignette false memories (Study 2)

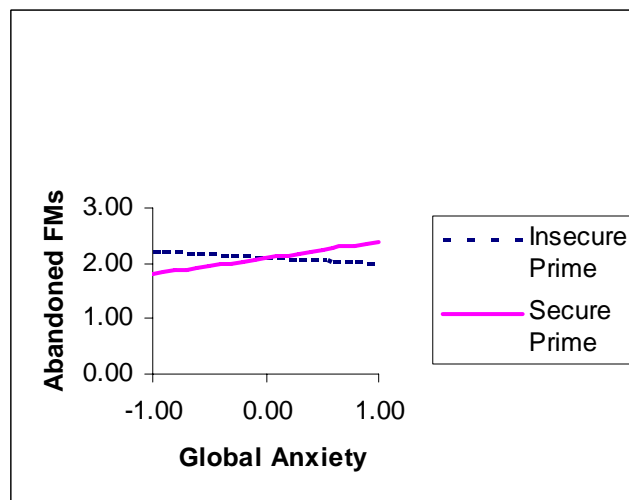


Figure 6: C1 prime by global anxiety predicting Abandoned word list false memories (Study 2)

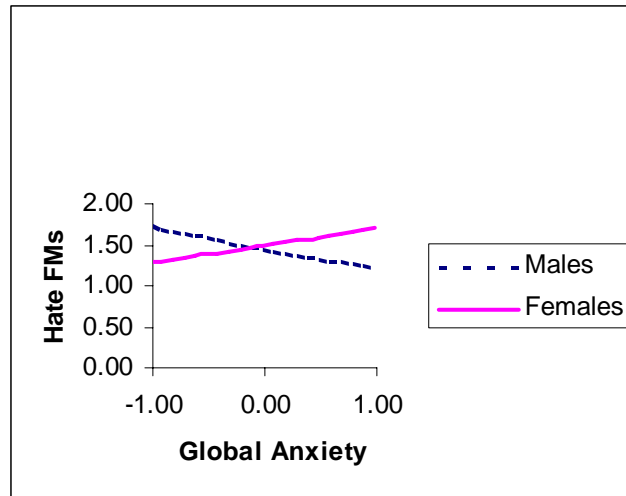


Figure 7: Sex by global anxiety predicting Hate vignette false memories (Study 2)

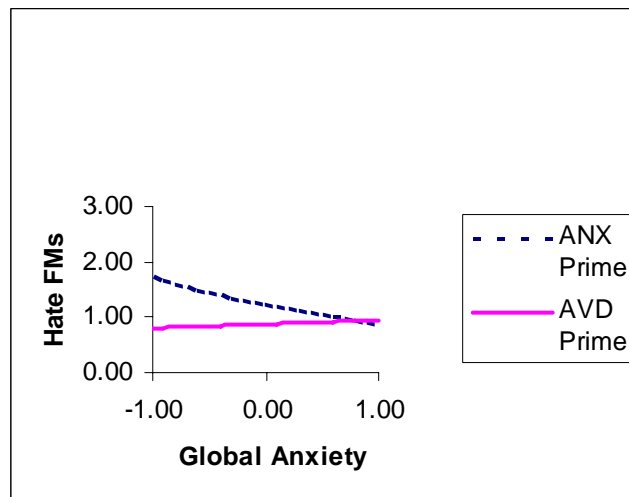


Figure 8: C2 prime by global anxiety predicting Hate word list false memories (Study 2)

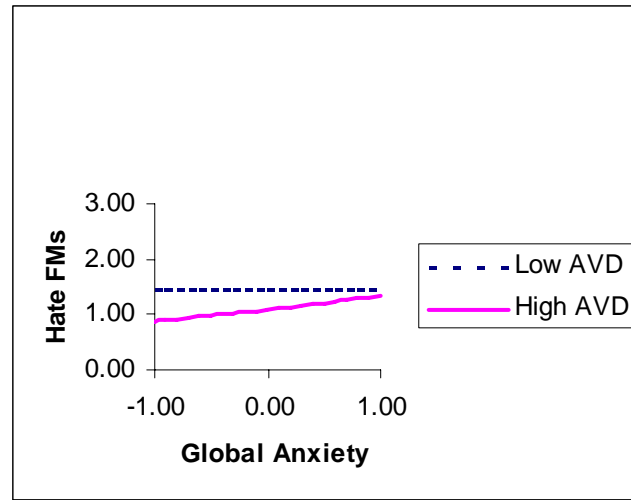


Figure 9: Global avoidance by global anxiety predicting Hate word list false memories (Study 2)

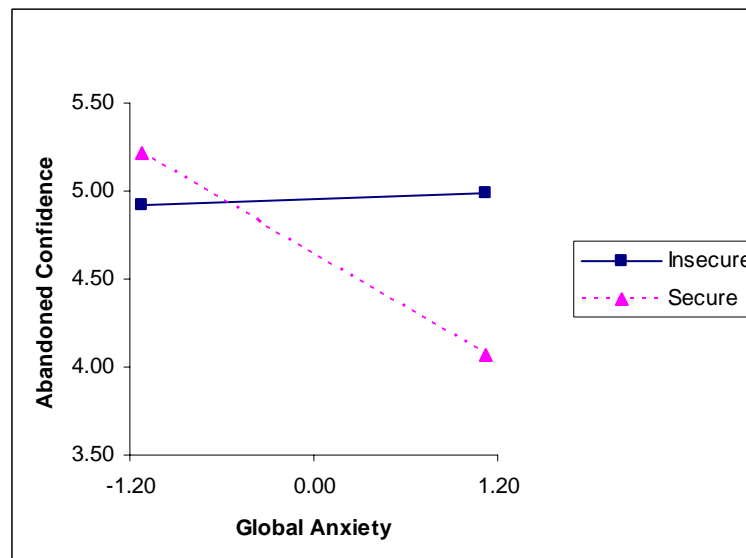


Figure 10: C1 prime by global anxiety predicting confidence in Abandoned vignette false memories (Study 2)

