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**THE RELATIONSHIP BETWEEN SELF-REPRESENTATION AND MOOD
AND THEIR IMPACT ON COGNITION**

by

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B.A., University of British Columbia, 1997

**THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS**

**in the Department
of
Psychology**

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SIMON FRASER UNIVERSITY

July, 2000

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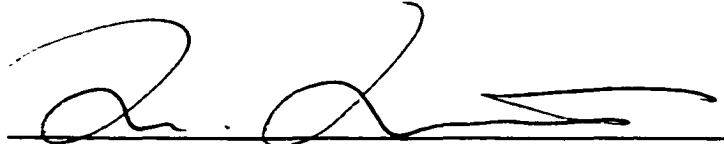
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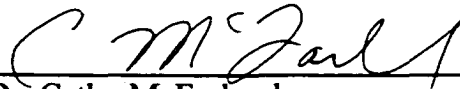
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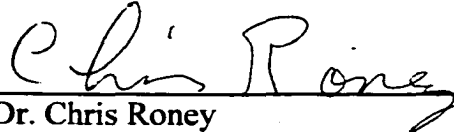
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ABSTRACT

Self-discrepancy theory is a model explicating the relationship between self-belief inconsistencies and negative affect. The present study examined the impact of induced negative mood and self-discrepancy on memory for events with a positive versus negative outcome focus. In the first session, participants (N = 84) completed the Selves Questionnaire, examining their level of ideal and ought discrepancy. Two days later participants were randomly assigned to either a sad or anxious mood induction condition. All participants read the same essay depicting events that reflected different types of psychological situations (presence/absence of positive and negative outcomes). The sad mood condition was expected to activate ideal discrepancy and result in preferential recall of positive outcome focus events in participants with high ideal discrepancy. In contrast, the anxious mood condition was expected to activate ought discrepancy as evidenced by better recall of negative outcome focus events in participants with high ought discrepancy. Results provide partial support for the bi-directional relationship between affect and self-discrepancy. In the sad mood condition, participants who scored high on ideal discrepancy recalled more positive outcome focus events compared to negative outcome focus events. However, participants in the anxious mood condition who scored high on ought discrepancy did not demonstrate biased recall for negative outcome focus events. This finding may be due to the fact that ought discrepancy was uniquely correlated with mood repair tendencies. Results are discussed in terms of the relationship between affect and cognitive processes including affect regulation.

ACKNOWLEDGEMENTS

I would like to take this opportunity to thank the many individuals who have contributed to this project. First and foremost, I would like to thank Dr. Marlene Moretti, my senior supervisor, for the support, encouragement and enthusiasm she demonstrated throughout my work on this project. I would also like to thank her for her timely feedback, insight and the faith and courage she placed in me. I would like to thank Dr. Cathy McFarland, my second advisor, for the time and support she provided, as well as her encouragement and helpful feedback. I would like to thank Dr. Chris Roney, external examiner, and Dr. Kim Bartholomew, defense chair, for taking time out of their schedules so near the end of the semester. I would also like to thank Lorie Tarcea for her support and assistance.

To the students who contributed to this project by acting as participants, I am in gratitude. I would also like to thank Douglas Scoular, Ben Cue, Adam Rudder and Cara Goldberg, for their assistance in data collection and support.

Many thanks to friends and colleagues who have offered their support and encouragement. I would like to include a special thank-you to Dr. Stan Floresco, whose support, encouragement and assistance have been invaluable. Finally, I would like to thank my dear friends Vaneesa Wiebe and Connie Greshner, and my parents Susanne and Peter Pajor for their caring support and encouragement.

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INTRODUCTION

The notion that our beliefs and representations of ourselves play a significant role in the development and maintenance of emotional and behavioral difficulties has been of long standing interest among theorists and researchers alike. Self-discrepancy theory (Higgins, 1987; 1989) is one model that explicates the relationship between self-related information and affect. Self-discrepancy theory provides a general framework for understanding and conceptualizing self-state representations as they develop within an interpersonal context and for considering the relationship between self-belief patterns, self-regulation and emotional experience. In particular, self-discrepancy theory proposes a model for understanding the causal relationship between different types of self-belief inconsistencies or discrepancies and various types of emotional difficulties. This area of research has been of interest to psychologists in an attempt to better understand how individuals develop, maintain and regulate their emotional states and has practical implications in terms of the potential for changing cognitive processes and alleviating emotional distress. The current investigation seeks to explore the interaction between experimentally induced mood and self-discrepancies and their impact on memory for different types of psychological situations. The approach utilized in this study was guided by the various elements of self-discrepancy theory described below.

A Model of Self-Representation and Self-Regulation

Within self-discrepancy theory, three domains of self-representations have been identified: the *actual-self* or self-concept comprises the attributes or characteristics that one believes they actually possess (the kind of person one believes he/she actually is); the *ideal-self* refers to a person's representation of the attributes or characteristics that they would

ideally like to possess (the kind of person one hopes, wishes or aspires to be); and the *ought-self* is a representation of the attributes that an individual believes they should or ought to possess (the kind of person one senses is their duty, obligation, or responsibility to be). Each of these self-state representations can be viewed from various standpoints: a person's own perspective (the attributes one believes they actually possess, ideally hope or wish to possess and should or ought to possess) and the inferred perspective of others (the attributes that one assumes that their parents, friends, or other individuals believe they actually, ideally or ought to possess) (Higgins, 1989).

Both the ideal and ought self-state representations (from both one's own and the inferred perspective of others) represent valued standards or self-guides that play a key role in regulating and evaluating the actual-self. Individuals use self-guides both to regulate their actual-self features (e.g., actions, appearance) so as to achieve congruence or reduce or avoid discrepancy with their self-guides (ideals and oughts), and to evaluate or monitor their progress in self-regulation. Self-discrepancy theory postulates that people are motivated to reach a condition where their self concept (actual-self-state) is congruent with or matches their self-guides (ideal or ought self-states) and they experience psychological distress when they perceive their actual self as substantially discrepant from important self-guides (Higgins, 1989).

A substantial body of research has supported various elements of self-discrepancy theory. Of most relevance to the proposed study are those investigations that have demonstrated the link between self-discrepancy and negative emotional states (see Strauman & Higgins, 1993 for a review). Correlational research (e.g., Higgins, Klein & Strauman, 1985) has demonstrated a positive relationship between overall level of

discrepancy (actual/ideal & actual/ought) and psychological distress. It has also demonstrated that specific types of self-discrepancies are associated with particular types of emotional distress: actual/ideal discrepancy (AI discrepancy) was uniquely associated with dejection-related emotions (feeling sad, disappointed) and actual/ought discrepancy (AO discrepancy) was uniquely associated with agitation related emotions (feeling nervous, tense). This relationship has also been supported in clinical populations (e.g., Strauman, 1989; Scott and O'Hara, 1993). For instance, Strauman (1989) found that depressed individuals suffered predominantly from AI discrepancy while social phobics suffered predominantly from AO discrepancy.

Research also supports the proposal that self-discrepancies are important vulnerability markers for depression and anxiety disorders. Strauman and Higgins (1988) found that specific types of self-discrepancies predicted unique clusters of emotional distress at two months later. Using structural equation modeling, these investigators found a unique relationship between AI discrepancy and depressive symptoms and between AO discrepancy and social anxiety. More recently, Strauman (1992) found that self-discrepancies predicted distinct emotional syndromes over a four month period. In a three-year longitudinal study, Strauman (1996) established the long-term stability of discrepancy structures within the self. This finding was replicated in a subsequent two-year longitudinal study in which the unique association between types of self-discrepancies and patterns of emotional distress was also demonstrated. These findings suggest that chronic discrepancy between actual-self and ideal and ought self-guides increases the likelihood of later depressive and anxiety symptoms respectively (Strauman, in press).

Even more compelling evidence in support of the relationship between self-discrepancies and the experience of specific types of emotional distress comes from experimental investigations on the emotional impact of priming self-discrepancies. According to self-discrepancy theory, discrepancies between attributes in the actual-self and attributes in the self-guides represent interconnected cognitive structures. These cognitive structures may be automatically activated by priming any one component of the representation (i.e., actual self-attributes or attributes within one of the self-guides).

In a study by Higgins, Bond, Klein, and Strauman (1986, study 1), participants with both high ideal and high ought self-discrepancies experienced increases in the kind of emotional discomfort associated with the type of self-discrepancy that was activated. Thus, they evidenced an increase in dejection-related emotions when the ideal self was primed and an increase in agitation-related emotions when the ought self was primed. In their second study, Higgins et al. (1986), had participants imagine either a positive event (e.g., receiving an "A" in a course; spending an evening with someone they admired) or a negative event (receiving a "D" in a course; finding out a lover had just left them). Imagining the same negative event, participants with predominant AI discrepancy experienced increased dejection and decreased psychomotor speed whereas those with predominant AO discrepancy experienced increased agitation and psychomotor speed. In a subsequent study, Strauman and Higgins (1987) had participants with predominant AI or AO discrepancies complete a series of sentences (An 'X' person is...) that contained attributes that were related to their self-discrepancies. Control attributes (yoked control) that reflected attributes from other participants' self-discrepancies were also included in some trials. Activating AI discrepancy produced feelings of sadness and decreased psychomotor

arousal, whereas activating AO discrepancy produced feelings of agitation and increased arousal. Strauman replicated these findings in a sample of clinically depressed and socially phobic individuals (Strauman, 1989).

Underlying the predictions regarding how different types of self-discrepancies lead to different emotions is the idea that each type of discrepancy reflects a particular type of negative psychological situation that is associated with specific types of negative emotional states. In line with cognitive dissonance theory, self-discrepancy theory presumes that inconsistencies between cognitions, including beliefs about one's actual self in relation to one's self-guides reflect personal costs or problems (Higgins, 1987). Thus, individuals are likely to feel disappointed and sad when they believe they have lost or will never obtain some desired goal. In contrast, individuals are likely to feel apprehensive or threatened when they believe that something terrible is going to happen. According to self-discrepancy theory, it is the absence of positive outcomes (either actual or expected) that is associated with dejection-related emotions such as sadness and disappointment. In contrast, it is the presence of negative outcomes (either actual or expected) that is associated with agitation-related emotions such as, anxiety or fear.

