

ADULT ATTACHMENT STYLES AND SELF REGULATORY RESOURCES:

A DYNAMIC INTERPLAY

by

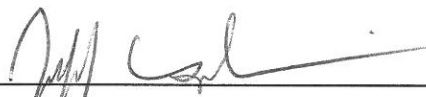
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Master of Arts in the Department of Psychology

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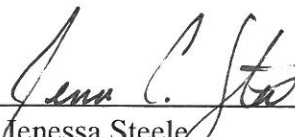
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ABSTRACT

This purpose of this study was to test whether self-regulatory resources are involved in the deactivating strategies utilized by individuals with dismissing avoidant attachment styles. After assessing participant's attachment styles using the ECR-R (Fraley, Waller, & Brennan, 2000) and the RQ (Bartholomew & Horowitz, 1991), participants were randomly assigned to one of three writing conditions: the first activated the attachment system, the second depleted self-regulatory resources, and the third acted as a control and did not activate the attachment system or deplete self-regulatory resources. Self-regulatory depletion was assessed by measuring persistence on an unsolvable anagram task. Independent from their attachment classification, there were no observed differences between participants who completed the attachment essay, the depletion essay, or the control essay concerning time spent on the anagram task. When averaged across the essay conditions, there were no significant differences between participants of differing attachment styles in regard to time spent on the unsolvable anagram task. A significant interaction between essay condition and attachment style was observed, with simple effects revealing that dismissing individuals who completed the attachment essay gave up sooner on the anagram task compared to other participants. There were marginally significant differences between participants that completed the depletion essay, with fearful participants "hyper-persisting" on the anagram task compared to the other participants. Out hypothesis was supported as the use of the deactivating strategies appears to deplete self-regulatory resources.

Keywords: dismissing avoidant, fearful avoidant, self-regulation, adult attachment theory

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DEDICATION

I dedicate this thesis to my dad. I know you would have been proud.

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I would also like to thank my parents, Rhonda and Andrew, as well as my grandmother, Shirley, for their constant encouragement and belief in my abilities. Last but not least, I dedicate this thesis to five of the best people I know, to Mike, to Mandy, to Amory, to Hilary, and to Elaina, you guys are awesome.

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CHAPTER 1: PURPOSE OF STUDY

The present study investigates the link between self-regulatory resources and the deactivating strategies thought to underlie the dismissing avoidant attachment style in adult romantic attachment. Mikulincer and Shaver's (2007) model of adult attachment suggests that the deactivating strategies reflect conscious processes that are impacted by cognitive load. Previous studies have demonstrated that the effectiveness of the deactivating strategies is moderated by the presence of cognitive/self-regulatory resources (Mikulincer, Dolev, & Shaver, 2004; Kohn, Rholes, & Schmeichel, 2012). However, no studies have investigated the bidirectional nature of the relationship and demonstrated that using deactivating strategies directly leads to self-regulation depletion. The present study extends this line of research.

CHAPTER 2: OVERVIEW OF PAST RESEARCH

Bowlby's Normative Theory of Attachment

Bowlby's attachment theory originated as a reaction to Freudian psychoanalysis, which suggested that the manifestation of mental illness/psychopathologies is the result of unresolved conflicts during a specific psychosexual stage (oral/anal/genital) of development (Kirkpatrick, 2004). During his time as a psychoanalyst, Bowlby noted that Freudian theory provided little explanation for why children raised in institutional environments with limited contact to caregivers failed to thrive in comparison to peers. Instead, Bowlby proposed his own theory—called attachment theory—that sought to explain this phenomenon.

According to Bowlby, the attachment system is an evolutionarily evolved behavior system that keeps the infant alive during early stages of life by maintaining proximity with a primary caregiver. The attachment system postulated by Bowlby is not a static system, but instead a system that seeks to maintain equilibrium within the individual through the active monitoring of internal and external threats. In face of threats in the external environment (e.g., unfamiliar stimuli, sudden noises), the child will attempt to increase proximity between itself and the attachment figure through behaviors such as crying and grasping. Internal stressors such as illness and fatigue also trigger the same strategies (Bowlby, 1973). If the caregiver responds effectively, thus establishing a felt security, the infant returns to baseline levels of anxiety and fear which deactivates the attachment system.

The system evolves in a true broaden and build fashion. Healthy activations and deactivations of the system allow the infant to create an internal working model of how their attachment system should operate, effectively creating a buffer for when their attachment figure

does not immediately respond to their needs. The primary caregiver thus becomes a secure base from which the child is free to engage in other behavior systems (e.g., feeding, exploring, and social) without worry of threat. During this time, children often activate the exploratory behavior system and begin to explore and interact with their environment and in essence, learn from it (Bowlby, 1988).

Ainsworth's Individual Differences Approach

Alternatively, whereas Bowlby was primarily concerned with extreme disruptions of the childhood attachment system (separation, loss, unable to designate a secure base), Mary Ainsworth and other researchers have examined less extreme variations of the childhood attachment system (Bowlby, 1988; Ainsworth, Blehar, Waters, & Wall, 1978). Ainsworth and colleagues devised a structured observational procedure called the Strange Situation Task (SST) to observe individual differences in patterns of attachment behavior. The SST can be divided into eight distinct "episodes," with each episode serving as either an opportunity for the child to engage their environment, a separation episode where the child's mother leaves the child alone, or reunion episode where either the stranger or the child's mother returns. For a comprehensive overview of each distinct episode see Table 1.

Table 1

Strange Situation Task Summary

<i>Episode Number</i>	<i>Persons Present</i>	<i>Duration</i>	<i>Brief Description of Action</i>
1	Mother, baby, & Observer	30 s	Observer Introduces mother and baby to experimental room, then leaves.
2	Mother & baby	3 min.	Mother is nonparticipant while baby explores: if necessary, play is stimulated after 2 minutes.
3	Stranger, mother, & baby	3 min.	Stranger enters. First minute: Stranger silent. Second minute: Stranger converses with mother. Third minute: Stranger approaches baby. After 3 minutes mother leaves unobtrusively.
4	Stranger & baby	3 min. or less	First separation episode. Stranger's behavior is geared to that of baby.
5	Mother and baby	3 min. or more	First reunion episode. Mother greets and/or comforts baby, then tries to settle him again in play. Mother then leaves, saying "bye-bye."
6	Baby alone	3 min. or less	Second separation episode.
7	Stranger & baby	3 min. or less	Continuation of second separation. Stranger enters and gears her behavior to that of baby.
8	Mother & baby	3 min.	Second reunion episode. Mother enters, greets baby, then picks him up. Meanwhile stranger leaves unobtrusively.

Note. This table represents a brief overview of each episode in the SST (Adapted from Ainsworth et al., 1978)

By observing patterns of exploration, separation protest, stranger anxiety, and ease with which children are consoled by their mothers, Ainsworth et al. (1978) identified three distinct attachment classifications in children. The first type of attachment system defined by Ainsworth et al. (1978) is the avoidant attachment style. Avoidant infants readily explore their environment but display minimal signs of distress during the separation episodes and continue with their previous task (exploring/interacting with environment). Interestingly, while avoidant infants do not display overt signs of distress at their caregiver's absence, physiological measures of distress such as heart rate suggest otherwise (Sroufe & Waters, 1977). For avoidant children, reunion with the mother is typically uncomfortable for both parties as the infant will often seize up, stiffen, or lean away from their attachment figure.

The second attachment classification identified by Ainsworth is the secure attachment style which is characterized by an infant that freely explores the novel environment and utilizes the attachment figure as a secure base from which to explore. Although the secure infant does show distress during the separation episode and shows stranger anxiety, the infant is easily consoled when the attachment figure returns and readily returns to the exploration of their environment (Ainsworth et al., 1978).

The third attachment style identified by Ainsworth et al. (1978) was the anxious ambivalent attachment style. These infants often display fear and anxiety by clinging to their mother's clothing in the presence of novel stimuli, rarely engage in exploratory play, show high levels of physical distress at the parent's absence as well as high levels of stranger anxiety, and alternate between proximity increasing and decreasing behaviors when they reunite with their attachment figure (Ainsworth et al., 1978).

According to Ainsworth et al. (1978), these distinct differences in attachment style arise from previous experiences with the attachment figure. Mothers of secure infants are consistently warm, nurturing, receptive, and attentive to their child's needs. Mothers of avoidant children can be defined as consistently emotionally/physically unavailable to their children and dismiss their child's bid for closeness in times of distress, often becoming emotionally withdrawn. As a result of this behavior, avoidant children adopt a similar pattern of behavior and are emotionally withdrawn, make no effort to interact with the attachment figure, and may in some cases be more emotionally responsive to a stranger rather than their attachment figure (Weinfield et al., 2008). Mothers of anxious ambivalent infants are characterized by their inconsistent responses to their infant's needs. These mothers alternate between both ends of the intimacy spectrum, fluctuating between being overly emotionally available (smothering the infant) to being emotionally distant to their infant. Though these mothers typically report high levels of attachment behaviors at the home (holding, playing, soothing), research suggest that perhaps it is not the amount of attention mothers give their infants that results in this attachment classification, but the timing with which mothers give their babies attention. To compensate for their caregivers lack of consistency, anxious ambivalent children adopt a strategy to reliably ensure they get the attention they need by increasing behaviors that maintain proximity between caregivers and themselves (Ainsworth et al., 1978).

Whereas Ainsworth et al., (1978) recognized three distinct patterns of attachment in childhood, Main and Solomon (1990) have identified a fourth pattern of attachment called disoriented/disorganized attachment that is thought to be the result of irregular experiences with the attachment figure during infancy such as abuse or neglect. Disoriented/disorganized infants

display traits of both the avoidant and anxious infants in the SST. During the SST, disoriented infants display confusion, disorientation, stilted behavior, and direct fear of the parent during reunion episodes.

Adult Attachment Theory

As individuals move into adolescence and then adulthood, the functioning of their attachment system is thought to generalize to other close relationships (Ainsworth, 1989). Hazan and Shaver (1987) suggested that the attachment system proposed by Bowlby and Ainsworth could be applied toward the study of adult romantic relationships. According to Hazan and Shaver (1987), love can be conceptualized as an attachment process and individual's childhood attachment experiences serve as a model for relationships with future partners. When an individual is "in love" and experiences feelings of stress and insecurity, the individual will seek out their partner in a proximity increasing fashion much in the same way a child would seek out their secure base. In support of this view, Hazan and Shaver (1987) identified three distinct attachment styles in adulthood that parallel the previous attachment classifications defined by Ainsworth and colleagues: Secure, Avoidant, and Ambivalent.

Subsequently, Bartholomew and Horowitz (1991) proposed a four category model of adult attachment based on participant's working model the self and others. Individuals with a positive model of self and a positive model of others are labeled as secure, which overlaps with prior definitions of secure attachment (Hazan & Shaver, 1987). Individuals with a negative view of self and a positive view of others—labeled preoccupied—are thought to be chronically focused on their romantic relationships and require constant approval from their partner, closely mirroring the anxious/ambivalent attachment style identified by Ainsworth et al. (1978).

Individuals with a positive view of self and a negative view of others are labeled as dismissing avoidant. Dismissing avoidant individuals actively avoid relationships with others for fear of disappointment and to maintain a sense of self-reliance when dealing with stressors.

Last, individuals with a negative view of self and a negative view of others are classified as fearful avoidant, characterized by feeling unworthy of relationships and that romantic relationships with others will ultimately lead to rejection. To save themselves from this fate, these individuals typically avoid relationships (Hazan & Shaver, 1987). More recently, the model proposed by Bartholomew has been modified to change the two labels "Model of Self" and "Model of Others" to "Anxiety" and "Avoidance." The previous model of self is thought to measure an individual's anxiety about relationships (abandonment) whereas the model of others was thought to measure their avoidant behavior towards others (distrust; Brennan, Clark, & Shaver, 1998). For a visual representation of the four factor model, see Figure 1.

		Internal Working Model of Self (Anxiety)	
		Positive (Low)	Negative (High)
Internal Working Model of Others (Avoidance)	Positive (Low)	SECURE: Individual is comfortable in relationships.	PREOCCUPIED: Individual is preoccupied with relationships.
	Negative (High)	DISMISSING: Individual is dismissing of relationships. Counter-dependent	FEARFUL: Individual is fearful of relationships and socially avoidant.

Figure 1. This figure is a visual representation of the four factor category model of adult romantic attachment (Adapted from Bartholomew & Horowitz, 1991).

Shaver and Mikulincer's Model

Drawing upon the previous literature on attachment theory, the researchers Shaver and Mikulincer (2002) mapped out a theoretical model of the attachment system that provides detailed explanations of how the different styles react when faced with stressors (see Figure 2). Their new model of attachment can be broken down into three distinct components, the active monitoring of internal and external stressors/threats (leads to activation of the attachment system), determining the availability and perceived responsiveness of the actual/conceptualized attachment figure, and the implementation of attachment strategies that reduce the perceived threats (different for the categories of attachment).

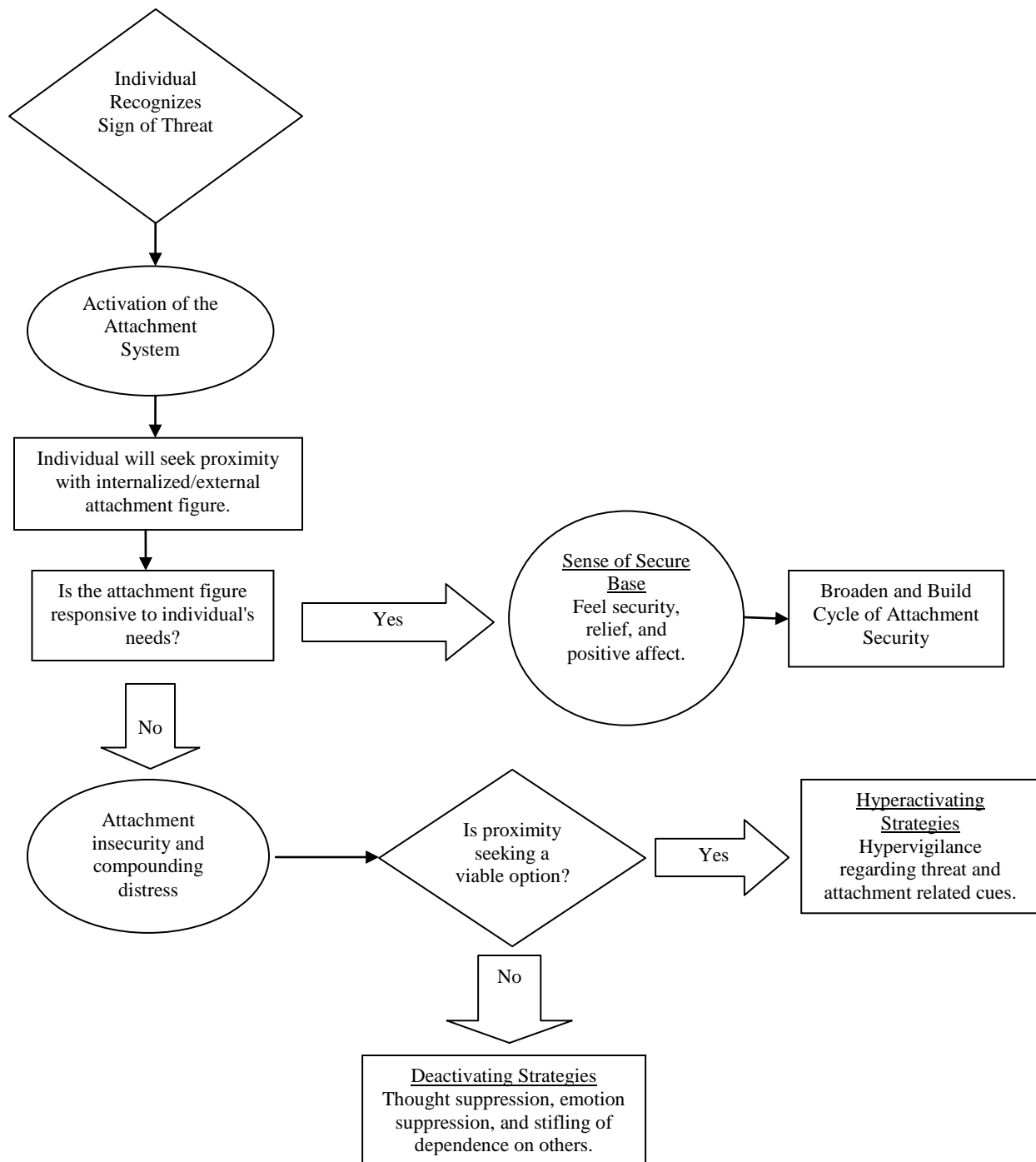


Figure 2. This figure is a visual representation of the Mikulincer and Shaver (2007) model of the attachment system for adult romantic relationships (Adapted from Mikulincer & Shaver, 2007; Shaver & Mikulincer, 2002).

After the attachment system is effectively "activated," the individual will increase proximity with their actual or internalized attachment figure and then evaluate the attentiveness and social responsiveness of their chosen attachment figure. If the individual had previously designated the attachment figure as a secure base, the individual will experience relief from the designated stressor and engage in other behavior systems (exploring, caregiving; Mikulincer & Shaver, 2007). However, if the individual does not perceive their attachment figure as responsive, the individual will adopt secondary strategies that modify the operation of the attachment system.

If an individual has an attachment figure that is not reliable but still views proximity seeking as a viable strategy, they will engage in up-regulating/hyperactivating strategies that amplify the "approach" aspect of the attachment system. These individuals will frequently exaggerate the expression of proximity seeking and distressing emotions as well as maintain hypervigilance towards signs of threat and other related information (Shaver & Mikulincer, 2002). This pattern of behavior characterizes anxious/preoccupied individuals (Hazan & Shaver, 1989; Bartholomew & Horowitz, 1991). Alternatively, if the individual does not view proximity seeking as a viable option, the individual employs a down-regulating/deactivating strategy to deal with the designated threat. These individuals deactivate their attachment system by suppressing distressing emotions and cognitions, dismissing fear related attachment cues, and stifling dependence upon others. Individuals who employ these strategies are labeled as having a dismissing avoidant attachment style.

Unlike the hyperactivating strategies of anxious/preoccupied individuals, the down-regulating strategies involve active conscious restructuring and require controlled cognitive

resources (Mikulincer & Shaver, 2007). Dismissing avoidants actively filter the flow of incoming information and will selectively encode or not encode information that could potentially activate the attachment system. Fraley et al. (2000) asked participants to listen to an emotionally laden interview about early childhood memories and the death of a sibling and then recall key facts from the interview immediately afterward. The researchers found that attachment related avoidance was negatively correlated with the recall of information, indicating that individuals high on avoidance did not encode the information as effectively as individuals who did not score high on avoidance. Similarly, the recall of information specifically pertaining to the participants is also affected by the deactivating strategies.

Fraley and Shaver (1997) demonstrated that when asked to suppress distressing thoughts about their partner abandoning them, participants rated as high on avoidance displayed a significantly reduced accessibility to abandonment related thoughts in comparison to those with low attachment avoidance. Mikulincer et al. (2004) further extended this line of research by demonstrating that the thought suppression strategies thought to underlie the dismissing avoidant attachment style are significantly impacted under high cognitive load. Similar to previous findings, individuals who score high on avoidance measures display a significant decrease in their access to breakup related words (relationship, separation) and words related to negative self-concepts after engaging in thought suppression. However, the researchers found that under high cognitive load individuals high on avoidance display an opposite rebound effect. High avoidant and high cognitive load participants displayed a higher accessibility to breakup related words after ego-depletion in comparison to those who scored high on avoidance but not under cognitive load. These results are similar to participants who scored high on anxiety measures as

they too display a great difficulty in their ability to suppress their distressing emotions/thoughts (Mikulincer et al., 2004). The results of their experiment suggest that the deactivating strategies employed by dismissing avoidants are not stable across all situations, with their effectiveness moderated by the presence of cognitive resources.

Self-Regulation

Self-regulation is a conscious effort exerted by individuals to regulate their thoughts and actions and to align themselves with current environmental and social demands as well as maintaining personal goals (dieting, academics) and resisting temptation (drugs, alcohol) (Baumeister & Alquist, 2009). Children rated as having high amounts of self-regulatory resources have better long term outcomes both academically and socially in comparison to peers who do not rate highly on this trait. Having high amounts of self-control is also associated with lower incidences of various psychopathologies including anxiety disorders, depression, gambling, and alcoholism in later adulthood as these individuals are better able to monitor and inhibit their first impulse in a given situation and engage in complex thinking to find an appropriate course of action (Tangney, Baumeister, & Boone, 2004).

In their series of studies examining self-control, Muraven, Tice, and Baumeister (1998) provided evidence that self-regulation has muscle like qualities; meaning that self-regulation operates in a limited capacity and can become temporarily depleted after strenuous use and subsequent tasks that involve self-regulation are significantly more difficult (Muraven et al., 1998). This observation paved the way for future studies, wherein researchers hypothesized that self-regulation is not a situation specific energy, but only a facet of a broader construct of mental

energies as many other processes are severely affected by self-regulation depletion such as decision making, self-control, and self-presentation (Vohs, Ciarocco, & Baumeister, 2005).

When examining Mikulincer and Shaver's model (2007), the deactivating strategies such as thought suppression and emotion regulation can be thought of as facets of self-regulation, suggesting that these processes can not only be affected by cognitive resource depletion, but also self-regulation depletion. Kohn et al. (2012) tested this hypothesis by randomly assigning participants to one of two essay conditions, with one serving as a self-regulation depletion condition and the other being a control condition. Prior to placing participants into groups, the experimenters assessed participants' attachment style with the Relationship Questionnaire (Bartholomew & Horowitz, 1991). After the participants finished their appropriate writing activity, they were asked to recall memories from their childhood.

The experimenters measured the speed at which participants could recall memories that corresponded to specific emotions (angry, sad, anxious, happy) and found that participants classified as having a dismissing avoidant attachment style experienced a significant reduction in the effectiveness of their deactivating strategies after ego depletion. Specifically, dismissing avoidants showed faster access to negative emotions in comparison to dismissing avoidants that did not experience ego depletion. The other attachment styles did not display this trend and showed no significant change in their access to negative emotions after ego depletion (Kohn et al., 2012). The results from this experiment suggest that the effectiveness of the deactivating strategies is moderated by the presence of self-regulatory resources. However, a limitation of their study is that the researchers failed to examine the reciprocity of the relationship between self-regulatory resources and the deactivating strategies of dismissing avoidants. Although it is

apparent that the effectiveness of the deactivating strategies are affected by self-regulation depletion, it has not been demonstrated that exercising the deactivating strategies of dismissing avoidants in the context of attachment system activation leads to significant deficits in self-regulatory resources.

Purpose

The purpose of this study was to demonstrate that activating the attachment system in individuals who have a dismissing avoidant attachment style will lead to self-regulation depletion in comparison to the other attachment styles. At the start of the experiment, participant attachment styles were assessed using the ECR-R and the RQ (Bartholomew & Horowitz, 1991; Sibley, Fisher, & Liu, 2005; Brennan et al., 1998). Subsequently, participants were randomly assigned to one of three essay conditions, with the first essay serving to activate the attachment system, the second essay serving to deplete self-regulatory resources, and the third acting as a control. Self-regulation depletion was assessed by measuring persistence on an unsolvable anagram task.

It was expected that the essay type will have a significant main effect on self-regulatory resources regardless of participant's attachment style, with participants in the self-regulation depletion condition on average spending significantly less time on the persistence measure in comparison to the other two essay conditions. There were no expected differences between the other essay conditions and no predicted main effect for attachment style. A significant interaction between essay type and attachment style was expected, with simple effects revealing a significant effect of attachment style on persistence for participants who are in the attachment essay condition. Specifically, dismissing avoidant participants in the attachment essay condition

will give up sooner on the self regulation task in comparison to the other two attachment groups. Significant differences across any of the other attachment groups—secure, preoccupied, and fearful—were not expected, regardless of essay condition.

CHAPTER 3: METHOD

Participants

The sample was comprised of 162 undergraduate students attending a medium sized small southeastern university (Radford University) with an uneven distribution of males and females (78.4% females and 21.6% males) with ages ranging from 17 to 25 ($M = 19.03$, $SD = 2.37$). The sample was predominately freshmen (71.0%), 16.0% were sophomores, 5.6% were juniors, and 7.4% were seniors. Also, a majority of the participants were Caucasian/White (74.7%), 9.9% identified themselves as African American, less than 1% identified as East/Southeast-Asian American, 1.2% identified as Pacific Islander American, less than 1% identified as South-Asian American, less than 1% identified as Middle Eastern/North African American, 5.6% identified themselves as Hispanic American, 1.2% identified themselves as American Indian/Native American, 3.7% of participants identified themselves as belonging to multiple ethnicities, and 1.9% of participants did not fall into any of the previous groups. The average reported college GPA was 2.94 ($SD = 0.83$).

When examining participant relationship status, 50% reported being single, 43.2% reported being in a relationship but not living together, 4.3% reported being in a relationship and living together, 1.2% reported being engaged, and 1.2% reported being married. When examining living situation while growing up (not current living situation), 61.1% reported living with both biological parents, 11.1% reported living with one biological parent, 10.5% reported living with one biological parent and one step parent, 11.1% reported living sometimes living with one parent and sometimes the other, less than 1% reported living with adopted parents, and 5.6% reported other (family situation did not fit established criteria).

After examining the participant's living situation while growing up, we also examined the educational status of the participants' parents. In regard to their mother's/stepmother's education, 5.6% reported that their mother did not finish high school, 17.3% reported that their mother received a high school diploma, 14.2% reported that their mother attended college but did not graduate, 17.9% reported that their mother completed a two year collegiate degree (Associates Degree/Equivalent), 34.6% reported that their mother completed a four year graduate degree (Bachelor's Degree/Equivalent), and 10.5% reported that their mother completed a post graduate degree (Master's Degree/Doctorate). In regard to their father's/stepfather's education, 6.8% reported that their father did not finish high school, 25.3% reported that their father received a high school diploma, 13% reported that their father attended college but did not graduate, 9.3% reported that their father completed a two year collegiate degree (Associates Degree/Equivalent), 31.5% reported that their father completed a four year graduate degree (Bachelor's Degree/Equivalent), 10.5% reported that their father completed a post graduate degree (Master's Degree/Doctorate), and 3.7% reported being unaware as to their father's educational status.

Last, we assessed whether the participant's mother or father were deceased at the time of the study and found that 96.9% reported their mother as being alive, 3.1% reported their mother as being deceased, 95.7% reported their father being alive, and 3.1% reported their father being deceased. Participants were recruited using convenience sampling via an online participant pool management system. All of the participants were recruited from various psychology courses throughout year and received extra credit/course credit in exchange for their participation. This sample of participants was derived from a larger sample of ($N = 191$), with 29 participants dropped from data analysis. Seventeen participants were dropped for failing to complete any of

the tasks correctly (self reported lack of effort, did not follow directions), seven participants were dropped for displaying demand characteristics (eagerness), and five were dropped due to computer malfunctions.

Measures

Two separate measures were used to assess the participants' attachment style. The first measure of attachment was the Experiences in Close Relationships Revised (ECR-R), which was used to determine the participant's scores on dimensions of anxiety and avoidance (Sibley, Fisher, & Liu, 2005; Brennan et al., 1998). The ECR-R is a 36 item inventory comprised of two 18 item subscales, an anxiety subscale and an avoidance subscale. The ECR-R was rated on a 7-point Likert scale that ranged from 1 (*disagree strongly*) to 7 (*strongly agree*), with participant's reading sentences that deal with attachment related anxiety (I prefer not to show a partner how I feel deep down) or attachment related avoidance (I do not often worry about being abandoned) and rating the amount each statement is representative of them. To compute an individual's score for the anxiety subscale ($M = 3.61$, $SD = 1.16$), a mean score from all even numbered items was computed (note: items 22 and 30 are reverse scored). To compute an individual's score for the avoidance subscale ($M = 2.69$, $SD = 0.91$), a mean score for all odd numbered items was computed (note: items 3, 5, 11, 15, 17, 19, 25, 27, 29, 31, 33, and 35 are reverse scored). Cronbach's alphas for the 18 anxiety items and the 18 avoidance items were .93 and .93 respectively.

The second measure to assess attachment style was the Relationship Questionnaire (RQ) which consisted of four short essays that described patterns of feelings one experiences in close relationships, wherein participants selected the paragraph that most applies to themselves. After

they have selected the paragraph, they viewed each paragraph a second time and rated the amount each pattern applies to them on a seven point scale that ranged from 1 (*very undescriptive of me*) to 7 (*very descriptive of me*). It was found that 43.8% of participants reported as having a secure attachment, 16% as having preoccupied attachment, 28.4% as having fearful avoidant attachment, and 11.7% reported as having dismissing avoidant attachment.

The Positive and Negative Affect Scale (PANAS) was used to ensure that mood is not a confounding variable. The PANAS is a 20 item inventory comprised of two lists of 10 adjectives that assess participants' positive and negative affect. The participant rated each adjective on a five point scale that ranged from 1(*very slightly*) to 5(*extremely*) the degree to which they felt that emotion at that time. To compute a participant's score for positive affect, a mean score ($M = 3.19$, $SD = 0.74$) was computed for all of the positive adjectives (interested, alert, excited, inspired, strong, etc.). To compute a participant's score for negative affect, a mean score ($M = 1.60$; $SD = 0.63$) was obtained from all of the negative adjectives (distressed, ashamed, upset, scared, afraid, etc.). Cronbach's alphas for the 10 positive affect adjectives and the 10 negative affect adjectives were .85 and .86 respectively.

Manipulation Check

To ensure that participants put forth effort on the self-regulation task, a three question manipulation check was administered to participants. The manipulation check asked participants to think back to previous parts of the study (essay task, anagram task) and rate on a nine point scale that ranged from 1 (*minimal effort*) to 9 (*maximal effort*), with participants rating how much effort they exerted on each task (see Appendix A). Participants that reported putting forth

minimal effort (≤ 3) on item two for select essay conditions (attachment/depletion) were dropped from the study.

Procedure

All participants signed up for one hour individual sessions. All of the data collection (survey responses) and performance elements (essay completion, persistence assessment) were recorded using an online survey system (Qualtrics). Prior to their participation, the participants signed informed consent sheets that briefed them on the nature of the study and informed them about their rights as participants (see Appendix B). Any participant under the age of 18 was required to have their parents fill out a copy of the Parental Consent form prior to their participation in the study (see Appendix C). At the start of the survey, the participant filled out both the ECR-R and RQ to assess his or her attachment style. Once the participants completed the questionnaires, they were randomly assigned to one of three possible essay conditions (see Appendix D).

The first possible essay (Attachment Essay) originated from the Adult Attachment Interview (AAI) outlined by Hesse (2007). The essay asked participants to describe and elaborate on their relationship with their mother/attachment figure in the attempt to activate their attachment system. During the attachment essay, the participant listed five adjectives they would use to describe their relationship with their mother/attachment figure and then to elaborate as to why they chose that particular adjective. The active retrieval of attachment related memories should theoretically activate the attachment system in the participant as memories during childhood (specifically negative memories) may serve to instigate feelings of anxiety/insecurity. From there, the participant engaged in hyperactivating, deactivating, or secure attachment

strategies to deal with the attachment related memories. Past researchers have found that individuals high on attachment related avoidance will engage in the deactivating strategies in response to distressing emotions/memories, even when they have not been primed to do so (Mikulincer, Dolev, & Shaver, 2004).

The second essay served as a self-regulation depletion task and is a modified replication of the Schmeichel (2007) ego depletion task. During the self-regulation essay, participants wrote a story about a recent trip they had taken but they were instructed to refrain from using the letters "a" and "n." The participants may use words that contain these letters, but they may not include those letters in the word.

The third essay served as a control condition, in that the essay did not activate the attachment system or lead to self-regulation depletion. Participants were asked to write a story about a recent trip they have taken; however, they were free to use the letters "a" and "n" in their essay.

After the participant had worked on the writing task for the predetermined amount of time (five min), they automatically advanced to the next section of the experiment, the PANAS. Participants completed the PANAS to ensure that the previous essay condition did not induce the participant into a negative mood. Once the participants finished the PANAS, they advanced to the unsolvable anagram task to assess self-regulation depletion (see Appendix E). At the start of the anagram task, participants were informed that they should continue working on the anagram task until they finish solving all of the anagrams or they simply cannot continue any more. The anagram task was comprised of 48 word scrambles, the majority of which were unsolvable (LENPTAE, UOLDIBE) with very few solvable (URSECD). Because the task is inherently

unsolvable, no participant "completed" all of the scrambles and all participants advanced when they simply did not have the ability to continue or when they reached the established time limit (20 min). In our sample, 29 participants persisted for the entirety of the task. The amount of time (s) participants spent on the anagram task served as an indicator of their current amount of self-regulatory resources, with longer time spent on the anagram task suggesting larger amounts of self-regulatory resources and vice versa. During the word scramble section, the experimenter relocated to an adjoining room so as to not pressure the participant to persist on the task any longer than they would normally do so.

After the participant completed the word scramble section, they answered a manipulation check that assessed whether or not participants put forth effort on the persistence task and previous writing task. Lastly, the participant completed a series of demographic questions (Appendix F). At the end of the experiment, the participant was thanked for their participation, briefed on the purpose of the study, given a copy of debriefing form (See Appendix G).

Statistical Analysis Plan

In the present study, the data analysis was conducted in three steps: demographic analyses, preliminary analyses, and main analyses. The demographic analyses compared the demographic variables (age, class rank, ethnicity, etc.) with the main variables of interest (ECR-avoidance, ECR-anxiety, RQ classifications, essay condition, and time spent on persistence task) to identify any potentially confounding relationships. These demographic analyses consisted of a series of Pearson's chi-square tests to test the associations between categorical variables, Pearson's correlations to test the association between continuous variables, and a combination of independent sample *t*-tests and one-way ANOVA's to test associations between categorical

predictors and qualitative outcomes. The preliminary analyses consisted of a series one-way ANOVA's to ensure that the short writing task did not induce participants into an undesired mood state.

The main analysis consisted of a factorial ANOVA and a pair of hierarchical regression. A 3 x 4 factorial ANOVA was used to tests interactions between experimental conditions (essay type) and categorical measures of attachment (RQ). If a significant interaction was found between the variables of interests, simple effects were conducted for both independent variables to determine where the interaction occurred. Hierarchical multiple regression protocols outlined by Aiken & West (1991) were used to test the interaction between experimental conditions and continuous measures of attachment. Step one for testing the interaction was to center the continuous predictors (ECR-R anxiety score and ECR-R avoidance score) by subtracting the mean score for each of these measures from each participant's raw score. Step two was to create dummy variables representing the participant's essay condition. Dummy variables are a way of recoding a categorical variable into a series of dichotomous variables representing specific comparisons between the levels of the categorical variable. When creating dummy coded variables, one level is designated as the baseline/comparison and shall receive a value of "0" for all dummy variables. For the first dummy variable, we assign a value of "1" to the first group we wish to compare to the control group with all other groups receiving a value of "0." For the second dummy coded variable, we assign a value of "1" to the second group we wish to compare against the mean with all other levels receiving a value of "0." The number of dummy coded variables needed to fully capture the effect of the categorical variable is (k-1), with "k"

representing the number of levels of the variable (a dummy variable is not created for the control condition representing the comparison level).

In step three the interaction term was created by multiplying the centered ECR-Anxiety and ECR-Avoidance scores by the dummy essay variables. In step four the interactions were tested by examining the R^2 change between in hierarchical multiple regression. When running the hierarchical regression, the dummy variables (Essay) and the appropriate attachment variables were entered into the first block and the appropriate interaction terms were entered into the second block. Significant regression coefficients in Block 1 would indicate significant main effects and a significant R^2 change for Block 2 would indicate significant interaction effects. Simple slopes were generated for each experimental condition to probe significant interactions.

CHAPTER 4: RESULTS

Demographic Analysis

In order to identify associations between demographic variables (sex, class rank, ethnicity, age, current GPA, high school GPA, relationship status, adoption status, living situation, mother's educational status, father's educational status, living status of either parent, and the experimenter identification) and the main variables of interest (adult attachment classification, essay condition, ECR-anxiety, ECR-avoidance, and time spent on persistence task) a series of preliminary analyses were conducted. A significant negative correlation was observed between the participant's age and their scores on the anxiety subscale of the ECR-R, $r(160) = -.162$, $p < .05$. As participants increase in age, their reported anxiety levels decrease. This observation is not surprising, as attachment related avoidance seems to increase with age and attachment related anxiety follows an opposite trend (Sibley et al., 2005).

There was a significant association between attachment classification and the current GPA of the participants, $F(3,118) = 4.81$, $p = .003$, $\eta^2 = .11$. Results of Fisher LSD post-hoc tests revealed that participants classified as secure ($M = 2.89$, $SD = 0.91$), dismissing avoidant ($M = 3.17$, $SD = 0.51$), and fearful avoidant ($M = 3.22$, $SD = 0.48$) had higher current college GPA's than participant's classified as preoccupied ($M = 2.39$, $SD = 1.03$).

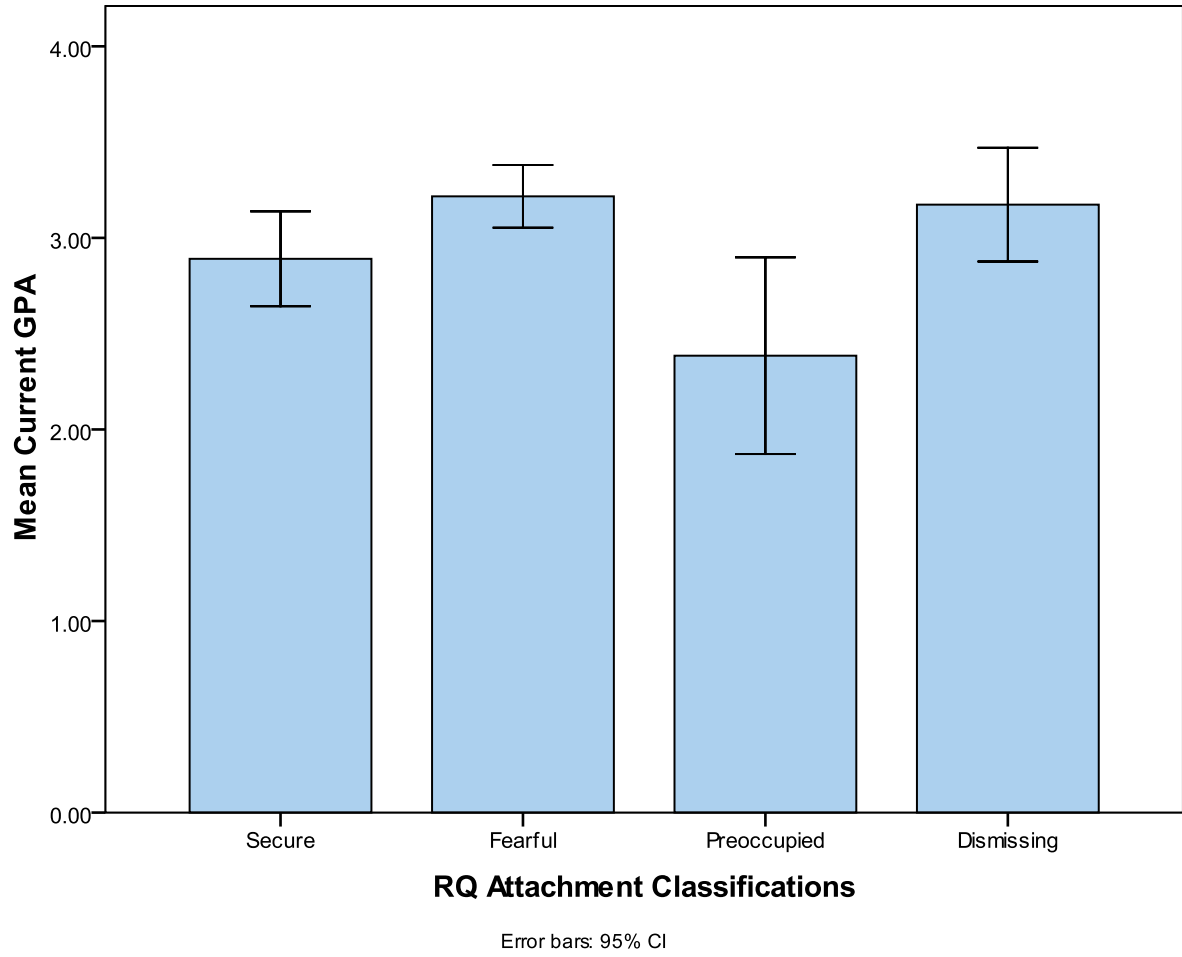


Figure 3. Mean current GPA's reported by the participants across the varying attachment classifications.

There was also a significant association between the participants' relationship status and their scores for attachment related avoidance, $F(4,157) = 6.92, p < .001, \eta^2 = .15$. Results of Fisher LSD post-hoc tests revealed that participants that are dating but not living with their significant other ($n = 70; M = 2.36; SD = .81$) and participants that are currently engaged ($n = 2; M = 1.61; SD = 0.39$) have on average lower avoidance scores in comparison to individuals that are single ($n = 81; M = 3.03; SD = 0.89$). There were no other observed differences between the other relationship statuses. For a graphical representation of group means, see Figure 4.

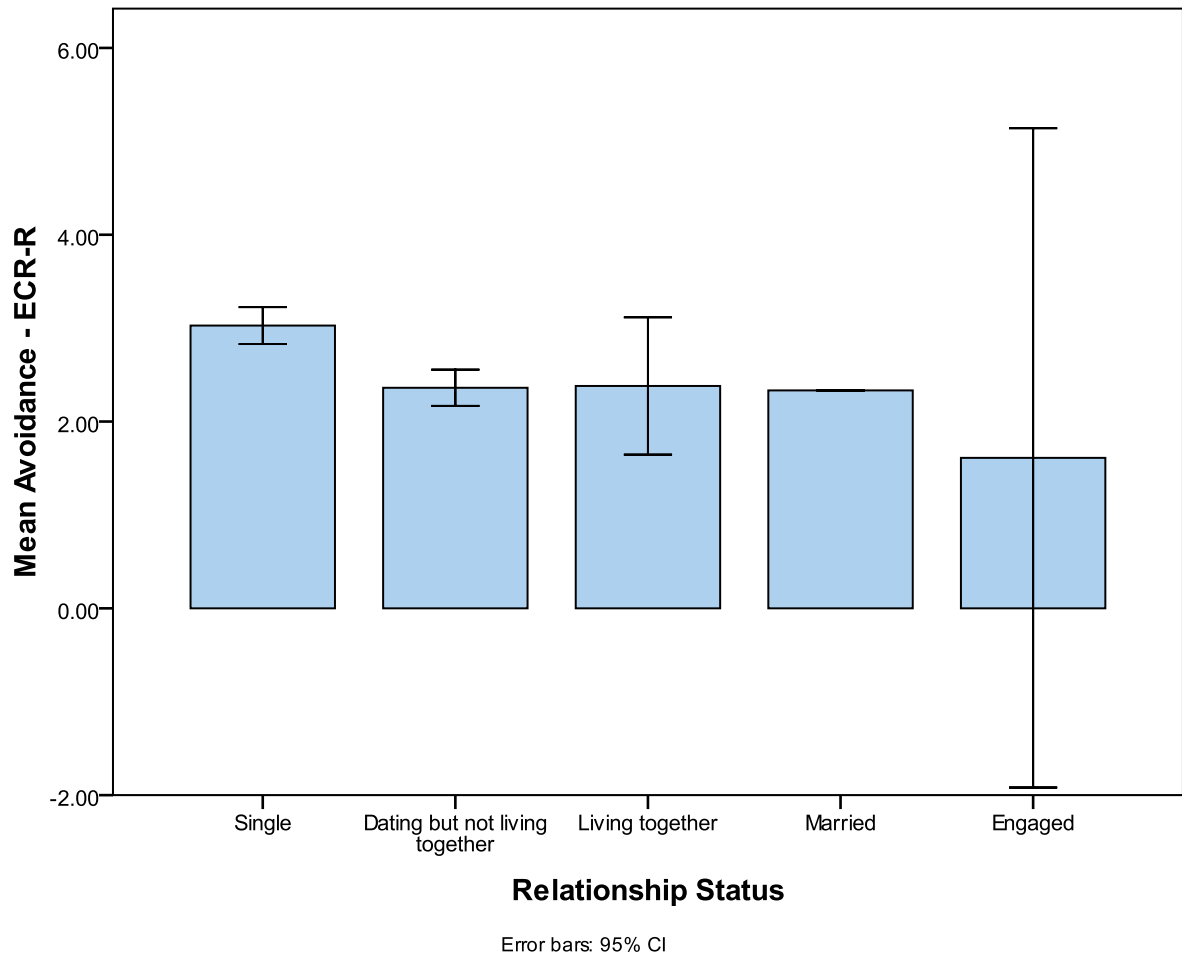


Figure 4. Mean ECR-R avoidance scores reported by the participants across their varying relationship statuses. Higher scores indicate higher levels of attachment related avoidance and vice-versa.

There was a significant association between the living status of the participant's mother on the participants' scores for attachment related anxiety, $t(160) = -2.37, p = .02; d = -.96$. Participants whose mother is still alive ($n = 157, M = 3.57, SD = 1.13$) have significantly lower scores for attachment related anxiety in comparison to participants whose mother is deceased ($n = 5, M = 4.80, SD = 1.43$). There was also a significant association between the living status of the participants' mother on time spent on persistence task, $t(5.48) = 2.82, p < .05; d = .82$ (*df* based off violated Levene's test). Participants whose mother is still alive ($n = 157, M = 583.76, SD = 366.73$) persisted longer on the unsolvable anagram task in comparison to participants whose mother is deceased ($n = 5, M = 367.71, SD = 158.19$). A significant association was also observed for the living status of the participants' father and attachment related anxiety, $t(5.54) = 3.13, p = .02; d = .871$ (*df* based off violated Levene's test). Participants whose father is still alive ($n = 155, M = 3.60, SD = 1.14$) had significantly higher scores for attachment related anxiety in comparison to participants whose father is deceased ($n = 5, M = 2.86, SD = 0.49$).

Although the effect for experimenter status (who “performed” the study) on persistence was not statistically significant, $F(3,158) = 2.257, p = .084, \eta^2 = .04$, it was observed that depending on whom facilitated the experiment, some participants persisted longer on the anagram task. All remaining demographic analyses were non-significant. Due to the unequal sample sizes between the mom “alive” and the mom “deceased” groups and the dad “alive” and the dad “deceased” groups, the living status of either parent was not included as a covariate in any of the main analyses. To ensure that experimenter status was not a confounding variable, it was included as a covariate in the main analysis.

Preliminary Analysis

After participants completed the short writing task, they completed the PANAS to ensure the task did not induce the participant into a different mood state. Independent from their attachment classification, there were no reported differences between participants that completed differing essay tasks with respect to their scores for positive affect, $F(2,153) = .92, p = .401, \eta^2 = .01$, or their scores for negative affect, $F(3,152) = .518, p = .597, \eta^2 = .01$. Also, independent from the essay condition, there were no reported differences between participants of differing attachment styles with respect to their scores for positive affect, $F(3,152) = 1.33, p = .267, \eta^2 = .03$, or their scores for negative affect, $F(3,151) = 1.66, p = .179, \eta^2 = .01$. Because there was no association between our categorical predictors and scores on the PANAS, participant's scores on the PANAS were not included as a covariate in the main analysis.

Main Analysis: Factorial ANOVA

To test the hypothesis that there would be a significant interaction between attachment classification and essay type, a series of factorial ANOVA's were conducted with experimenter identification included as a covariate (Table 2). With respect to essay type, it was hypothesized that participants in the self-regulation depletion condition would spend significantly less time on the persistence task in comparison to the other two essay conditions. Contrary to our hypothesis, there was no reported main effect for essay type on persistence. There was also no main effect for attachment classification on persistence which was in line with our second hypothesis. In line with our main research hypothesis, a significant interaction was observed between attachment classification and essay type on persistence (Figure 8). To determine where these significant interactions were, a series of simple effects tests were conducted. For all group means, standard deviations, and differences, see Table 3.

Table 2

ANOVA Table for Attachment Classification and Essay Condition

Effect	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	η^2
Essay Condition (A)	53550.93	2	26775.47	0.21	.00
Attachment Classification (B)	610725.03	3	203575.01	1.63	.03
(A x B)	1841806.73	6	306967.79	2.46*	.09
Experimenter Identity	105249.65	1	105249.65	0.84	.00
Error	18590120.59	149	124765.91		
Total	75257766.56				
(B) at Attachment Essay (a1)	1541089.54	3	513696.51	4.11*	.16
(B) at Ego-Depletion Essay (a2)	900221.67	3	300073.89	2.40 [†]	.18
(B) at Control Essay (a3)	32654.59	3	10884.86	0.09	.00
(A) at Secure Attachment (b1)	969256.71	2	484628.36	3.88*	.10
(A) at Fearful Attachment (b2)	498300.23	2	249150.12	2.00	.07
(A) at Preoccupied Attachment (b3)	44054.13	2	22027.07	0.18	.02
(A) at Dismissing Attachment (b4)	485193.67	2	242596.84	1.94	.45

Note. [†] = $p \leq .10$ * = $p \leq .05$. The identity of the experimenter was included as a covariate in these analyses

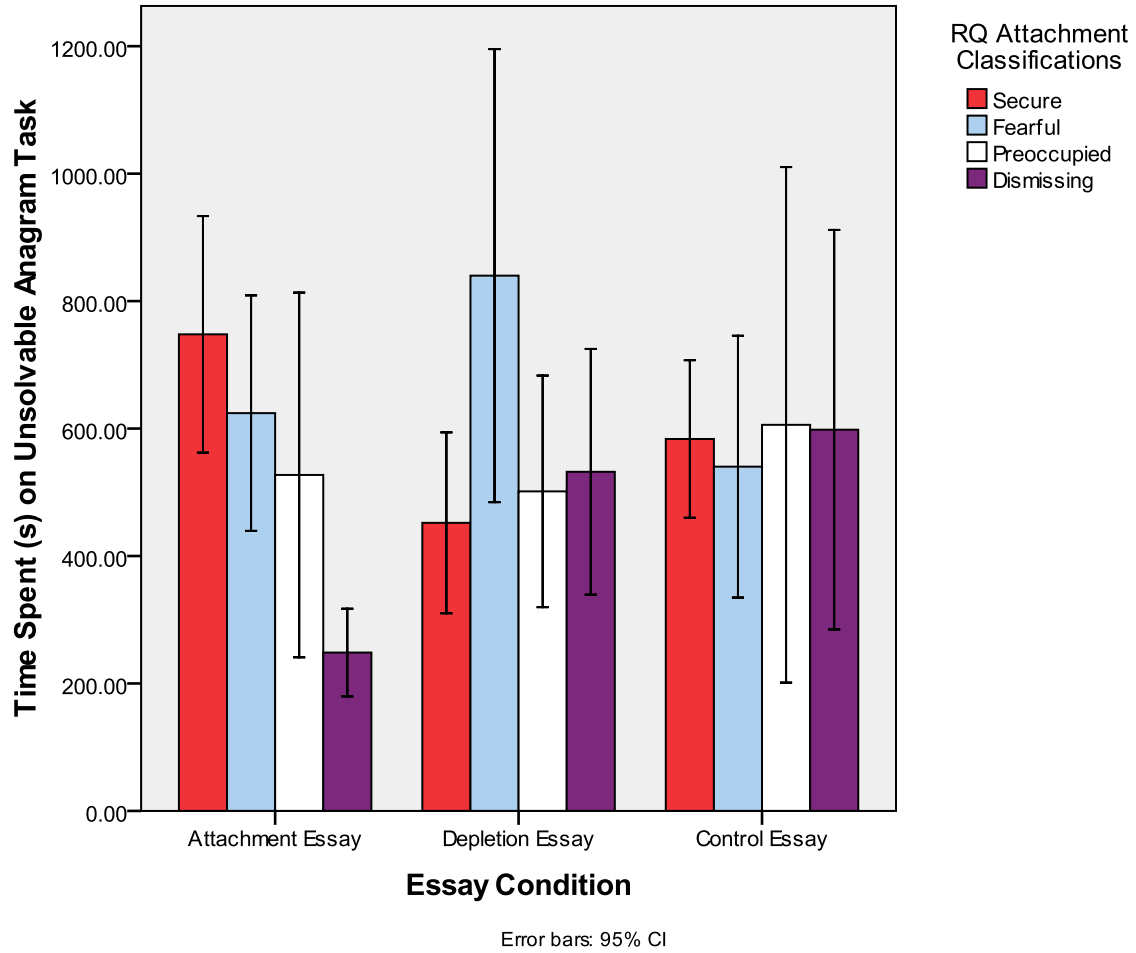


Figure 5. Mean time spent (s) on the unsolvable anagram task across essay condition as well as attachment classification (RQ). Error bars are at the 95% confidence interval.

Table 3

Mean Time Spent on Persistence Task (s.) across Attachment Classification and Essay Condition

	Attachment Classification (RQ)				<i>df</i>	<i>F</i>	η^2
	Secure	Fearful	Preoccupied	Dismissing			
Attachment Essay	<i>n</i> = 23 747.85 ^a (429.17) _a	<i>n</i> = 20 624.21 (394.78) _a	<i>n</i> = 8 527.21 (342.29) _{ab}	<i>n</i> = 8 248.52 (82.31) _b	2	4.11	.16
Ego-Depletion Essay	<i>n</i> = 21 452.06 ^b (311.80)	<i>n</i> = 8 839.94 (425.20)	<i>n</i> = 12 501.43 (286.02)	<i>n</i> = 5 532.14 (155.27)	2	2.40	.18
Control Essay	<i>n</i> = 27 583.66 ^{ab} (312.44)	<i>n</i> = 18 540.22 (413.07)	<i>n</i> = 6 605.84 (385.43)	<i>n</i> = 6 598.23 (298.71)	2	0.09	.00
<i>df</i>	3	3	3	3			
<i>F</i>	3.88	2.00	0.18	1.94			
η^2	.10	.07	.02	.45			

Note. Means within rows with differing subscripts are significantly different at least $p \leq .05$ with respect to Fisher's LSD Post hoc analyses. Means within columns with differing subscripts are significantly different at least $p \leq .05$ with respect to Fisher's LSD Post hoc analyses. Standard deviations are included in parentheses below means.