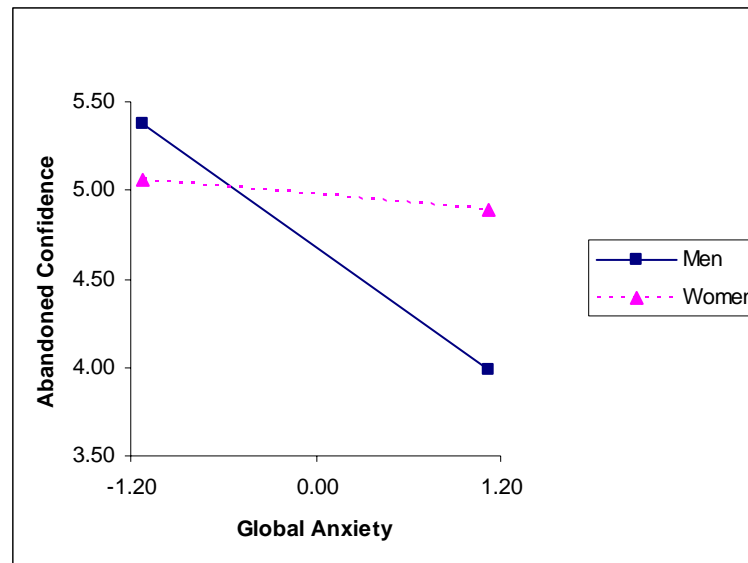


Figure 11: Sex by global anxiety predicting confidence in Abandoned vignette false memories (Study 2)

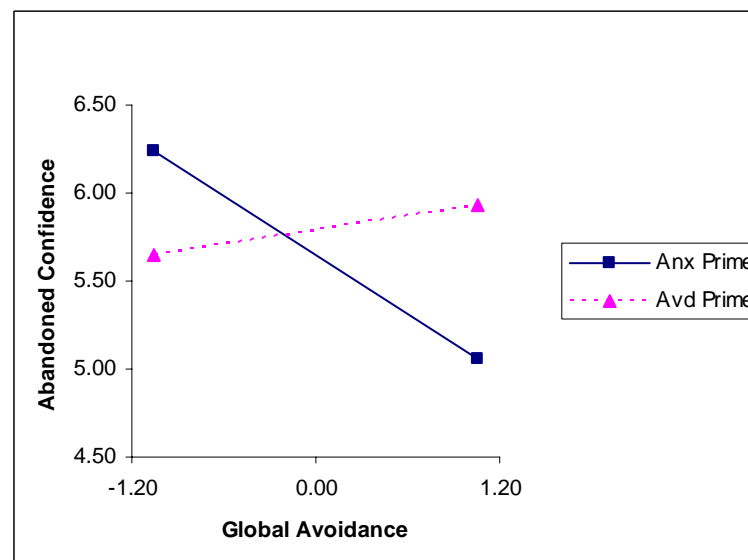


Figure 12: C2 prime by global avoidance predicting confidence in Abandoned word list false memories (Study 2)

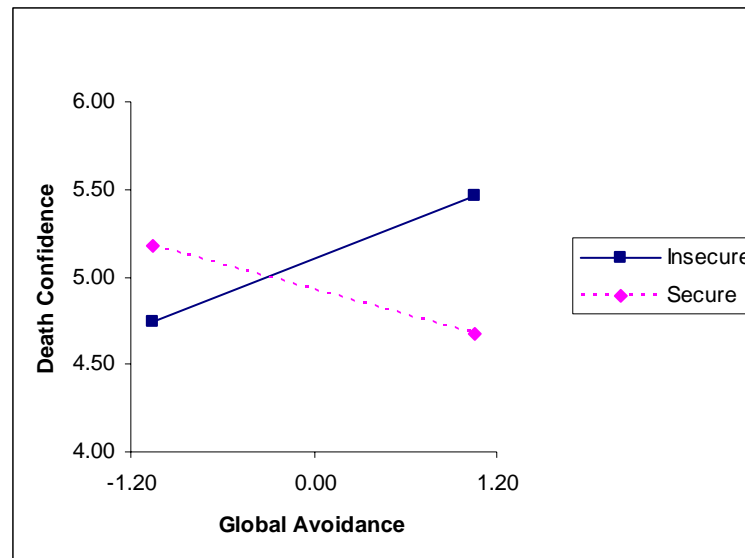


Figure 13: C1 prime by global avoidance predicting confidence in Death word list false memories (Study 2)