In terms of self-discrepancies, it is proposed that discrepancies between the actual-self and the ideal-self, (an AI discrepancy), represents the absence or loss of positive outcomes, in the form of loss of approval, love, or rewards for not meeting ideals or aspirations and is characterized by dejection related emotions such as dissatisfaction, disappointment, discouragement and sadness. In contrast, a discrepancy between the actual-self and the ought-self, (an AO discrepancy), represents the presence of negative outcomes in the form of anticipated punishment for the violation of duties and

responsibilities, and is characterized by agitation-related emotions such as fear, threat and anxiety (Higgins, Loeb, & Moretti, 1995).

Self-discrepancy theory asserts that all people possess both ideal and ought-self-regulatory systems to some degree. To the extent that one's developmental or disciplinary history emphasizes one type of outcome (presence or absence of positive outcomes) over the other (presence or absence of negative outcomes), a child will take on a "world view" (Higgins & Silberman, 1998; Higgins, 1999) with heightened sensitivity to positive versus negative outcomes and an associated tendency to predominantly utilize ideal or ought standards for self-regulation. This characteristic emphasis on positive outcomes (ideal standards) or negative outcomes (ought standards) is referred to as the individual's regulatory focus. Self-regulation in terms of an *ideal self-guide* then, involves behaviors that are oriented towards maximizing the presence of positive outcomes and minimizing the absence of positive outcomes. In terms of an *ought self-guide*, self-regulation would involve behaviors that are oriented towards maximizing the absence of negative outcomes and minimizing the presence of negative outcomes.

Thus, it is argued that self-discrepancies function at the level of sensitivity to different types of psychological situations. Research by Higgins and colleagues (see Higgins, 1987; 1989) has demonstrated that individuals who self-regulate in relation to an *ideal self-guide* are sensitive to psychological situations involving positive outcomes (presence and absence) whereas, people who self-regulate in relation to an *ought self-guide* are sensitive to psychological situations involving negative outcomes (absence and presence).

In a test of this theory, Higgins and Tykocinski (1992) had participants with predominantly AI versus predominantly AO discrepancy read and recall an essay containing statements of events in the life of a target person, including each of four outcome focuses (presence/absence of positive/negative outcome). Individuals with predominant AI discrepancy had better recall for events related to the presence/absence of positive outcomes (a positive outcome focus) compared to individuals with predominant AO discrepancy. In contrast, individuals with predominant AO discrepancy demonstrated biased recall for events related to the presence/absence of negative outcomes (a negative outcome focus). These results support the notion that regulation in relation to an ideal self-guide involves an orientation toward positive outcomes, whereas regulation in relation to an ought self-guide involves an orientation toward negative outcomes.

Subsequent research has demonstrated results consistent with these findings (Higgins, Roney, Crow & Hymes, 1994). For instance, Higgins et al. (1994) have demonstrated that regulatory focus can be momentarily primed. In one study, participants' ideal or ought self-representations were primed by asking them to report on their life changes that reflected either their hopes and aspirations (ideal priming) or their duties and obligations (ought priming). Participants exposed to ideal priming showed better recall for events related to attaining positive outcomes (approaching matches to desired self-states) than participants exposed to ought priming. In contrast, individuals exposed to ought priming showed better recall for events related to attaining the absence of negative outcomes (avoiding mismatches to desired self-states) than participants exposed to ideal priming. In another study Higgins et al. (1994) found that participants with predominant AI discrepancy more frequently selected approach strategies for maintaining friendships (e.g.,

trying to be generous and willing to give of oneself) compared to participants with predominant AO discrepancy. In contrast, participants with predominant AO discrepancy more frequently selected avoidance strategies for maintaining friendships (e.g., trying to stay in touch and not lose contact with friends).

Most of the research to date has focused on the emotional outcome of priming self-discrepancies or its effect on sensitivity to different types of psychological situations. However, if it is possible to observe negative emotional outcomes and biases in regulatory focus as a result of priming self-discrepancies, it would be of value to explore the inverse of this relationship. By inducing different negative mood states it should be possible to activate the different types of self-discrepancies. Once activated by the different negative mood states, these different self-discrepancies should lead to differential sensitivity to psychological situations associated with each type of self-discrepancy. For example, inducing a sad mood, which is associated with AI discrepancy (Strauman & Higgins, 1993 for review), should activate this particular type of discrepancy. Since AI discrepancy is associated with sensitivity towards positive outcome focus events (Higgins & Tykocinski, 1992), inducing a sad mood in participants with high AI discrepancy would be expected to lead to preferential recall for events with a positive outcome focus. Thus, the current study sought to determine whether the relationship between self-discrepancy and affect is bi-directional.

The prediction of a bi-directional relationship between self-representations and affect is based on a review of the literature linking affect and cognition and particularly memory processes (see Blaney, 1986 and Forgas, 1992). Historically, affect and cognition have been assumed to be radically different and virtually independent of each other (Laird,

1989). Now it is generally well accepted that cognitions influence affect, and inversely, that affect influences cognition and information processing.

Over the past two decades, a host of evidence has accumulated demonstrating mood influences upon virtually all cognitive and behavioral processes (Blaney, 1986 for review). To account for the role of affect in information processing, a number of theorists have developed models in which emotion and cognition are viewed as interactive (e.g., Teasdale & Fogarty, 1979; Bower, 1981; Isen, Shalke, Clark, & Karp, 1978; Clore & Parrott, 1991). According to these theorists, certain types of cognitions can produce emotional states, but affect itself may also alter cognitive states and processes, particularly processes related to memory. The notion that thoughts are associated with each other in meaningful ways in memory is one of the fundamental assumptions of cognitive psychology. Theorists have incorporated this idea into associative network models of cognition (Bower, 1981, 1991; Isen, 1984, 1987). These models, originally based in memory research, have been expanded to take into account the role of affect in information storage and retrieval. Associative network model theorists (Bower, 1981, 1991) suggest that mood states may be directly linked to cognitions within an associative network of representations. Affect may influence cognition through the automatic priming of its associated cognitive constructs as “activation of an emotion node also spreads activation throughout the memory structures to which it is connected” (Bower, 1981, p. 135). Accordingly, the experience of affective states should have predictable cognitive consequences in facilitating the access of associated constructs.

The current study sought to explore the influence of induced anxious and dysphoric moods on outcome focus orientation (positive/negative) in participants with varying degrees

of AI and AO discrepancies. Accordingly, it was predicted that inducing a sad mood would activate AI discrepancy and result in better recall for positive outcome focus events than negative outcome focus events for participants who displayed high AI discrepancy. In contrast, inducing an anxious mood was predicted to activate AO discrepancy and result in better recall for negative outcome focus events in participants with high AO discrepancy.

An important distinction related to this feature of varying sensitivity to types of psychological situations is the difference between overall valence and outcome orientation. The positive outcome orientation associated with regulation in relation to an ideal self-guide can produce experiences of both positive overall valence (the presence of positive outcomes) and negative overall valence (the absence of positive outcomes). Similarly, the negative outcome orientation associated with regulation in relation to an ought self-guide can produce experiences of both positive overall valence (the absence of negative outcomes) and negative overall valence (the presence of negative outcomes). According to self-discrepancy theory, different types of self-discrepancies are associated with sensitivity to different types of outcome focus. The effects of self-discrepancies on memory have been found to involve differences between events in outcome orientation rather than differences between events in overall valence.

METHOD

Participants

Ninety-six undergraduate students (50 male and 46 female, mean age = 21.3; $SD = \pm 4.5$) enrolled in a variety of introductory classes at Simon Fraser University were recruited for participation in this study. Each participant was run individually and received either course credit or monetary reimbursement (\$5 and entry into a lotto contest for \$50) for their participation in the research project. Participants who scored above a predetermined cut-off score on the Beck Depression Inventory – II (BDI-II; Beck, Steer, & Brown, 1996) were not asked to participate further in the second phase of the study involving the sad or anxious mood induction. Five male and 7 female participants scored above this cut-off. This resulted in a sample size of 84 (45 males and 39 females).

Procedure

Initially, participants were informed that the study was part of an ongoing research project investigating the relationship between mood and cognition. Participants were asked to read and sign a consent form and were assured of the anonymity of their responses throughout the study. The study was divided into two sessions spaced two days apart. The first session took approximately half an hour while the second session spanned approximately an hour and a half.

Phase I: Measures

Beck Depression Inventory - II (BDI-II; Beck, Steer, & Brown, 1996). During the first session participants completed the BDI-II. Participants were asked to respond according to how they had been feeling during the past week. The BDI-II is a 21-item instrument used to assess the cognitive, emotional, and vegetative symptoms associated

with depression. Scoring is completed by summing the severity of symptoms participants endorsed. The BDI-II, is rated on a 4-point scale ranging from 0 (not at all) to 3 (severely) with total scores ranging from 0 - 63. Individuals with moderate to severe depression as evidenced by scores above 20 on the BDI-II and/or those with scores above 15 who also endorsed the BDI-II question concerning suicidal thoughts were not included in the second phase of the study as it would have been ethically inappropriate to induce negative mood states in individuals who were already feeling distressed.

The Selves questionnaire (Higgins, Klein, & Strauman, 1985). The Selves questionnaire allows for the identification of chronically accessible self-beliefs and self-discrepancies. Participants were asked to list up to 10 attributes on each of three separate pages, describing their actual, ideal and ought-self from their own perspective. In total, participants were asked to generate three lists of attributes, one for each self-state. On the first page of the questionnaire, the different types of self-states are defined (i.e., the actual, ideal, and ought self-states). On each subsequent page there is a question about a different self-state. For the actual-self, participants were asked to “Please list the attributes of the type of person you believe you actually are”, for the Ideal-self “Please list the attributes of the type of person you would ideally like to be (i.e., wish, desire, or hope to be)” and for the ought-self, “Please list the attributes of the type of person you believe you ought to be (i.e., believe it is your duty, obligation or responsibility to be)”. For each listed attribute, participants were also asked to rate the extent to which they believe they actually possess that attribute, ought to possess that attribute or ideally want to possess that attribute. The 4-point rating scale ranges from 1 (a little) to 4 (extremely).

A two-stage process outlined by Higgins et al (Higgins, Bond, Klein, & Strauman, 1986, study 2) was used for quantifying the magnitude of discrepancy between each of the two pairs of self-states (i.e., “actual” versus “ideal” and “actual” versus “ought”).

1. For each self-discrepancy, the attributes in one self-state (e.g., actual-self) were compared against the attributes listed in the other self-state (e.g., ideal-self, ought-self) to determine which attributes were synonyms and which attributes were antonyms according to Roget’s Thesaurus. Attributes across the two self-states that were neither synonyms nor antonyms (i.e., attributes in one self-state that were unrelated to the attributes listed in the other self-state) were labeled *nonmatches*. Antonyms were considered *antonymous mismatches*. Synonyms where the attributes had been given the same extent ratings (i.e., differed by no more than 1 point on the 4-point scale) were considered *matches*. Synonyms where the attributes were given very different extent ratings (i.e., differed by 2 or more points on the 4-point scale) were considered *synonymous mismatches*.
2. The magnitude of discrepancy between the actual-self state and both the ideal and ought self-states was calculated by summing the total number of mismatches and subtracting the total number of matches (where antonymous mismatches are given a weight of 2 and both synonymous mismatches and matches are weighted 1). In this manner, two discrepancy scores were obtained; actual-ideal and actual-ought discrepancy.

Scores for both AI and AO discrepancy can range from 20 to –10. The current study established good interrater reliability with a Cohen’s Kappa of .87, for classifying attributes as either nonmatches, antonymous mismatches, synonymous mismatches or matches.

Following completion of the questionnaires, participants were asked to return to the lab two days later to complete the second phase of the study. This time interval between administration of the questionnaires and the laboratory session was selected for two reasons. First, participants should be less likely to deduce the purpose of the study. Second, the time interval would help to ensure that any effects obtained would be due to the priming effects of the mood induction rather than from having completed the Selves questionnaire.

Phase II: Measures and Procedure.

Mood Induction Procedure. Once participants returned to the laboratory, they were randomly assigned to either the sad or the anxious mood induction conditions. Anxious and sad moods were induced using the continuous music technique (CMT; Eich, & Metcalfe, 1989; Eich, 1995). By this technique, participants were asked to listen to various selections of “anxious” or “sad” instrumental pieces of classical music while contemplating sad or anxious thoughts (adapted from Eich, Macaulay, & Ryan, 1994). Eich (1995) reports that the CMT produces both strong and stable modifications of mood. However, anxious mood states are somewhat more difficult to attain as well as maintain (Eich & Macaulay, unpublished observations). Furthermore, Eich (1995) reports that research investigating the genuineness of CMT found that the majority of participants (98%) reported moderate to extreme degrees of effectiveness or emotional realism by this method. In addition to contemplating sad or anxious thoughts, participants were told to attend to the physiological signs of their respective moods such as, increased heart rate and breathing rate in an anxious mood, and reduced heart rate, heaviness, and fatigue in a sad mood.

Mood Manipulation Checks.

Mood Matrix (adapted from Russell, Weiss, & Mendelsohn, 1989). Participants were informed that the investigator would be coming into the room periodically throughout the mood induction procedure (at five minute intervals) with a brief measure for them to indicate their current mood, and that once the investigator felt that they had a chance to get into their mood, they would begin a series of tasks. The mood matrix contains two dimensions, one representing feelings or emotions, which runs on a horizontal axis, ranging from extremely unpleasant to extremely pleasant. The second dimension refers to level of arousal and runs vertically, ranging from extremely high arousal to extremely low arousal. Since the current study involved both sad and anxious moods, rather than global pleasant or unpleasant affective states, the dimension for feelings or emotions on the mood matrix was modified to accommodate the different mood states. Specifically, separate mood grids were created for sad and anxious moods so that for each mood, the feeling dimension ranged from extremely low to extremely high anxiety or sadness. To indicate their current mood, participants were required to place a check mark in the box that provided the best representation of how they were feeling (intensity of sad/anxious mood) and their level of arousal at the precise moment. Previous research by Eich (1995) has demonstrated that these two dimensions of feelings and arousal can vary independently of each other, although typically, participants experiencing an anxious mood state show higher levels of arousal while those in a sad or dysphoric mood state show lower levels of arousal (Eich, unpublished observations).

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). A second method for assessing participants' current mood was the Positive and

Negative Affect Schedule developed and validated by Watson and colleagues (1988). This measure was administered just prior to mood induction (with the mood matrix), after the critical mood was obtained (as indicated on the mood matrix), and following completion of the recall task. Administration of this measure involved the investigator reading aloud a list of 20 adjectives one at a time. The sum of the ratings on the 10 odd numbered items provides an index for Positive Affect. Whereas high Positive Affect is characterized as a state of high energy and pleasurable engagement, low Positive Affect reflects sadness and lethargy. The sum of the ratings on the 10 even numbered items provides a measure Negative affect. Negative Affect is described as a dimension of subjective distress. High levels of Negative Affect has been described as characteristic of aversive mood states such as, anxiety, fear and nervousness. Participants were asked to indicate on a five point scale (1 = very slightly or not at all, to 5 = extremely) how they are feeling right at this moment in time in terms of each of the emotion relevant adjectives (such as attentive, irritable). Although the mood matrix will serve as the primary measure for monitoring and measuring mood, the PANAS should provide a more clear and comprehensive picture of the participants' current affective states.

Once participants attained a "critical" level of mood, they were administered the Event Recall task, described below. Critical level of mood was operationally defined as reaching a moderately or very sad or anxious mood (i.e., a check mark in one of the three left-most columns of the mood grid) and moderate to very high arousal for the anxious mood condition (a check mark in one of the three upper-most rows of the mood grid) and moderate to very low arousal in the sad/dysphoric mood condition (a check mark in one of the three lower-most rows of the mood grid). Participants were not told in advance of

these criteria, and it was expected that participants would take variable amounts of time to reach the critical levels of mood. Thus, rather than locking participants into a fixed term of mood induction, an idiographic approach was utilized that allowed each participant to achieve a predetermined degree of mood at his/her own rate. However, due to time constraints and to avoid excessively lengthy and potentially futile durations of mood induction, an upper time-limit of 20 minutes was imposed. This cut-off was selected based on findings by Eich and Metcalfe (1989) demonstrating that participants in their studies required an average duration of 19 minutes ($SD = \pm 7.4$) to feel very unpleasant.

Participants who were not able to attain the desired mood state within the 20-minute time allotment, were allowed to proceed to the subsequent stage of the study involving the recall task described below.

Dependent Measure.

Event Recall Task. The Event Recall task, adopted from Higgins and Tykocinski (1992) involves recall for episodes (with presence/absence of both positive and negative outcomes) in the life of a fictional person. Subsequent to the mood induction, participants were asked to read the same essay about four days in the life of a target person in which different events reflecting each of four different types of psychological situations occurred (presence/absence of positive outcomes and presence/absence of negative outcomes). All participants were allotted three minutes to read the essay and were instructed to read the essay carefully and formulate an impression about the four days the target person had experienced. The essay describes 20 events (16 target events and 4 neutral fillers) that the target person experienced, in 16-30 words each. These events were described as having occurred over a period of four days, identified as day 1 to day 4, with five events for each

day. The target person's experiences were constructed to be circumstantial and not personality related (e.g., finding money on the street) in order to prevent priming self-discrepancies. For male participants, the target person was presented as a male undergraduate by the name of Donald. Female participants were presented with a female target person, an undergraduate student named Donna. For each day, the following four types of psychological situations were presented:

1. Presence of positive outcomes (positive outcome focus with positive overall valence). Example, "I got an A on my term paper and the instructor gave me some very favorable feedback on it".
2. Absence of positive outcome (positive outcome focus with negative overall valence). Example, "I thought we would be getting a bonus from work this month, but there was no extra money on our paychecks".
3. Presence of negative outcome (negative outcome focus with negative overall valence). Example, "I hurt my back moving heavy boxes and so it was really hard to get through school today".
4. Absence of negative outcome (negative outcome focus with positive overall valence). Example, "The instructor usually gives us a pop quiz and I hadn't prepared for it today, but the instructor forgot to make one up—so we didn't have to write it".

In constructing the essay used in this study, five items, one for each type of psychological situation (i.e., presence, absence of positive, presence, absence of negative and a neutral filler) were adopted directly from Higgins & Tykocinski's study (1992). The remaining 15 items were constructed by the investigator. A pool of 30 items were

constructed, six items for each of the four types of psychological situations. In order to select items that best represented each of the four types of psychological situations, 10 graduate students were asked to assign each of the 30 items to one type of psychological situation. Fifteen items with the highest level of agreement were then retained in the final essay. Fourteen of the selected items were correctly identified by 100% of the coders and one item was correctly assigned by 90% of the coders. Following this item selection procedure, the 15 items were randomly assigned to each of the four days presented in the essay with one of each type of psychological situation included in each day.

After reading the essay, participants were given a five-minute mood boost. Thus, they were once again asked to listen to music while contemplating thoughts to get into as sad or as anxious a mood as they could. Inclusion of the mood boost at this point served two main functions. First, it served as a distracter task, and second, it allowed participants a chance to maintain or increase their intensity of sad or anxious feelings. Following this 5-minute mood boost, participants were asked to recall as many of the events as close to word for word as they could. Each participant's reproduction of the target essay was scored for the number of target events recalled that reflected each of the four types of positive and negative psychological situations. Thus, recall scores for each of the four types of situations could vary between 0 and 4. After completing the recall task, participants were asked to complete the mood grid and PANAS once again to check on their mood.

Individual differences in affect-regulation.

After completing the event recall task, participants were presented with a short-form personality survey designed to assess the extent to which they generally attempt to change their unpleasant affective states. This affect-regulation measure contained 5 items taken

from the Mood Repair dimension of the 48-item Trait Meta-Mood Scale (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Mayer et al (e.g., Mayer and Gaschke, 1988) have identified several dimensions underlying people's experience of their moods. Mood repair reflects an individual's efforts to repair negative mood in a way that maintains a generally positive outlook. This scale was included to allow for analysis of the potential moderating role of affect-regulation in the interaction between mood and self-discrepancy on memory. For instance, high endorsement of mood repair might undermine the effectiveness of the mood induction, thereby obscuring the predicted results. The Mood Repair subscale is characterized by items such as, "I try to think good thoughts no matter how badly I feel" and "When I become upset, I remind myself of all the pleasures in life". Participants responded to each item on a scale of 1 (strongly disagree) to 5 (strongly agree). Total scores range from 5 to 25, with higher scores reflecting a greater general tendency to engage in mood-regulation.

RESULTS

Ideal and Ought Discrepancy

Participants varied considerably on both ideal and ought discrepancy. Ideal discrepancy scores ranged from -7 to $+11$ ($M = .05$, $SD = \pm 3.7$), and ought discrepancy scores ranged from -10 to $+9$ ($M = -1.36$, $SD = \pm 3.1$). Participants in this sample demonstrated significantly higher mean AI discrepancy scores compared to AO discrepancy scores ($t(83) = 4.7$, $p < .01$). Furthermore, there was a greater proportion of participants who scored above zero on the AI discrepancy (45.2%) compared to the AO discrepancy (23.8%). There was a strong positive correlation between actual-ideal discrepancy and actual-ought discrepancy ($r = .68$, $p < .01$).

Efficacy of Mood Induction

Mood grid sad/anxious feelings and arousal

Mean ratings of feelings (sad and anxious) and arousal recorded on three occasions over the course of the study are shown in Figures 1 and 2 respectively. These data were analyzed using two separate two-way ANOVA's with Mood (anxious or sad) as the between subjects factor and Time as the within subjects factor. Analysis of the Feeling intensity data revealed a significant main effect of Mood ($F(1,82)=13.31$, $p < 0.01$), a significant main effect of Time ($F(2,164)=148.18$, $p < 0.01$) and a significant Mood by Time interaction ($F(2,164)=7.25$, $p < 0.01$). Simple main effects analysis revealed that, at baseline (1st measure) participants in the anxious mood condition reported higher levels of feeling intensity (i.e., anxious) than participants in the sad mood condition reported feeling sad ($p < 0.01$). However, at both criterion and before recall, both groups reported similar levels of feeling intensity. Moreover, participants in both groups reported significantly higher ($p <$

0.05) levels of feeling intensity at both criterion and before recall rating occasions, when compared to baseline.

A similar analysis on the Arousal data revealed a significant effect of mood ($F(1,82) = 8.26, p < 0.01$), no significant main effect of Time ($F(2,164) = 2.3, n.s.$) and a significant interaction ($F(2,164) = 70.17, p < 0.01$). Simple main effects analysis revealed that participants in each mood condition did not differ in level of arousal at baseline, but did differ significantly at both criterion and before recall ($p < 0.01$). As predicted, subjects in the anxious mood group reported an increase in arousal after the mood manipulation ($p < 0.01$) while subjects in the sad mood condition reported a decrease in arousal ($p < 0.01$).

PANAS (Profile of Positive and Negative affect States)

The PANAS was included as an additional measure for examining the distinctness of the sad and anxious mood conditions. Mean ratings of positive affect (PA) and negative affect (NA) on three ratings are shown in figures 3 and 4. These data were analyzed using two separate two-way between/within mixed design ANOVA's with Mood (anxious or sad) as the between subjects factor and Time as the within subjects factor. Analysis of Positive Affect data revealed a significant main effect of Mood ($F(1,82) = 30.1, p < 0.01$), a significant main effect of Time ($F(2,164) = 68.8, p < 0.01$) and a significant Mood by Time interaction ($F(2,164) = 26, p < 0.01$). Simple main effects analysis revealed that, at baseline (1st measure) participants in the sad and anxious mood conditions did not differ in their level of Positive Affect. However, at both criterion and before recall, participants in the sad mood evidenced a large and highly significant reduction in Positive Affect ($p < .001$). In contrast, participants in the anxious mood condition showed no difference in Positive Affect

at criterion and only a small, but significant decrease in Positive Affect before recall ($p < .05$).

The same analysis was performed examining the Negative Affect scale data. There was no significant main effect of mood ($F(1,82) = 1.3, p = .255$). There was a significant main effect of Time ($F(2,164) = 49.1, p < .001$) and a marginally significant interaction between Mood and Time ($F(2,164) = 2.9, p = .06$). *A priori* it was of interest to examine the difference between the two mood conditions at each of the three rating occasions. Subjects did not differ in their level of Negative Affect at baseline. Subjects in both mood conditions showed a significant increase in Negative Affect at both criterion and before recall ($p < .05$). However, subjects in the anxious mood showed significantly higher levels of negative affect compared to participants in the sad mood at both criterion and before recall ($p < .05$). Thus, the sad versus anxious mood induction caused distinct patterns of change with respect to both Positive and Negative Affect¹.

Mood Repair

Participants in this sample tended to score relatively high on the mood repair scale ($M = 17.8, SD = 4.5$, with scores ranging from 5 to 25). There were no significant differences between the sad and anxious mood conditions in terms of endorsement of mood repair. However, there was an interesting relationship between endorsement of mood repair and self-discrepancy. Partialing out AO discrepancy, there was a significant negative correlation between mood repair and AI discrepancy scores ($r = -.31, p < .01$) and partialing out AI discrepancy, a significant positive correlation between mood repair and AO discrepancy was observed ($r = .23, p < .05$).

Essay Recall task

Each subject's reproduction of the target essay was scored (blind to the subject's mood condition and discrepancy scores) for the number of target events recalled that reflected each of the four types of positive and negative psychological situations. Recall scores for each of these four types of target events could vary from 0 to 4. Two raters independently scored the target essay with 93% agreement.

One set of dependent measure scores was computed. In accordance with the original hypotheses, scores for the two types of *Outcome Focus* were computed; one indicating the total number of events recalled with a positive outcome focus (presence/absence of positive event) and the other indicating the total number of events recalled with a negative outcome focus (presence/absence of a negative event).

Median splits were performed to categorize individuals as either high or low on each of the two discrepancy types (AI and AO). Furthermore, to examine the possible moderating role of mood repair, a median split was also performed creating two groups that were high versus low on mood repair. Two mixed design repeated measures analysis of variance were performed with Mood (sad versus anxious), Discrepancy level (one analysis examining high/low AI discrepancy and the second analysis examining high/low AO discrepancy) and Mood Repair (high versus low) as three between subjects factors and Outcome focus (positive versus negative) as the repeated measure. Finally, in order to control for the strong association between AI and AO discrepancies, these analyses were performed with AI or AO discrepancy entered as a covariate. Thus, the first analysis entered AI discrepancy as the between subjects factor and AO discrepancy as a covariate while the second analysis entered AO discrepancy as the between subjects factor and AI

discrepancy as a covariate. Two identical analyses were performed with Outcome focus entered as the repeated measure.

Results of the first analysis examining AI discrepancy, with AO discrepancy as a covariate and Outcome Focus as the repeated measure, revealed no significant main effects of Mood, AI discrepancy or Mood repair (all F 's $< .20$, n.s.). Likewise, there were no significant Mood x AI discrepancy, Mood x Mood repair or 3-way interactions (all F 's $< .49$, n.s.). There was a significant main effect of Outcome focus ($F(1,75) = 14.6$, $p < .01$), indicating that all subjects recalled significantly more positive outcome focus items than negative outcome focus items. As predicted, Outcome focus x AI discrepancy x Mood interaction was significant ($F(1,75) = 4.4$, $p < .05$). Consistent with the original hypothesis, simple main effects analysis revealed that in the sad mood condition, participants who scored high in AI discrepancy recalled more positive outcome focus items than negative outcome focus items ($p < .05$) whereas in the anxious mood these values did not differ. In contrast, the opposite pattern was observed for low ideals where participants in the anxious mood condition recalled more positive outcome focus items ($p < .05$) whereas in the sad mood these values did not differ (See Fig. 3). No other interactions were significant (all F 's < 2.2 , n.s.).

The same analysis was run entering AO discrepancy, with AI discrepancy as a covariate and Outcome Focus as the repeated measure (see Fig. 4). Consistent with results from the analysis described above with AI discrepancy, there was a significant main effect of Outcome Focus ($F(1,75) = 9.21$, $p < .05$), indicating that all participants tended to recall more positive outcome focus events than negative outcome focus events. There were no other significant main effects or interactions (all F 's < 3.5 , n.s.).

DISCUSSION

The purpose of this study was to further explore the causal link between self-discrepancy and affective states. A large body of research has amassed demonstrating the relationship between AI discrepancy and sad or dysphoric mood and between AO discrepancy and agitation or anxiety-related affect (Higgins, Klein & Strauman, 1985; see Strauman & Higgins, 1993 for a review). Research has also demonstrated that priming self-discrepancies results in various negative emotional states (dysphoric/anxious) (Strauman & Higgins, 1987). Furthermore, longitudinal data support the notion that different types of self-discrepancies represent vulnerability markers for distinct emotional problems, such as depression and anxiety disorders (Strauman, 1996).

The present study sought to demonstrate the *bi-directional* nature of the relationship between mood and self-discrepancies. Previous research has demonstrated the differential impact on emotional states when AI and AO discrepancies are activated or primed. Research has also shown that the different types of self-discrepancies are associated with differential sensitivity to material reflecting the presence/absence of positive and negative outcomes or “outcome focus” (Higgins & Tykocinski, 1992). The present study was conducted to determine whether inducing certain affective states could prime self-discrepancies and associated recall biases. For the current study, a measure designed to assess outcome focus was used as an indication of the type of self-discrepancy activated in each of the two different mood induction conditions (sad versus anxious).

The major prediction of this study was that by manipulating participants' mood states, it would be possible to induce biases in outcome focus consistent with the specific self-state discrepancies primed by the negative affective states. Specifically, it was

hypothesized that participants with higher scores on AI discrepancy who were assigned to a *sad mood* induction condition would recall more events with a *positive outcome* focus than negative outcome focus. In contrast, participants with higher scores on AO discrepancy who were assigned to an *anxious mood* induction condition would recall more events with a *negative outcome* focus than a positive outcome focus.

AI Discrepancy

Results of this study provide partial support for the original hypotheses. As predicted, controlling for AO discrepancy, participants with high AI discrepancy recalled more positive than negative outcome focus items in the sad mood condition. In contrast, high AI discrepancy participants in the anxious mood did not show this pattern of recall. Instead, they recalled equal numbers of both positive and negative outcome focus items. Previous research has shown that individuals with high AI discrepancy recall positive outcome focus events better than negative outcome focus events (Higgins & Tykocinski, 1992). Other research has demonstrated that activating AI discrepancy through various priming techniques selectively increases feelings such as sadness, disappointment and discouragement. The present findings expand upon these previous studies by demonstrating that inducing sad, but not anxious mood leads to selectively enhanced recall for positive outcome focus events compared to negative outcome focus events for individuals with high AI discrepancy. This finding provides the first empirical documentation of the bi-directional nature of the relationship between mood and self-discrepancy, where priming a self-discrepancy can increase feelings of sadness (Strauman & Higgins, 1987) and inducing a sad mood results in a pattern of recall consistent with high AI discrepancy.

A finding that was unexpected was that participants in the Anxious Mood condition, who scored low rather than high on AI discrepancy also demonstrated biased recall for items with a positive outcome focus compared to negative outcome focus. In contrast, participants with low AI discrepancy in the sad mood condition did not display differential recall for positive and negative outcome focus events. No explanation for this finding is readily available, as no predictions were made regarding how participants with low AI discrepancy would behave in either anxious or sad mood conditions. In fact, the finding that participants with low AI discrepancy in the anxious mood condition demonstrated better recall for positive outcome focus events is different from the notion proposed by Higgins and Tykocinski (1992). In their study, the authors proposed that participants with low discrepancy would not demonstrate differential recall for positive or negative outcome focus events. The current findings for participants low in AI discrepancy in the sad mood are consistent with these authors' predictions. It is important to note that in Higgins and Tykocinski's study, no mood manipulations were conducted, and in fact, they controlled for the effects of mood so that participants did not vary with respect to mood. As such, the present data demonstrate a novel finding that inducing an anxious mood in participants with low AI discrepancy leads to better recall for positive outcome focus events whereas inducing sad mood does not result in this pattern of recall. The underlying psychological processes which mediate these differential effects warrant further investigation.

AO discrepancy

In contrast to the results with AI discrepancy, predictions regarding AO discrepancy and outcome focus were not supported in this study. It was hypothesized that participants high in AO discrepancy in the anxious mood condition would recall more negative outcome

focus events compared to positive outcome focus events. However, controlling for AI discrepancy, no differences in recall for positive or negative outcome focus were observed in participants with high or low AO discrepancy in either the sad or anxious mood conditions. Participants high and low in AO discrepancy in both mood conditions recalled more positive than negative outcome focus events, as was indicated by the main effect of outcome focus in this analysis.

There are a number of possible reasons why high scores on AO discrepancy were not associated with heightened recall for negative outcome focus events by participants in the anxious mood condition. One reason may relate to research findings in the area of mood congruent memory biases in anxiety. Although less well researched than mood congruent memory effects in depression, some investigators suggest that there may be some differences in the ways in which memory biases occur in depression and anxiety (Bradley, Mogg & Williams, 1995). Bradley and colleagues (1995) summarize some of the research which has found mood congruent memory biases on explicit memory tasks in depressed but not anxious participants. In attempting to account for these disparate findings in anxiety and depression, Williams and colleagues (Williams, Watts, MacLeod & Mathews, 1988) have advanced a model suggesting that information biases may occur at different stages of processing and therefore may be evidenced on different types of memory tasks. Specifically, Williams et al., (1988) propose that anxious subjects have a bias favoring threat-related information at a pre-attentive stage of processing, involving integration rather than elaboration. In contrast, these investigators propose that mood congruent memory biases found in depression reflect greater elaboration for such material. According to these investigators, information biases found in anxiety would result in enhanced priming of

threat-related information on implicit rather than explicit memory tasks, whereas biases in depression would also be evidenced on explicit memory tasks which require deliberate recollection of past learning. There is some research evidence that supports this model by demonstrating biases in anxiety on implicit but not explicit tasks. With respect to the current study, further research may benefit from including implicit memory tasks. Memory biases for negative outcome focus information in participants with high ought discrepancy may not have been detected because the biases in information processing occurred at an early attentional stage. This bias might have been detected on an implicit rather than explicit memory task like the free recall task used in the current investigation.

A second reason why preferential recall for negative outcome focus events in participants who scored high on AO discrepancy was not observed may relate to the nature of the present sample. Previous research showing both heightened anxious mood in participants with AO discrepancy (Higgins, Bond, Klein, Strauman, 1986) and preferential recall of negative outcome focus events by participants with AO discrepancy (Higgins & Tykocinski, 1992) assessed these effects in subjects who displayed high and often predominant AO discrepancy (i.e., high AO discrepancy and low AI discrepancy). In contrast, the present study was limited because the magnitude of AO discrepancy in this sample was very low and only a relatively small number (23%) of participants scored above zero on the measure of AO discrepancy which ranged from -10 to 20. In contrast, a higher number (45%) of participants scored above zero on the measure of AI discrepancy. Furthermore, as noted in the results, mean AI discrepancy scores were significantly higher than AO discrepancy scores. Had this study utilized the Selves questionnaire as a preselection measure in order to obtain a distinct sample of participants with predominantly

high AO discrepancy, one might have observed enhanced recall of negative outcome focus events in the anxious, but not the sad mood condition.

A third reason why participants with high AO discrepancy in the anxious mood condition did not show better recall for negative outcome focus events may relate to participants engagement in affect regulation. Participants in the current study reported that, in general, they tended to engage in high levels of mood repair. The mood repair scale used in this study assessed more trait-like or a general tendency to engage in affect regulation (Salovey, Mayer, Goldman, Turvey, & Palfai, 1995). Furthermore, the mood repair scale places an emphasis on more cognitively-oriented approaches to affect regulation, such as optimistic thinking and actively thinking of pleasant or positive material. In this study, it was observed that participants tended to show preferential recall for items reflecting the presence of positive outcomes. Of direct relevance to this issue are the results of the partial correlational analysis assessing the relationship between self-discrepancy and mood repair. As previously noted, high scores on AO discrepancy were positively correlated with higher scores on mood repair, when AI discrepancy was partialled out of the analysis. In contrast, higher scores on AI discrepancy were *negatively* correlated with mood repair, when AO discrepancy was partialled out. In light of these findings, it is possible that those subjects who displayed high AO discrepancy were more likely to engage in affect regulation, including thinking about positive events. As such, participants with high levels of AO discrepancy may have undermined the recall effects of the anxious mood induction condition. Although participants reported feeling the required anxious mood state, by engaging in mood repair strategies, they may have been actively contemplating positive events, thus limiting their recall of negative outcome focus events.

Yet, this explanation runs counter to the original prediction and previous findings showing that high AO discrepancy is associated with a sensitivity towards negative outcome focus events. According to self-discrepancy theory, one would expect that affect regulation for participants with high AO discrepancy would involve contemplating negative outcome focus events reflecting the absence of negative outcomes, rather than positive outcomes. Once again, the reason that this was not observed may relate to the rather low levels of AO discrepancy in the current sample. Also of relevance here is the fact that the mood repair scale was not designed to differentiate between presence of positive outcomes and absence of negative outcomes. Thus, it does not address and may not be sensitive towards the potential underlying motivation in affect regulation to avoid negative outcomes in participants with high AO discrepancy.

Finally, it may be the case that the anxious mood induction was not entirely effective. As previously discussed, anxious mood in particular, may be more difficult to induce and maintain using the Continuous Music Technique. However, data from the manipulation checks utilized in this study do not support this contention (see below).

Mood Manipulation

Two manipulation checks were included in the present study to ensure that participants were in fact experiencing distinct affective states at two critical rating occasions; before reading the target essay and before the recall task. In terms of intensity of feelings, participants in both the sad and anxious mood began the study endorsing low levels of sad and anxious feelings. At both critical points in the study, after the initial mood induction and following the mood boost, participants in both the anxious and sad mood conditions did not differ in their ratings of feeling intensity, with both groups endorsing

feeling at least slightly high or higher levels of sadness and anxiety. Similarly as expected, following mood induction, the two conditions were clearly distinct in terms of level of arousal, with participants in the sad mood condition showing much lower arousal (slightly to moderately low arousal) compared to participants in the anxious mood condition who displayed high levels of arousal (slightly high or higher arousal).

Analysis of the PANAS, Positive and Negative affect scales also provides support for the distinctness of the two mood conditions. In terms of Positive Affect, participants in both the sad and anxious mood conditions showed equally high levels of Positive Affect at the outset of the study. While both groups showed at least some decline in Positive Affect over the course of the study, participants in the sad mood condition showed significantly lower levels of positive affect compared to participants in the anxious mood condition following mood induction. This finding is consistent with literature that highlights the unique role of low positive affect in depression (Clark & Watson, 1991). It is also noteworthy that participants in the anxious mood condition showed a gradual decline in positive affect across the different rating occasions. Furthermore, although participants in the anxious mood condition did not differ significantly in their endorsement of positive affect after the initial mood boost, their ratings of positive affect were significantly lower than baseline measures after the mood boost. This finding may relate to the long debated issue of the distinctness of sadness or depression and anxiety (see Clark & Watson, 1991 for a review of this literature). Findings of this study suggest that prolonged periods of anxiety may lead to symptoms similar to those experienced in depression, thus blurring the distinction between sadness and anxiety.

With respect to Negative Affect, participants in both mood conditions showed equally low levels of Negative Affect at the outset of the study (baseline). Similarly, participants in both the sad and anxious mood conditions showed significant increases in their reported level of Negative Affect both after mood induction and the mood boost. However, the two mood conditions were distinct in their displayed level of Negative Affect at these two critical points. Following the initial mood induction and the mood boost, participants in the anxious mood condition displayed higher levels of Negative Affect compared to participants in the sad mood condition. Thus, participants in the anxious mood showed a significantly larger increase in Negative Affect compared to participants in the sad mood condition following mood induction. Overall, analyses of the mood manipulation measures suggest that the mood induction procedure was successful in creating rather distinct and stable moods. Thus, it is unlikely that failure of the anxious mood induction contributed to the lack of results obtained with high ought discrepancy.