A significant simple effect for attachment classification on persistence in the attachment condition was observed. Results of Fisher LSD post-hoc tests revealed that in the attachment essay condition, participants rated as dismissing avoidant persisted significantly less on the persistence task in comparison to secure individuals and fearful avoidant individuals. In the attachment essay condition, there were no significant differences between the dismissing avoidants and participants with preoccupied attachment in regard to time spent on persistence task. These results are in support with our initial hypothesis, in that dismissing avoidant participants did persist significantly less on the unsolvable anagram task in comparison to the other attachment classifications. Although the simple effect for attachment classification on persistence in the depletion condition was marginally significant ($p = .07$), it was observed that participants labeled as dismissing tended to "hyper persist" on the anagram task in comparison to the other attachment classifications. There was no observed simple effect for attachment classification in the control essay condition. All attachment classifications persisted an equal amount of time on the unsolvable anagram task after completing the control essay.

When examining the effect of essay condition on persistence across the attachment classifications, a significant simple effect for essay condition on persistence for participants with secure attachment was observed. Results of Fisher LSD post-hoc tests revealed that for secure participants, those that completed the depletion essay gave up significantly sooner on the persistence task in comparison to those that completed the other essay tasks. There was no observed simple effect for essay condition for fearful, preoccupied, or dismissing participants.

Main Analysis: Hierarchical Regression

To determine if there was a significant interaction between the continuous predictors for adult attachment (ECR-R) and the essay conditions, hierarchical regression protocols outlined by Aiken and West (1991) were used. See Table 4 for the regression results. between attachment related anxiety and essay condition. Because there was a marginally significant effect for experimenter identification on persistence, the experimenter identification was dummy coded (head researcher as comparison) and entered into the first block of both regression models as a covariate prior to entering our experimental predictors. Although the overall effect for experimenter on persistence was non-significant ($p = .08$), it was observed that (Res. 1 vs. Renz) was a significant predictor for persistence, indicating that having researcher one facilitate the experiment seemed to lead to people giving up significantly sooner in comparison to the head researcher (Renz). With respect to attachment related anxiety, it was observed that neither participants' attachment anxiety scores nor what essay they completed accounted for a significant amount of the variability in the amount of time they spent on the anagram task, with the overall model (main effects included) still not accounting for a significant amount of the variability, $F(6,155) = 1.33, p = .25, R^2 = .05$. After entering the coded interaction terms for anxiety and essay condition into the third block, the F-Change between model two and three was not statistically significant, $F(2,153) = .58, p = .56, R^2 = .00$, indicating that this new model did not account for significantly more variability in the criterion in comparison to the previous model.

Table 4

Regression Model for the interaction between Anxiety and Essay Condition on Persistence Task (s)

Analysis	$R^2\Delta$	(df)	β	t	Simple Slopes		
					Essay Condition		
					Attachment	Depletion	Control
Anxiety x Essay Condition							
Block 1	.04 [†]	(3,158)					
Res. 1 vs. (Renz)			-0.19	-2.14 [*]			
Res. 2 vs. (Renz)			0.02	0.20			
Res. 3 vs. (Renz)			-0.09	-0.09			
Block 2	.01	(3, 155)					
Anxiety (ECR-R)			-0.03	-0.39	-.09	.12	-.06
Essay1 (Att vs Con)			0.02	0.24			
Essay2 (Dep vs Con)			-0.07	-0.77			
Block 3	.01	(2, 153)					
Anxiety x Essay1			-0.14	-0.89			
Anxiety x Essay2			0.86	0.39			

Note.[†] = $p \leq .10$, ^{*} = $p \leq .05$

With respect to attachment related avoidance (See Table 5), a marginally significant effect for attachment related avoidance was observed ($p = .09$). Independent from the essay condition, it appeared that attachment related avoidance was negatively associated with persistence with participants tending to spend less time on the persistence task as attachment related avoidance increased. Like the previous model, knowing what essay task the participant completed did not help in predicting their current level of self-regulatory resources. After entering the coded interaction terms for avoidance and essay condition into the third block, the F-change between model one and two was marginally significant, $F(2,153) = 2.42, p = .09, R^2 = .03$, indicating that this new model (interaction terms included) accounted for a marginally significant amount of the variability in the criterion (time on anagram task) in comparison to the previous model. With the inclusion of the interaction terms, the overall model now accounted for a significant amount of variability in the criterion, $F(8,153) = 2.00, p = .05, R^2 = .09$. Because a marginally significant interaction was observed, simple slopes were generated to probe significant interactions and it was revealed that the relationship between which essay task the participant completed and the participant's persistence on the unsolvable anagram task was moderated by the participant's level on avoidance, specifically in the attachment essay. In the attachment essay condition, as participants scores for attachment related avoidance increase they tended to spend less on the persistence task. However, attachment related avoidance was not a significant predictor for persistence in any of the other essay conditions (depletion/control).

Table 5

Regression Model for the interaction between Avoidance and Essay Condition on Persistence Task (s)

Analysis	$R^2\Delta$	(df)	β	t	Simple Slopes		
					Essay Condition		
					Attachment	Depletion	Control
Avoidance x Essay Condition							
Block 1	.04 [†]	(3,158)					
Res.1 vs. (Renz)			-0.19	-2.14*			
Res. 2 vs. (Renz)			0.02	0.20			
Res. 3 vs. (Renz)			-0.09	-0.09			
Block 2	.03	(3, 155)					
Avoidance (ECR-R)			-0.14	-1.74 [†]	-.33**	.12	-.08
Essay1 (Att vs Con)			0.01	0.11			
Essay2 (Dep vs Con)			-0.08	-0.85			
Block 3	.03 [†]	(2, 153)					
Avoidance x Essay1			-0.16	-1.40			
Avoidance x Essay2			0.09	0.91			

Note. [†] = $p \leq .10$, * = $p \leq .05$, ** = $p \leq .01$. The identity of the experimenter was included as a covariate in this analysis

CHAPTER 5: DISCUSSION

The present study tested the hypothesis that using the deactivating strategies thought to underlie the dismissing avoidant attachment style directly leads to self-regulation depletion. It was hypothesized that there would be a significant main effect for essay condition on persistence, with participants that completed the depletion essay persisting significantly less on the anagram task in comparison to the other essay conditions. There was no predicted main effect for attachment classification on persistence. Independent from essay condition, there were no expected differences between the different attachment groups regarding time spent on the unsolvable anagram task. Lastly, a significant interaction between essay type and attachment style was expected, with simple effects revealing a significant effect of adult attachment style on persistence for participants that completed the attachment essay. Specifically, dismissing avoidant participants in the attachment essay condition were expected give up sooner on the self regulation task in comparison to the other attachment styles.

With respect to the first hypothesis, it was observed that there was no significant main effect for essay condition on persistence. Independent from attachment classification, there were no significant differences concerning time spent on the persistence task between participants that completed differing essay tasks. The lack of significant differences indicates a flaw in the research design as the depletion essay did not achieve its intended purpose of depleting self-regulatory resources. There are two possible explanations for why this occurred, with the first being that we implemented a shortened version of the ego depletion task (five minutes instead of six minutes). Because none of the participants "fully" completed the depletion task, we cannot reliability expect them to be depleted at the time of assessment.

Another explanation for why the depletion task did not achieve its intended purpose directly ties to how we assessed our dependent variable. In our experiment, self-regulation depletion was measured by timing how long participants spent working on an unsolvable anagram task. In previous studies that implemented this measure of self-regulation depletion the researchers included the instructions, "This is not a test. Work on them for as long as you want." prior to participants working on the task (Muraven, Tice, & Baumeister, 1998). Although our study included a variation of this statement, the clear indication that the task was not a test/graded in any meaningful fashion should theoretically result with participants only persisting on the task due to their level of self-regulatory resources rather than their attempt to achieve some goal (successful completion of the anagram task). Because our study did not include this statement, we cannot be certain that participants only persisted due to the presence/lack of self-regulatory resources rather than being motivated to appease the researcher by completing the task. The implementation of an additional manipulation check assessing participant's perceived importance of the anagram task would be essential to determine if this is the case.

In addition, although some researchers have asserted that persistence on an unsolvable task is a reliable and valid measure for persistence (Muraven, Tice, & Baumeister, 1998), others have found contrasting findings. After attempting to replicate the results from the pivotal ego-depletion experiment (Muraven, Tice, & Baumeister, 1998), Murtagh and Todd (2004) found that persistence on an anagram task is too sensitive to individual differences to be solely affected by the participant's current level of self-regulatory resources, as evidenced by the variability in score demonstrated in the present study, which were much larger than the reported standard

deviations of past studies, however this may be attributable to the researchers not performing an exact replication of past studies (different depletion task).

In contrast to the second hypothesis, there was no observed main effect for adult attachment classification on persistence. Independent from essay condition, participants of differing attachment classifications did not significantly differ from one another concerning time spent on the unsolvable anagram task. With respect to the third hypothesis, our initial prediction was correct in that a significant interaction between attachment classification and essay type was observed with simple effects revealing a significant effect in the attachment essay condition. Using the deactivating attachment strategies thought to underlie the dismissing avoidant attachment style did directly lead to self-regulation depletion in the dismissing avoidants. Mikulincer and Shaver (2002) proposed that individuals that rate highly on attachment related avoidance utilize the deactivating strategies to suppress the activation of their attachment system. Past research has also found that the deactivating strategies are moderated by the presence/absence of self-regulatory resources (Kohn, Rholes, & Schmeichel, 2012). Taken together, it was hypothesized that utilizing the deactivating strategies would directly lead to self-regulation depletion and our results are in support of this view. The deactivating strategies can be conceptualized as a facet of self-regulation, with individuals that use these strategies (dismissing avoidants) falling prey to the cognitive "costs" of such behaviors. Although there was no significant effect for essay condition on persistence with individuals that have labeled as having a dismissing avoidant attachment style, the presence of a large effect for those participants ($\eta^2 = .45$) strongly suggests that our studies was underpowered, evidenced by the extremely

small sample sizes for some of the attachment classifications (e.g., dismissing avoidant, preoccupied).

Interestingly, although our depletion task did not achieve its intended purpose, a marginally significant effect in the depletion condition was observed ($p = .07$). Participants labeled as fearful avoidant tended to “hyper-persist” on the unsolvable anagram task in comparison to the other attachment classifications. The explanation for why these individuals persisted may tie back to both the inherent nature of the fearful avoidant attachment system in combination with the tasks/materials used throughout the experiment. When examining the depletion essay against the other essay conditions, it becomes clear that there is a more objective/“test-like” quality associated with the task. In the attachment essay, the participant was instructed to write about their relationship with their mother/attachment figure with no further instructions given. Much like the attachment essay, the control essay asked participants to write about a trip they have recently taken with no further instructions given. When examined at face value, both of these tasks can be viewed in a relatively subjective light with no clear right or wrong answer. In contrast to these two essays, the depletion essay was the same as the control essay with the addition of a set of instructions where the participant was forbidden to use predetermined letters during the essay. Although the task was still inherently subjective, the presence of a particular rule that must not be broken may have caused participants to view the task in a different manner than the other essay tasks. No longer entirely subjective, there is now an “official” wrong response (using the forbidden letters). Because this task has more limitations than the other tasks, it is possible participants may have viewed the depletion task in an ambiguous/threatening nature.

Although these limitations did not appear to affect the secure, preoccupied, or dismissing attachment classifications, the absence of any feedback on prior performance may led to the activation of the attachment system in fearful avoidants as their self-esteem may have been threatened. When greeted with new tasks that assess performance (our anagram task did not clearly state it was not graded) in the absence of feedback of on prior tasks (depletion condition), it may lead to fearful avoidants adopting a stance of uncertainty concerning their own performance, in process threatening their already fragile self-esteem (Mikulincer & Shaver, 2008). This perceived attack on self-esteem may have caused the fearful avoidants to engage in hyperactivating strategies which may have manifested as hyper-persistence on the unsolvable anagram task as a route of gaining positive feedback/approval from the experimenter. It should be noted that this pattern of behavior was not present in any of the other attachment classifications or in any of the other essay tasks (fearful avoidants did not hyper persist in the control condition), indicating that there is something inherent in this task that moderates the behavior of fearful avoidants.

Last, with respect to attachment related anxiety, it was observed that neither attachment related anxiety, the participant's essay condition, nor our computed interaction terms for our continuous and categorical predictors accounted for a significant amount of the variability in the criterion (persistence). As mentioned above, the lack of main effect for essay predicting persistence although unwanted was not entirely unexpected. The lack of a significant interaction between anxiety and essay condition coincides with the results of the factorial ANOVA as dismissing avoidants are not characterized by high levels of attachment related anxiety and thus

anxiety would not be a significant predictor in any of the essay conditions (Shaver & Mikulincer, 2008).

With respect to attachment related avoidance, it was observed that the neither participants' scores on attachment related avoidance nor what essay they completed accounted for a significant amount of the variability in the amount of time they spent on the anagram task. After entering the coded interaction terms for avoidance and essay condition into the model a marginally significant interaction was observed, with the overall model (interaction terms included) now accounting for a significant amount of the variance in the criterion (time on anagram task). Because a marginally significant interaction was observed, simple slopes were generated to probe significant interactions and it was revealed that the relationship between the participants' scores for attachment related avoidance and the participant's persistence on the unsolvable anagram task was moderated by the type of essay the participants completed, specifically in the attachment essay. In the attachment essay condition, as participants' scores for attachment related avoidance increase they tended to spend less on the persistence task. This finding can be easily interpreted by examining the results of the previous factorial analysis in relation to our hierarchical regression.

In the attachment essay condition, the dismissing avoidants spent significantly less time on the anagram task in comparison to secure and fearful participants. When examining individuals that are labeled dismissing avoidants, they tend to rate highly on measures of attachment related avoidance. Although there were no significant differences between secure and fearful individuals, a trend was observed in that fearful participants appeared to persist less time on the anagram task compared to secure participants. Because both avoidant classifications

(dismissing/fearful) tended to persist less on the persistence task, coupled with the fact that secure participants score lowly on measures of attachment related avoidance and tended to persist more than any other group, the significant effect of avoidance on persistence was not suppressed by the other participant's scores for attachment related avoidance allowing for the simple effect of avoidance in the attachment essay condition to be observed using our model.

Limitations

While our study demonstrated that use of the deactivating strategies directly led to self-regulation depletion for people who consistently use these strategies, the lack of a main effect for our essay condition calls into question the accuracy of our interpretation of the results in the depletion task.

Although it may appear to be lacking in external validity, asking the participant to self-report about attachment related memories concerning their parent/attachment figure did appear to activate the attachment system similar the way the attachment system could be activated in the “real world,” as discussions of childhood with peers are not that uncommon. However, we must not forget to take into account the writing aspect of the attachment essay, which is not something individuals typically do when describing past experiences, serving as a limitation for the mundane realism aspect of our paradigm for activating the attachment system in conditions similar to the real world. To determine the limits our attachment system paradigm, it would be beneficial to see if activating the attachment system in an experimental setting is possible without the participant completing a writing component. It should be mentioned that when analyzing the content of the attachment essays to ensure that participants completed the task correctly, it became apparent that the experimental realism associated with the attachment essay

was high as participants shared attachment related memories about their mother/attachment figure that could be viewed as personal/intimate.

A second difficulty in assessing the generalizability of our study is the nature by which we assessed our dependent variable. Even though persistence on a series of anagrams is seen by researchers as a reliable measure of self-regulation depletion, unless one is embroiled in the literary world where one's work is contingent upon the solving of anagrams it is highly unlikely that individuals will be given an anagram task and asked to work on them until they are done (Muraven, Tice, & Baumeister, 1998). To compensate for this lack of mundane realism, it may be beneficial to engineer a situation where assessing self-regulation closely mirrors situations commonly found in the "real-world".

Because there was no manipulation associated with the continuous predictors (ECR-anxiety, ECR-avoidance) in combination with the correlational nature of the predictors, we cannot be certain that participants' scores on these measures were not confounded by extraneous variables internal/external to the experiment (e.g., experimenter identification; participant's prior mood, etc.).

Future Directions

In conclusion, the present study is important because it provides evidence that the use of the deactivating strategies appears to deplete self-regulation resources. Because we have demonstrated that it is possible to directly activate the attachment system, an idea for future research would be to investigate the "nature"/direction of the anxiety used to activate the attachment system to see if it responds in a similar manner to non-attachment related stressors.

Although replicating the study with an improved depletion task would be the first course of action, another possibility would be to increase the already difficult nature of the depletion

task to ensure that depletion successfully occurs (e.g., include an additional letter to be omitted, participants suppress thoughts of a white bear during the task) or to use a different depletion technique entirely (e.g., emotion suppression during emotional movie). Concerning how we assessed the dependent variable, we would either replicate our design with the desired changes to our measure (e.g., altered directions, inclusion of an added manipulation check) or use another measure of self-regulation depletion as an alternative to the anagram task.

On the topic of the marginally significant finding wherein participants labeled as fearful avoidants hyper-persisted on the anagram task after completing the depletion essay, a future avenue of research would be to determine whether fearful participants are merely appraising that particular depletion task differently than the other attachment classifications (i.e., they are affected by the ambiguous feedback) or whether mild self-regulation depletion only serves to ignite hyper-persistence in those individuals.

Final Message

Although this research provided an essential piece of information toward a greater understanding of the deactivating strategies of the dismissing avoidant attachment style, the success of our paradigm in activating the attachment system in these individuals opens up a new avenue of research for investigating how differing stressors can potentially activate/not activate the attachment system in conjuncture with investigating the various effects/changes that result from the activation of this system.

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APPENDIX A

MANIPULATION CHECK ITEMS

Please answer the following question without looking back to earlier parts of the study-it is essential that we get an accurate measure of what you really remember. Looking back would invalidate the results of the study.

1. How much effort did you exert on the writing activity we asked you to complete?

<---1 (Minimum Effort)---2---3---4---5 (Moderate Effort) ---6---7---8---9 (Maximum Effort)--->

2. How hard did you try on the writing activity?

<---1 (Minimum Effort)---2---3---4---5 (Moderate Effort) ---6---7---8---9 (Maximum Effort)--->

3. How many distracting thoughts did you have while working on the writing activity?

<---1 (Minimum Effort)---2---3---4---5 (Moderate Effort) ---6---7---8---9 (Maximum Effort)--->

Note. All items are completed using a 1-9 rating scale.

APPENDIX B

CONSENT/ASSENT FORM

Title of Research: Attachment and Self-Regulation Study

Researcher(s): Dr. Jeff Aspelmeier & Jonathan Renz

We ask you to be in a research study designed to: examine how individuals' attitudes about relationships influence your thinking processes. We are asking for your participation because you are at least 17 years of age and currently enrolled as a student at Radford University. If you decide to be in the study, you will complete questionnaires measuring your attitudes about relationships. Next, you will complete a 5-minute writing session. Following that, you complete a measure assessing your current feelings and then you will complete several word scrambles. Finally, we will ask you to provide general information about yourself (e.g. age, sex, GPA, relationship status, family history, and other similar information). We are recruiting approximately 150-300 students for this study.

This study has no more risk than you may find in daily life.

You may receive course credit or extra credit for participating in this study. Your psychology instructor will determine the amount of credit.

No direct physical, health, psychological, or social benefits to participants are expected to result from participation in this study. However, the research will help improve our understanding of the nature of interpersonal processes in adult relationships.

You can choose not to be in this study. If you decide to be in this study, you may choose not to answer certain questions or not to be in certain parts of this study.

If you decide to be in this study, what you tell us will be kept private unless required by law to tell. If we present or publish the results of this study, your name will not be linked in any way to what we present.

If at any time you want to stop being in this study, you may stop being in the study without penalty or loss of benefits by contacting Dr. Jeff Aspelmeier, Box 6946, Department of Psychology, Radford University, Radford, VA 24142. (540) 831-5520. jaspelme@radford.edu

If you have questions now about this study, ask before you sign this form.

If you have any questions later, you may talk with Dr. Jeff Aspelmeier, Box 6946, Department of Psychology, Radford University, Radford, VA 24142. (540) 831-5520. jaspelme@radford.edu

This study has been approved by the Radford University Institutional Review Board for the Review of Human Subjects Research. If you have questions or concerns about your rights as a

research subject or have complaints about this study, you should contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University, dgrady4@radford.edu, 1-540-831-7163.

It is your choice whether or not to be in this study. What you choose will not affect any current or future relationship with Radford University.

If you are under 18 years of age, you may only participate in this study if you have a signed copy of the Introductory Psychology Research Participation Requirement Parental Consent Signature Form with you today.

If all of your questions have been answered and you would like to take part in this study, then please sign below.

_____	_____	_____
Signature	Printed Name(s)	Date

If Under 18 – Witness required.

_____	_____	_____
Witness's Signature	Witness's Printed Name	Date

I/We have explained the study to the person signing above, have allowed an opportunity for questions, and have answered all of his/her questions. I/We believe that the subject understands this information.

_____	_____	_____
Signature of Researcher(s)	Printed Name(s)	Date

Note: A signed copy of this form will be provided for your records.

APPENDIX C

PARENTAL CONSENT FORMS

*College of Humanities and Behavioral Sciences
Department of Psychology*

RU
RADFORD
UNIVERSITY

*P.O. Box 6946
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Communication
Criminal Justice
English
Foreign Languages
and Literatures
Geography
Media Studies
Military Science
Philosophy and
Religious Studies
Political Science
Psychology
Sociology and
Anthropology*

Dear Parent or Guardian:

Your child is currently taking Introductory Psychology (PSYC 121). Students taking this course have a research requirement that makes up about 6% of their course grade. Also, your child will be able to earn extra credit in PSYC 121 by doing more than the required amount of research. Students may fulfill the requirement in two ways: 1) Students may participate in research studies run through the Department of Psychology. 2) Students may complete brief research papers about recently published studies in psychology. A complete description of the research requirements are enclosed with these materials. Both activities are designed to require relatively equivalent amounts of time and effort, and students are free to choose which research activities they would like to do. Students may even combine activities to complete the research requirement; for example, they could be in one study and write one paper.

Participation in research studies is designed to be an interesting and educational experience that is directly related to your child's introduction to the field of psychology. Because your child is under 18 years of age, s/he must have permission from a parent or guardian to participate in these studies. The purpose of this letter and the enclosed forms is to get your consent for your minor child to participate in studies run through the Department of Psychology at Radford University.

We can not anticipate in which studies your child may choose to participate. In the past, students have participated in research on perception, mental abilities, memory, close relationships (family, friends and romantic partners), psychological well-being, social anxiety, and psychological test development. Because your child is a minor, s/he will not be allowed to participate in any studies that will deal with deception about the true purposes of the study, sensitive issues (e.g., illegal or potentially embarrassing behavior), or involve risks of harm or injury beyond those encountered in one's daily life.

When your child participates in studies, the results either will be anonymous or will be kept confidential by researchers. Only members of the research team conducting a particular study will have access to your child's information.

Allowing your child to take part in these projects is entirely up to you, and no one will hold it against you and/or your child if you decide not to give consent. If you do not want your child to participate in research studies, your child can still complete the research requirements by completing the research paper option describe above and in the enclosed materials.

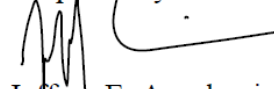
It is important for you to know that your child will complete forms obtaining informed assent (similar to this one) for each study in which s/he participates. These forms describe what your child will be asked to do in the study, and it will describe any potential risks and/or benefits that may result from participation. Further, your child will be reminded that his/her participation is entirely voluntary, and s/he may quit participating in the study at any time without penalty.

If you want to know more about the Research Requirements for Introductory Psychology or if you would like to like more details regarding studies your child may assent to, please call Dr. Jeff Aspelmeier at (540) 831-5520, or email him at jaspelme@radford.edu. If you want to know more about the university's policies regarding undergraduate participation in research or if you have any complaints or concerns about your child's rights as a research participant, please contact Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University, dgrady4@radford.edu, 1-540-831-716.

Enclosed you will find three copies of the Parental Consent Signature Form. If you want to allow your child to participate in research studies as part of Introductory Psychology, these forms should be signed by yourself and one other person 18 years of age or older as a witness to the signature (this is required by Virginia State law). Please sign all three copies. Keep one copy for your records. Using the enclosed postage paid business reply envelope, return the other two signed copies to:

Radford University
Department of Psychology
Research Pool Manager
Box 6946
Radford, VA 24142

Respectfully



Jeffery E. Aspelmeier, Ph.D.
Professor
Introductory Psychology Coordinator
Department of Psychology
Radford Univeristy

Enclosure: Business Reply Envelope, 3 Parental Consent Signature Forms, Course Policies for Research Requirement

Introductory Psychology Research Participation Requirement
Parental Consent Signature Form

Consent Statement:

I agree to let my child, _____, take part in studies conducted through the Psychology Department Research Participation Pool at Radford University. I understand s/he will not participate in any research that involves sensitive issues or potential harm beyond those encountered in one's daily life. I understand that my child will have a chance to complete an informed assent form for each study in which s/he participates and that s/he can stop at any time.

_____ Parent/Guardian Signature	_____ Date	_____ Parent/Guardian Printed Name
_____ Witness Signature	_____ Date	_____ Witness Printed Name

Introductory Psychology Research Participation Requirement
Parental Consent Signature Form

Consent Statement:

I agree to let my child, _____, take part in studies conducted through the Psychology Department Research Participation Pool at Radford University. I understand s/he will not participate in any research that involves sensitive issues or potential harm beyond those encountered in one's daily life. I understand that my child will have a chance to complete an informed assent form for each study in which s/he participates and that s/he can stop at any time.

_____ Parent/Guardian Signature	_____ Date	_____ Parent/Guardian Printed Name
_____ Witness Signature	_____ Date	_____ Witness Printed Name

Introductory Psychology Research Participation Requirement
Parental Consent Signature Form

Consent Statement:

I agree to let my child, _____, take part in studies conducted through the Psychology Department Research Participation Pool at Radford University. I understand s/he will not participate in any research that involves sensitive issues or potential harm beyond those encountered in one's daily life. I understand that my child will have a chance to complete an informed assent form for each study in which s/he participates and that s/he can stop at any time.

_____ Parent/Guardian Signature	_____ Date	_____ Parent/Guardian Printed Name
_____ Witness Signature	_____ Date	_____ Witness Printed Name

APPENDIX D

WRITING TASKS

Preliminary Instructions (Will be seen before essay condition): You are about to begin the writing portion of the survey. Please read the instructions very carefully. We would like you to write for five minutes. The computer will keep track of the time and when the time is up you will automatically advance to the next portion of the survey. It is very important that you write for the whole five minutes or else it could invalidate the results of this study.

Condition 1: Attachment Essay

- We would like you to choose five adjectives or words that reflect your relationship with your mother (or the person in your life who has served as your mother figure) starting from as far back as you can remember in early childhood--as early as you can go, but say, age 5 to 12 is fine.
- Then we would like to ask you why you chose the adjective. Write each adjective down and why that adjective describes your relationship with your mother in the space bellow.
- Again, you have 5 minutes to write. Please write for the entire time.

Adjective 1:

Why:

Adjective 2:

Why:

Adjective 3:

Why:

Adjective 4:

Why:

Adjective 5:

Why:

Condition 2: Depletion Essay

- We would like you to write a story about a recent trip you have taken. It may be a trip to the store, to Ohio, or to another country – wherever!
- Very important! When you are typing, please do not type the letters a or n anywhere in your story.
- You can use words that contain these letters, but you can't type the letters. For example this sentence would look like this:
You c use words th t co t i these letters, but you c 't type the letters.
- Don't worry about anyone seeing what you write; your name won't be on this document, so no one will ever know what you wrote.
- Again, you have 5 minutes to write. Please write for the entire time.

Condition 3: Free Writing

- We would like you to write a story about a recent trip you have taken. It may be a trip to the store, to Ohio, or to another country – wherever!
- Don't worry about anyone seeing what you write; your name won't be on this document, so no one will ever know what you wrote. We would like you to write for exactly 5 minutes.
- Again, you have 5 minutes to write. Please write for the entire time.

APPENDIX E

UNSOLVABLE ANAGRAM TASK

Please complete these word scrambles to the best of your ability. Continue on to the next section when you are either finished with all of the word scrambles or when you feel like you can't try any more.

LTEUBLA
GROADNE
LENPTAE
UOLDIBE
FSNAITE
OECARDE
TRAETCR
MRBTHUE
AEDRNOM
ARVHTEL
SHMCUEL
THATROE
RPSEONH
KECUBEL
RATSIID
DNOWIWE
SCUREED
TNHRCIE
LODLANE
NPGRISA
AICOLST
MBYLSOA
ONADESN
ENELGTD

OETKPCH
CSEDOLA
LEYPSET
CABLHED
PLECINA
OMCNMOT
POSTSGI
EMKOONY
GLUAERR
IIDVEDE
OEFSWLR
ROFAVSL
CMBHAOT
CTWSIHT
GAWHEIT
TETLELI
EODCMYN
URAHHCC
OERIRFPM
ONTCUESL
LSLIMNOI
SIVTION
LEKHPIC
NORCGEA

APPENDIX F

DEMOGRAPHIC QUESTIONS

Below is a list of questions pertaining to general information about yourself. Some questions will require that you to "fill in the blank" and some will require that you select from a list of options. Please answer each question as truthfully as possible. Remember that this information will be held confidential.

Sex Male Female

Class Standing:

1. Freshman
2. Sophomore
3. Junior
4. Senior

What is your Ethnicity?

- 1 – Caucasian/European American/White
- 2 – African American
- 3 – East-/Southeast-Asian American
- 4 – Pacific-Islander American
- 5 – South-Asian American (e.g., from India, Pakistan, Burma, Nepal, etc.)
- 6 – Middle-Eastern/North-African American
- 7 – Hispanic American (Latino/a, Chicano/a)
- 8 – Caribbean American
- 9 – American Indian/Native American
- 10 –Multi Ethnic – please specify: _____
- 11 – Other – please specify: _____

What is your Age?

What is current GPA?

What is your Graduating High School GPA?

Please indicate your current relationship status:

1. Single
2. Dating but not living together
3. Living together
4. Married
5. Separated
6. Divorced
7. Widowed
8. Engaged

If Yes, how long have you been engaged?

Were you adopted? Yes No

If Yes, at what age were you adopted?

Which best describes your living situation while growing up?

1. I lived with both biological parents together.
2. I lived with one biological parent. (Please specify which one _____).
3. I lived with one biological parent and one step-parent. (please specify which biological parent _____).
4. I sometimes lived with one biological parent and sometimes lived with the other.
5. I lived with adopted parents.
6. Other (please describe)

Please indicate the educational status of **both** your mother and father.

Father

- a. Did not complete High School
- b. Completed High School
- c. Attended College but did not graduate.
- d. Completed a 2 year College Degree (Associates Degree)
- e. Completed a 4 year Graduate Degree (Bachelors Degree)
- f. Earned a Post Graduate Degree (e.g., masters or doctoral degree)
- f. I do not know.

Mother

- a. Did not complete High School
- b. Completed High School
- c. Attended College but did not graduate.
- d. Completed a 2 year College Degree (Associates Degree)
- e. Completed a 4 year Graduate Degree (Bachelors Degree)
- f. Earned a Post Graduate Degree (e.g., masters or doctoral degree)
- g. I do not know.

Is your mother alive? Yes NO

10b. If no, how old were you when she died?

Is your father alive? Yes NO

11b. If no, how old were you when he died?

APPENDIX G

DEBRIEFING FORM

Attachment and Self-Regulation Debriefing:

Thank you for participating in our study. As a reminder this study investigated the influence that certain types of attitudes can have on one's thinking. Specifically we are interested in knowing whether people who are most optimistic about relationships benefit from this optimism after thinking about certain topics. In the past we have found that people with negative attitudes about relationships tend to feel more mentally tired after thinking about their relationships, compared to people with more positive attitudes. In this study we tested this finding by having some of you write about your parental relationships, asking other people write about a mentally challenging topic, and asking some people to write about whatever they wanted. Afterwards, we assessed how mentally tired you were by having you solve some word scrambles. We expected people with more optimistic relationship attitudes to be able to solve more math problems than less optimistic individuals.

Please remember that this is an ongoing study and that the quality of our results depends on people knowing very little about the study when they participate. Please do not discuss the procedures we use here with other people who may be eligible to participate.

If you have any questions or concerns about your participation here today, please inform the researcher at this time.

If in the future you have any question, concerns or complaints, you may contact any of the individuals listed below:

Dr. Jeff Aspelmeier, Box 6946, Department of Psychology, Radford University, Radford, VA 24142. (540) 831-5520. jaspelme@radford.edu

If you have any complaints or concerns about your rights as a research participant, please contact Dr. Dennis Grady, Dean, College of Graduate and Professional Studies, Radford University, dgrady4@radford.edu, 1-540-831-7163.

Again, Thank You for your participation.