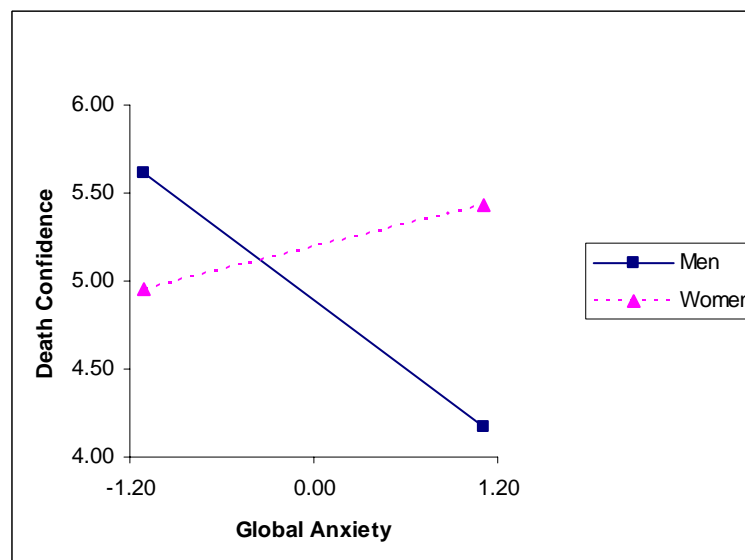


Figure 14: Sex by global anxiety predicting confidence in Death word list false memories (Study 2)

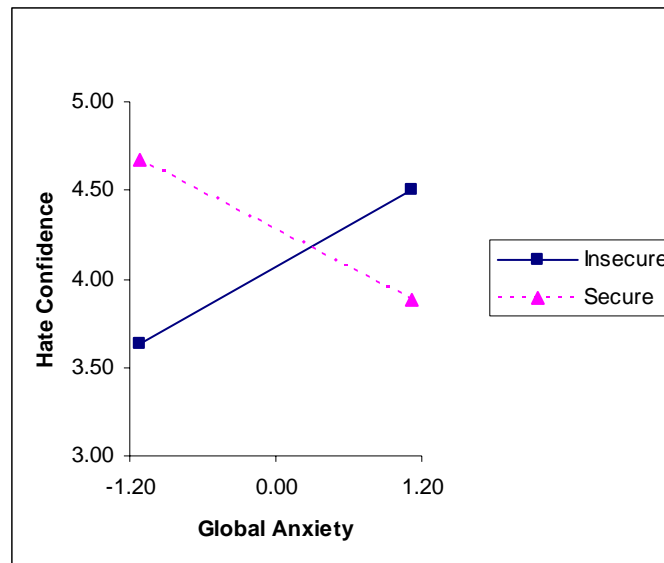


Figure 15: C1 prime by global anxiety predicting confidence in Hate vignette false memories (Study 2)

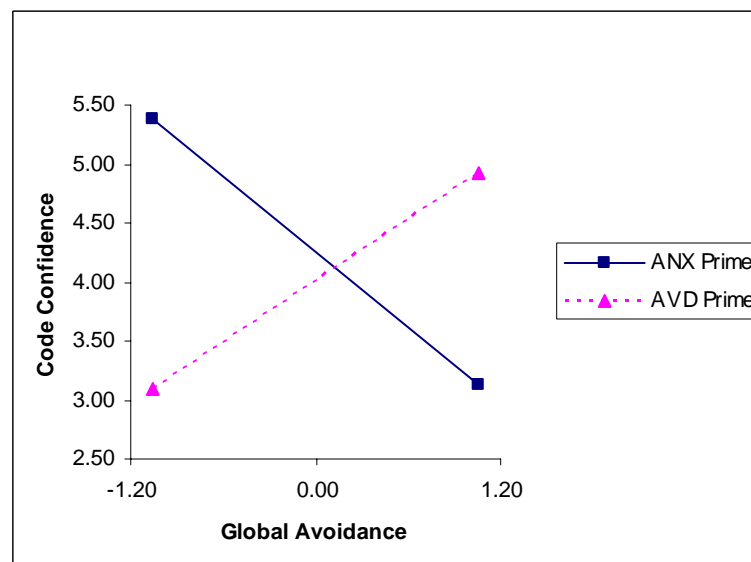


Figure 16: C2 prime by global avoidance predicting confidence in Code word list false memories (Study 2)

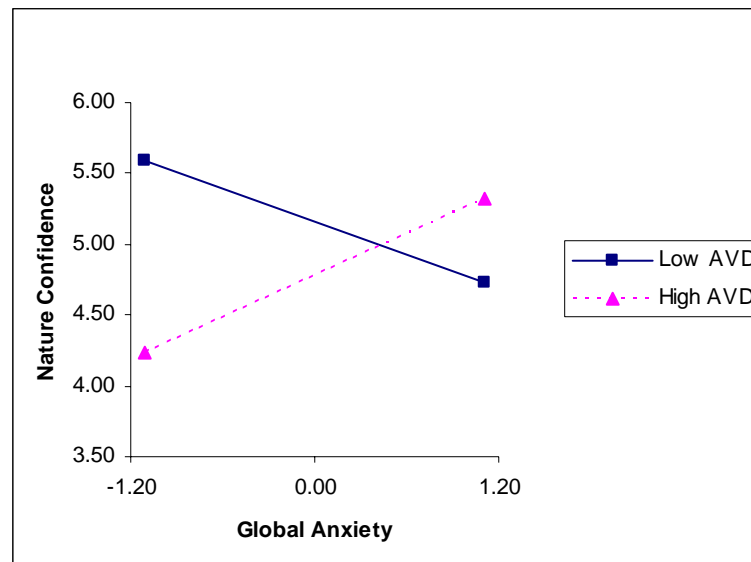


Figure 17: Global avoidance by global anxiety predicting confidence in Nature word list false memories (Study 2)

APPENDIX C

STUDY MATERIALS

INSTRUCTIONS – READ CAREFULLY!!

