

DISSERTATION

SOCIAL EXCLUSION, COGNITION, AND EMOTION

Submitted by

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In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

Colorado State University

Fort Collins, Colorado

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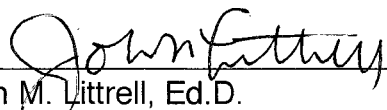
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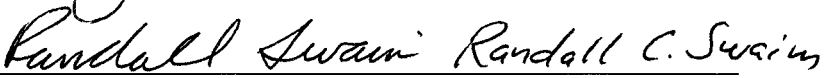
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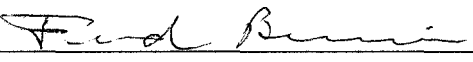
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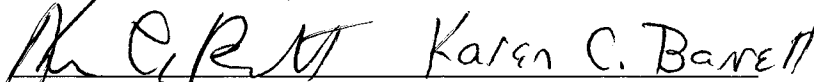
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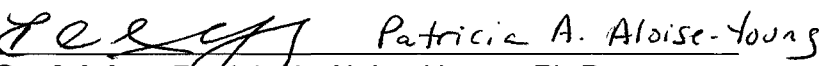
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## ABSTRACT OF DISSERTATION

### SOCIAL EXCLUSION, COGNITION, AND EMOTION

Being included in social groups has been important to human survival throughout evolutionary history, and has probably evolved as an important human need (Baumeister & Leary, 1995). While research suggests that exclusion is highly detrimental (e.g., Leary, Kowalski, Smith, & Phillips, 2003), more experimental research is needed to specify the emotional and cognitive effects. The purposes of the present research were to 1) identify specific emotion effects of exclusion, 2) test whether the experience of activating (e.g., anger) vs. withdrawal (e.g., sadness) emotions accounts for emotion-induced deficits in cognitive processing, 3) test whether the content of information (social versus non-social) affects processing among excluded participants, and 4) test these issues across higher-order processing tasks (e.g., comprehension) and memory tasks (i.e., recall of events from hypothetical diary entries).

Method: Fifty-nine male and 67 female undergraduate psychology students received bogus feedback from a personality test predicting one of the following: they would be surrounded by loved ones (inclusion), alone in life (exclusion), or accident-prone (negative control). Participants then completed self-report measures of emotions and action tendencies, reading comprehension tasks, and the memory task. Analyses: ANOVAs and MANOVAs were conducted to test the effects of the manipulation on each emotion. Next, ANCOVAs were

used to test the effects of gender, content of comprehension materials (passages or diary entries), and condition on cognitive performance (i.e., correct answers on comprehension task or number of diary entries recalled) covarying for each specific emotion.

Results and Conclusions: First, exclusion produced the most post-experimental relief, and anger (an activating emotion) was *less* common in the exclusion condition. Second, when relief was controlled, participants in the exclusion condition showed poorer comprehension in general, and when other emotions were controlled, excluded males showed poorer comprehension of the social passage, partially supporting previous research (Baumeister, Twenge, & Nuss, 2002). Third, diary entry findings showed evidence for mood congruent memory, such that except when controlling for relief, alone-in-life participants recalled more negative than positive events.

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## Social Exclusion, Cognition, and Emotion

### *Introduction*

The inclination to develop attachments and to be accepted in social groups has been proposed as a universal desire or motivation for humans (Baumeister & Leary, 1995; Bowlby, 1988; Williams & Zadro, 2001). While anecdotal and autobiographical evidence suggests that ostracism, such as exclusion or rejection, is highly detrimental to the emotions and sometimes functioning of individuals (Hazler & Carney, 2000; Kupersmidt & Coie, 1990; Kupersmidt, Burchinal, & Patterson, 1995; Leary, Kowalski, Smith, & Phillips, 2003; Prinstein, Boergers, & Vernberg, 2001), more experimental research is needed to specify the effects of ostracism. More precise knowledge in this area is needed regarding the cognitive and emotional effects of exclusion and rejection. The purpose of the present research is to specify some effects of social exclusion on cognition (higher-order processing and memory) and emotion. I hypothesized that: 1. Exclusion would produce more withdrawal emotion effects (sadness and shame) compared to activating emotion effects (anger); and 2. For both higher-order comprehension and memory tasks, exclusion will impair processing of non-social information, but may actually enhance processing of social exclusion information, particularly when anger, rather than sadness is elicited.

### *Definition of Social Exclusion*

Investigators studying ostracism from an evolutionary perspective define it as “the general process of social rejection or exclusion” (Gruter & Masters, 1986,

p.2). The reason for this very general definition is to enable the many forms of ostracism, exclusion, rejection, or isolation to be studied from the perspective that their commonalities may be tied to an underlying biological or physiological mechanism that has evolved as an adaptation for social animals, including humans (Gruter & Masters, 1986). Therefore, throughout the present document the terms ostracism, exclusion, and rejection will be used synonymously, under the evolutionary perspective that all of these phenomena represent the same underlying processes for individuals.

### **Theoretical Perspective**

#### *General Theoretical Perspective: Theory of the Need to Belong*

The theoretical basis for the present study is the evolutionary Theory of the Need to Belong (Baumeister & Leary, 1995). Baumeister and Leary (1995) propose that since belonging to groups has been integral to human survival, it has evolved as a fundamental psychological need. They specifically label their perspective as the “belongingness hypothesis” (p. 497), which is “that human beings have a pervasive drive to form and maintain at least a minimum quantity of lasting, positive, and significant interpersonal relationships” (p. 497). Evidence from social behaviors of other mammals supports the evolutionary perspective of belongingness as a need. Latane, Nesbitt, Eckman, and Rodin (1972) found that rats who were deprived of social interaction with other rats for 15 months were more likely to engage in social attraction behaviors compared to rats deprived of social interaction for only 15 minutes. When the rats were returned to social

environments and had the opportunity for social contact, these social attraction behaviors became less frequent. Evidence of an evolved tendency to desire belonging is also described by Goodall (1986) in her observations of chimpanzees. Goodall states that it is likely that the observed tendency to attempt to mend social relationships after fights among chimpanzees has evolved to serve the purpose of maintaining communal living in order to increase survival among the group members. Among males, maintaining this cohesion is important for defending the group's territory and for protection of the females and young. Lancaster (1986) discusses how ostracism can eventually lead to death among primates, and avoidance of this has become an adaptive feature of primate behavior.

Like rats and chimpanzees, humans need other humans for survival. Attachments and other social relationships are fundamental to human behavior (Bowlby, 1988). Social and group ties confer both survival (e.g., food, protection) and reproductive opportunities important to survival of one's genes. Thus, given social inclusion's importance to survival, we can expect that psychological mechanisms have become attuned to monitoring fulfillment of this need, with lack of fulfillment leading to psychological consequences.

#### *Specific Theoretical Basis for the Present Study*

According to the belongingness perspective, lack of belonging is expected to be an extremely distressing source of deprivation for humans, and will thus have a number of negative consequences. More relevant to the present study,

however, is the assertion that the motive to belong is responsible for much of human behavior, emotions, and cognitions (Baumeister & Leary, 1995).

Consistent with this assertion, Williams and Zadro (2001) similarly propose that since ostracism threatens basic needs, it is expected to have both short-term (e.g., emotional) and long-term (e.g., health) consequences. While some perspectives assert that the psychological desire to maintain social integration is motivated by cultural learning, the evolutionary perspective proposes the opposite: that the tendency for culture to reward and foster cohesion among social groups is a result of the universal human need to belong to groups, and thus the basic psychological makeup of the human species (Baumeister & Leary, 1995).

#### *Specific Tenets of Belongingness Hypothesis*

To determine whether the evolutionary perspective is correct, Baumeister and Leary (1995) call for support for eight specific criteria. First, if the evolutionary perspective on the need to belong is correct, evidence is needed to show that this need operates in a variety of situations and circumstances. This is the nature of fundamental motives, as opposed to motives learned for the purposes of specific situations. Second, a fundamental motive would affect emotions. Third, it would also affect and direct cognitive processing. Fourth, it is expected to have negative consequences (e.g., health) when the need is not met. Fifth, it should elicit goal-oriented behavior. Sixth, it should be universal across

cultures. Seventh, it should not be a product of other motives. Eighth, it should affect a number of different behaviors.

The present study systematically addresses some interrelated emotional and cognitive effects of exclusion, thus specifically focusing on the first, second, third, and fourth criteria of the belongingness hypothesis.

### **Research on the Effects of Ostracism**

Research on social support highlights the crucial psychological importance of connectedness to others (see Cohen, Gottlieb, & Underwood, 2000; Finch, Okun, Pool, & Ruehlman, 1999, for reviews). There is abundant evidence that interpersonal rejection or isolation, loneliness, and conflictual relationships are associated with mental health problems, particularly depression (Antonucci et al., 2001; Boivin, Hymel, & Burkowski, 1995; Cranford, 2004; Finch & Graziano, 2001; Finch et al., 1999; Mullins & Dugan, 1990; Newsom, Nishishiba, Morgan, & Rook, 2003; Reinhardt, 2001; Rook, 2001; Segrin, 1998; Segrin, 2000). Yet, virtually all individuals face some experiences of rejection. Under what circumstances is it more or less harmful? What processes mediate its effects?

Significant and extreme real-world rejection experiences have been held responsible for adolescent externalizing problems and school shootings (Hazler & Carney, 2000; Kupersmidt & Coie, 1990; Kupersmidt, Burchinal, & Patterson, 1995; Leary, Kowalski, Smith, & Phillips, 2003; Prinstein, Boergers, & Vernberg, 2001), and for murder by adults (Meloy, 1989), although systematic empirical data are lacking. These examples highlight the importance of understanding

social exclusion; however, such anecdotal information cannot provide clear specification of the effects of rejection.

Correlational and quasi-experimental studies have also indicated the importance of belonging and the severity of effects of exclusion (Baumeister, Stillwell, & Wotman, 1990; Baumeister, Wotman, & Stillwell, 1993; Leary, Tambor, Terdal, & Downs, 1995; Leary, Springer, Negel, Ansell, & Evans, 1998; Sommer, Williams, Ciarocco, & Baumeister, 2001). Leary, Tambor, Terdal, and Downs surmised that when individuals engage in socially unacceptable behavior, they will experience negative emotions in anticipation of exclusion. In support of this, they found that when individuals imagined engaging in acts that theoretically would produce rejection (e.g., cheating on a test), they were more likely to experience negative self-relevant emotions such as decreased pride and increased shame compared to responses to imagining acts that were higher in social desirability and thus were not considered acts that would lead to rejection (e.g., donating blood).

As further (albeit indirect) support for the hypothesis that exclusion leads to negative emotions, Leary, Tambor et al. (1995) asked participants to write about an incident that elicited negative emotions. They found that ratings of exclusion in the situation correlated with ratings of negative affect during these experiences. Leary, Springer, et al. (1998) found similar results in a study of the correlates of hurt feelings. Using autobiographical narratives, Baumeister, Stillwell, and Wotman (1990) found that severe interpersonal conflict experiences

(such as those involving ostracism or anger) have long-term consequences and are reported to affect individuals' lives long after the incident. Similarly, Baumeister, Wotman, and Stillwell (1993) found that unrequited love, a romantic form of ostracism, also has long-term effects, and may lead to lowered self-esteem. Sommer, Williams, Ciarocco, and Baumeister (2001) found that when participants recalled being the targets of ostracism, they reported having experienced negative emotions such as loneliness, loss of pride, anger, and anxiety.

While anecdotal and correlational study results are compelling, only through experimental techniques can we isolate how ostracism affects human thought and emotion. Understanding which emotions, and, especially, which emotional action tendencies, are elicited, may help enable us to predict whether social exclusion will lead to depression and/or aggression, and how excluded individuals might think and function in everyday life. I believe that better understanding the immediate effects of social exclusion will help us reduce or remediate its potentially devastating effects on physical and mental health and well-being.

### **Experimental Research**

A number of studies have experimentally examined either rejection or exclusion (Baumeister, Twenge, & Nuss, 2002; Craighead, Kimball, & Rehak, 1979; Dittes, 1959; Fenigstein, 1979; Gardner, Pickett, & Brewer, 2000; Geller, Goodstein, Silver, & Sternberg, 1974; Goldfried & Sobocinski, 1975; Leary,

Tambor, Terdal, & Downs, 1995; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997; Pepitone & Wilpizeski, 1960; Stroud, Tanofsky-Kraff, Wilfley, & Salovey, 2000; Twenge, Baumeister, Tice, & Stucke, 2001; Twenge, Catanese, & Baumeister, 2002; Williams, Cheung, & Choi, 2000; Williams & Sommer, 1997).

As one might expect, several studies suggest that social exclusion has a negative impact on emotion (Craighead et al., 1979; Fenigstein, 1979; Geller et al., 1974; Stroud et al., 2000; Williams, Cheung, & Choi, 2000; Williams & Sommer, 1997). However, surprisingly, some studies have not found such effects (Gardner et al., 2000; Goldfried & Sobocinski, 1975; Nezlek, Kowalski, Leary, Blevins, & Holgate 1997; Williams & Sommer, 1997).

#### *Studies Using Confederates*

A few studies have used confederates to manipulate rejection in a behavioral context (Geller et al., 1974; Pepitone & Wilpizeski, 1960; Stroud et al., 2000). Using the Yale Interpersonal Stressor (YIPS; Stroud et al., 2000) paradigm, which involves confederates excluding participants from discussion and bogus feedback that confederates perceived the participant as socially incompetent, Stroud et al. found, in their first study, that excluded participants reported higher negative affect and lower positive affect compared to control condition participants who engaged in a letter circling task that did not involve social interaction. Affect was measured by ratings on 24 mood adjectives, including items such as depressed, sad, angry, and fatigued (negative affect) and energetic, happy, relaxed, and alert (positive affect). Geller et al. (1974) found

that female participants who were ignored by two other females during an interaction felt more alone, dull, anxious, and withdrawn than those who were not ignored.

#### *Studies Using De-Selection From Work Groups*

Exclusion has also been manipulated through selection or de-selection from a lab work group (Dittes, 1959; Leary, Tambor, Terdal, & Downs, 1995; Twenge, Baumeister, Tice, & Stucke, 2001). Twenge, Baumeister et al. (2001) found no effects on the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) in one study where participants were told that the other individuals they had interacted with did not choose them as a member of their work group, but did find lower positive affect scores for rejected participants in another study using this same procedure. Leary, Tambor, Terdal, and Downs (1995) found that participants who were rejected from a lab work group reported lower self-ratings (feelings about the self) compared to pre-test self-feelings. Dittes (1959) found that rejected participants (rated as “below average” by other individuals in terms of desirability as a group member) felt more disturbed, less accepted, and threatened compared to those who had reputedly received “above average” ratings.

#### *Studies Using Imagery*

Exclusion has also been manipulated through the use of imagery (Craighead, Kimball, & Rehak, 1979; Goldfried & Sobocinski, 1975; Williams, Shore, & Grahe, 1998), indicating some support for emotion effects. Craighead,

Kimball, and Rehak (1979) found that when participants imagined rejection, they reported higher scores on the anxiety, depression, and hostility subscales of the Multiple Affect Adjective Check List compared to when imagining neutral and inclusion situations (in studies 2 and 3). Similarly, Goldfried and Sobocinski (1975) found that when participants imagined written rejection scenarios (e.g., a friend ignoring them at a party), they were more likely to experience negative emotions such as depression compared to when they imagined neutral scenarios. Williams, Shore, and Grahe (1998) found that when participants imagined their best friend giving them the silent treatment they wrote that they would experience negative emotions such as loneliness.

#### *Studies Using Bogus Information About Future Life Events*

Another manipulation of exclusion used for studying emotion effects, and the one that was used in the present study, involves using bogus information from a personality test to inform participants that they are predicted to be alone in life (Baumeister, Twenge, & Nuss, 2002; Twenge, Baumeister, Tice, & Stucke, 2001; Twenge, Catanese, & Baumeister, 2002). Baumeister, Twenge, and Nuss (2002) found that participants were more likely to report positive mood on a single-item rating scale (Study 1) and the Positive and Negative Affect Scale (PANAS; Study 3) after being informed that their personality test results predicted that they would be surrounded by loved ones, compared to those who were informed that their results predicted that they would be alone in life. Using the same paradigm, Twenge, Catanese, and Baumeister (2002) and Twenge,

Baumeister, Tice, and Stucke (2001) found that participants who were informed that they would be alone in life had lower mood ratings compared to individuals informed that they would be surrounded by loved ones, although this finding was not replicated when Twenge, Catanese and Baumeister used the PANAS as the measure of mood in the second study or the Brief Mood Introspection Scale in their fourth study.

### *Other Manipulations*

In addition to the standard paradigms mentioned, other manipulations of rejection have also been used, such as internet paradigms (Gardner, Pickett, & Brewer, 2000; Williams, Cheung, & Choi, 2000) and the use of interview settings (Fenigstein, 1979), and some of these manipulations have also shown support for emotion effects. Williams, Cheung, and Choi (2000) found that compared to included participants, participants who were excluded from a chat room interaction over the internet reported higher aversive impact scores, which included measures of mood. Fenigstein (1979) used negative evaluations during an interview as the manipulation of exclusion and found that participants who received negative evaluations reported higher negative feelings (including anxiety) compared to those who received positive evaluations. Thus, across a wide range of experimental manipulations and correlational research findings rejection and exclusion were found to be associated with negative emotional reactions.

### **Research on Specific Effects of Exclusion**

### *Emotion Effects*

However, more research is needed on the effects of exclusion on emotion, due to inconsistent findings and problematic measurements of emotion effects. While Stroud et al. found emotion effects for their first study using the YIPS paradigm, they did not find significant changes in self-reported negative emotion after exclusion in their second study using this paradigm. Baumeister et al. (2002) also found inconsistent results using the bogus feedback from a personality test, with emotion effects in their first and third studies but not in their second study. Craighead et al. (1979) did not find emotion effects in their first study using imagined rejection experiences, but did find emotion effects in the second and third studies using this manipulation.

Other studies did not find any effects on emotion. Nezlek, Kowalski, Leary, Blevins, and Holgate (1997) did not find any effects of being excluded from a work group on emotion ratings in either of their two studies. Gardner et al. used a chat room paradigm and did not find emotion effects as measured by the PANAS. While Goldfried and Sobocinski (1975) found increases in anxiety, depression, and hostility using the imagined social rejection paradigm, these results were only for individuals scoring high on the irrational beliefs test in the first study and only included depression for both groups (high and low on irrational beliefs) in the second study. Williams and Sommer (1997) found that participants excluded from a ball-tossing game reported lower mood compared to

included participants but did not differ in their mood ratings from control participants.

Further confusing the interpretation of emotion effects, some studies use standard self-report measures of emotion (e.g., the PANAS) while others use a variety of mood descriptors or other composites that may include constructs beyond emotion. For example, Williams, Cheung, and Choi (2000) included ratings of mood along with ratings of intensity of ostracism and perception of group cohesiveness items in their aversive impact score, which therefore cannot be interpreted as a measure of emotion alone. Similarly, Fenigstein's (1979) negative feeling index included ratings of the interview experience in terms of pleasantness and interest and was therefore not a specific measure of a particular emotion. Leary, Tambor, Terdal and Downs examined self-ratings rather than emotion specifically. Moreover, even those studies using the PANAS typically reported results simply in terms of positive and negative emotion, rather than determining the extent of specific emotions, limiting the clarity of behavioral and mental health implications.

### *Cognitive Effects*

In addition to this research on emotional effects of exclusion, there is evidence, based on experimental studies, that exclusion affects cognitive processes, although results for these effects are also mixed (Baumeister, Twenge, & Nuss, 2002; Gardner, Pickett, & Brewer, 2000; Goldfried & Sobocinski, 1975). On the one hand, Baumeister, Twenge, and Nuss found that

exclusion led to decrements in performance, specifically in higher-order processing such as analytical and comprehension tasks. Lower-level task performance, such as memory (i.e., recall of nonsense syllables), was not affected.

On the other hand, Gardner, Pickett, and Brewer (2000) found that exclusion led to selective memory effects, indicating an enhanced memory for information relevant to social inclusion. In this series of studies, participants were asked to read hypothetical diary entries. This task was followed by a filler task and then a surprise recall task in which participants were asked to write as many entries as they could remember from the diary. Rejected individuals remembered more social events than those who had been accepted in the chat room manipulation. Further still, Goldfried and Sobocinski (1975) found no effects of exclusion (using imagery) on distance approximation, word association, or speed writing. Further research is therefore needed to specify what types of cognitive effects are produced by exclusion and the role of emotion in these effects. In particular, the role of specific emotions in cognitive effects has not been studied; while none of the above studies found mediation of emotion on cognitive effects, none of these studies tested for the effects of specific emotions on cognitive task performance.

### *Social Behavior*

Finally, another area of functioning affected by exclusion may be social behavior. Exclusion has been found to affect aggression (Fenigstein, 1979;

Twenge, Baumeister, Tice, & Stucke, 2001) as well as conformity (Sommer, Williams, Ciarocco, & Baumeister, 2001; Williams, Cheung, & Choi, 2000; Williams & Sommer, 1997). There is evidence that rejection may lead to hostility or aggression (Fenigstein, 1979; Twenge et al., 2001). Twenge et al. found that participants who were told they would be alone in life based on a personality test were more aggressive toward confederates who gave them neutral or negative feedback on a written essay compared to participants who were told they would be surrounded by loved ones (inclusion) or accident prone (control) based on the personality test. Using a work group paradigm, they found that rejected participants were more aggressive toward individuals who provoked them, showing aggression by administering louder and longer blasts of noise for wrong answers produced by the confederate, compared to participants who were accepted (chosen) for the work group. In a confederate discussion group task, Fenigstein (1979), Pepitone and Wilpizeski (1960) and Dittes (1959) found that participants who were rejected liked group members less than those who had not been rejected. However, exclusion has also been shown to produce more affiliative or prosocial behaviors, such as conformity. Sommer et al. found that when participants recalled a time they were targets of the silent treatment that was for an unknown cause, this led to greater affiliation tendencies. Williams, Cheung, and Choi found that ostracized individuals were more likely to conform than those who were not ostracized, and Williams and Sommer found that females who were ostracized were more likely to work harder in a collective task.

### *Other Effects*

Other exclusion effects include negative beliefs about the self (Craighead et al., 1979; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997), and self-defeating behaviors (Twenge, Catanese, & Baumeister, 2002) including risky lottery choices, procrastination, and unhealthy eating behaviors (Stroud et al., 2000).

### **Need for Future Research on the Effects of Exclusion**

While a number of studies have been conducted using experimental techniques to test the effects of rejection, many questions still remain. What are the specific emotions that are elicited by exclusion? What is the role of specific emotions in cognitive effects of exclusion? The present study is designed to begin to answer these pressing questions.

### *Need for Research on Cognitive Processing Effects*

The first purpose of the present study is to test whether the cognitive effects of exclusion found by Baumeister, Twenge, and Nuss (2002) can be replicated. Baumeister et al.'s study involved a long-term informational source of exclusion where participants were told that, based on a personality measure, they are expected to be alone in life; the present study will replicate this procedure. It is expected that, based on Baumeister et al.'s findings, excluded participants will not perform as well as included or control participants on a non-social comprehension task.

The second purpose of the present study is to explore further the nature of the decrement in performance on complex reasoning tasks as a result of social exclusion. Baumeister, Twenge, and Nuss (2002) hypothesized that the impaired ability to perform well on these tasks resulted from individuals' need to direct their mental effort toward suppressing emotional distress, which detracted from effort needed to perform abstract reasoning. However, according to Baumeister and Leary's (1995) belongingness hypothesis and empirical evidence of the effects of social exclusion on processing of social information, an alternative explanation is that cognitive effort is not simply redirected toward suppressing emotion; it is focused selectively on social information, thus impairing processing of non-social information. From a functionalist perspective on emotion (Barrett & Campos, 1987), and in accordance with Baumeister and Leary's conceptualization of the need to belong, emotions produced by information suggesting that fundamental needs for social inclusion may not be met should motivate the individual to respond adaptively. To the extent that these needs seem thwarted or threatened, rather than completely precluded, the person should attempt to remedy their situation by processes such as seeking and attending to pertinent information.

In support of this, Gardner, Pickett, and Brewer (2000) found that rejected individuals had better memory for social information compared to accepted individuals. This is consistent with emotion research finding that negative emotions direct thought processes to the problem at hand by focusing on relevant details (Schwarz, 2000). In the current research, I thus propose that the

decrements in reasoning ability found by Baumeister et al. (2002) reflect a redirection of cognitive effort to social information processing rather than toward simply controlling emotion. Therefore, I will attempt to determine whether the selective attention and recall to social information found by Gardner et al. a) replicates to a different manipulation of social exclusion, and b) generalizes to cognitive tasks requiring abstract verbal reasoning about social information. In other words, Gardner et al. tested the effects of exclusion from lab work groups on memory for diary information. In the present study, I will use a different manipulation of exclusion, consistent with that used by Baumeister et al., to test whether this long-term (alone in life) version of exclusion similarly produces selective memory for social events in a person's diary entries. Furthermore, since memory and higher-order processing are different types of information processing (one requiring rote memory and the other requiring deduction and inference), I will test whether the findings of improved processing of social information in Gardner et al's diary entry task generalize to higher order processing of social information in reading comprehension tasks. Rote memory only requires recalling exact phrases or events, without requiring reasoning about the meaning of those events beyond what is explicitly stated. Comprehension, on the other hand, requires inferring the purpose or meaning of a passage or elements of a passage beyond what is explicitly stated, through the use of abstract reasoning or inferring information from other parts of the passage.

*Need for Research on Emotions and Cognitive Processing Effects*

The third purpose of the present study is to test further the role of emotion in the effects of exclusion on cognitive processing. While Baumeister, Twenge, and Nuss (2002) attempted to control for the impact of negative emotion through their self-report measures and inclusion of a separate negative feedback condition, further investigation of the role of emotion is needed. The inclusion of the PANAS measure of felt emotion may not be sufficient to detect emotion effects. There are a number of limitations to self-reports of verbally labeled emotions, including the problem of social scripts for when particular emotions are expected, social desirability of reporting emotions regarding types of emotions that are desirable to have, face-saving, or a lack of awareness of one's emotional state. To help rectify this problem, I propose to test for effects on emotion using an indirect measure of emotion, specifically reports of action tendencies, in addition to a self-report measure of emotions. "Action tendencies" refers to "organisms' dispositions to perform behaviors that fulfill a particular function with respect to the environment" (Barrett & Campos, 1987, p.562). Action tendencies can be measured as either engaging in a particular behavior or the inclination to engage in a set of behaviors. Therefore, even if individuals are not introspective or willing enough to report feeling a particular emotion, they may be able and willing to report feeling an inclination to engage in a set of behaviors, thus indirectly revealing their emotional state. By including the measurement of action tendencies I investigate the role of emotion in response to social exclusion using a broader range of measures.

### *Need for Research on Specific Emotions*

Another limitation of Baumeister et al.'s (2002) procedure for detecting emotion effects was that it did not test for the effects of *specific* emotions. This is consistent with previous views of emotion and cognition which defined emotion as consisting of two categories- positive and negative (see Forgas, 1995). The positive emotions were believed to have one set of properties and associated effects, and negative emotions the other. Recently, however, researchers are calling for attention to not only whether emotions are positive or negative, but the properties of specific emotions within these categories and their specific effects on thought and behavior (Lerner & Keltner, 2000).

According to the Functionalist Perspective on Emotions (e.g., Barrett & Campos, 1987; Barrett, 1998), as well as other appraisal perspectives of emotion (e.g., Lerner & Keltner, 2000) different emotions serve different functions for a person in relation to the environment. Emotions alert individuals to threats to goals or opportunities in the environment, and thus direct cognitive processing and action (Barrett & Campos, 1987; Barrett, 1998; Izard, 1977; Lazarus, 1991; Lerner & Keltner, 2000). Unlike valence-based models of emotion, the Functionalist perspectives emphasize the specific functions (including cognitions, goals, and action tendencies) of discrete emotions, such as the various negative emotions previously subsumed under the heading of negative valence. In their Functionalist approach, Barrett and Campos (1987) assert that emotions can be categorized into families, with associated action tendencies, appreciations

(implicit or explicit “hot” cognitions), goals, vocal patterns, facial movements (particularly for certain emotions), physiological responses, and adaptive functions. Anger and sadness are both appropriate to study in relation to exclusion, because according to the Functionalist perspective, while they are in different emotion families, both are classified as the type of emotions elicited in response to threats to significant goals such as need for social relationships. However, although either or both may be elicited when such a need or goal is threatened, in sadness, the person perceives the goal as unattainable; whereas, in anger it is viewed as temporarily blocked.

#### *Importance of Action Tendencies*

This differentiation is critical because of the different action tendencies predicted for these emotions (Barrett & Campos, 1987; Barrett, 1998). In sadness, since the goal is perceived as unattainable, the action tendency is withdrawal and conservation of attentional and behavioral resources; in contrast, in anger, efforts would be made to overcome the obstacle. This is supported by research showing that environmental damage situations that induced anger were most likely to lead to an action tendency associated with blame (boycotting) whereas situations that induced sadness did not elicit an active response (Nerb & Spada, 2001). Raghunathan and Corfman (2004) found that individuals induced into a sad mood were more likely to prefer to engage in tasks that did not require attentiveness (but instead preferred tasks that would bring pleasure) compared to individuals in a neutral or anxious mood. Physiological arousal is also heightened

during anger, indicating that it is an activating emotion (Levenson, Ekman, & Friesen, 1990). Research also indicates that angry behavior is dominant behavior, shown in studies where individuals are more likely to concede to an opponent in an angry mood (Van Kleef, De Dreu, & Manstead, 2004).

### *Effects of Action Tendencies on Cognition*

Action tendencies not only apply to behaviors that result from emotions, but the cognitions and perceptual processes as well. Research on the influence of emotions on cognition supports the perspective that specific negative emotions influence cognitive processing in a variety of ways (Hemenover & Zhang, 2004; Keltner, Ellsworth, & Edwards, 1993; Lerner, Gonzalez, Small, & Fischhoff, 2003; Lerner & Keltner, 2001; Lerner, Small, & Loewenstein, 2004; Smith & Ellsworth, 1985; Tiedens & Linton, 2001). Supporting their hypothesis that some specific emotions are associated with certainty about one's own judgments (e.g., happiness, disgust) and others with uncertainty (e.g., fear, hope), Tiedens and Linton (2001) found that participants who were instructed to recall fear-inducing or hope-inducing autobiographical memories were less certain about their predictions for events that would occur in the subsequent year compared to participants who were instructed to recall happiness-inducing or disgust-inducing autobiographical memories.

Consistent with the perspective that emotions shape appraisal tendencies concerning the value of objects, Lerner, Small, and Loewenstein (2004) found that the specific emotion elicited (using film clips) predicted the pattern of

subsequent choice (similar to “buying”) and selling prices for an object (a highlighter set). For instance, participants induced into a sad mood had higher choice prices compared to selling prices, in contrast to the typical trend for selling prices to exceed buying prices.

In support of the perspective that anger is an activating emotion that arouses cognitions associated with reaching a particular goal, Hemenover and Zhang (2004) found that participants induced to feel angry were more optimistic about imagined subsequent stressors compared to individuals in a neutral mood, and Smith and Ellsworth (1985) found that anger led to perceptions of greater human (compared to situational) control and attentiveness compared to sadness. Lerner, Gonzalez, Small, and Fischhoff (2003) found that participants induced to remember and experience sadness regarding terrorist attacks were more likely to report feeling at risk for future negative events compared to those induced to remember and experience anger. Similarly, Lerner and Keltner (2001) found that dispositionally fearful individuals were less optimistic about future life events compared to dispositionally angry individuals (study 2). Lerner and Keltner (2001) also found that angry individuals were more likely to prefer risky options, demonstrating optimism regarding risk compared to fearful individuals who preferred the option with a known outcome (study 1). Furthermore, Lerner, Gonzalez, Small, and Fischhoff found that those in the anger-eliciting condition were more supportive of governmental policies consistent with vengeance compared to those in the fear-eliciting condition. These results demonstrate a

variety of ways that specific emotions have been shown to affect cognition. They also illustrate how specific emotions shape optimism/pessimism and preferences for action, consistent with the perspective that anger is a forward-activating (rather than withdrawal) emotion and thus produces activating cognitive responses.

While no research has focused specifically on how certain emotions enhance or impede cognitive processing such as that implicated in comprehension tasks, based on these findings and theoretical predictions I expect that emotion effects may account for Baumeister et al.'s (2002) results. If Baumeister et al.'s participants believed that the personality test was a valid predictor of their future social inclusion, and believed that this goal was unattainable for them, they should have experienced sadness. Since action tendencies do not refer only to overt behaviors, but also to the goal-directed organization of the organism's cognitive processes, I would expect this tendency to withdraw to apply to cognitive processing as well. This would especially be the case when the content of the material at hand is judged to be irrelevant to making the desired goal attainable. This is the case for Baumeister's comprehension materials, which had no social relevance (i.e., no content relevance). Thus, I propose that Baumeister et al.'s results may be explicable in terms of sadness. When participants do not perceive this information to be unchangeable, we expect that it will elicit anger, and the results could be very different. If participants believed that their goal of belonging was only temporarily blocked, I

would expect the emotion of anger to be aroused, and the individual's action tendencies to be to remove the obstacle or actively find a solution to the problem. Anger, then, should actually enhance cognitive processing, particularly for content-relevant information.

Only a few studies have been conducted on the effects of specific emotions on information search and processing, and other high level cognition, but the results of these studies support the predictions that discrete emotions differentially affect cognitive processing (Chen, Lewin, & Craske, 1996; Englis, 1990; Nabi, 2003; Newhagen, 1998). Nabi (2003) found that when primed with anger, individuals were more likely to seek information as to how to punish an individual for drunk driving compared to individuals primed with fear. Individuals primed with fear, on the other hand, were more likely to seek information about society-wide protection measures that could be implemented to prevent the problem. As further support of the possibility that emotions direct cognition towards dealing with information that is relevant to them, Chen, Lewin, and Craske (1996) found that in a condition that activated a fear of spiders, spider-phobic participants were more attentive to the content of spider-related words and were therefore less able to identify the color of the words correctly during a Stroop task compared to the non-fear-activating condition. Using emotion elicited by television commercials, Englis (1990) found that eliciting surprise and disgust led to greater attention as evidenced by better recall of commercial content compared to commercials with neutral or warm affect.

In addition to emphasis on anger and sadness, another possibility is that exclusion situations elicit the emotion of shame (Dickerson et al., 2004), which, like sadness, is a withdrawal emotion (Barrett & Campos, 1987). For example, among salespeople, shame has been shown to lead to withdrawal behaviors, further leading to decrements in performance on the job (Verbeke & Bagozzi, 2002). Since Baumeister et al. did not use a self-report measure that could adequately test for the emotion of shame in particular, it was not possible for them to test the perspective that due to the elicitation of a withdrawal emotion individuals were not as motivated or able to perform well on comprehension tasks.

#### *Hypothesized Emotion Effects*

In the present study, I predict that exclusion will elicit the withdrawal emotions of shame and sadness (Hypothesis #1). I will use the Differential Emotions Scale (DES; Izard, 1977) and self-reported action tendencies that enable differentiation of the negative emotions shame, guilt, anger, sadness, as well as guilt, enjoyment, and interest, and thus allow tests of the cognitive functioning of individuals reporting these emotional states.

#### *Hypothesized Cognition and Emotion Effects*

To clarify the role of emotion and content relevance in cognitive effects of exclusion, I will be testing three specific possibilities. First, it may be that type of emotion is irrelevant, and only the relevance of the content to need threat is important. In other words, it may be that humans have evolved cognitive

mechanisms to attend to threatened needs, and these mechanisms of enhanced attention to information relevant to those needs are activated independently of emotional arousal. If this is the case, participants will be better at comprehending information that pertains to a threatened need irrespective of which negative emotion they are experiencing, if any. This is consistent with Gardner et al.'s findings where excluded participants had better memory for social information, although no effects for emotions were found ("content only").