The relationship between affect and cognition

The proposal of a bi-directional relationship between affect and self-discrepancy is not unfounded. The notion that cognitions effect feelings is well accepted and has been incorporated into cognitive theories of depression and anxiety. According to Beck (Beck, 1976; Beck, Emery & Greenberg, 1985), depression involves dysfunctional schemata which are concerned with information about loss or failure, whereas, anxiety involves schemata that are concerned with information relevant to threat or danger. It is assumed that activation of these schemata leads to the selective processing of schema-congruent information which results in the experience of depression and anxiety. Similarly, anxiety and depression have both been shown to have an effect on cognition. Evidence of mood

congruency effects and mood dependent memory are two examples of the effects of mood on cognition. These phenomena have been incorporated into associative network models of memory (Bower, 1981; 1991). The affect-priming framework of associative network models of memory predicts indirect effects of mood on cognition through selective priming and activation of mood-related constructs. From this perspective, mood can automatically prime memories with which it is associated (Bower, 1991).

Self-discrepancy theory provides yet another model that attempts to explicate the link between affect and cognition. Self-discrepancy theory assumes that self-knowledge is organized in memory and that the relation between each actual self-attribute and its corresponding self-guide attribute (ideal or ought) becomes interconnected in memory as a cognitive structure. Moreover, the cognitive structures that represent the relation between actual self and self-guide attributes are stable internal representations of self-knowledge that guide information processing, and facilitate efficient encoding, interpretation, and memory of self-related information. Self-discrepancy theory proposes that self-discrepancies are cognitive structures that can automatically induce negative emotional states when activated (Strauman & Higgins, 1987; Strauman, 1989).

As a psychological construct, the self has its origin in one's history of life experiences. Thus, self-beliefs develop in the context of emotionally significant life experiences. From a developmental perspective (Higgins, 1989), self-discrepancy theory postulates that the psychological importance of congruence versus discrepancy between attributes of one's actual-self and attributes within each of the two types of self-guides derive from different types of caretaker-child interactions. The theory presumes that to ensure fulfillment of nurturance and security needs that are necessary for survival, children

come to learn how their own attributes and behaviors influence caregivers' responses to them (Bowlby, 1988). Furthermore, developmental patterns of caretaker-child interactions are proposed to play a significant role in determining characteristic modes of self-regulation. Parents or caretakers who typically appraise their child in terms of their ideals (hopes and wishes) for the child are likely to respond in a manner that orients the child toward the presence and absence of positive outcomes (nurturance needs). Thus, when child behaviors and attributes match parents' hopes and wishes, they respond by producing positive outcomes for the child (praise or affection). When the child is discrepant from their hopes or wishes, parents respond by withholding positive outcomes for the child (withdrawal of love, or praise). This pattern of socialization constitutes a *promotion focus* in which the child learns that in order to obtain nurturance one needs to attain accomplishments and fulfill hopes and aspirations. In contrast, parents who typically appraise their child in terms of their beliefs about how the child ought to be (duties and obligations), are likely to respond in ways that orient the child toward the presence and absence of negative outcomes (security needs). Thus, when child behaviors match duties or obligations, parents respond so as to remove the threat of negative outcomes for the child (reassurance), whereas, behaviors that mismatch duties and obligations evoke parental responses that produce negative outcomes (criticism, punishment). This pattern of socialization constitutes a *prevention focus* in which the child learns that to obtain security (avoid punishment) one needs to be responsible and meet obligations.

As a model of the role of self-discrepancy in vulnerability to emotional distress, self-discrepancy theory presumes that at earlier points in an individual's life, certain behaviors or personal attributes were associated with negative emotional consequences (i.e. the absence

of positive outcomes or the presence of negative outcomes). As children mature, they acquire internalized, self-guides or knowledge structures that possess inherent emotional significance due to their long history of connection with social learning experiences. Self-guides are presumed to be representations of a set of emotionally significant life experiences, events in which the individual experienced emotional consequences for meeting or failing to meet behavioral standards. Thus, self-guides as representations of emotionally significant experiences can be considered affectively charged.

The assumption that self-knowledge, including beliefs about one's actual self and self-guides, is organized in memory in the form of a cognitive structure is not unlike the notion of a schema which has become an important element in cognitive theories describing cognitive structures and processes involved in depression and anxiety (e.g. Beck, Rush, Shaw, & Emery, 1979; Dobson, 1985). Schemas are viewed as organized clusters of stored knowledge, beliefs and assumptions. It is believed that the content of schemas is constructed and organized from life experiences and that schemas are used to perceive and evaluate current information (Martin, 1990).

Theorists have proposed that depressed individuals' schema centers upon themes of loss, failure, personal deficiency, worthlessness, self-blame and guilt. This view is consistent with self-discrepancy theory which suggests that depression is associated with ideal discrepancy which in turn is presumed to represent the absence of positive outcomes (e.g. losses, failure to obtain goals or positive outcomes). In contrast, the anxious individuals' schema is thought to center around themes of threat, danger and uncertainty. This view is consistent with self-discrepancy research demonstrating a causal link between anxiety and ought discrepancy, with ought discrepancy presumed to represent the presence

of negative outcomes (e.g. punishment). One way in which schemas can be activated is by events which resemble those on which the schema was originally based (Martin, 1990).

With respect to the current study, both the induced mood and the event recall task (positive versus negative outcome focus) reflect events and contexts that may be viewed as similar to those on which the self-belief structures were originally developed and associated with.

Findings of the current study then may be viewed as consistent with an associative network model of memory (Bower, 1981, 1991) and associated findings of mood-dependant memory. Mood-dependent memory refers to the phenomenon of enhanced recall in a mood state that matches the mood in which information was encoded. From the perspective of self-discrepancy theory, the induced sad and anxious affective states could be viewed as congruent with the affective states experienced developmentally when different types of discrepancies were associated with different types of psychological situations. For instance, the sad mood induction may be viewed as matching the sad mood associated with the experience of absence of positive outcomes for failure to meet ideal standards or guides.

Directions for future research.

It may be of interest to examine the directional relationship between mood and self-discrepancy using other mood induction techniques such as video tapes depicting material with sad versus anxious quality or more naturalistic types of mood manipulation such as weather or performance related feedback indicating success/failure on a task. The mood induction technique used in this study offered the advantage of maximizing internal validity, perhaps at the expense of external validity. It may be argued that the mood states induced in the current study are qualitatively different from those more naturally experienced in real life. Furthermore, other researchers (e.g., Parrott & Sabini, 1990) have noted the important

role of individuals' awareness of their mood in observing the impact of mood on cognition. In the current study, participants were clearly informed of their mood induction condition and were directly asked to actively attempt to alter their mood states. More naturalistic mood induction techniques that control for participants awareness of their mood might help to distinguish the role of affective states while minimizing the potential role of awareness or focus on mood.

It would also be of value to consider other measures that assess sensitivity to positive and negative outcome focus. The current study employed one measure that has been used in previous research. This measure involved circumstantial external events that occurred in the life of a fictional character. However, measures that place greater emphasis on internal mental processes such as imagination and autobiographical memory may be more closely connected to mood and may prove to be more sensitive in registering subtle differences in outcome focus related to the different types of self-discrepancy. One example is the use of story generation in response to Thematic Apperception Test pictures (TAT; Murray, 1943). One of the postulates of self-discrepancy theory is that self-guides develop through socialization experiences, especially involving interactions with caregivers. Therefore, a story generation task might be sensitive to the influence of activating self-discrepancies since it draws on information that is highly idiographic in nature. Additionally, it may be of value to include measures of implicit memory bias. The measure utilized in the current study was highly explicit in nature. Asking participants to freely recall events they had read without any prompts or cues requires that participants actively and consciously engage in a process of remembering information recently learned. As discussed earlier, there is some evidence that memory biases might be more likely detected in anxious

mood on implicit memory tasks, that do not require conscious effort at recollection, compared to explicit memory tasks.

Finally, it would be interesting to see whether results from this study and those found by Higgins and Tykocinski (1992) are replicable in clinical populations. For instance, do individuals with depression and anxiety disorders show the same type of biased sensitivity towards positive versus negative outcomes respectively.

Summary and Conclusions

To date, the mechanisms linking affect and cognition are not fully understood. Self-discrepancy theory is one model that attempts to explain the underlying processes that mediate the relationship between affect and cognition. Findings of the current study in conjunction with previous research suggests that there is a bi-directional relationship between ideal discrepancy and sad mood. Research has demonstrated that priming a particular discrepancy can lead to different types of negative emotional states and the current study shows that, at least for ideal discrepancy, inducing a sad mood state can activate ideal discrepancy as evidenced by better recall for events with a positive outcome focus. At present it is unclear whether there is a bi-directional relationship between ought discrepancy and anxious mood. Further research is needed to clarify this issue. This research may benefit from examining more closely the role of affect regulation and the distinction between explicit and implicit memory biases.

Contemporary interest in cognitive therapies for depression and anxiety disorders makes issues about the relationship between cognition and affect especially important. The present study adds to the growing body of evidence that provides laboratory support for the effects of mood on cognitive processing and how these processes are influenced by an

individual's self-discrepancy. These results provide support for the view that temporary mood states effect cognitive processes just as cognition has been found to influence affective experience. Thus, it appears that the experience of different mood states, such as sadness or depression, influences the information individuals attend to, and how they process and recall information.

The current findings of a bi-directional relationship between sad mood and ideal discrepancy is also consistent with the vicious circle effect for the onset and maintenance of depression. According to Beck's cognitive theory of depression, depressive cognitions lead to depressed mood and behavior. Along these lines, self-discrepancy research has shown that activating ideal discrepancy leads to heightened sad mood states. The current finding of induced sad mood activating ideal discrepancy completes the cycle between mood and cognition. Thus, while activation of ideal-discrepancy leads to sad mood, sad mood in turn can result in attentional biases towards material associated with ideal discrepancy which may contribute to the enduring nature of depressive affect. In contrast, the lack of a demonstrated bi-directional relationship between anxious mood and ought discrepancy may be consistent with the more transient nature of anxiety.

Ultimately, this line of research will potentially lead to a greater understanding of the way in which complex psychological constructs such as self-perception and emotion interact to influence human cognitions and behavior.

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FIGURE CAPTIONS

Figure 1. Mood matrix Intensity of Sad and Anxious feelings and arousal.

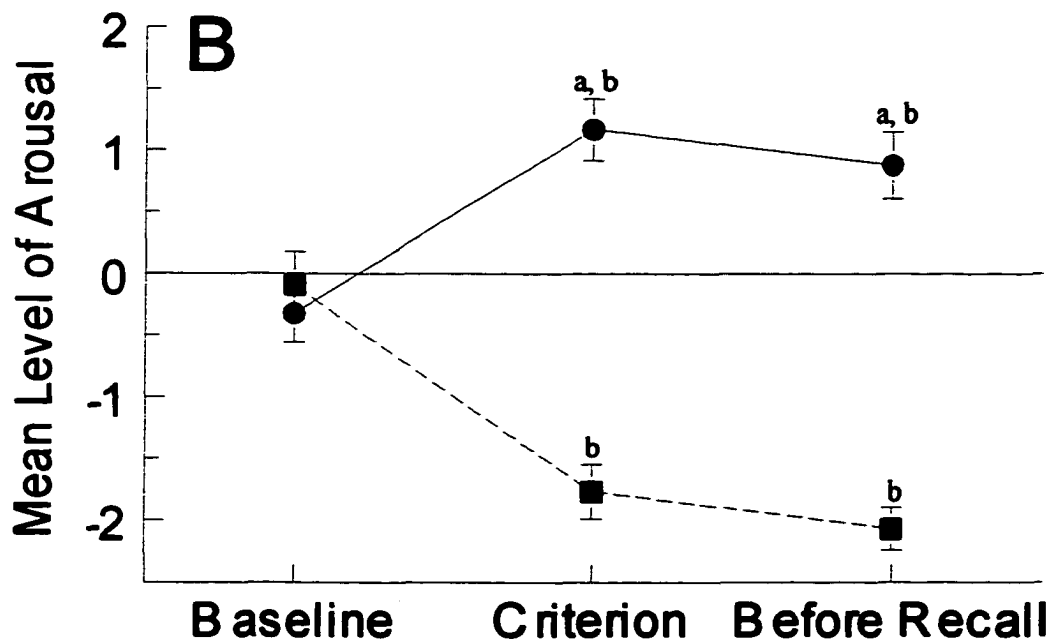
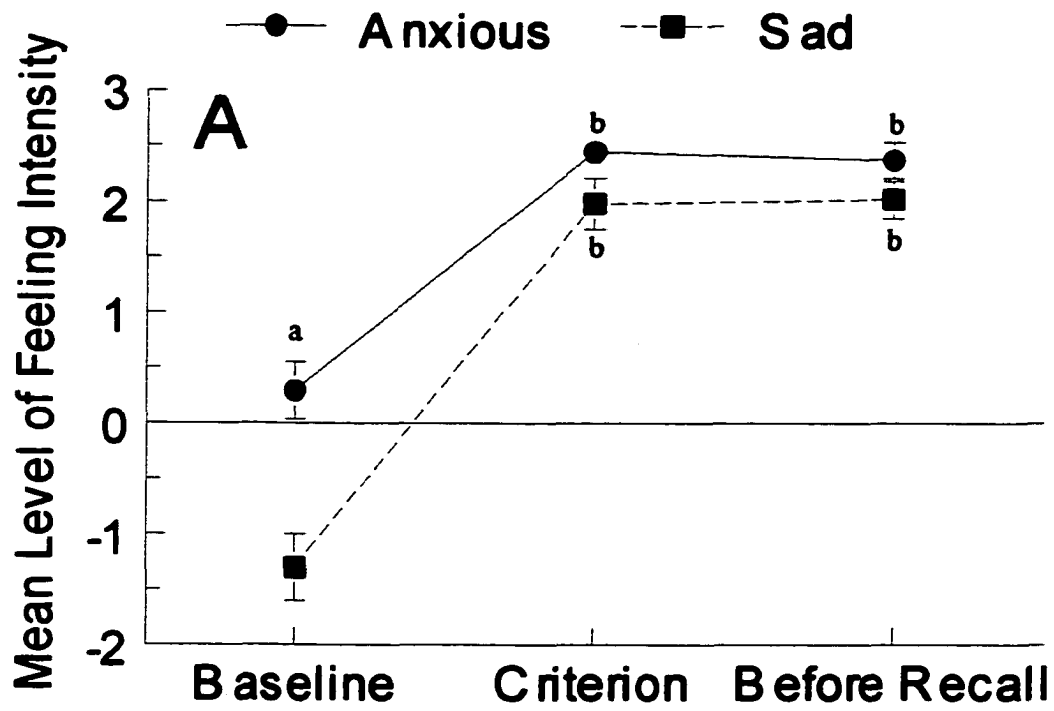
(A) Mean (\pm sem) intensity ratings of sad or anxious feelings taken on three separate rating occasions ($n = 84$). (B) Mean (\pm sem) intensity ratings of arousal for participants in the sad and anxious mood conditions taken on three separate rating occasions ($n = 84$). *a* - denotes significant differences between groups at the same rating occasion at $p < .05$. *b*: denotes significant within group differences compared to Baseline measures at $p < .05$

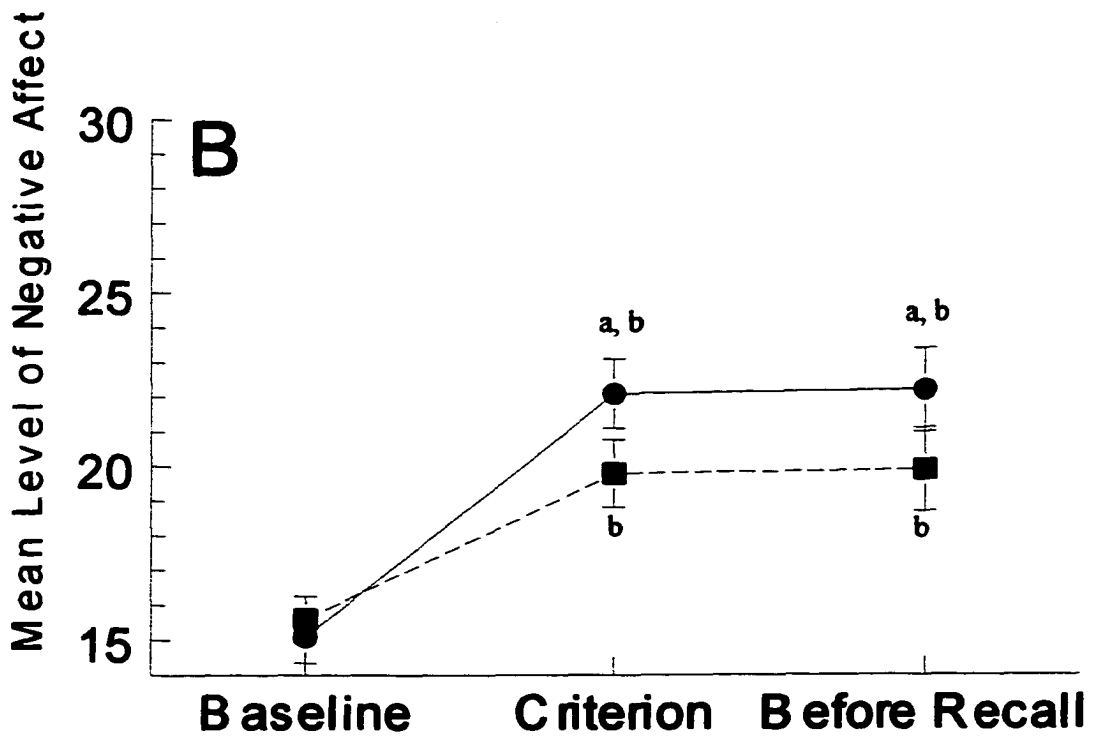
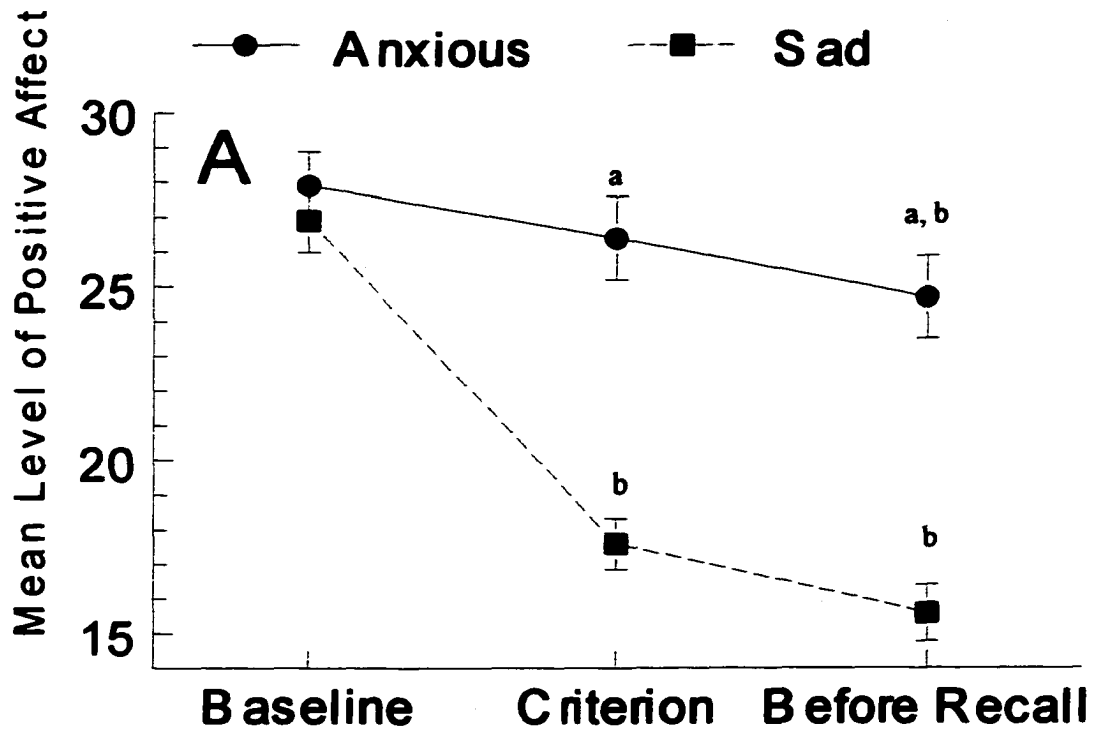
Figure 2. PANAS; Positive Affect and Negative Affect scales.

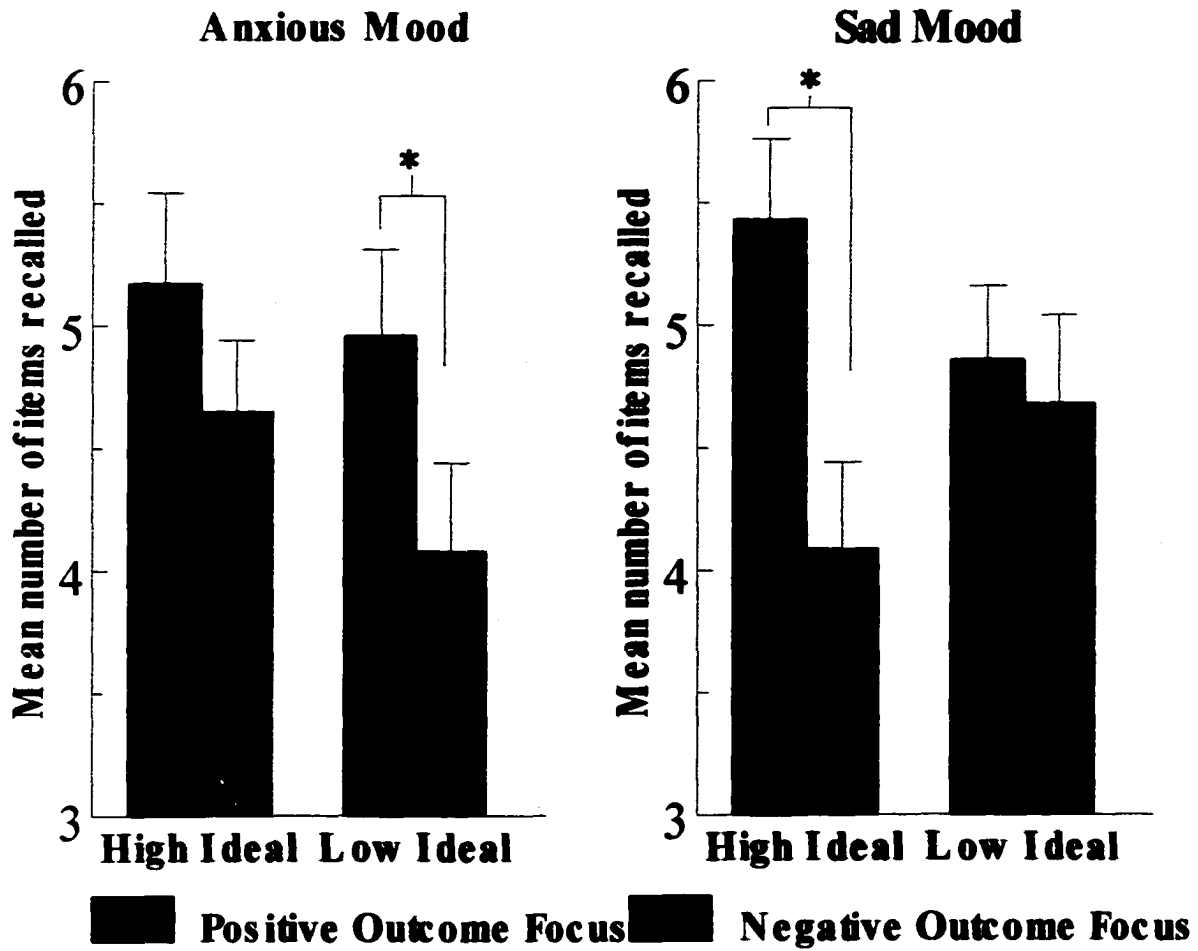
(A) Mean (\pm sem) ratings of positive affect on three separate rating occasions for participants in the sad and anxious mood conditions ($n = 84$). (B) Mean (\pm sem) ratings of Negative Affect on three separate rating occasions for participants in the sad and anxious mood conditions ($n = 84$). *a* denotes significant differences between groups at the same rating occasion at $p < .05$. *b*: denotes significant within group differences compared to Baseline measures at $p < .05$

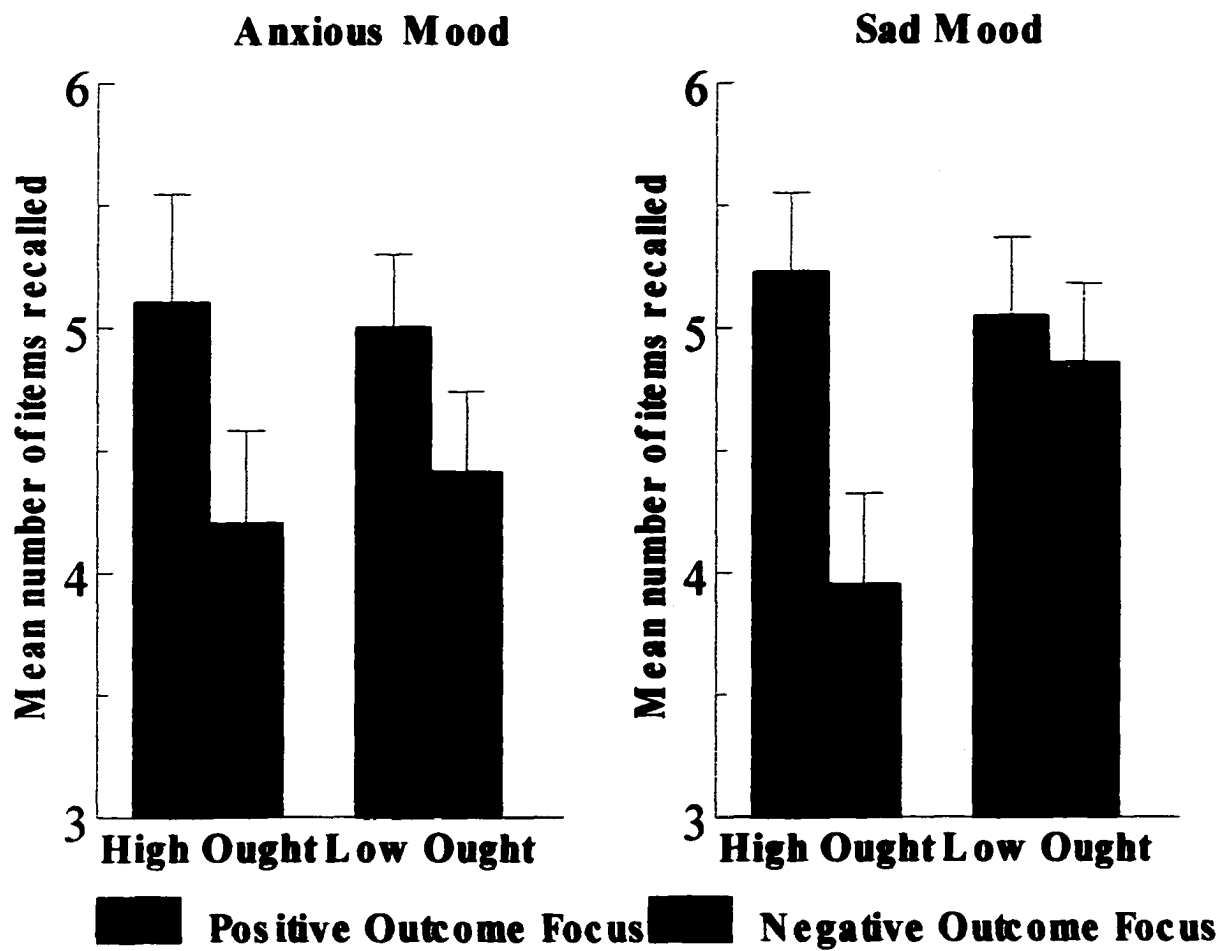
Figure 3. Three-way, Mood x Ideal discrepancy (high versus low) x Outcome focus interaction with Ought discrepancy entered as a covariate. Mean (\pm sem) number of items recalled with positive outcome focus and negative outcome focus for participants displaying high Ideal discrepancy (black bars) and low Ideal discrepancy (gray bars) in the sad and anxious mood conditions. Asterix denotes significance at $p < .05$.

Figure 4. Three-way, Mood x Ought discrepancy (high versus low) x Outcome focus interaction with Ideal discrepancy entered as a covariate. Mean (\pm sem) number of items recalled with positive outcome focus and negative outcome focus for participants displaying high Ought discrepancy (black bars) and low Ought discrepancy (gray bars) in the sad and anxious mood conditions.









FOOTNOTES

¹ Partial correlations were computed to examine the relationship between discrepancy type and each mood manipulation measure. Results indicated that AI discrepancy (controlling for AO discrepancy) correlated negatively with arousal on the first (baseline) rating occasion ($r = -.23$, $p < .05$). However, when participants in each mood condition were analyzed separately, this correlation remained significant only for participants in the anxious mood ($r = -.38$, $p < .05$). Thus, higher scores on AI discrepancy was associated with lower levels of arousal at baseline for participants in the anxious mood but not in the sad mood. A second finding was that for participants in the anxious mood, but not the sad mood, AO discrepancy (controlling for AI discrepancy) correlated negatively with positive affect (PANAS scales) both after mood induction (criterion; $r = -.4$, $p < .05$) and after the mood boost ($r = -.34$, $p < .05$). Thus, higher levels of AO discrepancy were associated with lower levels of positive affect, after mood induction and mood boost, for participants in the anxious, but not the sad mood.