(Study 1 – Part 1)

Please read each of the three paragraphs below¹⁶. Among your current and previous relationship partners (including romantic/dating partners, parents, siblings, or best friends), what *one person* most closely resembles the person described in each paragraph?

Write this person's initials below in the spaces provided after each paragraph. Then, using the 7-point scales, indicate the extent to which each paragraph accurately describes the relationship partner you have indicated.

Paragraph A

Think of a person who is reluctant to get as close as you would like. You often worry that this relationship partner doesn't really love you or won't want to stay with you. You want to merge completely with this person, and this desire sometimes scares him/her away.

1. This paragraph reminds me the most of a relationship partner with the initials ____ .
2. Please rate how closely **Paragraph A** describes your actual relationship with this partner:

1 2 3 4 5 6 7

This is nothing like my
relationship partner.

This is exactly like my
relationship partner.

3. I would characterize this person as a CURRENT or FORMER (circle which):

Romantic/dating partner	1	Sibling	4
Parent/caregiver	2	Other _____	5
Best friend.....	3		

Paragraph B

Think of a person you are somewhat uncomfortable being close to. You find it difficult to trust him/her completely, difficult to allow yourself to depend on him/her. You are nervous when this relationship partner gets too close and often, s/he wants me to be more intimate than you feel comfortable being.

4. This paragraph reminds me the most of a relationship partner with the initials ____ .

¹⁶ Paragraphs A, B, and C are modified versions of Hazan & Shaver's (1987) attachment descriptions.

INSTRUCTIONS – READ CAREFULLY!!

(Study 2 – Part 1)

Please read each of the three paragraphs below carefully¹⁷. Then answer the questions that follow.

Paragraph 1

I find that this person is reluctant to get as close as I would like. I often worry that this relationship partner doesn't really love me or won't want to stay with me. I want to merge completely with this person, and this desire sometimes scares him/her away.

Paragraph 2

I am somewhat uncomfortable being close to this person. I find it difficult to trust him/her completely, difficult to allow myself to depend on him/her. I am nervous when this relationship partner gets too close and often, s/he wants me to be more intimate than I feel comfortable being.

Paragraph 3

I find it relatively easy to get close to this person and am comfortable depending on him/her and having him/her depend on me. I don't often worry about being abandoned by this relationship partner or about him/her getting too close to me.

Below, please write the initials of the relationship partner indicated in the spaces provided. Then indicate which of the above paragraphs most closely describes your relationship with that particular person by circling the number for the appropriate paragraph.

	Paragraph 1	Paragraph 2	Paragraph 3
1. My mother's (or stepmother's) initials: _____	1	2	3
2. My father's (or stepfather's) initials: _____	1	2	3
3. My current romantic partner's initials _____ (if I have one):	1	2	3
4. Initials of the ex-romantic partner whom I _____ dated the longest (if I had one): _____	1	2	3
5. Initials of the sibling to whom I feel the _____ closest: _____	1	2	3
6. Initials of my non-romantic, same-sex best friend: _____	1	2	3

¹⁷ Paragraphs A, B, and C are modified versions of Hazan & Shaver's (1987) attachment descriptions.

Now think for a moment of the 10 significant relationships that have had the most impact, whether positive or negative, on your life up to this point. Please list below the initials of these relationship partners if they have not already been identified above (e.g. additional romantic partners or siblings, grandparents, close friends, etc.). Then indicate which paragraph best describes your relationship with each of them. (If you do not have 10 impactful relationships, please just list as many as you do have.)

	Paragraph 1	Paragraph 2	Paragraph 3
7. Relationship partner's initials: _____	1	2	3
8. Relationship partner's initials: _____	1	2	3
9. Relationship partner's initials: _____	1	2	3
10. Relationship partner's initials: _____	1	2	3
11. Relationship partner's initials: _____	1	2	3
12. Relationship partner's initials: _____	1	2	3

INSTRUCTIONS: Please re-read the 3 paragraphs on the previous page. Taking into consideration ALL of the relationship partners whom you just identified, indicate below which ONE relationship is the VERY BEST EXAMPLE of each paragraph description. Then answer the questions using the scales provided.

13. The relationship that is the best example of **Paragraph 1** is/was with partner (write initials): _____

14. I would characterize this person as my (circle one):

- | | | | |
|--------------------------------|---|----------------------------|----|
| Current Romantic Partner | 1 | Current Best Friend | 6 |
| Ex-romantic partner | 2 | Former Best Friend..... | 7 |
| Mother or Stepmother | 3 | Current Close Friend | 8 |
| Father or Stepfather | 4 | Former Close Friend..... | 9 |
| Sibling | 5 | Other _____ | 10 |

15. Please rate how closely **Paragraph 1** describes your actual relationship with this partner:

1 2 3 4 5 6 7

This is nothing like my relationship partner.

This is exactly like my relationship partner.

16. The relationship that is the best example of **Paragraph 2** is/was with partner (write initials): _____

17. I would characterize this person as my (circle one):

Current Romantic Partner	1	Current Best Friend	6
Ex-romantic partner	2	Former Best Friend.....	7
Mother or Stepmother.....	3	Current Close Friend	8
Father or Stepfather	4	Former Close Friend.....	9
Sibling	5	Other _____	10

18. Please rate how closely **Paragraph 2** describes your actual relationship with this partner:

1 2 3 4 5 6 7

This is nothing like my relationship partner.

This is exactly like my relationship partner.

19. The relationship that is the best example of **Paragraph 3** is/was with partner (write initials): _____

20. I would characterize this person as my (circle one):

Current Romantic Partner	1	Current Best Friend	6
Ex-romantic partner	2	Former Best Friend.....	7
Mother or Stepmother.....	3	Current Close Friend	8
Father or Stepfather	4	Former Close Friend.....	9
Sibling	5	Other _____	10

21. Please rate how closely **Paragraph 3** describes your actual relationship with this partner:

1 2 3 4 5 6 7

This is nothing like my relationship partner.

This is exactly like my relationship partner.

22. Your Age (circle one): 18 19 20 21 22 23 24 25 Other _____

23. Sex (circle one): M F

PERSONALITY, RELATIONSHIP, & MEMORY STUDY (S1)
(Study 1 & Study 2 – Part 2)

1. Arrive at Room 348 at least 15 minutes before your session to set up the room:
 - A. Make sure all computers are booted up. Click on Cancel at the Novel and Windows prompts.
 - B. Double-click on the MediaLab icon on the computer desktop screen.
 - C. At the top of the MediaLab screen, go to Run → Run last selection again OR Run → Select and run an experiment → FM2Study.
2. Check the list of participants for your session and make sure you have a Part 1 form with card for every person listed. Also make sure you have enough Debriefing Forms for everyone in today's session.
3. When the room is ready, invite the participants in and have them sit at an empty cubicle.
4. Ask participants their names and check them off the participant list for today. If anyone is not present who is on the list, mark them as a "No Show". Also write down WHICH STATION each person is seated at.
5. Once everyone is seated, read to them the following:

Hi and welcome back to our study on "Personality, Relationships, & Memory".

Today you will complete Part 2 of our study which will be administered via computer. Approximately one week ago you participated in Part 1 and answered some questions about your relationship beliefs. You also identified several relationship partners by their initials. In today's session you will write a brief and confidential description of ONE of the relationship partners you identified during Part 1.

Before the writing exercise, you will answer some new questions about personality and relationship perceptions. You will also complete several cognitive tasks throughout today's study. After answering some initial questions, you will engage in the brief writing task before being presented with several lists of words to be remembered. Later in the study you will be asked to recall these words. Finally, you will answer some remaining questions about your perceptions. The entire study should take about 80 minutes to complete.

I will now give you a card on which a set of initials is written. These initials should match up with one of the relationship partners whom you identified during Part 1. [Give cards to participants.] Does everyone recognize the partner whose initials are written on your card? [If anyone does not, check their card against their Part 1 form to verify if the initials were misspelled but DO NOT allow participant to review their actual Part 1 information.]

All instructions for each segment of the study will be presented to you on the computer. Please note that you CANNOT GO BACKWARDS in the computer questionnaires, so once you have answered a question you will not be able to return to it and change an answer. Therefore please consider each question carefully before making a response.

If at any time you have a question, please stand up to get my attention. It is IMPORTANT to note that several of the tasks – the writing exercise and the memory task – are timed, so if you have a question please be sure to ask BEFORE you begin the timed tasks.

One final instruction before we begin: It is VERY IMPORTANT that you DO NOT hit the ESCAPE key, the CTRL key, or any other unusual keys on the keyboard during the experiment. These computers will freeze and “lock up” when people press such keys in an attempt to shorten the timed tasks or questionnaires. If this happens, we will need to restart your experiment all over again from the beginning. To prevent this from happening, just sit quietly until the timed tasks have “timed out” and the computer will automatically proceed to the next questionnaire.

Are there any questions before we begin?

I will now come around to each of your computers to get you started.

6. Go to each computer and enter the participant’s ID number and Condition number into the box on the MediaLab screen. Make sure the instruction screen pops up and then let them proceed.
 - If participants have any writing materials out (i.e. pencils, pens, and/or paper) ask them to put them away since we don’t want them writing words down during the experiment.
7. During the experiment, keep an eye out for the following:
 - A. People sleeping during the PowerPoint word list presentation. → (you should also hear typing for the essay question after about 10-15 minutes into the experiment)
 - B. People writing down the words during PowerPoint presentation.
 - C. People finishing in 60 minutes or less → note this on the participant list!

8. When participants are finished, if others are still working then take them into the hallway outside to debrief them QUIETLY. If people are waiting in the hall for the next session, be sure to walk the participant far enough away from them that the new people cannot hear your debriefing!
 - A. COLLECT THE CARD from participant – they are not to take this home with them!
 - B. Give participant copy of Debriefing Form.
 - C. Ask if they had any trouble with any instructions or computer tasks.
 - D. If they finished in 60 minutes or less, ask them whether or not they pressed the ESC key, the CTRL key, or some other key to “fast-forward” through parts of the study (be sure to find out which key they used and when!). WRITE DOWN this information on the participant list for today.
 - E. Ask if there were any lists that they could NOT recall any words for. If so, WRITE DOWN which lists.
9. When the experiment is over, make sure you have written down all No Shows and also marked WHICH COMPUTER each participant used.
10. Shut down the MediaLab program by clicking on the X on the upper right corner of the screen.
11. Replace all cards with the appropriate Part 1 Forms and leave them on the shelf by the door. Turn off lights. If you are the LAST session of the day, also lock the door.

WRITING PRIME INSTRUCTIONS PRESENTED VIA MEDIALAB

We are interested in how people communicate their thoughts and feelings about relationship partners. In the next exercise, you will be asked to write a brief description of a relationship partner whom you identified by initials in the previous session. The experimenter indicated to you at the beginning of today's session which partner you would be writing about. If you have any uncertainty about which person this is, please raise your hand and ask the experimenter now.

You will have 10 MINUTES to work on this exercise by typing in your thoughts and feelings into the space provided on the next page. Anything you write will be kept confidential. Neither your name nor the name of your partner (only their initials) will be linked to your description. When the time is up, a menu will pop up on the computer screen telling you to proceed to the next task. **IT IS IMPORTANT THAT YOU DO NOT PROCEED PAST THE WRITING EXERCISE UNTIL THE 10 MINUTES ARE UP**, so please continue working on your description on the next page until the menu pops up on screen.

To begin the writing exercise, click "Continue" below and go to the next screen.

How has this person TYPICALLY responded to you at times when you needed them THE MOST (when you really needed them to "be there" for you). What specific thoughts and feelings did you have as a result of their responses? How has this affected your overall view of your relationship? Include as many details as possible (whether positive, negative, or both) in your description.

5. How likely is this person to be the FIRST person you want to tell if you achieve something good?

(If this person is a PAST relationship partner, indicate how likely it WAS for him/her to be the first person you wanted to tell if you had achieved something good during the time in which you were relationship partners.)

1 2 3 4 5 6 7

Not Likely Very Likely

6. Is this person someone you can always count on?

(If this person is a PAST relationship partner, indicate if this person WAS someone you could always count on during the time in which you were relationship partners.)

1 2 3 4 5 6 7

Not At All Definitely

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CODING DIMENSIONS – STUDY 1

1. **How many words does the paragraph contain?**
2. **According to the paragraph, to what extent was (is) the relationship partner *available* to the participant (whether physically or emotionally) when the participant needed them the most?**

1 2 3 4 5 6 7

Never Available

Always Available

3. **Based on the paragraph, to what extent has the relationship partner been supportive versus unsupportive of them when the participant has needed them the most?**
(Regardless of how supported the participant says s/he feels, how *TRULY* supportive or unsupportive were their partner's responses?)

1 2 3 4 5 6 7

Unsupportive

Neither/
Neutral

Supportive

4. **To what extent does the paragraph discuss examples – good or bad – of *instrumental* support from the partner? (i.e., giving or not giving advice, problem solving help, financial support, etc.)**

1 2 3 4 5 6 7

Not at All

A Great Deal

5. **To what extent does the paragraph discuss examples – good or bad – of *emotional* support from the partner? (i.e., giving or not giving comfort and care, showing concern, alleviating distress, attempts to make the participant feel better, etc..)**

1 2 3 4 5 6 7

Not At All

A Great Deal

6. **To what extent does the participant report being able to *count on* this relationship partner for help, understanding, etc... when the participant needs them the most?**

1 2 3 4 5 6 7

Not At All

A Great Deal

7. To what degree does the paragraph focus on the participant's **feelings and emotions** (whether positive or negative) versus **objective facts** about their relationship partner?

1 2 3 4 5 6 7

Focused Mainly Equally Focused Mainly
On Facts Focused on Feelings/Emotions

8. To what extent is the paragraph written in **vague, non-specific terms** versus **detailed, specific terms** concerning the relationship partner and the participant's reactions to him/her?

1 2 3 4 5 6 7

Vague/ Detailed/
Non-specific Specific

9. To what extent does the participant report being able to *trust* this relationship partner?

1 2 3 4 5 6 7

Not At All A Great Deal

10. Overall, to what extent does the paragraph reflect a positive versus negative view of the relationship between the participant and this relationship partner? (*Regardless of how positive or negative the participant says s/he feels, how TRULY positive or negative does the paragraph sound about their relationship with this partner?*)

1 2 3 4 5 6 7

Very Neutral Very
Negative Positive

CODING DIMENSIONS – STUDY 2

- 1. According to the paragraph, to what extent was (is) the relationship partner *available* to the participant (whether physically or emotionally) when the participant needed them the most?**

1 2 3 4 5 6 7

Never Available

Always Available

- 2. Based on the paragraph, to what extent has the relationship partner been supportive versus unsupportive of them when the participant has needed them the most?**
(Regardless of how supported the participant says s/he feels, how *TRULY* supportive or unsupportive were their partner's responses?)

1 2 3 4 5 6 7

Unsupportive

Neither/
Neutral

Supportive

- 3. To what extent does the paragraph discuss examples – good or bad – of *instrumental* support from the partner? (i.e., giving or not giving advice, problem solving help, financial support, etc.)**

1 2 3 4 5 6 7

Not at All

A Great Deal

- 4. To what extent does the paragraph discuss examples – good or bad – of *emotional* support from the partner? (i.e., giving or not giving comfort and care, showing concern, alleviating distress, attempts to make the participant feel better, etc..)**

1 2 3 4 5 6 7

Not At All

A Great Deal

- 5. To what extent does the participant report being able to *count on* this relationship partner for help, understanding, etc... when the participant needs them the most?**

1 2 3 4 5 6 7

Not At All

A Great Deal

6. To what degree does the paragraph focus on the participant's **feelings and emotions** (whether positive or negative) versus **objective facts** about their relationship partner?

1 2 3 4 5 6 7

Focused Mainly Equally Focused Mainly
On Facts Focused on Feelings/Emotions

7. To what extent is the paragraph written in **vague, non-specific terms** versus **detailed, specific terms** concerning the relationship partner and the participant's reactions to him/her?

1 2 3 4 5 6 7

Vague/
Non-specific Detailed/
Specific

8. To what extent does the participant report being able to *trust* this relationship partner?

1 2 3 4 5 6 7

Not At All A Great Deal

9. To what extent are **POSITIVE** aspects of the relationship partner and the participant's relationship with the partner discussed in the paragraph? (*Regardless of how positive the participant says s/he feels, how TRULY positive does the paragraph sound about the relationship with this partner?*)

1 2 3 4 5 6 7

Not at all Somewhat A Great Deal

10. To what extent are **NEGATIVE** aspects of the relationship partner and the participant's relationship with the partner discussed in the paragraph? (*Regardless of how negative the participant says s/he feels, how TRULY negative does the paragraph sound about the relationship with this partner?*)

1 2 3 4 5 6 7

Not at all Somewhat A Great Deal

- 11. Overall, to what extent does the paragraph reflect a positive versus negative view of the relationship between the participant and this relationship partner?** *(Regardless of how positive or negative the participant says s/he feels, how TRULY positive or negative does the paragraph sound about their relationship with this partner?)*

1 2 3 4 5 6 7

Very Negative	Neutral/ Mixed	Very Positive
------------------	-------------------	------------------

ABANDONED List

LEFT
HOMELESS
ORPHAN
REJECTED
SCARED
HURTS
COLD
CHILD
LOST
CONFUSED
LONELY
FEAR

ABANDONED List

My partner has LEFT me. I feel HOMELESS, like an ORPHAN who has been REJECTED by his parents. I am SCARED to be without my partner. My partner's leaving HURTS so much that I feel COLD inside. Like a little CHILD, I am LOST and CONFUSED. I am LONELY, but all I have now is my FEAR.

DEATH List

GONE
GRAVE
BLACK
TEARS
GRIEF
COFFIN
DEPRESSED
CRYING
DARK
HEAVEN
FUNERAL
MOURNING

DEATH List

My partner is GONE. I stand over her GRAVE in my BLACK clothing and shed TEARS of GRIEF. I look at the COFFIN and feel so DEPRESSED. I can't stop CRYING. My world is DARK and I wonder if there is a HEAVEN. The FUNERAL is finally over, yet my MOURNING has just begun.

HATE List

DESPISES
DISLIKE
MEAN
MAD
UPSET
LOATHING
ENEMY
EVIL
BAD
RESENTMENT
UNWANTED
UNLOVED

HATE List

My partner DESPISES me. I sense her DISLIKE each time she is MEAN to me. She often gets MAD or UPSET with me for little things. Her LOATHING makes me feel like I'm the ENEMY, some EVIL person. When my partner makes me feel BAD, I am filled with RESENTMENT. As a result, I feel UNWANTED and UNLOVED.

SEPARATED List

FIGHTING
DIFFERENT
BREAK-UP
PARENTS
PAIN
SPLIT
HARD
CUSTODY
EMPTY
FRUSTRATED
APART
LOSS

SEPARATED List

My partner and I are FIGHTING. We are so DIFFERENT that I worry we might BREAK-UP like my PARENTS did. The PAIN of their SPLIT was HARD, and neither wanted CUSTODY of me. I felt EMPTY inside. Now I am FRUSTRATED with my partner and worry that we are coming APART. I just can't bear another LOSS.

CODE List

ALARM
COMPUTER
PASSWORD
NUMBER
WORD
NAME
RED
BLUE
ZIP
PATTERN
MORSE
BREAK

CODE List

My apartment has an ALARM system. It's like a COMPUTER with a PASSWORD that I can't remember. Is it a NUMBER or a WORD? When I enter my NAME I see a RED flashing light. It turns BLUE when I enter my ZIP. If only the PATTERN was in MORSE, I know I could BREAK it.

NATURE List

ENVIRONMENT
BEAUTIFUL
WALK
TRAIL
FOREST
BIRDS
ANIMALS
EARTH
WOODS
GREEN
PLANT
WILDERNESS

NATURE List

My ENVIRONMENT is BEAUTIFUL. I WALK along a TRAIL through the FOREST and listen to the BIRDS singing. Everything is so GREEN. I wonder how many ANIMALS have passed over this same EARTH before me. The WOODS call to me. I wish I could PLANT something of my own and be a part of this great WILDERNESS.

INFORMED CONSENT
Personality, Relationships, and Memory

This research is part of dissertation work examining links between personality, relationships, and memory. Approximately 400 people recruited via the Introductory Psychology subject pool will participate. In phase 1 of this study, I will be asked to complete a confidential questionnaire assessing my personality and beliefs about dating partners and relationships in general, as well as several current or past relationship partners that I will identify only by their initials. During phase 2 (which will occur 1-2 weeks after phase 1), I will write a short, confidential paragraph describing one of the relationship partners I identified in phase 1. Finally, I will memorize and recall several sets of words, then complete some final questions regarding relationship perceptions. I understand that my answers are confidential and I should not write my name or any other identifying information on the questionnaire. Each phase of the study should take approximately 1 hour to complete for a total of 2 hours for the entire study.

The risks associated with participating in this study are minimal. However, I understand that some participants may experience discomfort in thinking about, writing about, or recalling experiences with certain relationship partners. The benefits of participation include learning about how memory performance and personality are linked. I acknowledge that I have been given an explanation of the procedures to be followed and I have been given a description of any attendant discomforts and/or risks.

I realize that I am free to decline from answering any question that may make me feel uncomfortable, and to withdraw my consent and discontinue participation in the study at any time and for any reason without the loss of promised compensation (earning 1 experimental credit for Psychology 107 if participant withdraws during phase 1; earning 1 additional experimental credit if participants withdraws during phase 2)

I understand that my responses are guaranteed to be completely confidential, and that all data will be analyzed by group averages and not by individual responses.

I understand that this research study has been reviewed and approved by the Institutional Review Board (IRB)--Human Subjects in Research, Texas A&M University. For research related problems or questions regarding subjects' rights, I can contact the IRB through Dr. Michael W. Buckley, Director of Research Compliance, Office of the Vice President for Research at 979-458-4067 (mwbuckley@tamu.edu).

If I am in need of emotional assistance as a result of participating in this study, or if I want to speak with someone about issues related to this study, I can contact the Student Counseling Service at 845-4427 or the Helpline (after 5:00 p.m. and on weekends) at 845-2700.

Any additional questions about this research project may be directed to Dr. Jeff Simpson (979-845-3799, Room 291 Psychology, jas@psyc.tamu.edu) or Carol L. Wilson (979-862-8405, Room 377 Psychology, wilsoncl@tamu.edu), both of whom are in the Department of Psychology.

I have read and understand the explanations provided to me. I have had all of my questions

answered to my satisfaction, and I voluntarily agree to participate in this study. I have been given a copy of this consent form.

Date

Printed Name of Participant

Signature of Experimenter

Signature of Participant

DEBRIEFING FORM¹⁹
Personality, Relationships, and Memory

You have just participated in research conducted by researchers in the Department of Psychology at Texas A&M University. This research investigates whether people with certain personality traits or relationship histories incorrectly remember words that could have (but did not) appear in lists of words or paragraphs to be remembered.

In phase 1 of the study, you were asked to complete questionnaires asking about your personality and general beliefs about romantic (dating) partners/relationships. You also identified and described several relationships with specific ~~romantic~~ partners. In phase 2 you were asked to report your perceptions of a current relationship and ~~romantic~~ partner. Afterward you thought about and wrote a brief description of one of the ~~romantic~~ partners whom you identified by initials during phase 1. The purpose of this exercise was to prime you to think about one of four types of relationships that have been identified in prior relationship research. All participants were then exposed to sets of words presented in one of three ways; as short word lists (condition 1), as paragraphs about fictitious relationship partners (condition 2), ~~or as word sets to be used in writing your own paragraphs (condition 3)~~. You were asked to memorize and recall the word sets from the condition to which you were assigned, ~~after which you saw another large list of words and were asked to indicate whether each “test” word appeared in one of the earlier (original) lists~~. Finally, you completed a set of questions asking about perceptions of your current relationship/partner.

We predict that people who have certain types of personalities or relationship histories should be more likely to “falsely” remember words that are central to how they view themselves and other people. We also predict that priming people to think about certain types of relationships will influence their tendency to falsely remember relationship-relevant concepts. Past research suggests that “false” memories can be created when words that are semantically related to (but are not on) original memory lists subsequently appear on “test” lists. In many situations, people falsely recall “seeing” semantically similar words that were not on the original lists. The current research is designed to identify whether people with certain personality traits or relationships histories are more likely to falsely remember words for which they are “schematic” (i.e., words that are central to a dominant or pervasive theme in their lives).

To ensure confidentiality, you have been given a random, confidential identification number. Your data will be entered into the computer for statistical analyses using this identification number. This procedure will guarantee that your name or student ID number will never be associated with any of your data.

If for any reason you are in need of emotional assistance as a result of participating in this study, or would like to speak with someone about issues related to this study, you can contact the Student Counseling Service at 845-4427 or the Helpline (after 5:00 p.m. and on weekends) at 845-2700.

If you have further questions about this research, please contact Carol Wilson (377 Psychology Building, 862-8405) or Dr. Jeff Simpson (291 Psychology Building, 845-3799). Thank you for helping us to complete this research project.

¹⁹ Condition 3 below was not tested in the current set of studies. In addition, participants in both studies identified both romantic and non-romantic relationship partners as described previously in the methods section. Finally, participants performed a recall memory test only and not a recognition test as provided for in this debriefing form.

VITA

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ARTICLES

Ickes, W., Dugosh, J. W., Simpson, J. A., & Wilson, C. L. (2003). Suspicious minds: The motive to acquire relationship-threatening information. *Personal Relationships*, 10, 131-148.

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CHAPTERS

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