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Attachment-Related Strategies During Thought Suppression: Ironic Rebounds and Vulnerable Self-Representations

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The authors conducted 2 studies of attachment-related variations in thought suppression. Participants were asked, or not asked, to suppress thoughts about a relationship breakup and then to perform a Stroop task under high or low cognitive load. The dependent variables were the rebound of previously suppressed separation-related thoughts (Study 1) and the accessibility of self-traits (Study 2). Under low cognitive load, avoidant individuals did not show any rebound of separation-related thoughts and activated positive self-representations. Under high cognitive load, avoidant participants failed to suppress thoughts of separation and were more likely to activate negative self-representations. Attachment anxiety was associated with high activation of negative self-representations and unremitting separation-related thoughts. The results are discussed in terms of the hidden vulnerabilities of avoidant individuals.

One of the core premises of Bowlby's (1973, 1980, 1982) attachment theory is that individual differences in attachment security are crucial for understanding how people deal with stress and distress. Recently, Mikulincer and Shaver (2003) proposed an integrative model of the activation and dynamics of the attachment system in adulthood and showed that the model accounts for individual differences in affect regulation in terms of the two dimensions of attachment-system organization: anxiety and avoidance. Individual differences in attachment-related anxiety and avoidance were conceptualized in terms of two psychological strategies: hyperactivation and deactivation of the attachment system. These strategies have measurable effects on cognition, emotion, psychological well-being, and interpersonal behavior. In the two studies reported here, we focus on avoidant individuals' deactivating defenses and examine the effectiveness and psychological consequences of one of the most important cognitive mechanisms involved in these strategies—suppression of attachment-related thoughts. Before describing these studies, we briefly summarize our model and some of the evidence associated with it.

Attachment Avoidance and the Dynamics of Deactivating Strategies

In the past decade, hundreds of studies have examined hypotheses derived from Bowlby's attachment theory by assessing a person's *attachment style*—the systematic pattern of relational expectations, emotions, and behaviors that results from the internalization of a particular history of attachment experiences (Fraley & Shaver, 2000). Initially, research was based on Ainsworth, Blehar, Waters, and Wall's (1978) three-category typology of attachment styles in infancy—secure, anxious, and avoidant—and on Hazan and Shaver's (1987) discovery of similar adult styles in the romantic relationship domain. Subsequent studies (e.g., Bartholomew & Horowitz, 1991; Brennan, Clark, & Shaver, 1998) revealed, however, that attachment styles are more appropriately conceptualized as regions in a two-dimensional space. The first dimension, typically called attachment *avoidance*, reflects the extent to which a person distrusts relationship partners' goodwill and strives to maintain autonomy and emotional distance from partners. The second dimension, typically called attachment *anxiety*, reflects the degree to which a person worries that a partner will not be available in times of need. The two dimensions can be measured with reliable and valid scales (e.g., Brennan et al., 1998) and are associated in theoretically predictable ways with relationship quality and affect regulation (see Mikulincer & Shaver, 2003; Shaver & Clark, 1994, for reviews).

Recently, Mikulincer and Shaver (2003) proposed that variations along the dimensions of attachment avoidance and anxiety reflect both a person's sense of attachment security and the ways in which he or she deals with distress. According to Mikulincer and Shaver, people who score low on these dimensions hold internalized representations of comforting attachment figures, which create a continuing sense of attachment security, positive self-regard, and reliance on constructive strategies of affect regulation. Those who score high on either attachment avoidance or attachment anxiety possess internalized representations of frustrating or unavailable attachment figures and hence suffer from a continuing sense of attachment insecurity. These insecure individuals rely on what Cassidy and Kobak (1988) called *secondary attachment strategies* (contrasted with the primary strategy of seeking proximity to an attachment figure when one is confronted with a threat), which involve either deactivating or hyperactivating

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the attachment system in an attempt to cope with threats. Whereas high scores on the attachment avoidance dimension indicate reliance on deactivating strategies (inhibition of proximity seeking and instead trying to handle stressors alone), high scores on the attachment anxiety dimension reflect hyperactivating strategies—energetic attempts to attain greater proximity, support, and love combined with a lack of confidence that it will be provided (Mikulincer & Shaver, 2003).

In the studies reported here, we wanted to focus on the nature, effectiveness, and psychological consequences of the deactivating strategies associated with avoidant attachment. According to Mikulincer and Shaver (2003), the primary goal of these strategies is to inhibit activation of attachment needs and concerns to avoid further distress caused by perceiving attachment figures as unavailable. At the interpersonal level, these strategies consist of active attempts to maximize cognitive, emotional, and physical distance from a partner; avoidance of interactions that demand emotional involvement, interdependence, and intimacy (e.g., Brennan & Shaver, 1995; Collins & Read, 1990; Feeney & Noller, 1990); and unwillingness to deal with a partner's distress and needs for proximity (e.g., Collins & Feeney, 2000; Feeney, 1996; Simpson, Rholes, & Nelligan, 1992). In the process of affect regulation, deactivating strategies are aimed at minimizing the appraised magnitude of threats and the experience of distress, which if acknowledged, might reactivate painful, unmet needs for proximity and security. This goal of deactivation is accomplished by cognitively distancing oneself from threats (e.g., Lussier, Sabourin, & Turgeon, 1997; Mikulincer, Florian, & Weller, 1993); suppressing thoughts related to rejection, separation, and loss (Fraley & Shaver, 1997); repressing painful memories (Mikulincer & Orbach, 1995); and deploying attention away from attachment-related threats (Fraley, Garner, & Shaver, 2000). These mental processes are efforts to encapsulate indicators of vulnerability into segregated mental structures that have little effect on behavior or conscious experience (George & West, 2001).

Deactivating strategies are also evident in the process of self-esteem maintenance. In an effort to block cognitive access to sources of distress, deactivating strategies divert attention from self-relevant sources of distress, inhibiting the appraisal of negative aspects of the self and suppressing thoughts about personal weaknesses and imperfections. This defensive inflation of self-esteem is bolstered by adopting a self-reliant attitude that increases perceived autonomy and enhances the sense of personal strength and self-worth. Several studies have documented the defensive nature of the avoidant self-image: People who score high on attachment avoidance report high levels of explicit self-esteem (e.g., Bartholomew & Horowitz, 1991; Brennan & Morris, 1997; Cooper, Shaver, & Collins, 1998), have limited cognitive access to negative self-traits (Mikulincer, 1995), inflate their positive self-appraisals in reaction to threatening events (Mikulincer, 1998), and project onto others their own negative self-traits (Mikulincer & Horesh, 1999).

Effectiveness of Avoidant Deactivating Defenses

One of the most controversial issues in the attachment literature is the effectiveness of avoidant deactivating defenses in maintaining emotional equanimity when a person is threatened or undergoing stress. There is some direct evidence about the effectiveness of these defenses. For example, Fraley and Shaver (1997) asked whether avoidant deactivating defenses are capable of preventing the typical postsuppression rebound effect (e.g., Wegner, Schneider, Carter, & White, 1987)—heightened intrusion into consciousness of unwanted thoughts following suppression of these thoughts—and the distress elicited by these unwanted thoughts. Participants were asked to suppress thoughts about a painful breakup of a close relationship and then performed a stream-of-consciousness task without instructed suppression. Fraley and Shaver (1997) assessed both the number of times separation-related thoughts appeared during the second task (rebound of the previously suppressed thoughts) and participants' physiological arousal (skin conductance) levels. They found that attachment avoidance was associated with both a weaker rebound effect and lower skin conductance, suggesting that avoidant deactivating defenses are effective in blocking unwanted thoughts and preventing the emotional arousal they might otherwise cause.

In two other experiments, Fraley et al. (2000) asked whether deactivating strategies are capable of allowing people to avert or ignore attachment-relevant distress-eliciting information. Participants listened to an interview about attachment-related threats (a painful loss) and were later asked to recall details from the interview either immediately or at various delays ranging from 0.5 hr to 21 days. An analysis of forgetting curves revealed that (a) people who scored high on attachment avoidance initially encoded less information about the interview than people who scored low on this dimension (especially ones who were also relatively high on attachment anxiety) and (b) the two groups forgot the information they encoded at the same rate. These findings imply that deactivating strategies are capable of deflecting painful attachment-related information right from the start.

Nevertheless, Mikulincer and Shaver (2003) suggested that deactivating strategies might sometimes lead to adjustment problems. Although these strategies allow a person to maintain a defensive facade of self-efficacy and imperturbability, they leave suppressed problems unresolved, and under certain conditions, encapsulated mental contents can impair a person's ability to confront life's adversities. According to Mikulincer and Shaver, this impairment is particularly likely to be manifested during prolonged, highly demanding distress-eliciting experiences that require active confrontation of a problem and mobilization of external sources of support. In these cases, deactivating strategies can be inadequate and overwhelmed, resulting in a marked decline in functioning and what Horowitz (1982) called "avoidance-related" posttraumatic symptoms (e.g., psychic numbing, behavioral inhibition). In addition, the unresolved distress can be indirectly manifested in somatic symptoms, sleep problems, and other health disorders, and a negative attitude toward relationship partners can channel this distress into feelings of hostility, detachment, and estrangement from others.

There is some preliminary support for this darker portrayal of avoidant coping strategies. Berant, Mikulincer, and Florian (2001, 2003) studied mothers' reactions to the birth of an infant with congenital heart disease and found that attachment avoidance, as assessed at the time of the initial diagnosis of the infant's disorder, predicted maternal distress and marital dissatisfaction 1 year later. Moreover, Mikulincer, Horesh, Eilati, and Kotler (1999) found that attachment avoidance was positively associated with the severity of psychiatric symptomatology among Israeli Jewish settlers whose lives were in danger because of residing in disputed territory controlled by the Palestinian Authority.

In a series of laboratory studies, Mikulincer, Birnbaum, Woddis, and Nachmias (2000) showed that the introduction of a cognitive load, which has been found to interfere with mental suppression (see Wenzlaff & Wegner, 2000, for a review), impaired avoidant individuals' ability to block the activation of attachment-related worries. Under low cognitive-load conditions, avoidant study participants reacted to symbolic threat-related primes with relatively low activation of attachment-related worries. However, when a high cognitive load was imposed (a secondary but demanding cognitive task), avoidant participants exhibited high activation of attachment-related worries following priming with threat-related words. Under high-load conditions, avoidant participants resembled their anxiously attached counterparts, exhibiting high accessibility of separation-related thoughts and an automatic spread of activation from attachment-unrelated threats to attachment-related worries.

Although the findings just reviewed point to the potential vulnerability of a person using avoidant defenses, the evidence obtained so far is fairly indirect. The studies conducted to date were not designed primarily to test the effectiveness of deactivating strategies and do not provide direct evidence about the collapse of these strategies. For example, Berant et al. (2001, 2003) and Mikulincer et al. (1999) focused on the mental health of avoidant individuals under stress and were not able to examine the specific nature of their seemingly inadequate defenses. Moreover, Mikulincer et al.'s (2000) study was designed to examine the association between attachment-unrelated threats and attachment-related worries, so we cannot be certain that heightened access to attachment-related worries under high cognitive load was caused by a collapse of mental suppression.

Current Studies

In the final volume of his trilogy on attachment and loss, Bowlby (1980) devoted a great deal of attention to the theoretically critical role that psychological defenses play in dealing with attachment-related threats such as separation and loss, especially defenses that operate outside of conscious awareness and result in partial or complete deactivation of the attachment system. Bowlby was particularly interested in such deactivating defenses, because he had observed in clinical settings that attempts to ignore or dismiss painful attachment-related thoughts were often followed by a rebound of intrusive thoughts about the lost attachment figure and associated feelings of longing and despair. Moreover, he believed that the study of these defenses is extremely important for understanding disordered patterns of mourning and delineating difficulties in long-term adjustment produced by defensive detachment from a lost relationship partner. To date, however, researchers have failed to deal systematically with this important theoretical issue. More direct evidence is needed regarding the possible vulnerabilities associated with avoidant deactivating strategies and the psychological consequences of the collapse of these strategies.

The goal of the studies reported here was to make substantial empirical progress in probing the nature and consequences of avoidant suppression of attachment-related threats and associated negative emotions. The studies focus on the suppression of separation-related thoughts and examine (a) the effectiveness of deactivating strategies in preventing the rebound of separation-related material that has been suppressed, (b) the possibility of impairing this effectiveness by subjecting people to a cognitive load, and (c) the immediate psychological consequences of failed suppression. Specifically, we replicated key aspects of Fraley and Shaver's (1997) experiment—asking participants to think about a painful separation or breakup and either instructing them or not instructing them to suppress thoughts about this separation. We then examined the rebound of the suppressed separation-related thoughts (Study 1) and the effects of these thoughts on self-representations (Study 2). The effects of mental suppression were assessed under conditions of low or high cognitive load so that we could determine whether deactivating strategies are capable of inhibiting the rebound of previously suppressed separation-related thoughts and capable of blocking the spread of these thoughts to negative self-representations, even when other cognitive demands draw on limited psychological resources.

In examining the ability of avoidant individuals to prevent the rebound of previously suppressed thoughts, we introduced an important change in Fraley and Shaver's (1997) procedure. In their study, Fraley and Shaver assessed the rebound of separation-related thoughts by counting the number of times participants noticed spontaneous eruptions of these thoughts during a stream-of-consciousness task. Although this procedure has been used in other studies (e.g., Kelly & Kahn, 1994; Wegner et al., 1987; Wegner, Erber, & Zanakos, 1993), it has serious weaknesses. In some studies, for example, it has been impossible to detect a rebound effect (see Wenzlaff & Wegner, 2000, for a review). This may have happened because self-reports of thought intrusions tap only explicit, conscious activation of particular thoughts. We now know that lack of explicit activation or conscious reporting does not entail lack of implicit cognitive activation (Wegner & Smart, 1997). A thought that is not present in the stream of consciousness can still be active at a preconscious, implicit level and can still influence other cognitions and behaviors (Wegner & Smart, 1997). Therefore, Fraley and Shaver's (1997) findings indicate only that avoidant individuals are able to block conscious activation of separation-related thoughts, not that they are also able to block implicit activation of these thoughts. Especially when studying defensive processes, this is a serious limitation.

We therefore decided to assess the implicit activation of previously suppressed separation-related thoughts by measuring the extent to which these thoughts influence performance on a cognitive task (see Bargh, Chen, & Burrows, 1996; Sherman, Mackie, & Driscoll, 1990, for examples). We used a Stroop (1938) color-naming task, which has worked well in previous studies of thought suppression (e.g., Wegner & Erber, 1992). Research consistently indicates that activation of a specific mental representation increases attention to representation-congruent aspects of stimuli, thus slowing the naming of the color in which the stimuli are presented in a Stroop task (e.g., Mathews & McLeod, 1985). That is, interference with color-naming responses in the Stroop task indicates the implicit accessibility of certain concepts or thoughts. Therefore, if previously suppressed separation-related thoughts, as well as associates of those thoughts, become reactivated, this reactivation should slow the naming of the colors in which separation-related words are presented. Moreover, if avoidance-related deactivating strategies can inhibit this rebound effect, attachment avoidance should be associated with less interference and faster color naming of separation-related words.

In an effort to interfere with avoidant individuals' deactivating strategies, we manipulated the cognitive load under which study participants performed the Stroop task. We used the cognitive-load manipulation—instructing participants to perform the Stroop task

together with another effortful task (e.g., Gilbert & Hixon, 1991; Gilbert & Osborne, 1989)—for two reasons. First, Wegner (1994) contended that mental suppression is an effortful cognitive operation that cannot be used effectively in the absence of sufficient cognitive resources. If this is true, an added cognitive load should tax these resources, allowing a resurgence of suppressed ideation. In fact, several studies have found higher rebound effects under high as compared with low cognitive load conditions (see Wenzlaff & Wegner, 2000, for a review). Therefore, the introduction of a high cognitive load can reveal the boundaries of avoidant individuals' ability to prevent the rebound of suppressed material; beyond this limit, we will be able to document the collapse of this ability. Second, Mikulincer et al. (2000) had already demonstrated that a high cognitive load impairs avoidant individuals' ability to block attachment-related worries following priming with threat-related cues. On this basis, we hypothesized that a high cognitive load would impair avoidant study participants' suppression efforts and cause them to exhibit a rebound of previously suppressed separation-related thoughts.

Beyond examining the effectiveness of deactivating strategies, we also examined the consequences of failed suppression efforts on avoidant individuals' self-concepts (Study 2). As mentioned earlier, one of the goals of deactivating strategies is to cause the maintenance of a positive self-image by facilitating access to positive self-representations and blocking the accessibility of negative self-representations (Mikulincer, 1995, 1998). