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Dysfunctional Attitudes and Low Self-Esteem Mediate the Effect of Attachment Anxiety

Priming on Depression

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Abstract

Previous studies regarding the relationship between attachment anxiety and depression and the mediating roles of dysfunctional attitudes and self-esteem have been correlational in nature. The current study used an experimental design to look at these relationships. Attachment style was determined using a shortened version of the Experiences in Close Relationships Scale, and then either secure attachment, anxious attachment, or a control of grocery shopping was primed by instructing participants to write about one of the three scenarios. Dysfunctional attitudes were assessed, followed by state self-esteem and then state depression. Multiple regression analyses revealed that trait attachment anxiety and the anxiety prime predict dysfunctional attitudes, which in turn predict state-self esteem. Finally, state-self esteem predicted state depression and rendered previously significant associations between attachment anxiety, avoidance, anxiety priming, dysfunctional attitudes and depression insignificant when included in the analysis.

Dysfunctional Attitudes and Low Self-Esteem Mediate the Effect of Attachment Anxiety
Priming on Depression

Attachment theory posits that interactions with caregivers early in life form the basis of cognitive “working models” about the self and others which people use to navigate interpersonal relationships (Bowlby, 1969/1982). According to research based on the theory, having an inconsistent and unresponsive caregiver contributes to a negative working model, which causes an insecure attachment consisting of negative thoughts and feelings about oneself and others that then transfer from one relationship to another (Hazan & Shaver, 1994). Insecure attachment can manifest itself in two main ways. Individuals who are *avoidant* exhibit fear of closeness with others, and strict self-reliance, whereas those of the *anxious* style tend to have a strong fear of abandonment and become highly distraught when others are not available (Brennan, Clark, & Shaver, 1998). A wealth of research has shown that the working models associated with anxious and avoidant attachment styles are related to a variety of psychopathologies, one of them being depression (Shorey & Snyder, 2006). One reason for this is that being insecurely attached is related to being more cognitively disposed (Beck, 1987) to low self-esteem and other vulnerabilities.

Studying these working models appears to be a useful way to determine the cognitive and emotional pathways that lead to depression. Roberts, Gotlib, and Kassel (1996) demonstrated that the relationship between attachment style and depressive symptoms is mediated almost entirely by maladaptive self-views and low self-esteem. However, their studies and others like them have been correlational in nature. The current study expands upon them by investigating whether experimentally primed anxious attachment increases depressive affect, and whether state self-esteem and dysfunctional attitudes mediate the causal relationship between anxious

attachment and depression. Anxious attachment in particular was focused on because previous research has shown that the relationship between avoidant attachment and depression is not mediated by dysfunctional attitudes, but other pathways (Lee & Hankin, 2009).

Attachment Theory and Research

Bowlby (1969/1982) developed his theory of attachment as a way of explaining the infant-caregiver relationship. He observed, in his own studies and those of others (based upon children who had been separated from their primary caregiver during World War II and also from children who had to endure long stays in the hospital while separated from their parents), that infants who had been separated from their caregivers exhibited extreme levels of distress and made drastic efforts to increase proximity to a caregiver (i.e., crying, clinging, and searching). While the tendency of this time period was to consider this behavior a manifestation of early defense mechanisms, as posited by psychoanalysts, Bowlby noted that these behaviors can be observed across a wide variety of mammalian species and therefore appeared to have a biological basis.

Based on these observations, Bowlby (1969/1982) posited an evolutionary function to infants' maintaining proximity to their caregivers. The hypothetical psychological underpinnings of proximity maintenance came to be known as the attachment behavioral system, a biologically ingrained system with a goal of maintaining proximity in the face of danger, and the function of promoting survival. Distance between an infant and caregiver, especially in threatening situations, activates the attachment system, which activates behaviors that increase the likelihood of regaining closeness. Because these behaviors occur in response to the distancing of a primary caregiver, they were named "attachment behaviors," whose sole purpose was to maintain proximity and a corresponding sense of "felt security" (Sroufe & Waters, 1977). As a result,

these caregivers came to be referred to as attachment figures; for infants this would be a primary caregiver, one who provides care and protection necessary for survival. Furthermore, the presence of an attachment figure enables infants to explore without being inhibited by anxiety.

The attachment behavioral system is modeled after ethological explanations of human development, but also provides a basis for explaining emotion regulation and personality. Modeled on control systems theory, the main function of the system is to constantly check whether or not the caregiver is within proximity. If yes, then infants feel secure and confident in themselves and are free to explore the environment (Ainsworth, Blehar, Waters & Wall, 1978). The attachment figure provides a “secure base” for the infant. However, if the caregiver is not within proximity, the attachment behaviors discussed above come into effect. In this case children feel acute anxiety and distress and are too preoccupied to explore the environment and be social. In this way, the attachment system begins to shape personality at an early age with anxious infants developing inhibited personality characteristics.

Experiences with early caregivers cause individual differences to develop among infants, called attachment styles (Ainsworth et al., 1978). Mary Ainsworth developed a laboratory technique called the strange situation to measure these styles, in which an infant and parent are both brought into the laboratory and are separated and then reunited in a series of brief stages. As Bowlby posited, the attachment behavioral system usually operates in such a way that infants will seek proximity when a caregiver leaves, but also that the system will be deactivated once proximity is restored and that children will be calmed by this reunion. However, the strange situation shows us that this is not always the case; though the system operates that way for the majority of infants (whom Ainsworth called “secure”), there are two main alternative patterns of attachment system functioning: “anxious-ambivalent,” and “avoidant.”

Securely attached infants in the strange situation become concerned when separated from the parent, but are easily comforted when the parent returns (Ainsworth et al., 1978). However, some infants appear to have mixed emotions when it comes to the reunion phase. These infants are not easily comforted and are referred to as having an anxious-ambivalent attachment style, as they seek comfort from caregivers but also express anger at them for having left, and appear to experience continued anxiety even when proximity is restored. Avoidant infants seem to show little emotion when their caregivers leave. These infants ignore their caregivers upon return and even go so far as to actively avoid contact with them.

These three styles develop within the first year of life as a result of the level of sensitivity and responsiveness of the infant's caregiver (Ainsworth et al., 1978; Bowlby & Ainsworth, 1991). Infants who are secure tend to have caregivers who are sensitive and responsive to their needs. Anxious-ambivalent infants are those whose caregivers are delayed or inconsistent in responding to their cries or interfere with their activities. These infants will cry more, engage in less exploration in general, and have an anxious disposition. Caregivers who are consistently rejecting and unresponsive produce avoidant infants who avoid their caregivers and seem indifferent to their presence. These connections show that infants learn what to expect from their caregivers, and construct working models of themselves and their social interactions, which are based upon what they have learned to expect (Bowlby, 1969/1982). For example, infants who are securely attached will learn to expect that if they are hungry and cry, their caregivers will most likely respond by feeding them. This example also shows the interplay between working models and attachment style that will be elaborated upon in the next section.

The way in which caregivers respond to infants needs allow the infants to form mental representations about what to expect in close relationships, which in turn affect how they process

social information (Bowlby, 1973). These mental representations are referred to as internal working models and can shape perceptions of social interactions in positive or negative ways, depending on whether the individual's attachment style is secure or insecure.

Attachment in Adulthood

Bowlby contended that attachment processes are so important to human character that they operate from the "cradle to the grave" (1982). The mechanisms by which these processes are proposed to transfer are the same working models that are begun in infancy; however, they are said to become increasingly inflexible (though still "working," in the sense of being provisional and responsive to actual life events) as one ages (Dykas & Cassidy, 2011). This leads to consistent expectations and behavioral patterns in social interactions that can be colored by one's experiences early on in life.

Therefore, early attachment styles persist throughout the lifespan and into adulthood where people begin to form new types of relationships. In these romantic relationships, the attachment process is said to operate much like it does with one's caregiver in childhood. Hazan and Shaver (1987) were the first to explore this notion and extend attachment theory to incorporate romantic love as an attachment process characterized by different styles, measured by self-report, that parallel individual differences in childhood. Furthermore, Hazan and Shaver found evidence for continuity of styles from childhood into adulthood in that the relative ratios of styles (secure, anxious-ambivalent, and avoidant) remained almost the same for adult attachment styles as for those in infancy. Fifty-six percent of participants classified themselves as secure, 15% as anxious-ambivalent, and 24% as avoidant. These percentages are nearly identical to those identified by Campos, Barrett, Lamb, Goldsmith, and Sternberg (1983) in infancy.

In addition to this support for the continuation of attachment styles from infancy to adulthood, there is considerable evidence for continuing personality implications resulting from attachment styles in adulthood. Working models formed in relation to the self and relationships were found to influence personal beliefs about relationships based on attachment style (Hazan and Shaver, 1987). Participants responded to a series of statements designed to reflect their attitudes about love in general and these statements were taken to be a reflection of their working models. Those who were securely attached were more likely to believe that romantic love can be enduring and that romantic feelings vary in intensity throughout a relationship but can reach the intensity felt at the beginning of a relationship even after some time. Avoidant participants tended to agree that intense romantic love does not exist, rarely lasts, and that it is very difficult to find someone with whom one can fall in love. The anxious-ambivalent participants claimed that they found it easy to fall in love and that although this frequently happened to them, they ultimately found it difficult to find what they would consider real love.

Similar to the well-adjusted behavior found in secure infants, the same types of patterns are found in adults. Those who are secure in attachment style tend to be more satisfied overall in their relationships, romantic and non-romantic. These relationships tend to be long lasting and marked by trust and commitment to one another, with no apprehension towards being dependent on one another (Feeney, Noller, & Callan, 1994). Also related to the behavior found in secure infants is the fact that secure adults also tend to use their partners as a secure base (Fraley & Davis, 1997). One factor that contributes to this notion of a secure base in adulthood is that secure adults are more likely to seek help from their partners when they are distressed, and are also more likely to give support to their partners when in need (Simpson, Rholes, & Nelligan, 1992).

These perceptions give us insight into the internal working models that, having been created during infancy, develop to become a core component of romantic relationships in adulthood. However, besides influencing personality through working models, attachment styles create personality differences within the specific context of romantic relationships by influencing one's experience of love (Hazan & Shaver, 1987). Securely attached individuals will describe their romantic relationship in positive terms and characterized by acceptance for their partners flaws but also feeling accepted themselves. Conversely, avoidant individuals report very few positive experiences within their romantic relationships. They harbor a fear of intimacy but also excessive jealousy and fluctuating emotions. Similar to those who are avoidant, anxious-ambivalent individuals associate jealousy and emotional highs and lows with romantic relationships, but their relationships are also characterized by obsession and desire for reciprocation, as well as extreme sexual attraction.

Using the attachment styles developed by Ainsworth et al. (1978) to classify adults' personality styles in romantic relationships helps to illustrate the continuity of the attachment system throughout the lifespan, but it also oversimplifies the complex nature of personality structure. Both children and adults, rather than "belonging" to one attachment category or another, are more accurately described as inhabiting a region within a two dimensional space defined by mostly orthogonal dimensions of anxiety and avoidance, where security corresponds to low anxiety and avoidance (Bartholomew & Horowitz, 1991). The anxious-ambivalent style is reconceptualized as relatively high anxiety and low avoidance across time and relational contexts. Avoidance corresponds to being high on the avoidance dimension, but Bartholomew and Horowitz draw a distinction between "dismissing avoidants" (high on avoidance and low on

anxiety) and “fearful avoidants” (high on avoidance and high on anxiety), a distinction not made in infancy.

Brennan, Clark, and Shaver (1998) also conceptualized attachment as having two critical dimensions, attachment-related anxiety and attachment-related avoidance and further developed the theoretical understanding of these dimensions. Those who are high on attachment-related anxiety have the tendency to worry about the availability of their partners and are preoccupied with how responsive and attentive they are. People who are low on this dimension have a more secure and realistic view of their partner’s accessibility. Those high in attachment-related avoidance are overly self-reliant and tend not to self-disclose. Conversely, those low in this dimension are comfortable being close with and depending upon others.

While it is often assumed, as Bowlby said, that attachment related processes operate from the “cradle to the grave” (1982), it should not necessarily be assumed that this is always the case. Fraley (2002) derived two separate models predicting continuity of attachment processes in adulthood from those in infancy, which make very different propositions. One model sees attachment processes developed in infancy as able to be “overwritten” as one progresses through life and creates new attachment relationships. In this model, one may come to adulthood with entirely new attachment tendencies affecting behavior than were developed as an infant. The other model shows that the attachment representations formulated in infancy may not be completely overwritten as one ages, and regardless of the new attachment experiences that are incorporated into one’s working models, those that were formed during infancy will inevitably effect one’s behavior in relationships throughout life. Both of these models show that there is some variability in the tendency for initial attachment representations to affect all attachment-related processes occurring thereafter.

Attachment Style and the Self Concept

Given the fact that working models represent attachment experiences and use these representations as mechanisms that can determine interactions within and feelings about future relationships, it seems likely that they could also affect feelings about one's self. This has been demonstrated extensively in past research. For example, secure attachment has been shown to be related to higher self-esteem, extroversion, and openness to new experiences, while insecure attachment, and specifically anxious attachment, has been related to low self-esteem, introversion, and low openness to experience (Mickelson, Kessler, & Shaver, 1997). Furthermore, secure individuals tend to report significantly more positive self-concepts than do insecurely attached individuals (Cooper, Shaver, & Collins, 1998).

These differences are reflected in attachment-based differences in access to cognitive information. Secure individuals show a more coherent and well-organized self-representation with access to both positive and negative information about one's self that create cognitive balance (Mikulincer, 1995). Conversely, anxious individuals have a more fragmented self-representation that comprises strongly negative self-views. Furthermore, views about one's self were not well integrated into a cohesive self-concept were nearly entirely negative and facilitated negative affect.

It seems, then, that those who are anxiously attached have much less positive self views, especially in threatening situations. When failure is imminent, anxious individuals tend to make more stable and global attributions about negative events, which further cement preexisting negative self-views into place (Kogut & Mikulincer, 2002). This pattern of attribution is related to a style identified by Abramson, Metalsky, and Alloy (1989) that catalogues "hopeless-

depressives.” In this light, it seems plausible that by way of these negative self views, anxious attachment could lead to depression.

Attachment and Depression

While attachment theory has widespread implications for romantic relationships, and the study of personality in general, the theory has also been applied to the study of a wide range of psychopathologies (Shorey and Snyder, 2006) and shown to be a useful tool for their explanation. In particular, attachment theory has been effective in explaining depression, as insecure attachment styles are associated with the negative self-views represented in working models. In fact, the main argument in Beck’s (1987) theory of depression is that depression results from negative views of one’s self. Therefore, negative thoughts resulting from dysfunctional beliefs are seen as the primary cause of depression. Another tenet of Beck’s theory is that these dysfunctional beliefs focus individuals’ attention onto the negative aspects of their environment, and they pay selective attention to those aspects of their surroundings that confirm their preexisting negative beliefs.

A substantial amount of evidence exists to support the relationship between attachment and depression. Bifulco, Moran, Ball and Lillie (2002) investigated simply the relationship between attachment style and tendencies towards depressive symptoms. It was found that insecure attachment, poor social support, and childhood abuse combined were the best predictors of clinical depression in adulthood. In addition, in adolescents, anxious attachment has been shown to predict increased hostility and depression in comparison to their avoidant or securely attached peers (Cooper et al., 1998). In terms of severity of symptoms, it has been shown that no distinction exists between anxious and avoidant individuals when it comes to depression (Roberts, Gotlib, & Kassel, 1996), but what distinguishes these two styles are the mechanisms by

which each come to produce depression. As mentioned above, for anxiously attached individuals, constant reinforcement of negative self-views leads them to fit the model of hopeless depressives, while those who are avoidantly attached tend to suppress negative self-views. (Abramson et al., 1989; Kogot & Mikulincer, 2002). In avoidantly attached individuals, it appears to be the “fearful avoidant” type as classified by Bartholomew and Horowitz (1991) that is most related to depression, as this type is high on anxiety, and although they still suppress negative self-views, they tend to feel that they are unworthy of attention from a romantic partner.

Mediating Factors in the Attachment-Depression Relationship

Negative thinking appears to be central in terms of understanding how anxiously attached individuals develop depression (Charoensuk, 2007). In the attachment-depression literature, negative thinking about one’s self has typically been referred to as “dysfunctional attitudes” and that term has come to represent the most popular way of conceptualizing this construct. As dysfunctional attitudes are negatively biased beliefs about oneself, others and the future, they fit well within the general notion that negative thinking is a precursor to depression in insecurely attached individuals.

However, previous research has shown that other factors can be instrumental in causing depression as well, perhaps in tandem with these dysfunctional attitudes. Namely, low-self esteem coupled with high levels of dysfunctional attitudes has been proposed as another mediator in the attachment-depression relationship (Riggs & Han, 2009). What may be of specific interest within the general umbrella of dysfunctional attitudes is that they comprise assessments of low self-worth, which in turn leads to low self-esteem (Kenny & Sirin, 2006).

It is important to note that not all individuals who hold dysfunctional attitudes will develop low self-esteem and depression. Some individuals have dysfunctional attitudes about the

importance of social support (e.g., “I can’t be happy if I am not loved”) but nevertheless perceive having social support so that self-esteem levels are maintained. However, some of those with high attachment anxiety and dysfunctional attitudes will seek reassurance that they are loved from their relationship partners, even though their partners may have previously made attempts to express their love. This process is termed “excessive reassurance seeking” (ERS; Joiner, Alfano, & Metalsky, 1992). ERS can create a self-fulfilling prophecy where the relationship partners actually do begin to pull away as a result of being constantly questioned about their feelings, and this can lead to depression in the reassurance seeking partner (Starr & Davila, 2008). ERS has been shown to be a mechanism that is often used by those high in attachment anxiety (Shaver, Schachner, & Mikulincer, 2005). This mechanism may be a critical link between dysfunctional attitudes and low self-esteem.

There are several different reasons to believe that low self-esteem would be proximately related to the development of depression. For one thing, some research suggests that low self-esteem and depression are essentially the same, representing bipolar ends of a single continuum (Watson, Suls, & Haig, 2002). Other theories assert that low-self esteem may either be a risk factor for depression or simply an outcome of the disorder. However, research pitting these theories against one another has suggested that low self-esteem is in fact a precursor to depression and not a consequence of it (Orth, Robins, & Roberts, 2008) , Therefore, there is some reason to expect that a mediational pathway exists whereby attachment anxiety causes depression by increasing dysfunctional attitudes, which in turn lower self-esteem and thus create depressive affect.

Indeed, the predictive power of attachment style in determining depression has been demonstrated as most robust when it was considered in combination with both dysfunctional

attitudes and low self-esteem (Lee & Hankin, 2009). The finding that self-esteem and dysfunctional attitudes mediate the relationship between attachment insecurity and depression has been demonstrated across multiple studies (Hankin et al., 2005; Reinecke & Rogers, 2001) and suggests that attachment style is more of a risk factor than simply a correlate of depression.

Roberts, Gotlib and Kassel (1996) shed more light on the mediating roles of dysfunctional attitudes and low self-esteem by developing and testing a mediational model along the lines of the one mentioned above. According to this model, insecure attachment predisposes individuals to developing dysfunctional attitudes through working models that have reinforced negative views of the self and others that have developed from attachment experiences. These attitudes then predispose lower levels of self-esteem.

The mediational model proposed by Roberts et al. (1996) is similar to the model tested by the present study in that both seek to explain the attachment-depression relationship as mediated by dysfunctional attitudes and resulting low self-esteem. However, Roberts et al.'s model was based upon correlational research. The goal of the current study was to provide stronger evidence for the causal nature of the attachment-depression relationship, by experimentally manipulating attachment anxiety through the use of an anxiety prime.

Although primes have not previously been used to elicit the effect of dysfunctional attitudes and low self-esteem on depression, attachment primes have been used to bring about self-criticism (Demarest, 2008). Those with insecure attachment styles are more self-critical overall and insecure attachment is positively correlated with reports of more critical parents, more jealousy, lower satisfaction in romantic relationships and decreased commitment to romantic relationships. Insecurely attached individuals tend to externalize blame in the wake of

negative attachment memories (like a painful break-up) as a possible mechanism for fending off self-esteem threats.

Demarest's research topic is especially of interest in the current study as I look to flesh out the relationship between attachment, self-esteem, self-criticism, and depression. One key aspect of her study is the use of attachment primes to manipulate secure and insecure attachment. In order to successfully manipulate attachment in the current study, I used similar attachment primes, which capitalized on the fact that all people, regardless of their stable attachment style, have some secure, and some insecure, attachment-related memories (Carnelley & Rowe, 2010).

The use of primes as an experimental manipulation in the current research calls for dependent measures to be oriented towards detecting state changes in feeling. Past research has not yet looked at the effect of attachment priming on state depression; however, it seems necessary in the wake of so many significant correlational findings. Because in correlational mediational studies it is not possible to discern either the direction or order of mediation, an experimental confirmation of the Roberts et al.'s (1996) findings is necessary. Therefore, the current research aims to replicate their findings. In this study participants were randomly assigned to receive a securely attached, anxiously attached, or control prime and subsequently completed measures of attachment style, dysfunctional attitudes, state self-esteem and depression. I predicted that priming anxious attachment would result in increased state depressive feelings and that effect would be mediated by intensified dysfunctional attitudes and lowered state self-esteem reported by participants in the anxiety priming condition compared to those in either the secure or control conditions.

Method

Participants and Procedure

One hundred and fifty-five (114 women and 41 men) were recruited using Amazon Mechanical Turk (<https://www.mturk.com>) and paid for their participation. Participants varied in age ($M = 34.71$, $SD = 11.18$). All participants were informed that they would be taking part in a study about personality. After this brief introduction they were given the option to proceed by clicking a button on the bottom of the screen. The Experiences in Close Relationships Questionnaire (Brennan, Clark, and Shaver, 1998) was then presented, after which participants were randomly assigned to either a secure, anxious or control prime condition. The bottom portion of the screen was followed by a prompt that instructed participants to take a minute to think about the situation, paying close attention to the emotions that one would have in that particular situation. After reflecting, participants were instructed to write two paragraphs describing the emotions they would or do have in that situation. All participants then completed a measure for dysfunctional attitudes, followed by a measure of state self-esteem, and then a state depression measure.

Materials

Survey design. The study was created using www.zoomerang.com and administered via the Internet on Amazon Mechanical Turk.

Adult Attachment Style. Adult attachment style was assessed using a short version of the Experiences in Close Relationships Questionnaire (ECR, Brennan, et al., 1998), whose instructions and items were modified slightly so that participants would respond with regard to their general experiences in close relationships (not just romantic ones). Ten items from the ECR were randomly selected, half of which assessed attachment anxiety (e.g., “I worry about being abandoned,” “I worry about being alone”), and half of which assessed attachment avoidance (e.g., “I try to avoid getting too close to others”). The attachment anxiety and avoidance scales

both demonstrated adequate reliability ($\alpha = .86$ and $\alpha = .78$, respectively). Participants rated their agreement with each item on a scale of 1 to 7 (1 = *disagree strongly* and 7 = *agree strongly*).

Attachment priming. Attachment was primed using prompts adapted from Bartz and Lydon's (2004) study, and a neutral prime was adapted from Carnelley and Rowe (2010). In the securely attached prime condition the top portion of the screen read:

Please imagine that you are in a relationship where you feel like it is relatively easy to get close to the other person and you feel comfortable depending on the other person. In this relationship you don't often worry about being abandoned by the other person and you don't worry about the other person getting too close to you. If you have had a relationship like this or are currently in one, then think of that relationship.

The anxious attachment prime read:

Please imagine that you are in a relationship where the other person is reluctant to get as close as you would like. In this relationship you worry that the other person doesn't really like you, or love you, and you worry that they won't want to stay with you. In this relationship you want to get very close to the other person but you worry that this will scare the other person away. If you have had a relationship like this or are currently in one, then think of that relationship.

In the control condition the prime read, "Please imagine that you are shopping for groceries at a supermarket. If you have recently been shopping for groceries, then think of that experience."

Dysfunctional attitudes. Maladaptive self-views in the form of dysfunctional attitudes were measured by the Dysfunctional Attitudes Scale (DAS) (Weissman & Beck, 1978). The

DAS is a 40 item scale and was shown to be adequately reliable ($\alpha = .93$). The DAS is designed to measure peoples' negative attitudes about their selves, the outside world and the future. Items such as "It is difficult to be happy unless one is good looking, intelligent, rich and creative" and "If I do not do well all the time, people will not respect me" are rated on a 7 point scale (1 = *totally agree* and 7 = *totally disagree*). This scale was modified to reflect state dysfunctional attitudes by instructing participants to report how they feel "right now, in this moment."

State self-esteem. The State Self Esteem Scale (SSES) is a 20-item scale that measures state performance, social and appearance self-esteem (Heatherton & Polivy, 1991; here, the overall score was used). Participants rate how much they agree with statements such as, "I feel confident about my abilities" and "I feel self-conscious," based on a scale ranging from 1 to 5 (1 = not at all and 5 being extremely). The SSE was found to be reliable in this study ($\alpha = .93$).

State depression. State depression was measured using a subscale of the state form of the Multiple Affect Adjective Checklist Revised (MAACL-R; Zuckerman & Lubin, 1985). The MAACL-R consists of a list of 132 adjectives and has subscales for anxiety, depression, hostility, positive affect and sensation seeking. It was modified from its standard checklist format to have a scale ranging from 1 to 4 (1 being strongly agree and 4 being strongly disagree). While the MAACL-R contains many subscales, only the hostility, anxiety and depression subscales were for use in this study and because depression was the main variable of interest, it was the only one analyzed. Therefore, participants viewed a list of words containing only the words included on that subscale, which included: "alone", "destroyed", "discouraged", "forlorn", "lonely", "lost", "miserable", "rejected", "sad", "suffering", "sunk", and "tormented". This subscale was demonstrated to be sufficiently reliable ($\alpha = .95$).

Results

Statistical analysis followed the steps proposed by Baron and Kenny (1986) for testing for statistical mediation. This strategy uses multiple regression analyses to first establish a relationship between the initial variable (here, a dummy coded variable contrasting the anxiety prime, 1, with the comparison conditions, 0) and the outcome variable (depression), called a direct path. The relationship between the initial variable and the mediating variable is then determined; however, in this case there were two mediating variables, so the Baron and Kenny method was altered to accommodate the experimental design. These mediators are then shown to predict the outcome variable (depression) while controlling for the initial variable (anxiety prime). Lastly, in order to determine that these two variables actually mediate the relationship between the initial and outcome variables, regression analyses of the initial variable predicting the outcome variable and controlling for the mediators should show the path from the initial to outcome variable to be nonsignificant. Two of these mediational analyses were conducted, one to establish the mediational pathway between anxiety, dysfunctional attitudes and state self-esteem and another for the mediational pathway between dysfunctional attitudes, state self-esteem and depression. In each analysis, attachment anxiety and avoidance were included as covariates so that the “pure” effect of attachment anxiety priming could be discerned (i.e., separated from the effect of dispositional attachment style).

The first mediational analysis established the relationship between dispositional attachment anxiety and attachment anxiety priming, trait and primed, as well as attachment avoidance, and depression. A multiple regression analysis using trait attachment anxiety and avoidance and the anxiety prime as predictor variables revealed that trait anxiety, avoidance and the anxiety prime led to increased depression, $t(153) = 5.22, \beta = .37, p < .01$, $t(153) = 2.63, \beta = .19, p < .01$, and $t(153) = 2.50, \beta = .18, p < .05$ respectively.

The relationship between these same predictor variables and the proposed mediators was then conducted and showed that trait anxiety and avoidance measured with the ECR predicted lower state self-esteem, $t(153) = 5.10, \beta = -.37, p < .01$ and $t(153) = 2.96, \beta = -.21, p < .01$, respectively. Trait anxiety was associated with increased levels of dysfunctional attitudes, $t(153) = 8.82, \beta = -.58, p < .01$, and the anxiety prime marginally increased dysfunctional attitudes, $t(153) = 1.81, \beta = -.12, p > .01$. Attachment avoidance did not increase dysfunctional attitudes, $t(153), \beta = .90, ns$. Dysfunctional attitudes and attachment avoidance lowered state self-esteem, $t(153) = 7.32, \beta = .57, p < .01$ and $t(153) = 3.46, \beta = -.22, p < .01$, respectively. However, attachment anxiety had no significant effect, $t(153) = .71, \beta = -.06, ns$. When the anxiety prime, trait anxiety, trait avoidance and dysfunctional attitudes were included together in the regression analysis, only trait avoidance and dysfunctional attitudes remained significant predictors of state self-esteem, $t(153) = 3.34, \beta = -.21, p < .01$ and $t(153) = 7.04, \beta = .55, p < .01$, respectively. This suggests that dysfunctional attitudes mediate the relationship between attachment anxiety and state self-esteem.

The next set of analyses established the relationship between dysfunctional attitudes and state self-esteem, and state depression, while controlling for trait anxiety and avoidance. Dysfunctional attitudes predicted increased depression, $t(152) = 5.09, \beta = .42, p < .01$, as did attachment avoidance, $t(153) = 2.90, \beta = -.19, p < .01$. Attachment anxiety increased depression to a marginal degree, $t(153) = 1.78, \beta = -.15, p > .01$. Dysfunctional attitudes also led to decreased self esteem, $t(153) = 7.32, \beta = .57, p < .01$, while attachment avoidance led to lowered state self esteem existed as well, $t(153) = 3.46, \beta = -.22, p < .01$. Attachment anxiety did not predict state self esteem, $t(153) = .71, \beta = -.05, ns$.

Lastly, analyses controlling for dysfunctional attitudes, attachment anxiety, avoidance, and state self-esteem and predicting depression revealed that state self-esteem led to increased depression, $t(153) = 6.46, \beta = .50, p < .01$. Dysfunctional attitudes, attachment anxiety and avoidance did not affect depression, $t(153) = 1.62, \beta = .14, ns$, $t(153) = 1.63, \beta = -.12, ns$, and $t(153) = 6.46, \beta = .50, ns$, respectively. However, without state self-esteem both attachment anxiety and avoidance become significant predictors of depression. Regression analysis of the anxiety prime, attachment anxiety, avoidance, dysfunctional attitudes and state self-esteem predicting depression showed that state self-esteem remained the only significant factor in the model, $t(153) = 6.23, \beta = .49, p < .01$. Attachment anxiety and avoidance fall to insignificant levels when considered in this way, $t(153) = 1.60, \beta = -.12, ns$, and $t(153) = 1.34, \beta = -.08, ns$. The anxiety prime and dysfunctional attitudes become insignificant as well, $t(153) = 1.30, \beta = -.08, ns$ and $t(153) = 1.55, \beta = .13, ns$. These final analyses are akin to the last step of the Baron and Kenny (1986) model, which shows the path from predictor to outcome variable as insignificant with the inclusion of mediators (see Figure 1).

Discussion

Overall, the hypothesis that priming attachment anxiety would increase state depressive feelings that were mediated by state self-esteem and dysfunctional attitudes was generally supported. Attachment anxiety and avoidance were found to be significant predictors of depression, but the anxiety prime had an additional effect on state depression. The effect of the anxiety prime was reduced, however, when controlling for state dysfunctional attitudes and state self-esteem, suggesting a mediational pathway. Additional analyses supported the notion that attachment anxiety priming caused increased dysfunctional attitudes, which in turn lowered state

self-esteem, which in turn increased state depressive affect. Therefore, in the current research, statistical evidence for a mediational model was found.

Relation to Past Research

These results also converge with many of the previous research findings I discussed earlier in this paper. Similar to the findings of Roberts, Gotlib and Kassel (1996), both attachment avoidance and attachment anxiety were related to depression, although only attachment anxiety was primed in the current study. However, that dysfunctional attitudes were shown to mediate state depression further supports the notion that there are two different mechanisms which account for depression in avoidantly and anxiously attached individuals, the latter having to do with the reinforcement of negative self-views as represented in the dysfunctional attitudes scale.

Also in keeping with past research are the proposed mediators of the current study. Negative thinking in general has been named as one of the key mediators in the attachment-depression relationship (Charoensuk, 2007), and much of the previous research is in agreement that some form of negative thinking is responsible for explaining this relationship. Low self-esteem and irrational beliefs have been shown to mediate the attachment-depression relationship (Riggs & Han, 2009), as well as self-worth (Kenny & Sirin, 2006), most specifically dysfunctional attitudes (Lee & Hankin, 2009; Reinecke & Rogers, 2001; Roberts, Gotlib & Kassel, 1996).

Implications for Future Research

Future research might consider priming attachment avoidance in the experimental manipulation so a comparison between the mechanisms leading to depression in both attachment avoidance and anxiety can be made. Given that fearful avoidants in particular are prone to

depression, one might expect priming avoidance to have an effect on dysfunctional attitudes and low self-esteem and lead to depression in a manner similar to anxiety because this group tends to incur depressive symptoms that are manifested in feelings of unworthiness (similar to dysfunctional attitudes). However, since dismissing avoidants typically suppress attachment-related emotions and this has been shown to decrease activation of the attachment system (Rholes & Simpson, 2004), it does not seem likely that this group of avoidantly-attached individuals would conform to the proposed mediational model.

While the results of this study support evidence for dysfunctional attitudes and low self-esteem mediating the relationship between attachment anxiety and depression, it may be that research involving any of these variables will inevitably yield significant effects because they are all related and mutually influence each other. It may not be that priming attachment anxiety engages a specific pathway that first involves dysfunctional attitudes and then strictly self-esteem to get to depression (even though there is ample evidence to support this proposition), but that these variables are all so highly related that it does not matter in which order any model instantiates them. In this view, trying to come up with a single pathway may be shortsighted and prevent a comprehensive description of the underlying dynamics of interest. Future research might attempt to discern whether this proposition is true by testing mediational models that include these same variables but in different places along the pathway. Doing so should elicit the same results regardless, if the above notion is true.

Along the same lines is the criticism that not only are all of these variables related, but rather than being distinct constructs, they might all just be tapping into facets of one larger construct, such as insecurity (Hart, Shaver, & Goldenberg, 2005). If this is true, then attachment insecurity, low self-esteem, dysfunctional attitudes and depression are all measures of insecurity,

and therefore virtually any mediational model involving these variables would fit because components of felt insecurity are aspects of the same process. Future research might address this issue by employing other primes that induce insecurity (e.g. mortality salience), which should mimic the results of the current research if this proposition is true.

Semantic priming may also be responsible for the effects of the current research, as it is not possible to tease apart whether participants actually *felt* the way that the anxiety prime described or if cognitive information of that sort was simply more readily available. While this issue is not necessarily specific to the current research, it is something that should be taken into account and might be addressed in future research. A potential study might pit an anxiety prime with writing task (as in this study) against a classic semantic priming task where attachment anxiety related words are presented below recognition threshold. If the effects observed in this study were in fact due to priming alone, the above-mentioned task should yield the same results and engage the same mediational model.

Limitations of the Current Research

The current research confirms the results found by Roberts, Gotlib, and Kassel's research using an experimental manipulation, which is a more powerful design in that it can establish a causal pathway. However, some of the findings were inconsistent, mainly that Roberts et al. found a significant effect of attachment anxiety upon dysfunctional attitudes, and in this study the anxiety primes elicited only a marginal effect upon DAS. In depth look at possible explanations for this is in order.

Although Roberts et al. (1996) did not use primes in their study, the effect of attachment anxiety they measured it in the dispositional state can still be compared to that in this study. Because they found attachment anxiety, as measured by the entire ECR (rather than our short

version), to significantly predict dysfunctional attitudes, it seems logical that the anxiety prime of the current research might have the same effect rather than a marginal one. Altering either the anxiety prime or the measure of dysfunctional attitudes might be useful in achieving significance. As Roberts et al. used the same measure of dysfunctional attitudes as this study, changing the anxiety prime to more closely tap the same emotions as the ECR seems more plausible.

It is entirely possible that the nature of the anxiety prime was simply not strong enough or accurate enough to elicit a response close enough to the feelings typically associated with anxious attachment. In this study the primes were designed to have participants read about an attachment scenario and then write about how it would feel to be in this situation, or does feel; however, it could be that writing about a hypothetical situation does not actually bring about strong feelings of anxiety and that having actually been in, or currently being in, an relationship of this type is the best way to manipulate attachment anxiety. Although being in a relationship representative of one of the attachment styles is not an experimental manipulation, perhaps this idea could be replicated to a degree by including more explicit emotional information within the primes. If this is the case, then it might be useful to elaborate more upon the actual *feelings* associated with attachment anxiety, rather than presenting a few and then relying on participants to conjure the rest. In this way, providing an emotionally evocative passage might have a better chance of actually causing these anxious feelings.

In addition to possibly changing the primes used, presenting the measures in person rather than via the internet may help to bring forth the effect of the anxiety prime, as it is impossible to control for environment when administering surveys over the internet and this is also the method employed by Roberts, Gotlib and Kassel. Therefore, being on a personal

computer at home may impede the feelings that the primes are meant to impart because the surroundings are distracting. Having participants in a controlled setting would limit distractions and might augment results because they are focusing more upon the primes as intended. However, for the current study, being able to collect data over the Internet allowed for a greater participant population to be reached and therefore increases the generalizability of the results obtained.

Despite room existing for methodological improvement and the mediational model's weaknesses, my findings suggest that priming attachment anxiety does indeed lead to increased state depression, and that the relationship is mediated by dysfunctional attitudes that result from attachment anxiety, and low self-esteem that result from dysfunctional attitudes. Explicit models describing the predictive factors of depression have the potential to form the basis of therapeutic interventions, and therefore, these results have strong implications for future therapeutic techniques in treating depressed individuals.

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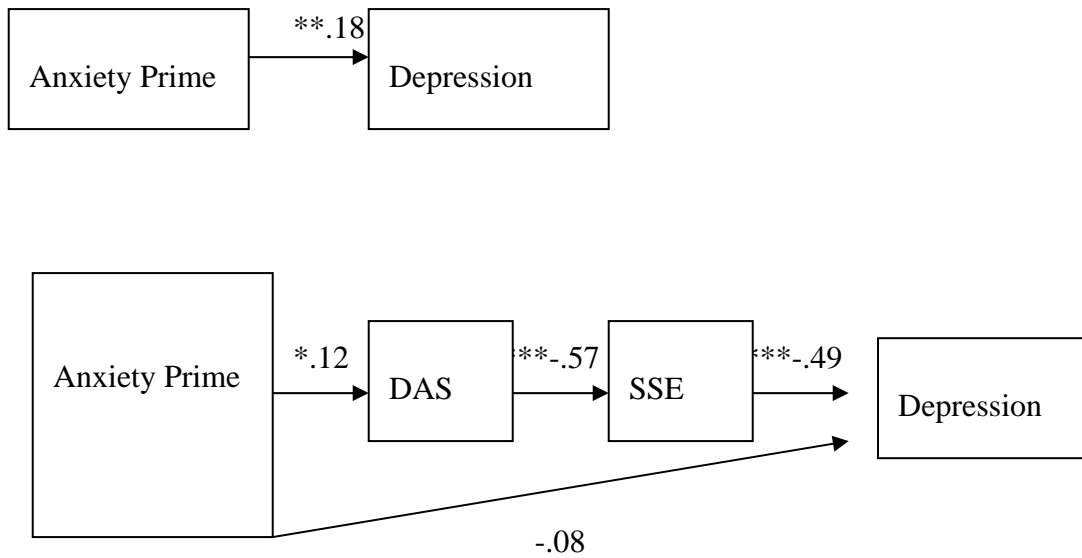


Figure 1. Path model where dysfunctional attitudes and state self-esteem mediate the relationship between anxiety priming and depression. DAS = Dysfunctional Attitudes Scale; SSE = State Self-Esteem.

* $p < .10$, ** $p < .05$, *** $p < .01$