Second, as I predict, and consistent with the Functionalist Perspective on Emotion, it may be that previous exclusion studies did not have an adequate test of emotion, and both need-relevance of content and emotion play a role in the activation of cognitive mechanisms when a need is threatened. In other words, the activating properties of each emotion and the content-relevance of information may interact to determine the extent that an individual processes information. If this is the case, it is predicted that when individuals recognize relevant information in a comprehension passage or diary entry (i.e., interpersonally relevant social information), while also in an angry mood, they will exhibit better performance compared to their performance on need-irrelevant comprehension passages and other individuals not experiencing anger ("emotion X content"; Hypothesis #2).

Third, consistent with other emotion perspectives, it is also possible that regardless of the nature of exclusion, individuals who are excluded will experience the withdrawal emotions of shame and/or sadness and will show

impaired performance on information processing, irrespective of the information content they are processing. Individuals who are provided with exclusion information thus will report sadness and/or shame and will not perform as well on comprehension passages. If this is the case, content of the comprehension passages will not matter, and the happy individuals will have the best performance on both comprehension passages compared to all other individuals, who will report shame and/or sadness as their primary emotional state (“emotions only”).

## Method

### *Participants*

Participants included 61 male and 67 female undergraduate introductory psychology students. However, two male participants were dropped due to suspicion of the experimental manipulation. Therefore the sample used for the present study included 59 males and 67 females between the ages of 18 and 26 years. Students were given course credit for participation.

### *Materials and Procedure*

First, participants were instructed to read and sign a consent form (see Appendix 1) and then to complete a demographics sheet indicating gender, age, and other items regarding control variables such as social contacts and length of time living in Colorado (see Appendix 2). Participants were then instructed to complete a personality inventory (Eysenck Personality Questionnaire; Eysenck & Eysenck, 1975) that took approximately 10-15 minutes to complete. This

provided the cover for the bogus personality feedback. Next, participants were given an accurate description of some results of their personality questionnaire. Third, participants were given one of three bogus descriptions of their future, purportedly based on their personality profiles. All bogus descriptions were taken directly from Baumeister Twenge, and Nuss (2002) and included the following:

Bogus description for condition A (future belonging): “You’re the type who has rewarding relationships throughout life. You’re likely to have a long and stable marriage and have friendships that will last into your later years. The odds are that you’ll always have friends and people who care about you.”

Bogus description for condition B (future alone): “You’re the type who will end up alone later in life. You may have friends and relationships now, but by your mid-20s most of these will have drifted away. You may even marry or have several marriages, but these are likely to be short-lived and not continue into your 30s. Relationships don’t last, and when you’re past the age where people are constantly forming new relationships, the odds are you’ll end up being alone more and more.”

Bogus description for condition C (misfortune control condition): “You’re likely to be accident prone later in life—you might break an arm or a leg a few times, or maybe be injured in car accidents. Even if you haven’t been accident

prone before, these things will show up later in life, and the odds are you will have a lot of accidents.”

Next, participants completed the Differential Emotions Scale (DES; Izard, 1977; see Appendix 3). The DES consisted of 31 emotion items rated on a scale from 0 (“not at all”) to 4 (“very much”). Instructions read: “Please rate each of the following items according to how you are feeling at the present time.” The items of primary relevance to the present study included three anger items (i.e., “Enraged,” “Mad,” and “Angry”), three sadness items (i.e., “Downhearted,” “Sad,” and “Discouraged”), and three shame/shyness items (i.e., “Bashful,” “Shy,” and “Sheepish”). Although instructions asked participants to rate the extent they were experiencing these emotions at the present time, since 2 of the 3 shame measures include items asking information about characteristics that are considered by the general population to be reflective of a stable personality trait of being “shy”, this construct was not considered to be a measure of shame by itself, but rather a combination of shame and the trait shyness. Other items served as filler items to balance positive and negative items so as to avoid biasing participant responses to negative emotion items.

Participants then engaged in a distractor task, and completed a questionnaire rating their emotion action tendencies (see Appendix 4). Note that in the rating of action tendencies, participants indicated the extent to which they felt like engaging in each behavior, rather than the extent to which they would

actually engage in the behavior. Instructions read “We would like you to tell us how much you feel like doing each of the following things (even if you wouldn’t actually do it) at this moment.” There were 13 emotion action tendency items. Each action tendency item was rated on a scale from 1 (“not at all”) to 5 (“extremely”). The items of interest for the present study included the anger action tendency items (i.e., “yelling at someone,” “hitting someone,” and “hitting or destroying something”), shame action tendency items (i.e., “hiding/covering my face,” “avoiding people,” and “running away”), and sadness action tendency items (i.e., “giving up,” and “crying”). Other items, such as enjoyment and other positive action tendencies, were included as filler items.

Participants were then given 3 minutes to read a sample of two passages that served as GRE test items followed by corresponding multiple choice questions, which they had unlimited time to complete (see Appendix 5 for passages, questions, and answers). Participants were then given 3 minutes to read another sample of two passages that served as GRE test items, followed by additional corresponding multiple choice questions, which they again had unlimited time to complete. These comprehension tasks combined took up to 25 minutes to complete. To allow tests of comprehension of social versus non-social information, one comprehension task was a non-social passage used by Baumeister et al. This passage involved a description and analysis of comparisons between the Southern and Northern colonies of the United States. The social passage was created for the purposes of the present study, using pilot

sessions with undergraduate and graduate students, and consisted of descriptions of research on the predictors of popularity and social or peer rejection among children.

Participants were then instructed to read a series of 4 hypothetical diary entries (approx. 5 minutes). To enable tests of memory for valence and different levels of sociality of information, the diary events consisted of 3 categories of social information (i.e., individual, interpersonal, and collective) and 2 levels of valence (i.e., positive and negative). In other words, for each level of sociality, there were both negative and positive events and vice versa. For example, one of the individual positive events read: "I've been running for only a few weeks but today I ran 2 miles and it really made me feel good," whereas a negative individual event read "I overslept and got to my chemistry midterm late." For interpersonal events, a positive event read, "My roommate and I went out on the town tonight and had a really great time together," whereas a negative event read "My best friend blew me off; we had made weekend plans but I guess they just didn't matter."

For collective events, a positive event read, "All of us in my fraternity/sorority have been working really hard on the Greek Week Community Drive, and I really think we are making a difference in people's lives," whereas a negative event read, "A group of kids from my fraternity/sorority said some mean things to a kid with disabilities, and I felt really lousy about being associated with my fraternity/sorority." These categories were determined on the basis of whether

or not other individuals were directly involved in the event (e.g., individual diary events), whether the other individuals had a close relationship with the person writing the diary entries (e.g., interpersonal events involving close friends, roommates, or romantic partners), and whether the events involved positive or negative events that resulted from being part of a group (e.g., events that involved group effort by a choir or fraternity). The diary entries also included neutral filler events, such as “I went to the grocery store” that were not included in the present study analyses. Participants read 4 days of diary entries, with approximately 7 events listed for each day. Individual, interpersonal, and collective events were presented in random order.

After reading over the diary entries, participants engaged in a filler word game task (for 4 minutes), followed by a recall task of the hypothetical diary information (for 10 minutes) after which they were fully debriefed (see Appendix 6). Participants then responded to a post-debriefing questionnaire that asked them to rate the degree to which they felt relief (see Appendix 7). The post-experimental relief item, included partly as a manipulation check and a test of relief from negative emotions, read “How relieved were you to find out that your feedback was not true? Use the rating scale below to indicate how relieved you were:” rated on a scale from 1 “felt the same, did not feel any relief” to 5 “extremely relieved.” It was expected that although individuals may not be willing or able to admit to the experience of specific emotions after experiencing the

bogus feedback, they may be more willing or able to report the removal of a negative emotional state after learning that the stressor was not real.

### Plan of Analysis

First, preliminary analyses were planned to check internal consistency reliabilities and inter-item correlations for items that were conceptualized as indices of the same emotion, to determine if aggregation was warranted. If intercorrelations and alphas were reasonable, composites would be created using the average of DES emotion items for each emotion, and then composites created using the action tendencies items for each emotion. Therefore each emotion was expected to be measured using one composite of rated DES emotions and a second composite of corresponding rated emotion action tendencies. Composites would then be tested for skewness and all composites with skewness scores above 1 transformed to improve distribution. Emotion and action tendency composites for different emotions would then be correlated to ensure that these constructs were not so highly correlated as to preclude consideration of them as distinct emotions, with a cutoff score of  $r = .6$  to make this determination.

Next, Analysis of Variance tests (ANOVAs) or Multivariate Analysis of Variance tests (MANOVAs) would be conducted to test the effects of the experimental manipulation (and gender) on ranked emotions and their action tendencies. For emotions that did not have both action tendencies and DES composites, 2 x 3 ANOVAs would be conducted for between-subjects variables

gender (male vs. female) and condition (inclusion vs. exclusion vs. negative control) on either the ranked DES rating (e.g., sadness, shame/shyness) or ranked action tendency (e.g., shame action tendencies). For emotions with both DES composite and action tendency, a 2 x 3 MANOVA would be conducted with the same factors and the addition of multiple dependent variables (e.g., ranked anger DES composite and ranked anger action tendency composite).

Then, a 2 x 3 x 2 mixed ANOVA of the effects of between-Ss variable gender (male vs. female) and condition (inclusion vs. exclusion vs. negative control), and the within-subjects variable GRE passage level (non-social vs. social) on comprehension scores (number of items answered correctly) would be conducted without controlling for emotion, for the purpose of identifying main effects on comprehension scores and interactions without considering the role of emotions. This would later serve as a baseline to compare the effects of exclusion on comprehension, after controlling for each emotion.

Fourth, the above 2 x 3 x 2 ANOVA testing the effects of the manipulations on comprehension scores would be replicated as a series of ANCOVAs, with each emotion (and/or action tendency) serving as a covariate. These analyses would be conducted for the purpose of identifying how controlling for specific emotions would affect the outcomes for the comprehension tasks.

Fifth, a 2 x 3 x 3 x 2 mixed ANOVA would be conducted for the effects of between-subjects variables gender (male vs. female) and condition (inclusion vs. exclusion vs. negative control), and within-subjects variables social level

(individual vs. interpersonal vs. collective diary entries), and valence of diary entries (positive vs. negative) on the dependent variable diary recall (number of events recalled). This analysis would first be conducted without controlling for emotions to serve as a baseline for comparison of the results when emotions were covaried. This analysis would then be conducted as a series of ANCOVAs with each emotion (and/or action tendency) as the covariate to determine how controlling for each emotion changed the results.

## Results

### **Preliminary analyses**

First, composites were created for discrete emotions using the items from the DES. To ensure that these scales had good internal consistency, Cronbach's alphas were calculated for the three items indexing each emotion. For the anger composite, items included "enraged," "angry," and "mad" ( $\alpha = .90$ ) with all item-total corrected correlations above .6. The sad composite consisted of the items "downhearted," "sad," and "discouraged" ( $\alpha = .81$ ) with all corrected item-total correlations above .6. The shame/shyness composite consisted of items "sheepish," "bashful," and "shy" ( $\alpha = .78$ ). Composites were created using an average of all three items for each scale.

Next, composites were created for action tendencies. Recall that all action tendencies items asked participants to indicate the extent to which they *felt* like engaging in the noted behavior, rather than the likelihood that they would actually engage in that behavior. The anger action tendency composite consisted of items

“yelling at someone,” “hitting someone,” and “hitting or destroying something” ( $\alpha = .73$ ). The shame composite consisted of items “hiding/covering my face,” “avoiding people,” “running away,” and “crying” ( $\alpha = .84$ ). Originally, “crying” had been conceptualized as a sadness action tendency; however, it was correlated .68, .56, and .48 with each of the shame action tendencies, respectively, but only .19 with the other sad action tendency, “giving up,” so it seemed empirically to reflect tears of shame or embarrassment rather than sadness, and was aggregated with the shame action tendencies. All composites were created using the mean of the included items.

Each emotion and action tendency composite (or item, for items that were not aggregated) was tested for skewness. Since many composites showed a skewness score above 1, indicating notable positive skewness (e.g., anger, sad, shame/shyness DES composites and anger and shame action tendency composites), attempts were made to correct the skewness by performing a logarithmic transformation on scores. This did not correct the skewness, nor did a square root transformation. Thus, it was decided to use a non-parametric approach by ranking scores on all emotion and action tendency composites and using the ranks in the analyses (see Conover & Iman, 1981).

Comprehension passage scores also were tested for skewness. Since neither passage was beyond the absolute value of 1.0 in skewness, neither variable was transformed into ranks.

To test whether it was reasonable to treat the self-report emotion measures for the various specific emotions separately in analyses, I conducted correlations among all DES emotion composites and among action tendency composites. It was deemed desirable to treat the different emotions separately, given the Functionalist Perspective on Emotion, which argues that different discrete emotions serve different specific adaptive functions and have meaning beyond simple valence. Since correlations all were below .6, indicating that over 64% of the variance among composites was unshared, it seemed justifiable to use these separately in analyses rather than combined into a single analysis.

### **Effects of Gender, and Condition on Emotions**

The first set of analyses examined the effects of the manipulations and gender on self-reported emotional feelings and, when available, emotional action tendencies. First, 2 x 3 ANOVAs with gender (male vs female) and feedback condition (inclusion, alone-in-life, accident prone) as factors were conducted on DES composites for emotions on which no action tendencies had been assessed, to determine whether the exclusion manipulation affected these emotion ratings.

*Sadness.* For the sadness composite (see Table 1 for means and standard deviations), there was not a significant effect for gender or condition; however, there was a trend toward significance for condition, (see Table 2), suggesting a small to medium effect that might reach significance with a larger sample size. Examination of the means indicated that the average rating for

sadness was highest for participants in the alone-in-life condition, followed by the inclusion condition and the accident-prone condition.

*Shame/Shyness.* It was decided not to include the shame action tendencies composite with the shame/shyness composite because the DES items (sheepish, bashful, and shy) seemed to reflect the trait of shyness, rather than the state emotion of shame. The shame action tendencies composite will be examined separately later. There was no effect of conditions, gender, or their interaction for the shame/shyness DES composite (see Tables 3 and 4).

*Table 1.*

*Mean Ranked Sadness Composite Rating Across Experimental Condition*

Condition	Mean Sadness rating	Standard Deviation	Sample Size
Inclusion	53.30	30.06	36
Alone-in-Life	64.57	30.12	36
Accident-Prone	49.67	28.32	37

*Table 2.*

*Analysis of Variance for Effects of Gender and Condition on Ranked Sadness Composite*

Source	df	F	$\eta$	p
Gender (G)	1	.01	.00	.94
Condition (C)	2	2.46	.22	.09
G x C	2	.46	.10	.64
Within-group error	103	(887.74)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$ .

*Relief.* For the post-experimental rating of “relief” upon hearing that the information was not true, there was a large and significant effect for condition, with alone-in-life participants reporting the most relief, followed by the accident prone condition, and finally by the inclusion condition (see Tables 5 and 6).

*Table 3.*

*Mean Ranked Shame/Shyness Composite Rating Across Experimental Condition*

Condition	Mean Shame rating	Standard Deviation	Sample Size
Inclusion	53.05	30.61	36
Alone-in-Life	62.40	30.50	36
Accident-Prone	53.20	31.24	37

*Table 4.*

*Analysis of Variance for Effects of Gender and Condition on Ranked Shame/Shyness Composite*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Gender (G)	1	2.26	.14	.14
Condition (C)	2	1.05	.14	.35
G x C	2	.12	.00	.89
Within-group error	103	(979.59)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$ .

According to follow-up tests (Tukey HSD), both the alone-in-life and accident-prone conditions were significantly different from the inclusion condition means. The effect for gender was also significant, with a moderate effect size. Females reported higher overall relief compared to males ( $M = 44.65$ ,  $SD = 20.28$ ,  $N = 30$  and  $M = 31.66$ ,  $SD = 18.31$ ,  $N = 43$ , respectively). The gender by condition interaction was not significant.

*Table 5.*

*Mean Ranked Relief Rating Across Experimental Condition*

Condition	Mean Relief rating	Standard Deviation	Sample Size
Inclusion	21.37	11.44	25
Alone-in-Life	50.13	18.76	24
Accident-Prone	44.32	18.32	24

*Table 6.*

*Analysis of Variance for Effects of Gender and Condition on Ranked Relief Rating*

Source	df	<i>F</i>	$\eta$	<i>p</i>
Gender (G)	1	16.00*	.44	<.01
Condition (C)	2	25.58*	.66	<.01
G x C	2	2.28	.24	.11
Within-group error	67	(217.79)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

### *Effects of Gender and Condition on DES Emotions with Action Tendencies*

Next, 2 x 3 MANOVAs, with gender and condition as factors, were conducted to test the effects of the experimental manipulation on DES emotions for which action tendencies also were measured.

*Anger.* Both the multivariate effect of gender and the multivariate effect of condition on the anger composite and angry action tendencies were significant, Wilks  $F(2,59)=3.25$ ,  $p = .05$  and Wilks  $F(4,118)=2.56$ ,  $p = .04$  for gender and condition, respectively. However, the interaction between gender and condition was not significant, Wilks  $F(4,118) = 1.97$ ,  $p = .10$ . Follow-up ANOVAs indicated significant effects of gender and condition on anger action tendencies (see Tables 7 and 8), but no significant effect of either on self-reported angry feelings. Males ( $M = 37.64$ ,  $SD = 17.55$ ,  $N = 42$ ) indicated greater inclination to engage in angry action tendencies compared to females ( $M = 28.08$ ,  $SD = 11.88$ ,  $N = 24$ ). Follow-up Tukey HSD tests of the condition main effect indicated that, consistent with hypotheses, participants in the alone-in-life condition were less likely to report angry action tendencies compared to those in the inclusion condition (see Table for means and standard deviations). Accident-prone condition ratings did not differ from alone-in-life or inclusion ratings.

Table 7.  
*Mean Ranked Anger Composites and Action Tendencies by Condition*

Condition	Mean Ranked Anger	Standard Deviation	Sample Size
Inclusion			
Anger DES	52.90	20.38	23
Anger Action Tend	39.07	17.88	23
Alone-in-Life			
Anger DES	57.01	10.68	21
Anger Action Tend	27.04	11.96	21
Accident-Prone			
Anger DES	49.57	16.73	22
Anger Action Tend	31.42	15.84	22

Table 8.  
*Multiple Analysis of Variance for Effects of Gender and Condition on Anger*

Source	df	F	$\eta$	p
Gender (G)				
Anger DES	1	.69	.10	.41
Anger Action Tend	1	6.61*	.32	.01
Condition (C)				
Anger DES	2	.63	.14	.54
Anger Action Tend	2	3.68*	.33	.03
G x C				
Anger DES	2	.54	.14	.58
Anger Action Tend	2	2.48	.28	.09
Within-group error				
Anger DES	60	(428.00)		
Anger Action Tend	60	(211.55)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

*Shame.* The effect of gender and condition on shame action tendencies was not significant, nor was the interaction (see Tables 9 and 10).

Table 9.

*Mean Ranked Shame Action Tendency Across Experimental Condition*

Condition	Mean Shame rating	Standard Deviation	Sample Size
Inclusion	39.52	18.85	23
Alone-in-Life	34.45	16.71	21
Accident-Prone	29.58	16.41	22

Table 10.

*Analysis of Variance for Effects of Gender and Condition on Ranked Shame Action Tendency*

Source	df	F	$\eta$	p
Gender (G)	1	2.10	.17	.15
Condition (C)	2	1.70	.22	.19
G x C	2	.89	.17	.42
Within-group error	60	(297.19)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

To summarize, there was some (albeit weak) support for the prediction that exclusion would affect emotions. Specifically, the effect of exclusion on sadness approached significance, such that excluded participants had the highest mean sadness rating compared to the inclusion condition. The effect of exclusion also had an effect on anger, such that excluded participants were less

likely to experience anger compared to the included participants. Interestingly, there was also a strong effect on post-experimental relief, such that excluded participants were more likely to experience relief compared to included participants. On the basis of this finding, it was concluded that post-experimental relief was the best proxy of emotion elicited by the manipulations in the present study. To determine to what extent relief may be simply a more powerful measure of a specific emotion, the relief measure was correlated with each emotion composite. It was found that the only emotion that showed a significant correlation with ranked post-experimental relief was ranked shame/shyness ( $r = .24, p = .05, N = 73$ ). This indicates that post-experimental relief is not a good proxy measure of *specific* negative emotions, but in theory, the absence of a negative state indicated by experiencing relief does show that some negative state was experienced, thus involving negative emotion of some kind.

### **Effects of Gender, Condition, and Passage Level on Comprehension**

#### **Scores**

##### *Effects of Gender, Condition, and Passage on Comprehension, Without Controlling for Emotion*

First, a 2 x 3 x 2 mixed ANOVA was conducted for the effects of gender, condition, and passage level (non-social vs. social) on comprehension scores without controlling for emotion (see Tables 11 and 12). This was for the purpose of identifying main effects and interactions on comprehension across all

emotions, to serve as a baseline to compare the effects on comprehension after controlling for each emotion.

*Table 11.*  
*Mean Comprehension Score by Passage Across Experimental Condition*

Condition	Mean Score	Standard Deviation	Sample Size
Inclusion			
Non-Social Passage			
Males	3.70	1.92	20
Females	2.52	1.60	21
Social Passage			
Males	4.50	1.24	20
Females	4.38	1.69	21
Alone-in-Life			
Non-Social Passage			
Males	3.16	1.34	19
Females	2.61	1.62	23
Social Passage			
Males	3.42	1.68	19
Females	3.91	1.12	23
Accident-Prone			
Non-Social Passage			
Males	2.80	1.77	20
Females	3.14	1.64	22
Social Passage			
Males	3.70	1.55	20
Females	4.36	1.33	22

Without controlling for emotion or action tendencies, there was a significant effect for passage, qualified by a significant gender by passage interaction. To follow up the interaction, the effects of passage were analyzed for each gender. For males, there was a significant effect for passage,  $F(1,56)=5.47$ ,  $p = .02$ ,  $\eta = .30$ , such

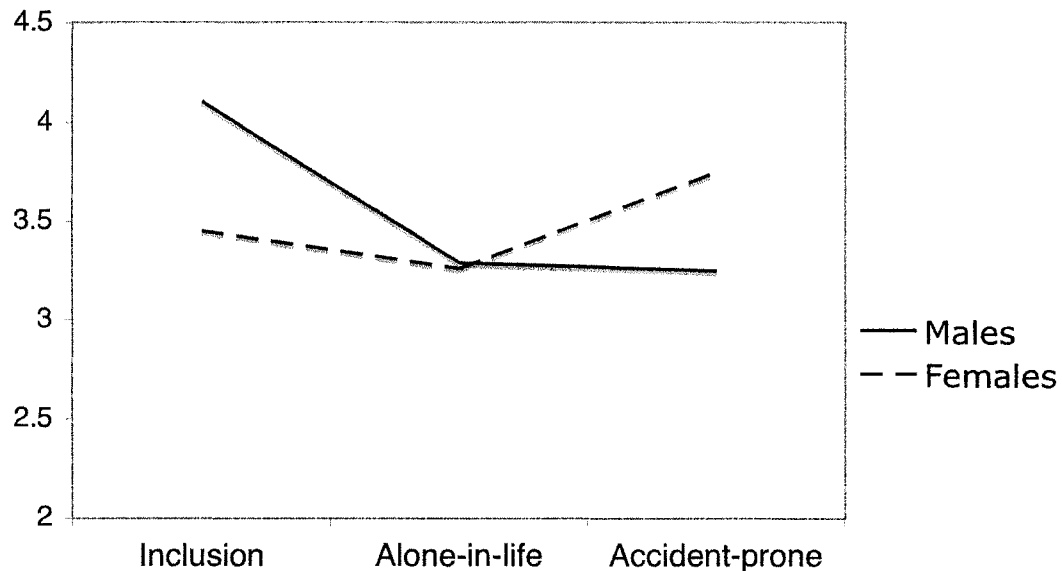
Table 12.

*Analysis of Variance for Passage, Gender, and Condition*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Gender (G)	1	.09	.00	.77
Condition (C)	2	2.06	.17	.13
G x C	2	2.17	.20	.07
Within-group error	119	(2.52)		
Within subjects				
Passage (P)	1	30.41*	.45	<.01
P x G	1	4.43*	.20	.04
P x C	2	.67	.10	.52
P x G x C	2	.40	.10	.68
Within-group error	119	(2.29)		

that there were higher scores for the social passage ( $M = 3.88$ ,  $SD = 1.53$ ,  $N = 59$ ) compared to the non-social passage ( $M = 3.22$ ,  $SD = 1.71$ ,  $N = 59$ ). For females, there was also a significant effect for passage,  $F(1,63)=30.93$ ,  $p < .01$ ,  $\eta = .57$ , such that there was better recall for the social ( $M = 4.21$ ,  $SD = 1.39$ ,  $N =$

66) compared to the non-social ( $M = 2.76$ ,  $SD = 1.62$ ,  $N = 66$ ) passage. While the effect of condition was not significant, the means were in the expected direction. In addition, the gender by condition interaction did approach significance (see Figure 1). Examination of the means indicated that



**Figure 1. Non-significant Condition by Gender Interaction on Comprehension Scores**

for females, the alone-in-life ( $M = 3.26$ ,  $SD = 1.10$ ,  $N = 23$ ) manipulation produced the lowest comprehension scores compared to the inclusion ( $M = 3.45$ ,  $SD = 1.15$ ,  $N = 21$ ) and accident-prone conditions ( $M = 3.75$ ,  $SD = 1.13$ ,  $N = 22$ ) across passages. For males, however, the accident-prone condition ( $M = 3.25$ ,  $SD = 1.12$ ,  $N = 20$ ) produced the lowest scores compared to the inclusion ( $M = 4.10$ ,  $SD = 1.12$ ,  $N = 20$ ) and alone-in-life ( $M = 3.29$ ,  $SD = 1.13$ ,  $N = 19$ ) conditions across passages.

## **Effects of Gender, Condition, and Passage Level on Comprehension Scores, Covarying for Emotions**

### *Effects of Gender, Condition, and Passage Level on Comprehension Scores Covarying for DES Emotions.*

The next set of analyses tested for effects of the manipulations on participants' comprehension of the social and non-social GRE questions. To test for possible effects of emotions and condition ("content only", "emotions only", and "content x emotions") on comprehension passage scores, 2 x 3 x 2 mixed ANCOVAs for gender (male vs. female), condition (accident-prone vs. inclusion vs. alone in life), and passage (non-social vs. social) were conducted on comprehension scores with those DES emotions for which we had not measured associated action tendencies as covariates.

*Sadness.* First, the 2 x 3 x 2 ANCOVA was conducted using sadness as the covariate. This was for the purpose of testing whether controlling for an emotion with withdrawal action tendencies would change the nature of the effects of the manipulations on comprehension scores. After controlling for sadness, there were no significant main effects or interactions of condition and gender on comprehension (see Table 14). There was a significant main effect for passage, such that the non-social passage produced lower comprehension scores ( $M = 2.99$ ,  $SD = 1.64$ ,  $N = 109$ ) compared to the social passage ( $M = 3.97$ ,  $SD = 1.46$ ,  $N = 109$ ).

*Shame/Shyness*. The 2 x 3 x 2 ANCOVA was then conducted using shame/shyness as the covariate. This was for the purpose of testing whether controlling for another withdrawal emotion, particularly one expected to be elicited under exclusion conditions, would change the nature of the effect of the

*Table 13.*  
*Analysis of Covariance for Passage, Gender, and Condition Controlling for Ranked Sadness*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Sadness (S)	1	.02	.00	.89
Gender (G)	1	.49	.10	.49
Condition (C)	2	2.12	.20	.13
G x C	2	1.33	.17	.27
Within-group error	102	(2.67)		
Within subjects				
Passage (P)	1	8.43*	.28	.01
P x Sadness	1	.44	.00	.51
P x G	1	2.50	.14	.12
P x C	2	.40	.10	.67
P x G x C	2	.18	.00	.83
Within-group error	102	(2.15)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

conditions on comprehension. When Shame/Shyness was the emotion covariate, there was again a significant effect for passage, with the non-social passage receiving lower comprehension scores compared to the social passage (see Table 14). No other effects or interactions were significant.

Table 14.

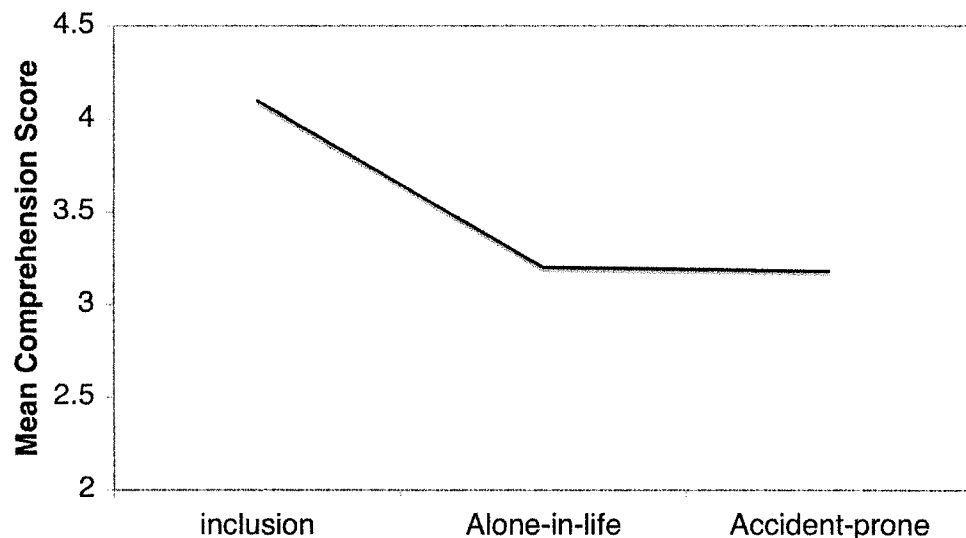
*Analysis of Covariance for Passage, Gender, and Condition Controlling for Ranked Shame/Shy*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Shame/Shyness	1	.01	.00	.93
Gender (G)	1	.50	.10	.48
Condition (C)	2	2.11	.20	.13
G x C	2	1.35	.17	.26
Within-group error	102	(2.67)		
Within subjects				
Passage (P)	1	5.92*	.22	.02
P x Shame/Shy	1	.00	.00	.96
P x G	1	2.44	.14	.12
P x C	2	.52	.10	.59
P x G x C	2	.18	.00	.83
Within-group error	102	(2.15)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

*Relief.* The 2 x 3 x 2 ANCOVA was then conducted using post-experimental relief as the covariate. This was for the purpose of testing whether controlling for a proxy measure of emotion, which may be less susceptible to social desirability effects, would change the nature of the effect of the conditions

on comprehension. When post-debriefing relief was the covariate, there again was a main effect for passage (see Table 15), such that the non-social passage ( $M = 3.10$ ,  $SD = 1.43$ ) received lower mean comprehension scores compared to the social passage ( $M = 3.94$ ,  $SD = 1.54$ ). Moreover, with relief as the covariate, there was also a main effect for condition, such that participants in the inclusion condition ( $M = 4.10$ ,  $SD = 1.60$ ) scored highest on comprehension scores, followed by accident-prone participants ( $M = 3.18$ ,  $SD = 1.34$ ), followed by alone-in-life participants ( $M = 3.20$ ,  $SD = 1.40$ ), as expected. Follow-up contrasts indicated that both alone-in-life means (difference =  $-.92$ ,  $SE = .40$ ,  $p = .03$ ) and accident-prone means (difference =  $-.90$ ,  $SE = .37$ ,  $p = .02$ ) were significantly different from the inclusion condition mean, as predicted (see Figure 2).



**Figure 2. Main Effect of Condition on Comprehension Scores, Controlling for Post-Experimental Relief**

Table 15.

*Analysis of Covariance for Passage, Gender, and Condition Controlling for Ranked Relief*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Relief	1	.81	.10	.37
Gender (G)	1	.64	.10	.43
Condition (C)	2	3.33*	.30	.04
G x C	2	.20	.10	.82
Within-group error	66	(2.32)		
Within subjects				
Passage (P)	1	5.75*	.28	.02
P x Relief	1	1.48	.14	.23
P x G	1	1.00	.14	.32
P x C	2	.31	.10	.73
P x G x C	2	1.09	.17	.34
Within-group error	66	(1.98)		

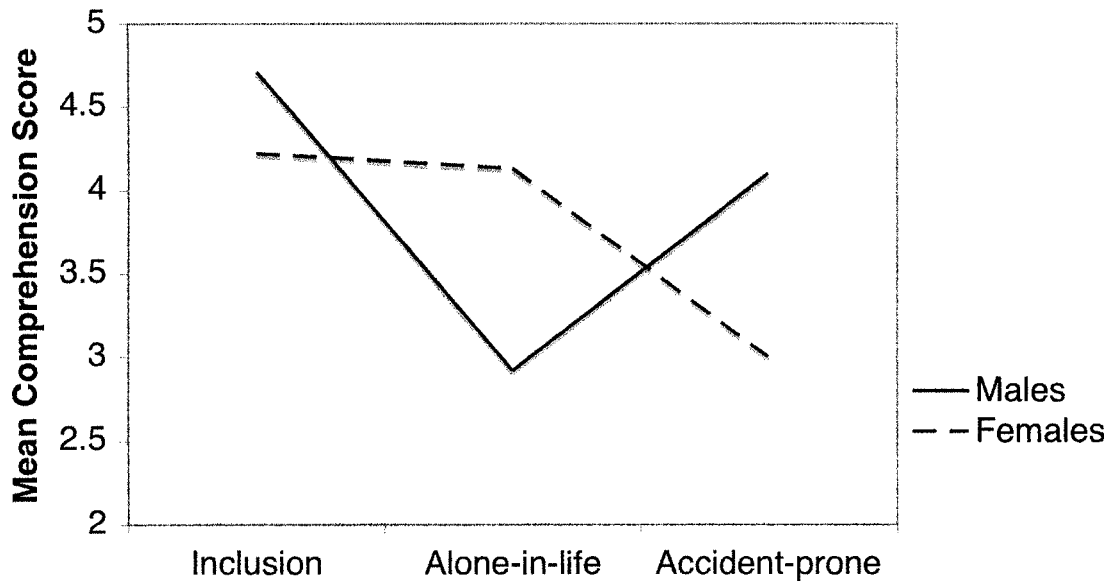
Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$ .

*Effects of Gender, Condition, and Passage Level on Comprehension Scores Covarying for DES Emotions with Associated Action Tendencies.*

Next, 2 x 3 x 2 mixed ANCOVAs for effects of gender, condition, passage, DES composites, and action tendencies on comprehension scores were conducted.

*Anger.* The 2 x 3 x 2 ANCOVA was then conducted using anger DES ratings and action tendencies as the covariates. This was for the purpose of testing whether controlling for an emotion with activating action tendencies would change the nature of the effect of the conditions on comprehension. When controlling for anger, there was a significant effect for passage (see Table 16, such that the non-social passage ( $M = 3.13$ ,  $SD = 1.38$ ,  $N = 66$ ) received lower mean scores compared to the social passage ( $M = 3.84$ ,  $SD = 1.45$ ,  $N = 66$ ).

There was also a significant passage by gender by condition interaction. To break down the interaction, simple interaction tests were conducted separately for each passage. For the non-social passage, the condition by gender simple interaction was not significant  $F(2,58)=1.54$ ,  $p = .22$ ,  $\eta = .33$ . For the social passage, the condition by gender simple interaction was significant  $F(2,58)=3.55$ ,  $p = .04$ ,  $\eta = .33$  (see Figure 3). To break down the simple



**Figure 3. Condition by Gender Interaction on Social Comprehension Scores, Controlling for Ranked Anger Emotions and Action Tendencies**

interaction, simple effect tests were conducted by gender. For male performance on the social passage, there was a significant effect for condition,  $F(2,37)=4.25$ ,  $p = .02$ ,  $\eta = .44$ . Simple contrasts indicated that for males, while controlling for the activating emotion of anger, performance on the social passage was poorer in the alone-in-life condition ( $M = 2.92$ ,  $SD = 1.61$ ,  $N = 13$ ) compared to the inclusion condition ( $M = 4.71$ ,  $SD = 1.20$ ,  $N = 14$ ), (difference = -1.90,  $SE = .65$ ,  $p = .01$ ). For female performance on the social passage, however, there was no simple effect of condition  $F(2,19)=2.16$ ,  $p = .14$ ,  $\eta = .44$ .

*Shame.* Since the DES composite of shame included items that are more consistent with trait shyness, whereas shame action tendencies were viewed as acute responses from ongoing shame and/or embarrassment, shame action

Table 16.

*Analysis of Covariance for Passage, Gender, and Condition Controlling for Ranked Anger Emotion with Action Tendencies*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Anger DES	1	.61	.10	.44
Action Tend	1	1.24	.14	.27
Gender (G)	1	.04	.00	.85
Condition (C)	2	1.84	.24	.17
G x C	2	1.05	.20	.36
Within-group error	58	(1.91)		
Within subjects				
Passage (P)	1	4.28*	.26	.04
P x Anger DES	1	.00	.00	.97
P x Action Tend	1	1.84	.17	.18
P x G	1	.06	.00	.80
P x C	2	1.29	.20	.28
P x G x C	2	4.15*	.36	.02
Within-group error	58	(1.77)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$ .

tendencies were analyzed separately from DES shame/shyness. Thus the 2 x 3 x 2 ANCOVA was then conducted using the composite of shame action tendencies

as the covariate. This was for the purpose of testing whether controlling for action tendencies associated withdrawal behaviors would change the nature of the effect of the conditions on comprehension. When controlling for shame action tendency, there was a significant effect for passage (see Table 17), such that the non-social passage ( $M = 3.09$ ,  $SD = 1.38$ ,  $N = 66$ ) received lower mean scores compared to the social passage ( $M = 3.86$ ,  $SD = 1.45$ ,  $N = 66$ ). There was also a significant passage by gender by condition interaction. To break down the interaction, simple interaction tests were conducted separately for each passage. For the non-social passage, the condition by gender simple interaction was not significant  $F(2,58)=1.27$ ,  $p = .29$ ,  $\eta = .20$ . For the social passage, the condition by gender simple interaction was significant  $F(2,59)=3.77$ ,  $p = .03$ ,  $\eta = .33$  (see Figure 4).



Figure 4. Effects of Gender and Condition on Social Comprehension Scores, Controlling for Ranked Shame Action Tendencies

To break down the simple interaction, simple effect tests were conducted by gender. For male performance on the social passage, there was a significant effect for condition,  $F(2,38)=5.67$ ,  $p = .01$ ,  $\eta = .48$ . Simple contrasts were used to determine which of the three means differed from each other. These contrasts indicated that for males, while controlling for shame action tendencies, performance on the social passage was poorer in the alone-in-life condition ( $M = 3.38$ ,  $SD = 1.47$ ,  $N = 21$ ) compared to the inclusion condition ( $M = 4.52$ ,  $SD = 1.38$ ,  $N = 23$ ), (difference =  $-1.77$ ,  $SE = .53$ ,  $p < .01$ ). For female performance on the social passage, however, there was no simple effect of condition  $F(2,20)=2.63$ ,  $p = .10$ ,  $\eta = .46$ .

To summarize, the effects of social exclusion on comprehension scores was weak, and did not appear to be accounted for by emotions. While the effect of exclusion on comprehension was not significant without controlling for emotions, controlling for emotions either did not change this effect or had an effect opposite to my hypothesis, such that the effect of condition on comprehension was only significant after controlling for relief. Furthermore, controlling for other emotions (i.e., anger, shame action tendencies) also had the effect that exclusion decreased comprehension scores for males on the social passage. This is more consistent with Baumeister et al.'s explanation than those hypothesized in the present study.

Table 17.

*Analysis of Covariance for Passage, Gender, and Condition Controlling for Ranked Shame Action Tendency*

Source	<i>df</i>	<i>F</i>	$\eta$	<i>p</i>
Between subjects				
Shame Action	1	1.59	.17	.21
Gender (G)	1	.20	.00	.66
Condition (C)	2	3.43*	.32	.04
G x C	2	1.23	.20	.30
Within-group error	59	(1.91)		
Within subjects				
Passage (P)	1	6.87*	.32	.01
P x Shame Act	1	1.87	.17	.18
P x G	1	.22	.00	.64
P x C	2	1.13	.20	.33
P x G x C	2	3.75	.33	.03
Within-group error	59	(1.75)		

Note. Values enclosed in parentheses represent mean square errors. \* $p < .05$

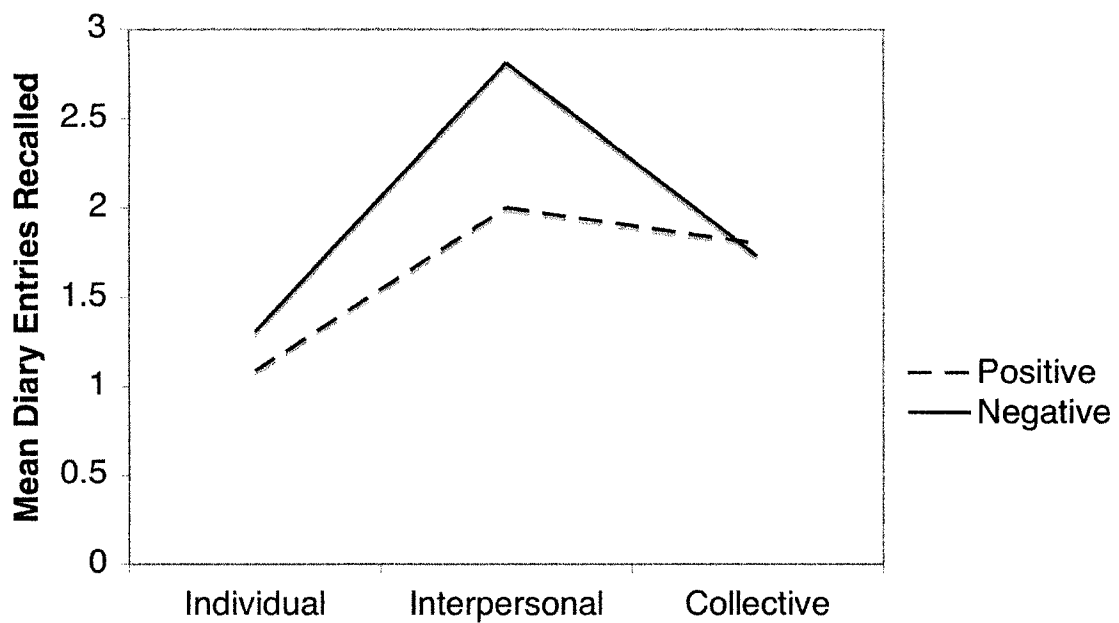
## **Effects of Gender, Condition, Social Level, and Valence on Diary Recall**

### *Effects of Gender, Condition, Social Level, and Valence on Diary Recall Without Controlling for Emotions*

The next set of analyses concerned the effects of condition, gender, social content of the diary entries, and valence of the diary entries, on the participants' recollection of the diary entries. First, the effects were examined without controlling for any emotions, to provide a baseline against which to control the analyses that included emotion variables as covariates.

When emotions were not controlled, there was a significant main effect for social,  $F(2,226)=87.64$ ,  $p < .01$ ,  $\eta = .66$ , qualified by a social by valence interaction,  $F(2,226)=17.25$ ,  $p < .01$ ,  $\eta = .36$  (see Figure 5).

To break down the interaction, the effect of social level of diary entries was conducted for each valence. For positive events, there was a significant effect for social,  $F(2,228)=29.26$ ,  $p < .01$ ,  $\eta = .45$ . Simple contrasts indicated that both interpersonal ( $M = 2.00$ ,  $SD = .91$ ,  $N = 120$ ) and collective events ( $M = 1.80$ ,  $SD = 1.16$ ,  $N = 120$ ) were recalled more frequently compared to individual events ( $M = 1.09$ ,  $SD = .88$ ,  $N = 120$ ),  $F(1,114)=64.26$ ,  $p < .01$ ,  $\eta = .60$ , and  $F(1,114)=29.81$ ,  $p < .01$ ,  $\eta = .46$ , respectively. For negative valence, there was



**Figure 5. Valence by Social Interaction Without Controlling for Emotions**

also a significant simple effect for social,  $F(2,230)=94.79, p < .01, \eta = .67$ .

Bonferroni corrected follow-up tests indicated that both interpersonal ( $M = 2.81, SD = .87, N = 121$ ) and collective ( $M = 1.73, SD = 1.06, N = 121$ ) negative events were recalled more frequently compared to individual ( $M = 1.31, SD = .87, N = 121$ ) negative events,  $F(1,115)=176.69, p < .01, \eta = .78$ , and  $F(1,115)=14.24, p < .01, \eta = .33$ , respectively.

The omnibus test also indicated that there was a significant valence by condition interaction,  $F(2,113)=5.41, p = .01, \eta = .28$  (see Figure 6).

To break down the interaction, the effect of valence was examined for each condition. For the inclusion participants, there was not a significant effect for valence, although the trend was toward significance,  $F(1,39)=3.93, p = .06, \eta = .30$ . For excluded participants, on the other hand, there was a very strong effect



**Figure 6. Condition by Valence Interaction Without Controlling for Emotions**

for valence,  $F(1,38)=41.75$ ,  $p < .01$ ,  $\eta = .72$ , such that negative events ( $M = 2.00$ ,  $SD = .63$ ,  $N = 40$ ) were recalled better than positive events ( $M = 1.45$ ,  $SD = .57$ ,  $N = 40$ ). For accident-prone participants, there was also a simple effect for valence,  $F(1,36)=4.82$ ,  $p = .04$ ,  $\eta = .35$ , such that negative events ( $M = 1.97$ ,  $SD = .63$ ,  $N = 38$ ) were recalled better than positive events ( $M = 1.76$ ,  $SD = .68$ ,  $N = 38$ ).

*Effects of Gender, Condition, Social Level, and Valence on Diary Recall, Covarying for Emotion*

To test the effects of specific emotions on memory for positive and negative and social vs. non-social events,  $2 \times 3 \times 2 \times 3$  mixed ANCOVAs for gender, condition, valence (positive vs. negative), and social (individual vs. interpersonal vs. collective) were conducted covarying for either DES emotional

feelings or DES feelings and action tendencies on recall of diary entries.

Consistent with the analyses above for effects of manipulations on emotions, the first set of analyses concerns DES emotions that did not have measured action tendencies, and the second set of analyses includes those that did.

*Effects on Diary Recall Covarying for DES Emotions.*

*Sadness.* First, the 2 x 3 x 3 x 2 ANCOVA was conducted using sadness as the covariate. This was for the purpose of testing whether controlling for an emotion with withdrawal action tendencies would change the nature of the effects of the manipulations on diary recall. Controlling for sadness, there was a valence by condition interaction,  $F(2,96)=6.82$ ,  $p < .01$ ,  $\eta = .35$  (see Figure 7).



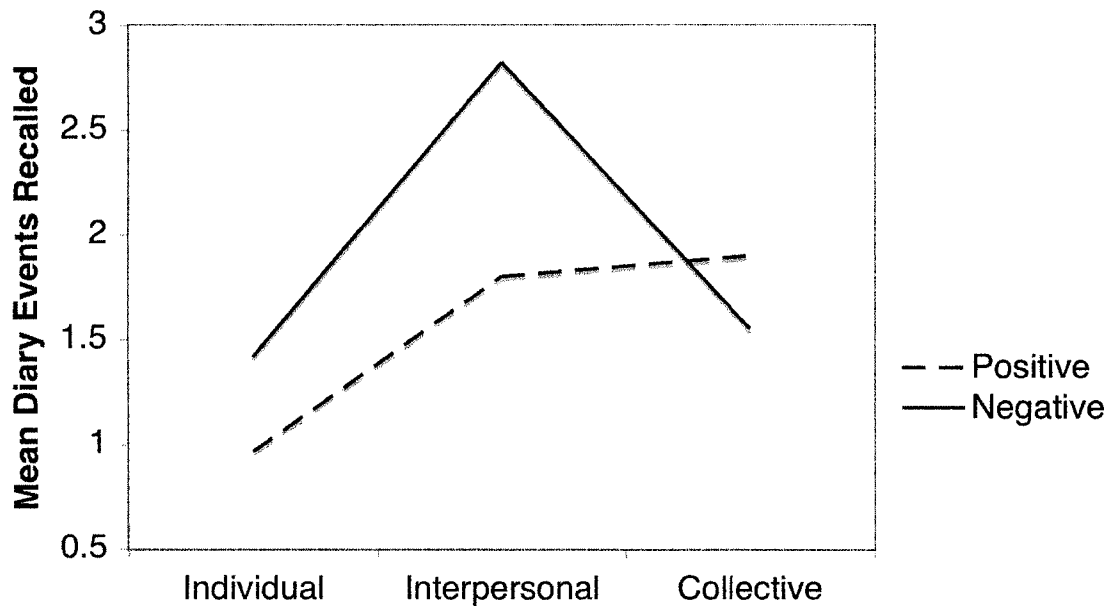
**Figure 7. Effects of Valence of Diary Events and Experimental Condition on Number of Diary Events Recalled, Controlling for Sadness**

To follow up the interaction, simple effect tests were conducted separately for each condition to test for simple effects of valence. For inclusion, there was not a

significant effect for valence,  $F(1,32)=.80$ ,  $p = .38$ ,  $\eta = .20$ . For alone-in-life, there was a significant effect for valence,  $F(1,32)=7.09$ ,  $p = .01$ ,  $\eta = .42$ , such that negative events ( $M = 2.03$ ,  $SD = .59$ ,  $N = 35$ ) were remembered better than positive events ( $M = 1.45$ ,  $SD = .53$ ,  $N = 35$ ). For accident-prone condition, there was not a significant effect for valence,  $F(1,30)=.00$ ,  $p = .98$ ,  $\eta = .00$ . Thus when controlling for sadness, it was found that participants in the alone-in-life condition remembered negative events better than positive events.

Omnibus tests also indicated that there was a significant effect for social  $F(2,192)=17.51$ ,  $p < .01$ ,  $\eta = .39$ . However, this was qualified by a significant social by valence by sadness interaction,  $F(2,192)=5.06$ ,  $p = .01$ ,  $\eta = .22$ . To break down the interaction, tests of simple social by valence interactions were conducted separately for individuals with high and low sadness scores. A median split was conducted on sadness scores to create two groups (high vs. low). For individuals rating low on sadness, there was a social by valence interaction,  $F(2,92)=4.30$ ,  $p = .02$ ,  $\eta = .30$ . To follow up the simple interaction, simple effect tests were conducted separately for valence. For positive diary entries among individuals low on sadness, there was a simple effect for social,  $F(2,92)=9.04$ ,  $p < .01$ ,  $\eta = .40$ . Simple contrasts, with Bonferroni correction for Type I error, indicated that the interpersonal positive diary entries ( $M = 2.13$ ,  $SD = 1.0$ ,  $N = 52$ ) were remembered better than the individual positive diary entries ( $M = 1.27$ ,  $SD = .87$ ,  $N = 52$ ),  $F(1,46)=21.14$ ,  $p < .01$ ,  $\eta = .57$ ; however, the collective positive diary entries ( $M = 1.70$ ,  $SD = 1.30$ ,  $N = 52$ ) were not remembered significantly

better than the individual positive diary entries,  $F(1,46)=3.90$ ,  $p = .10$ ,  $\eta = .28$ . For negative diary entries among individuals low on sadness, the same pattern was significant, except that it was a greater effect,  $F(2,92)=47.88$ ,  $p < .01$ ,  $\eta = .71$ . Simple contrasts using Bonferroni correction indicated that both interpersonal ( $M = 2.76$ ,  $SD = .79$ ,  $N = 52$ ) and collective ( $M = 1.89$ ,  $SD = 1.00$ ,  $N = 52$ ) diary entries were remembered better compared to the individual negative diary entries ( $M = 1.22$ ,  $SD = .87$ ,  $N = 52$ ),  $F(1,46)=111.39$ ,  $p < .01$ ,  $\eta = .84$ , and  $F(1,46)=15.39$ ,  $p < .01$ ,  $\eta = .50$ , respectively. For individuals high on sadness, there was also a simple social by valence interaction,  $F(2,74)=16.83$ ,  $p < .01$ ,  $\eta = .56$  (see Figure 8).



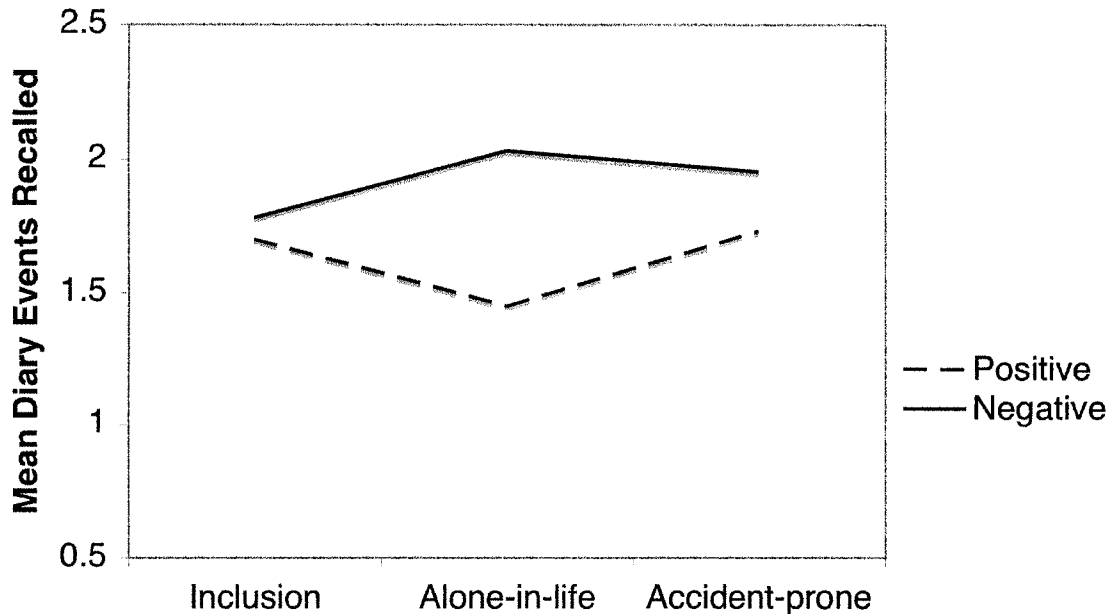
**Figure 8. Social by Valence Interaction for Individuals High on Sadness**

To follow up the interaction, simple effect tests were conducted for each valence. For positive diary entries, there was a significant effect for social,  $F(2,74)=12.85$ ,

$p < .01$ ,  $\eta = .51$ . Simple contrasts indicated that both the interpersonal ( $M = 1.80$ ,  $SD = .85$ ,  $N = 43$ ) and collective ( $M = 1.90$ ,  $SD = 1.11$ ,  $N = 43$ ) positive diary entries were remembered better compared to the individual entries ( $M = .97$ ,  $SD = .85$ ,  $N = 43$ ),  $F(1,37)=23.36$ ,  $p < .01$ ,  $\eta = .62$ , and  $F(1,37)=18.25$ ,  $p < .01$ ,  $\eta = .57$ , respectively, similar to the results for low sadness individuals. For individuals high on sadness and negative diary entries, there was a significant effect for social,  $F(2,78)=29.01$ ,  $p < .01$ ,  $\eta = .66$ . Simple contrasts indicated that the interpersonal entries ( $M = 2.82$ ,  $SD = 1.07$ ,  $N = 45$ ) were remembered better than the individual entries ( $M = 1.42$ ,  $SD = 1.01$ ,  $N = 45$ ),  $F(1,39)=35.95$ ,  $p < .01$ ,  $\eta = .69$ ; however, the collective negative events ( $M = 1.55$ ,  $SD = .94$ ,  $N = 45$ ) were not more likely to be remembered compared to the negative individual events  $F(1,39)=.55$ ,  $p = .92$ ,  $\eta = .10$ . Thus for individuals high in sadness, the tendency for collective negative events to be remembered better than individual negative events did not hold.

*Shame/Shyness.* The  $2 \times 3 \times 3 \times 2$  ANCOVA was then conducted using shame/shyness as the covariate. This was for the purpose of testing whether controlling for another emotion with withdrawal action tendencies, particularly one expected to be elicited by social exclusion, would change the nature of the effects of the manipulations on diary recall. Controlling for shame/shyness, there was a significant effect for valence,  $F(1,96)=7.19$ ,  $p = .01$ ,  $\eta = .26$ , qualified by a valence by condition interaction,  $F(2,96)=7.85$ ,  $p < .01$ ,  $\eta = .37$  (see Figure 9).

To examine whether positive and negative events were remembered differently for each condition, the interaction was broken down by condition. For inclusion participants, there was a significant effect for valence,  $F(1,32)=4.80$ ,  $p = .04$ ,  $\eta = .36$ , such that negative events ( $M = 1.78$ ,  $SD = .53$ ,  $N = 35$ ) were

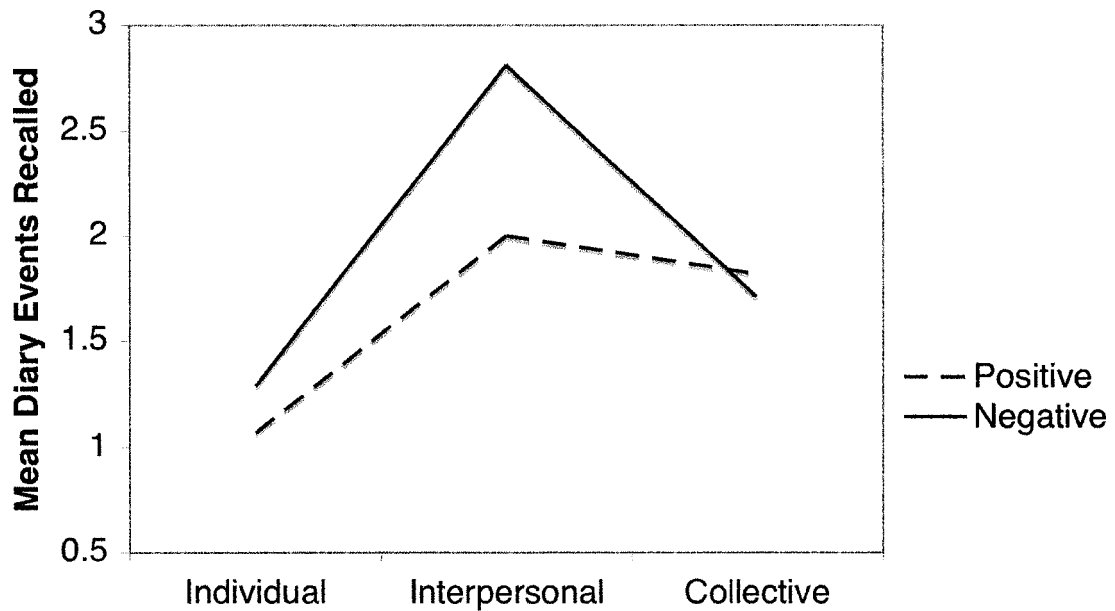


**Figure 9. Condition by Valence Interaction Controlling for Shame/Shyness**

recalled more frequently than positive events ( $M = 1.70$ ,  $SD = .59$ ,  $N = 35$ ). For alone-in-life participants, there was also an effect for valence,  $F(1,32)=9.40$ ,  $p < .01$ ,  $\eta = .48$ , such that negative events ( $M = 2.03$ ,  $SD = .59$ ,  $N = 35$ ) were recalled more frequently compared to positive events ( $M = 1.45$ ,  $SD = .53$ ,  $N = 35$ ). For accident-prone participants, however, there was not a significant effect of valence,  $F(1,30)=.09$ ,  $p = .76$ ,  $\eta = .00$ . Thus when controlling for shame/shyness, inclusion and alone-in-life conditions led to greater recall for

negative information whereas there was no difference in recall for negative vs. positive diary information for the accident-prone condition participants.

There was also a main effect for social,  $F(2,192)=15.63$ ,  $p < .01$ ,  $\eta = .37$ , qualified by a social by valence interaction,  $F(2,192)=3.60$ ,  $p = .03$ ,  $\eta = .20$  (see Figure 10).



**Figure 10. Social by Valence Interaction Controlling for Shame/Shyness**

To break down the interaction, the effect of social was analyzed for each valence. For positive events, there was a significant effect for social,  $F(2,194)=4.00$ ,  $p = .02$ ,  $\eta = .20$ . Simple contrasts with Bonferroni correction indicated that the interpersonal ( $M = 2.00$ ,  $SD = .91$ ,  $N = 103$ ) positive events were recalled more frequently compared to individual ( $M = 1.07$ ,  $SD = .81$ ,  $N = 103$ ) positive events,  $F(1,97)=8.95$ ,  $p = .01$ ,  $\eta = .28$ , whereas collective ( $M = 1.82$ ,  $SD = 1.22$ ,  $N = 103$ ) positive events and individual positive events did not differ significantly

$F(1,97)=3.80, p = .10, \eta = .20$ . For negative events, there was also a simple effect for social,  $F(2,196)=17.46, p < .01, \eta = .39$ . Bonferroni simple contrasts indicated that negative interpersonal ( $M = 2.81, SD = .91, N = 103$ ) events received higher ratings compared to negative individual ( $M = 1.29, SD = .91, N = 103$ ) events,  $F(1,98)=31.51, p < .01, \eta = .49$ , whereas this was not found for the negative collective ( $M = 1.71, SD = 1.01, N = 103$ ) events,  $F(1,98)=3.74, p = .12, \eta = .20$ . Thus these findings are similar to those found in the findings for low sadness.

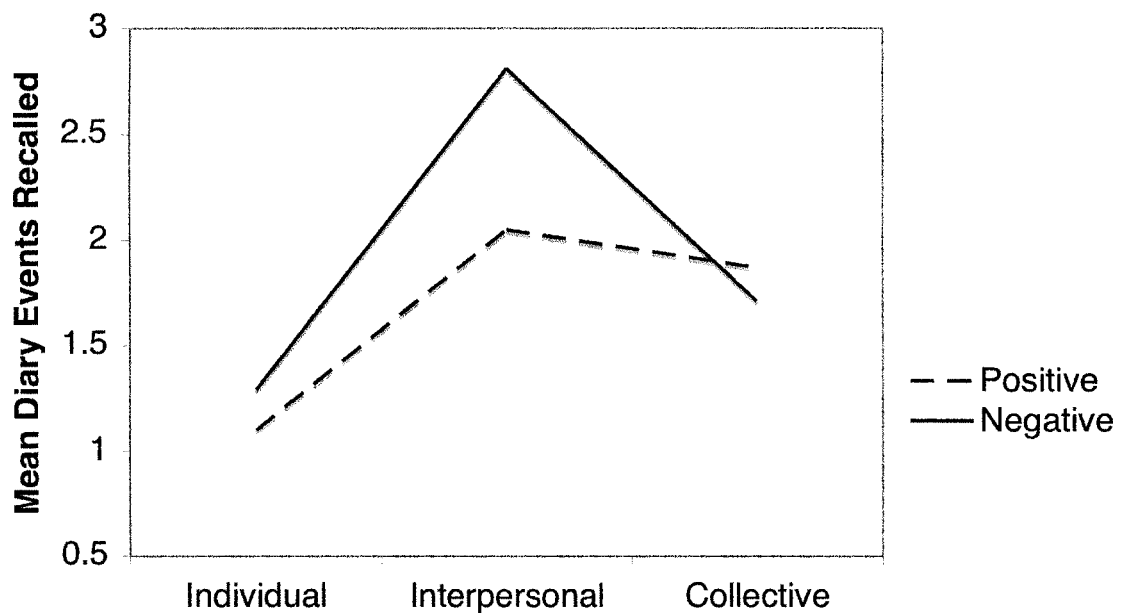
*Relief.* The  $2 \times 3 \times 3 \times 2$  ANCOVA was then conducted using post-experimental relief as the covariate. This was for the purpose of testing whether controlling for a proxy measure of emotion would change the nature of the effects of the manipulations on diary recall. When controlling for relief, there was a main effect for social,  $F(2,130)=7.27, p < .01, \eta = .32$ . Simple contrasts indicated that, across all other conditions, interpersonal events ( $M = 2.44, SD = .76, N = 72$ ) were recalled more frequently compared to individual events ( $M = 1.18, SD = .68, N = 72$ ),  $F(1,65)=14.92, p < .01, \eta = .44$ . There were no other significant differences or interactions. Thus controlling for relief eliminated the social by valence interaction and valence by condition interactions seen in previous analyses.

*Effects on Diary Entry Recall Covarying for DES Emotions with Associated Action Tendencies.*

Next, 2 x 3 x 3 x 2 mixed ANCOVAs for effects of gender, condition, social level, and valence covarying for DES composites and action tendencies on diary recall scores were conducted.

*Anger.* First, the 2 x 3 x 3 x 2 ANCOVA was conducted using anger the DES composite and action tendencies composites as the covariates. This was for the purpose of testing whether controlling for an emotion with activating action tendencies would change the nature of the effects of the manipulations on diary recall. When controlling for anger emotions and action tendencies, there was a significant effect of social,  $F(2,116)=5.05$ ,  $p = .01$ ,  $\eta = .28$ , qualified by a social by valence interaction,  $F(2,116)=3.48$ ,  $p = .03$ ,  $\eta = .24$  (see Figure 11).

To break down the social by valence interaction, the effect of social was analyzed for each valence. For positive events, there was not a significant simple



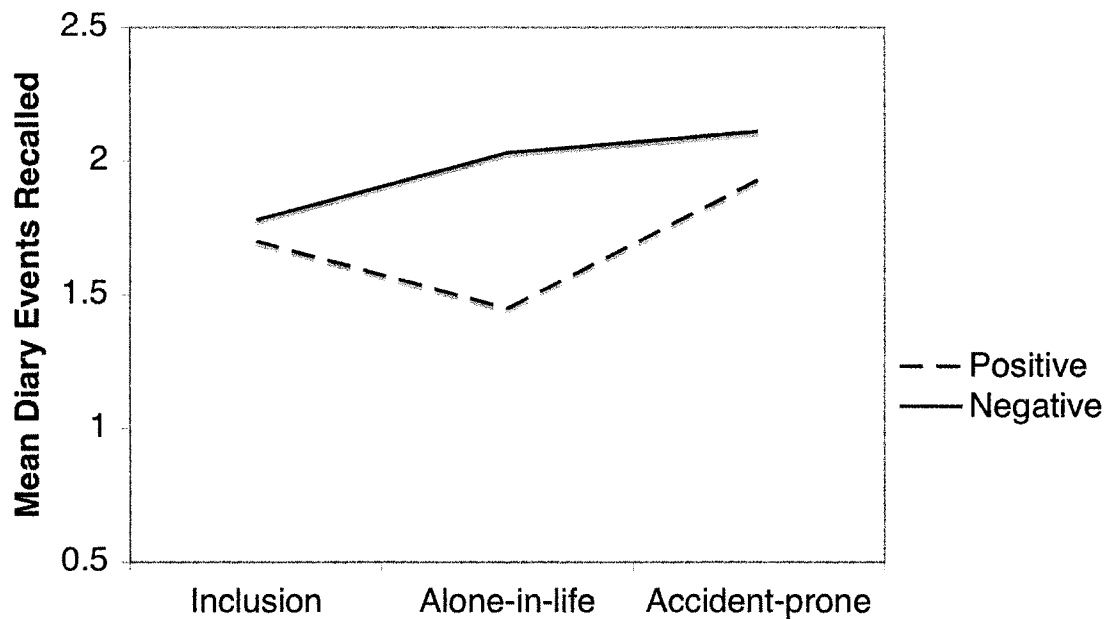
**Figure 11. Social by Valence Interaction, Controlling for Anger**

effect for social,  $F(2,116)=.74$ ,  $p = .48$ ,  $\eta = .10$ . For negative events, there was a significant simple effect for social,  $F(2,116)=9.15$ ,  $p < .01$ ,  $\eta = .37$ . Simple contrasts indicated that negative interpersonal ( $M = 2.81$ ,  $SD = .76$ ,  $N = 72$ ) events received higher ratings compared to negative individual ( $M = 1.29$ ,  $SD = .76$ ,  $N = 72$ ) events,  $F(1,58)=18.11$ ,  $p < .01$ ,  $\eta = .49$ , whereas the difference between negative individual and negative collective ( $M = 1.71$ ,  $SD = .59$ ,  $N = 72$ ) events only approached significance,  $F(1,58)=5.33$ ,  $p = .06$ ,  $\eta = .28$ . Interestingly, controlling for anger eliminated the significant difference in recall scores across social conditions when the information being recalled was positive.

The main effect for condition also was significant,  $F(2,58)=3.11$ ,  $p = .05$ ,  $\eta = .32$ . However, follow-up tests indicated that the difference between alone-in-life and inclusion means were not significant, nor was the difference between the means for accident-prone and inclusion conditions. Examination of the means indicated that alone-in-life participants remembered the least number of diary entries ( $M = 1.62$ ,  $SD = .64$ ,  $N = 24$ ), followed by inclusion ( $M = 1.72$ ,  $SD = .60$ ,  $N = 25$ ) and accident-prone ( $M = 2.04$ ,  $SD = .62$ ,  $N = 23$ ) participants. Unlike previous analyses, there was not a significant valence by condition interaction.

*Shame.* The  $2 \times 3 \times 3 \times 2$  ANCOVA was then conducted using shame action tendency as the covariate. This was for the purpose of testing whether controlling for withdrawal action tendencies expected in situations involving exclusion would change the nature of the effects of the manipulations on diary recall. When controlling for shame action tendencies, there was a main effect for

social,  $F(2,118)=4.69$ ,  $p = .01$ ,  $\eta = .26$ . Simple contrasts indicated that interpersonal ( $M = 2.45$ ,  $SD = .91$ ,  $N = 103$ ) events were recalled more frequently compared to individual ( $M = 1.19$ ,  $SD = .81$ ,  $N = 103$ ) events,  $F(1,59)=10.85$ ,  $p < .01$ ,  $\eta = .40$ . There was also a significant valence by condition interaction,  $F(2,59)=3.58$ ,  $p = .03$ ,  $\eta = .33$  (see Figure 12).



**Figure 12. Condition by Valence Interaction, Controlling for Shame Action Tendencies**

To follow up the interaction, the effect of valence was examined separately for each condition. For inclusion participants, there was a simple effect for valence,  $F(1,32)=4.80$ ,  $p = .04$ ,  $\eta = .36$ , such that negative events ( $M = 1.78$ ,  $SD = .53$ ,  $N = 35$ ) were recalled more frequently compared to positive events ( $M = 1.70$ ,  $SD = .59$ ,  $N = 35$ ). For alone-in-life participants, there was also a significant simple effect for valence,  $F(1,32)=9.40$ ,  $p < .01$ ,  $\eta = .23$ , such that negative events ( $M = 2.03$ ,  $SD = .59$ ,  $N = 35$ ) were recalled more frequently than positive events ( $M =$

1.45,  $SD = .53$ ,  $N = 35$ ). For accident prone participants, the simple effect of valence was not significant,  $F(1,30) = .09$ ,  $p = .76$ ,  $\eta = .00$ . No other main effects or interactions were significant.

To summarize, diary recall results did not support the second hypothesis. Across all analyses, participants in the exclusion condition were no more likely to recall social events compared to participants in the other conditions. Rather, the only effect of cognition on overall recall of events was when controlling for anger, the exclusion participants recalled fewer diary events compared to other conditions, and this effect approached significance. On the other hand, diary recall results did indicate a trend such that interpersonal events were recalled better compared to individual events, and the exclusion manipulation produced an effect on recall where except when controlling for relief, excluded participants were more likely to remember negative compared to positive events.

## Discussion

### **Effects of Conditions on Emotions**

The greatest effect of the manipulations on reported emotional feelings was found for post-debriefing relief. For relief, there was a main effect for condition, with alone-in-life participants reporting greater relief compared to inclusion participants. Relief is an emotion that is experienced when an event that elicits negative emotion is removed (Roseman, Antoniou, & Jose, 1996). Thus, even though relief is a positive emotion, relief upon finding out that one is *not* predisposed to be alone indicates that one was previously experiencing negative

emotion relating to the belief that one *would* be alone in life, and indicates that individuals in this condition experienced more negative reactions to the manipulation compared to other conditions. This is consistent with previous research finding that exclusion does in fact produce negative emotions (Craighead et al., 1979; Fenigstein, 1979; Geller et al., 1974; Stroud et al., 2000; Williams, Cheung, & Choi, 2000; Williams & Sommer, 1997).

In terms of participants' reports of specific emotions and action tendencies, findings provided only partial support for hypotheses. For anger, there was a significant effect for condition, such that individuals in the exclusion condition were less likely to report angry action tendencies, consistent with the hypothesis that alone-in-life feedback would elicit more withdrawal emotions like sadness and shame than activating emotions like anger. For sadness, results were in the expected direction, with alone-in-life participants experiencing more sadness compared to other participants, but with the effect only approaching significance. With greater power this effect may have been significant, so this finding warrants further study with a larger sample. Such a finding, if significant, would be consistent with our first hypothesis, that the alone-in-life condition would elicit more of the withdrawal emotions of sadness shame and less of the activating emotion of anger. Neither the effect of the conditions on shame feelings nor shame action tendencies was significant, however, contrary to prediction. Thus, our hypothesis that exclusion would elicit withdrawal emotions in particular was only partially and weakly supported.

One reason for this may be that the self-reports of DES emotions and action tendencies, which were the only measures that enabled distinction between specific passive and active emotions, are both subject to social desirability effects. This is evidenced by the fact that *post-experimental* relief, the only measure that was positive and desirable in its context, was most strongly affected by condition. I concluded that post-experimental relief was therefore the best proxy measure for emotion effects produced by the experimental conditions because social desirability did not operate to attenuate ratings of relief. While post-experimental relief was not correlated with anger or sadness measures, the concept of relief from a negative state implicates the experience of negative emotions being elicited at some point. One emotion that was not measured but which could have been elicited by the study was worry/anxiety, which might have been elicited given the fact that the exclusion was perceived as a *possible* future event. It is possible that this emotion, or some combination of all of the negative emotions, was related to relief.

Nevertheless, future research should be conducted to understand the nature of emotion measurement in terms of social desirability affecting emotion ratings and why relief may not be related to rated emotional states at the time of the exclusion experience. While an emotion perspective suggests that relief involves negative emotion, it is possible that this negative emotion was not felt consciously, and was not reportable. This possibility is also consistent with Baumeister's self-regulation of emotion explanation. According to the self-

regulation explanation, an individual regulates emotion so as to not feel this negative emotion, and thus they may experience relief after the stressor is removed without experiencing negative emotion at the time (or immediately after) the stressor was introduced. Future research is needed to understand the relationship between emotional states and post-experimental relief in order to understand how relief may be interpreted in terms of emotions.

In the present study, however, I interpreted the relief finding as likely to be indicative of problems of socially desirable responding leading to attenuation of emotion effects. Social desirability is especially likely for the emotions of sadness and shame, since Western culture considers emotions that are both negative and passive to be especially undesirable. This is problematic for studies such as the present where measurement of sadness and other withdrawal emotions is particularly important. However, while the results are somewhat weak with respect to our hypotheses, these emotion effects do show the importance of differentiating specific emotions, particularly sadness and anger, when measuring emotions, by demonstrating that these emotions produced different trends (in fact opposite trends) from each other. Although the more socially desirable post-experimental measure (relief) was effective in capturing the effects of the manipulations on emotion, moreover, unfortunately, it is a non-specific measure that only indicates that some negative emotion has been elicited. Thus, one suggestion for future research is to develop measures of emotions that are not only less subject to social desirability effects but are *also* able to measure

*specific* emotions. One possibility for conducting this type of research is to use a forced-choice format, where participants are asked to choose between two or more emotions, rather than rating each item independently on a scale that allows them to deny the experience of any emotional response.

In terms of the implications of these emotion findings for the Belongingness Perspective, these results address both the second and fourth tenets of the belongingness hypothesis. The second tenet states that exclusion should affect emotions. While emotion effects were not strong in the present study, I was able to conclude that some form of emotion was elicited (via the finding for post-experimental relief) by manipulating the presence or absence of fulfillment of the need to belong, and that the emotional response elicited from threats to this need are more likely to involve emotions that elicit withdrawal tendencies compared to those that elicit activating behavioral tendencies (e.g., the sadness and anger findings). The fourth tenet states that when the need to belong is not met, there will be negative consequences for the organism. To the extent that negative emotions produce negative effects for the individual, these results may also be interpreted as showing negative consequences under circumstances that involve exclusion. This is especially pertinent when exclusion unnecessarily produces withdrawal behaviors that lead to relinquishing of the goal of fulfilling a social need. Future research should be conducted to understand the process of exclusion leading to emotions with withdrawal action

tendencies and the effects on social behavior and long-term social outcomes for individuals.

### **Effects of Exclusion and Content Relevance of Materials on Comprehension, Controlling for Emotions**

The hypothesis that exclusion would produce enhanced processing of social information when anger was experienced was not supported. Rather, our findings that performance on the comprehension tests, especially for males on the social passage, was worse for participants in the alone in life condition were more consistent with Baumeister, Twenge, and Nuss's (2002) prior results. Although the condition main effect did not reach significance when no covariates were included, and although emotion covariates never contributed significantly to results, when certain covariates were included, some significant effects of condition were observed.

The strongest effect of the alone-in-life manipulation on passage comprehension was found when relief, the best proxy variable for emotion produced by the experimental manipulation, was controlled. This analysis revealed a significant effect for condition, such that alone-in-life participants showed significantly poorer comprehension scores compared to included participants. This replicates Baumeister, Twenge, and Nuss's (2002) finding that emotion did not account for the cognitive impairment among excluded individuals. Furthermore, controlling for some emotions (i.e., anger and shame), produced a significant gender by passage by condition interaction indicating that males'

performance on the *social* (but not the non-social) passage was worse if they had been told they would be alone in life. The results of these analyses, too, provided some support for the Baumeister, et al. finding of impaired higher-order processing and not for the hypothesized enhancement of processing of relevant (i.e., social) information, although the effects were weak and were not robust across gender or comprehension tasks.

### **Effects of Conditions and Social Relevance on Diary Recall, Controlling for Emotions**

The hypothesis that social relevance would affect recall in the exclusion condition was also not supported for the memory task. Excluded participants were no more likely to recall social events compared to other participants. Rather, in general participants remembered social events more than individual events, consistent with the belongingness theory's interpretation of how the need to belong affects everyday cognition (see Baumeister & Leary, 1995), or perhaps because, as students of psychology, they were more interested in interactions with people than in solitary events. Therefore, Gardner, Pickett, and Brewer's (2000) results were not replicated. Rather, the only significant finding for the effects of condition on overall memory performance was more consistent with an impaired processing perspective. Specifically, when controlling for anger, alone-in-life individuals remembered the fewest total diary entries compared to the other conditions. However, the finding that alone-in-life participants recalled fewer diary events actually contradicts Baumeister et al.'s (2002) explanation that the

effects on higher-order processing are due to self-regulation of affect. In fact, it supports the explanation that the decrement in reasoning is not due to self-regulation of affect, but rather to rumination or distraction. According to Baumeister et al. (2002), decrement of processing on both difficult (comprehension) and easy (rote memory) tasks would be evidence that the alone-in-life manipulation is causing the participant to ruminate about the feedback, leading to distraction from the task at hand. While this explanation received only partial support, in that the accident-prone condition did not have similar effects, it is possible that this could be explained by the participants' greater concern about facing a future alone than with having more mishaps. Further research is needed to determine whether participants ruminate more about being alone in life than being accident prone, as well as to distinguish whether cognitive effects are due to self-regulation of affect or rumination/distraction under varying conditions.

Along these lines, another possibility, which would also explain the discrepancy between Gardner et al.'s (2000) findings and the findings generated by the alone-in-life paradigm, is that alone-in-life feedback is not actually an optimal manipulation for eliciting both affective and cognitive aspects of exclusion. This feedback is a long-term informational source of exclusion, whereas Gardner et al.'s study involved a real-time experimental form of exclusion, where participants experienced exclusion directly. This is important because alone-in-life feedback only *predicts* exclusion. Participants may not be

likely to experience a specific or conscious emotion if they are faced with something that is “likely” to happen compared to something that is happening at the moment.

One reason for this is that reacting to something that might happen in the future is a largely cognitive exercise. It requires attention and reflection to produce an imagined experience, whereas dealing with a present situation is naturally attended to and may also therefore involve not only cognition but lower brain processing of social cues, emotional associations, and other implicit processes that can also produce an emotional experience (e.g., in the amygdala). Moreover, these two explanations are by no means mutually exclusive; the fact that the exclusion has not yet occurred may also contribute to the paradigm’s tendency to elicit rumination because such future-oriented information would be expected to cause participants to ruminate about ways to prevent the occurrence of the exclusion. In contrast, real time exclusion would preclude such preventative measures.

Another reason participants may be unlikely to experience conscious and discrete emotion from the alone-in-life prediction is that if it is not consistent with their self-concept, expectations, and past experiences (which for many it probably is not), participants should experience a discrepancy that leads to a cognitive process of questioning this feedback and trying to reconcile this surprising information with their past experiences and what they already believe about themselves (M. D. Slater, personal communication, 2004). Furthermore,

the fact that references to marriage were included as part of the experimental manipulation may preclude this manipulation from being relevant to all participants. For example, individuals who are not planning on getting married or who have a different sexual orientation may not be affected by this information. These issues, of lack of immediacy and elicitation of cognitive dissonance, could explain both why the results were not consistent with Gardner et al.'s findings as well as why the rumination/distraction explanation may be a more plausible one for why emotion has not played a part in the results generated by the alone-in-life paradigm. Furthermore, problems with generalizability of some of the information may weaken the strength of the information's effects on emotions for some participants.

With respect to the tenets of the belongingness hypothesis, these results address the fourth tenet in particular. The fourth tenet states that threats to the need to belong, or the absence of the fulfillment of this need, have negative consequences for the individual. If we assume that the present manipulation does in fact have the expected effect on individuals, in that it does impose the experience of exclusion, the results of the present study provide partial support for previous research showing that threats to the need to belong require the individual to focus or exert energy towards regulating negative affect, leading to an impaired ability to engage in cognitive processing. This may be particularly the case for higher-order processing such as comprehension. However, future

research is needed to clarify the strength of this effect, the situations under which it occurs, and the mechanism by which this effect on cognition is produced.

### *Diary Findings*

*Recall for social information.* Across conditions and emotions, the pattern of results indicated that interpersonal events were recalled more readily than individual or collective events. This difference was particularly pronounced if the information was negative in valence and when controlling for post-experimental relief, shame/shyness, and shame action tendencies. While there were some variations in this effect depending on which emotion was being controlled for (e.g., individuals rating high on sadness were not less likely to remember individual negative events compared to collective negative events, and controlling for anger produced these effects only for negative events), this general trend supports the belongingness hypothesis that the need to belong has an impact on cognition.

This finding is most pertinent to the third tenet of the belongingness hypothesis. The third tenet states that the need to belong affects and directs cognitive processing. According to the Theory of the Need to Belong, the evolved tendency to seek belonging affects how we think about events, and predicts that “people will devote considerable cognitive processing to interpersonal interactions and relationships” (Baumeister & Leary, 1995, p. 503), especially those that are personally relevant (Sedikides, Olsen, & Reis, 1993). The results of the present study are consistent with this prediction and the prior research

supporting it, in that they indicate that, irrespective of whether or not the need to belong is being threatened or fulfilled, individuals are more likely to remember social events compared to events that are highly individualized. In addition to providing support for this tenet of the belongingness hypothesis, the present study also expands what we know from previous literature by showing that sociality not only affects cognition when there are implications for the self (Baumeister & Leary, 1995), but it also applies to cognition regarding interpersonal events happening to a stranger in hypothetical diary entries.

*Mood Congruent Memory effects.* Most important, however, was the finding that alone-in-life participants were most likely to show a significant difference in the tendency to remember negative over positive events. This is consistent with mood-congruent memory effects. Mood congruent memory (MCM) refers to “the observation that a given mood tends to enhance the encoding or retrieval of target events that share the same affective valence” (Eich & Macaulay, 2000, p. 244). In the present study, except when controlling for the proxy emotion measure of post-experimental relief, there was a significant condition by valence interaction, such that the alone-in-life participants recalled more negative events compared to positive events, and this difference was more robust among the alone-in-life participants compared to the inclusion or accident-prone participants. The fact that this finding was eliminated when relief was controlled may indicate that, while relief itself was not significant, this proxy variable of negative emotion may have partially accounted for the effect. This is

consistent with research showing that individuals are more likely to encode and recall events that are consistent with their emotional state (see Eich, Kihlstrom, Bower, Forgas, & Niedenthal, 2000 for review).

This finding is most relevant to the third tenet of the belongingness hypothesis, regarding how the need to belong affects and directs cognitive processing, as well as the fourth tenet's assertion that there are consequences for the individual when the need is not met. While my hypothesis focused on how exclusion may direct cognition to information that is consistent with the nature of the exclusion situation in terms of content (i.e., social in nature), the present study revealed that it may be the consistency between the exclusion situation and the information in terms of *valence*. In other words, I did not find selective memory for events with social content, but I did find selective memory for events with negative valence. Rather than content-congruent memory, I found mood-congruent memory effects. This supports the tenet that exclusion will affect and direct cognitive processing, and it also adds to our understanding of these effects by showing that it is not necessarily directing cognitive processing to information that has social content, but to information that is pertinent to the negative affect or valence produced by the exclusion experience. The finding that this effect was eliminated when controlling for post-experimental relief also indicates that the mechanism by which this occurs is through some form of negative emotion experienced by the individual as a result of perceiving threat to this need.

### *Limitations*

In addition to the limitations mentioned previously of possible social desirability influences on emotion measures, there are a number of limitations to the present study that deserve mention. First, while the manipulation of exclusion was consistent with previous research, it may not have been sufficient to induce a full experience of social exclusion. Although participants were told (and at least somewhat believed, as suggested by their relief after debriefing) that they would be alone in life, all of the other aspects of the experiment involved the experience of social inclusion. This was true from the beginning of the experiment (where they were greeted by a friendly experimenter or two and assigned their own personal experimenter to administer the procedure to them individually) up until the manipulation where they rated their emotions (e.g., via friendly administration of instructions and a portrayal of empathy after the experimenter had delivered the “bad news”). This overall “inclusion” experience is evidenced by the highly positive post-experimental feedback, including specific mention by many participants that they enjoyed the experiment. This proved to be a positive quality of the study in terms of paving the way with my university’s IRB committee in the decision to allow future research procedures that involved a manipulation of social exclusion, but probably was a setback in our attempt to manipulate the experience of “exclusion” with enough realism to produce strong effects.

A second limitation was small sample size. Given the number of independent variables in each analysis, a larger sample size would be required in order for each of the effects and interactions to be analyzed appropriately. For

example, some complex interactions led to comparisons of groups of less than 10 participants. Numbers this low risk not only insufficient power for detecting an effect (Type II error) but susceptibility to random variation that leads to interpretation of an effect that does not exist (Type I error).

### *Summary*

In summary, the present research adds to existing literature in a number of ways. First, it provides evidence that social exclusion leads to negative emotions, and partially supports the hypothesis that it is more likely to lead to negative withdrawal emotions than negative activating emotions. Second, it highlights the importance of understanding and addressing the issue of emotion measurement, with an emphasis on attention to specific emotion effects and the problem of socially desirable responding on explicit emotion questionnaires. Third, it highlights the necessity of understanding how different types of social exclusion affect people in order to develop better manipulations of social exclusion and respective hypotheses. Fourth, it supports the belongingness hypothesis by showing that interpersonal diary information is remembered better than collective or individual information. This supports Baumeister and Leary's (1995) expectation that much cognitive energy is directed towards social relationships. Finally, the present results demonstrate mood-congruent memory effects, indicating that when experiencing a negative emotional state, people are more likely to encode and/or recall negative events.

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## Appendix 1

### COLORADO STATE UNIVERSITY INFORMED CONSENT TO PARTICIPATE IN A RESEARCH PROJECT

TITLE OF PROJECT: Personality and Thought Processes (HRC # 04-217H)

NAME OF PRINCIPAL INVESTIGATOR: Karen Barrett

NAME OF CO-INVESTIGATOR: Sarah Tragesser

CONTACT NAME AND PHONE NUMBER FOR QUESTIONS/PROBLEMS:

Sarah Tragesser, (970) 491-4644

SPONSOR OF PROJECT: None

PURPOSE OF THE RESEARCH:

To investigate how an individual's characteristics such as their personality relate to their thought processes.

PROCEDURES/METHODS TO BE USED:

This study will only require one session of approximately 1 hour and 15 minutes of your time. The study will be conducted one person at a time in a small lab room. You will be expected to fill out questionnaires, read materials, and answer questions, including memory tasks.

RISKS INHERENT IN THE PROCEDURES:

The only risk is of the mild stresses involved in obtaining information about your personality and being asked to answer comprehension questions about a written passage. All of these are considered to be minimal risks, comparable to commonly experienced daily events. It is not possible to identify all potential risks in research procedures, but the researcher(s) have taken reasonable safeguards to minimize any known and potential, but unknown, risks.

BENEFITS:

The primary benefit to you from this study will be obtaining information about your personality.

COMPENSATION:

You will receive 2 hours of research credit for participating in this study.

CONFIDENTIALITY:

To protect your confidentiality, all identifying information will be removed from your responses and questionnaires and responses will be assigned arbitrary numbers (e.g., 001). Immediately after data is collected, consent forms including identifying information will be removed from the associated responses.

LIABILITY:

The Colorado Governmental Immunity Act determines and may limit Colorado State University's legal responsibility if an injury happens because of this study. Claims against the University must be filed within 180 days of the injury.

Questions about participants' rights may be directed to Celia S. Walker at (970) 491-1563.

Page 1 of 2 Participant's initials \_\_\_\_\_ Date \_\_\_\_\_

**PARTICIPATION:**

Your participation in this research is voluntary. If you decide to participate in the study, you may withdraw your responses and consent and stop participating at any time without penalty or loss of benefits to which you are otherwise entitled.

Your signature acknowledges that you have read the information stated and willingly sign this consent form. Your signature also acknowledges that you have received, on the date signed, a copy of this document containing 2 pages.

\_\_\_\_\_  
Participant name (printed)

\_\_\_\_\_  
Participant signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness to signature (project staff)

\_\_\_\_\_  
Date

Page 2 of 2 Participant's initials \_\_\_\_\_ Date \_\_\_\_\_

Appendix 2

GENERAL INFORMATION

Gender (please circle one): M F

Age: \_\_\_\_\_

Major: \_\_\_\_\_

Class rank: Freshman Sophomore Junior Senior Grad student

What were your SAT scores? Verbal \_\_\_\_\_ Quantitative \_\_\_\_\_ Didn't take SATs \_\_\_\_\_

What were your ACT scores? \_\_\_\_\_ Didn't take ACT \_\_\_\_\_

What is your GPA? \_\_\_\_\_

Are you in a sorority or fraternity? Yes No

How long have you been at CSU? \_\_\_\_\_

How long have you lived in Colorado? \_\_\_\_\_

How many close friends do you have in Ft Collins? \_\_\_\_\_

How many close friends do you have who do not live in Ft Collins? \_\_\_\_\_

In a typical week, about how many times do you talk on the telephone with friends, neighbors or relatives?

1. more than once a day, 2. once a day, 3. 2 or 3 times a week,  
4. about once a week 5. less than once a week, 6. never or no phone

How often do you get together with friends, neighbors or relatives and do things like go out together or visit in each home?

1. more than once a week, 2. once a week, 3. 2 or 3 times a month,  
4. about once a month, 5. less than once a month, 6. never

How much does your romantic partner make you feel loved and cared for?

1. a great deal 2. quite a bit 3. some 4. a little 5. not at all

On the whole, how much do your friends and relatives make you feel loved and cared for?

1. a great deal 2. quite a bit 3. some 4. a little 5. not at all

Please list your parents' occupations

---

Please list the Psychology and Human Development courses you have taken:

---

### Appendix 3

#### DES

Please rate each of the following items according to how you are feeling at the present time. Use the scale below from 0 (not at all) to 4 (very much).

---

0	1	2	3	4
not at all	a little	a moderate amount	quite a bit	very much

---

- \_\_\_ Attentive
- \_\_\_ Guilty
- \_\_\_ Bashful
- \_\_\_ Delighted
- \_\_\_ Shy
- \_\_\_ Amazed
- \_\_\_ Scared
- \_\_\_ Downhearted
- \_\_\_ Scornful
- \_\_\_ Enraged
- \_\_\_ Mad
- \_\_\_ Feeling of distaste
- \_\_\_ Sad
- \_\_\_ Contemptuous
- \_\_\_ Repentant
- \_\_\_ Astonished
- \_\_\_ Fearful
- \_\_\_ Joyful
- \_\_\_ Concentrating
- \_\_\_ Happy
- \_\_\_ Surprise
- \_\_\_ Discouraged
- \_\_\_ Angry
- \_\_\_ Disgusted
- \_\_\_ Afraid
- \_\_\_ Blameworthy
- \_\_\_ Disdainful

- Alert
- Sheepish
- Feeling of revulsion
- Enjoyment

## Appendix 4

Now we are ready to do the next task. We would like you to tell us how much you **feel like** doing each of the following things (even if you wouldn't actually do it) at this moment? Use the scale below to write a number next to each item:

- 5 = extremely
- 4 = considerably
- 3 = somewhat
- 2 = slightly
- 1 = not at all

\_\_\_\_\_hiding/covering my face

\_\_\_\_\_avoiding people

\_\_\_\_\_laughing

\_\_\_\_\_yelling at someone

\_\_\_\_\_hitting someone

\_\_\_\_\_giving up

\_\_\_\_\_running away

\_\_\_\_\_smiling

\_\_\_\_\_trying to make up with someone

\_\_\_\_\_crying

\_\_\_\_\_getting together with my friends

\_\_\_\_\_calling/talking to my parent(s)

\_\_\_\_\_hitting or destroying something

## Appendix 5

Version A

### *Passage 1*

Surprisingly enough, modern historians have rarely interested themselves in the history of the American South in the period before the South began to become self-consciously and distinctively “Southern”—the decades after 1815. Consequently, the cultural history of Britain’s North American empire in the seventeenth and eighteenth centuries has been written almost as if the Southern colonies had never existed. The American culture that emerged during the Colonial and Revolutionary eras has been depicted as having been simply an extension of New England Puritan culture. However, Professor Davis has recently argued that the South stood apart from the rest of American society during this early period, following its own unique pattern of cultural development. The case for Southern distinctiveness rests upon two related premises: first, that the cultural similarities among the five Southern colonies were far more impressive than the differences, and second, that what made those colonies alike also made them different from the other colonies. The first, for which Davis offers an enormous amount of evidence, can be accepted without major reservations; the second is far more problematic.

What makes the second premise problematic is the use of the Puritan colonies as a basis for comparison. Quite properly, Davis decries the excessive influence ascribed by historians to the Puritans in the formation of American culture. Yet Davis inadvertently adds weight to such ascriptions by using the Puritans as the standard against which to assess the achievements and contributions of Southern colonials. Throughout, Davis focuses on the important, and undeniable, differences between the Southern and Puritan colonies in motives for and patterns of early settlement, in attitudes toward nature and Native Americans, and in the degree of receptivity to metropolitan cultural influences.

However, recent scholarship has strongly suggested that those aspects of early New England culture that seem to have been most distinctly Puritan, such as the strong religious orientation and the communal impulse, were not even typical of New England as a whole, but were largely confined to the two colonies of Massachusetts and Connecticut. Thus, what in contrast to the Puritan colonies appears to Davis to be peculiarly Southern—acquisitiveness, a strong interest in politics and the law, and a tendency to cultivate metropolitan cultural models—was not only more typically English than the cultural patterns exhibited by Puritan Massachusetts and Connecticut, but also almost certainly characteristic of most other early modern British colonies from Barbados north to Rhode Island and New Hampshire. Within the larger framework of American colonial life, then, not the Southern but the Puritan colonies appear to have been distinctive, and even they seem to have been rapidly assimilating to the dominant cultural patterns of the late Colonial period.

Version A

## Questions on Passage 1

Circle one letter for each question, based on the passage you read.

1. According to the passage, which two colonies had the most typically Puritan attitudes?
  - A) Massachusetts and Rhode Island
  - B) Rhode Island and New Hampshire
  - C) New Hampshire and Connecticut
  - D) Massachusetts and Connecticut
  - E) New Hampshire and Massachusetts
  
2. The author's main point in the passage is:
  - A) to argue that the Southern colonies were not tremendously different from the Northern, non-Puritan colonies
  - B) to argue that Southern culture was distinctive even before 1815
  - C) to discuss the inroads Puritanism made into the South
  - D) to discuss similarities within the Southern colonies
  - E) to discuss how slavery shaped the culture of the South
  
3. The passage implies that the attitudes toward Native Americans that prevailed in the Southern colonies:
  - A) were in conflict with the cosmopolitan outlook of the South
  - B) derived from Southerners' strong interest in the law
  - C) were modeled after those that prevailed in the North
  - D) developed in response to attitudes in the Puritan colonies
  - E) differed from those that prevailed in the Puritan colonies
  
4. The author is primarily concerned with:
  - A) refuting a claim about the influence of Puritan culture on the early American South
  - B) refuting a thesis about the distinctiveness of the culture of the early American South
  - C) refuting the two premises that underlie Davis' discussion of the culture of the American South in the period before 1815
  - D) challenging the hypothesis that early American culture was homogeneous in nature
  - E) challenging the contention that the American South made greater contributions to early American culture than Puritan New England did.

5. According to the passage, which type of colony was the most different or distinctive from the other British colonies as a whole?

- A) Southern
- B) Catholic
- C) Puritan
- D) Caribbean
- E) Northern

6. Which of these is NOT mentioned in the passage as characteristic of the South in this period?

- A) a strong interest in politics
- B) a strong interest in the law
- C) acquisitiveness
- D) a strong religious orientation
- E) the cultivation of metropolitan cultural models

7. Which of the following is the most accurate assessment of the author's attitude toward Professor Davis?

- A) disagreement on one premise and agreement on the other
- B) agreement on all major points
- C) almost complete disagreement
- D) agreement on one premise and ambivalence on the other
- E) complete agreement

8. The author of the passage is in agreement with which of the following elements of Davis' book?

- I. Davis' claim that acquisitiveness was a characteristic unique to the South during the Colonial period
- II. Davis' argument that there were significant differences between Puritan and Southern culture during the Colonial period
- III. Davis' thesis that the Southern colonies shared a common culture

- A) I only
- B) II only
- C) III only
- D) I and II only
- E) II and III only

(Answers: D, A, E, B, C, D, A, E)

Version B

*Passage 1*

The data base for peer assessments of the behavioral correlates of status is more extensive for elementary school children. These studies provide even more support for the relations between prosocial behavior and peer acceptance and between antisocial behavior and peer rejection. For example, Smith had her fourth-grade class give both positive and negative sociometric choices and then asked them open-ended questions about the reasons for their choices. Helpfulness and consideration for others were positively related to positive nominations, and verbal abusiveness, rule violations, and bullying were associated with negative nominations. In a study of third- and fifth-graders, Ladd and Oden also found a positive relationship between peer ratings of helpfulness and peer ratings of social acceptance.

In two related papers, peer sociometric ratings were correlated with three subscale scores for the Revised Class Play in samples of second- through sixth-grade children. The correlations of status with the Sociable-Leadership factor were strongly positive, ranging from .56 to .75. The correlations of status with the Aggressive-Disruptive factor were negative, but the strength of the relation varied with age. The correlations were modest for the second-, third-, and fourth-graders, ranging from -.32 to -.49, and nonsignificant for the older two groups. Peer status had increasingly negative correlations with the Sensitive-Isolated factor with increasing age. The relationship between status and isolated behavior, although significant in second and third grades, increased dramatically in the fourth and fifth grades, suggesting greater attention by peers to asocial and overemotional behavior.

The pattern revealed in each of the preceding studies is for peer status, assessed unidimensionally, to have moderate negative correlations with direct aggression and stronger negative correlations with social withdrawal, indirect aggression, and hypersensitive types of behavior. Because linear correlations of status and behavior can mask contrasting patterns of behavior among different types of social status, a number of investigators have used both positive and negative nominations to form distinct status groups of children. Coie et al., for example, used positive and negative nomination scores to define five different social status groups: popular, socially rejected, socially neglected, controversial, and average. A total of 848 children from the third, fifth, and eighth grades were surveyed with a six-item peer assessment instrument. The popular group received high scores for cooperative and leadership behavior and low scores for starting fights, being disruptive, and asking others for help. Rejected children had the opposite profile: They were high on starting fights, being disruptive, and asking for help in school and low on cooperativeness and leadership. The controversial group were equally as high on leadership scores as the popular group but were also described by peers as being as disruptive and aggressive as the rejected group. Their cooperativeness ratings were midway between those of popular and rejected children and significantly different from both of these groups. Neglected children had scores below the mean for all but the shy and withdrawn item but were not significantly different from average children in this

regard. The average subjects were, in fact, at the mean for all six items, in keeping with their sociometric status.

Version B

## Questions on Passage 1

Circle one letter for each question, based on the passage you read.

1. From the passage, which two tendencies, overall, are the most likely to lead to peer rejection?

- verbal abusiveness and rule violations
- shyness and rule violations
- shyness and asking for help
- aggression and disruptiveness
- aggression and uncooperativeness

2. The author's main purpose in writing the passage is to

- A) provide evidence showing administrators and school personnel that social rejection is occurring in schools
- B) inform parents and teachers about the most common traits associated with rejection
- C) paint a picture of social popularity in elementary school children
- D) describe research findings regarding the correlates of social status among children
- E) Establish a data base to be used by practitioners interested in enacting social change in peer relations in schools

3. It can be inferred from the passage that

- A) Controversial children are unlikely to possess good leadership abilities
- B) Aggressive behavior may become unimportant to one's social status in early adolescence
- C) Hypersensitivity is most relevant to social status among younger children
- D) Shyness is primarily relevant for females
- E) Aggression is primarily relevant for males

4. The author is primarily concerned with

- A) developing a framework for understanding rejection in early childhood
- B) the consequences of rejection for emotional development
- C) developing a theory of popularity
- D) the differences in predictors of rejection between early elementary school and later elementary school years

- E) factors that distinguish rejected and accepted children
5. According to the passage, what are the factors most relevant to acceptance?
- A) helping/cooperation behavior, leadership abilities
  - B) following the rules, leadership abilities
  - C) following the rules, extraversion
  - D) confidence, following the rules
  - E) confidence, helping/cooperation behavior
6. Which of these is NOT mentioned in the passage as characteristic of rejected children?
- A) physical aggression
  - B) verbal aggression
  - C) hypersensitivity
  - D) social withdrawal
  - E) disability
7. Which of these is NOT implied in the passage as characteristic of accepted children?
- A) being able to work on schoolwork independently, without help from other students or teachers
  - B) being willing to help other children
  - C) being quick-witted
  - D) having a somewhat extraverted personality
  - E) not going too far outside the norm in their behaviors
8. What is a potential advantage of Coie et al.'s design?
- A) emphasized later childhood/late elementary school years
  - B) enables one to understand popular children as well, rather than only rejected children
  - C) enables understanding how male and female rejected students may differ
  - D) provided a more detailed descriptions of rejected and accepted groups
  - E) provides descriptions of different categories of status groups rather than using a linear continuum that may mask qualitative differences among groups

(Answers: E, D, B, E, A, E, C, E)

## Appendix 6

### Diary Entries for 4 Days

Day 1:

I bought an instant lottery ticket and won \$10.

I received a package in the mail from my brother (who I'm really close to) and it was full of these hilarious pictures from our last vacation together.

I went to the dentist and had three cavities—Ugh, I can't believe it.

It occurred to me today that my relationship with my girlfriend (boyfriend) is going really well—we seem really happy.

A group of kids from my fraternity (sorority) said some mean things to a kid with disabilities, and I felt really lousy about being associated with my fraternity (sorority).

I went to the grocery store.

I really love being in the Choir because everyone always enjoys our music and is smiling when they leave our concerts.

Day 2:

I forgot to bring the music for a really important practice session for the Student Choir that I sing in (we're going to competition soon)—boy was everyone mad.

I love the books we “have” to read for my English class!

A \$5 bill fell out of my pocket and blew away before I could grab it.

My best friend and I had a blast playing Ping Pong all afternoon.

I went to the post office and bought stamps so I could mail out the rent check.

I forgot all about my older sister's birthday—I think I really let her down and I don't know if she'll accept my apology.

All of us in my fraternity (sorority) have been working really hard on the Greek Week Community Drive, and I really think we are making a difference in people's lives.

Day 3:

I rode the bus to get to work.

I was reading an editorial in the student paper—it seems that no matter how hard we try, my university just gets no respect in the business world.

My intramural soccer team has really been working together lately.

My best friend blew me off; we had made weekend plans but I guess they just didn't matter.

My roommate and I went out on the town tonight and had a really great time together.

I overslept and got to my chemistry midterm late.

I've been running for only a few weeks but today I ran 2 miles and it really made me feel good.

Day 4:

I got a haircut that I absolutely can't stand; it's incredibly ugly.

My girlfriend (boyfriend) totally flirted with someone else tonight and practically ignored me; I don't know how seriously I should take it.

I took a long peaceful walk by myself today, enjoying the beautiful weather.

My roommate and I got into an enormous fight tonight over the room being such a mess—I don't know if we're ever going to stop fighting about the same old stuff.

I was elected as one of just a few brothers (sisters) in my fraternity (sorority) to represent us on the Greek Council.

My Irish heritage is really important to me but when I went to the student Irish Association they acted like I didn't belong there, like they thought I didn't fit in.

I ordered a cheeseburger and some fries for lunch today.

## Verbal Abilities Task

**In the space below, please think of and write down as many words as possible using letters from the words crustacean and librarian. [You will be given 4 minutes to complete this task].**

In the space below, please write down as many events from the diary that you can remember. [You will be given 10 minutes to complete this task].

## Appendix 7

Subject #: \_\_\_\_\_

### Post-Experiment Questionnaire

For the purposes of getting feedback about your experience in this study, please complete the following questions. It is important that you do not show your responses to the experimenter. After completing this survey, please put this piece of paper in the folder provided to you beforehand by the experimenter so that your responses will be completely anonymous.

1. Now that it is over, how much did you enjoy your experience as a participant in this study?

1                      2                      3                      4                      5  
disliked very much                      no comment                      enjoyed it very much

2. How would you rate your enjoyment of this study compared to other studies you have participated in? Please circle a number below:

1                      2                      3                      4                      5                      6  
poor/boring                      no different                      fun/interesting

3. How relieved were you to find out that your feedback was not true? Use the rating scale below to indicate how relieved you were: \_\_\_\_\_

1 = felt the same, did not feel any relief

2 = a little relieved

3 = somewhat relieved

4 = very relieved

5 = extremely relieved

4. How likely would you be to recommend this study to a friend if a friend asked what study he/she should participate in?

1                      2                      3                      4                      5  
not at all                      slightly                      somewhat                      very                      extremely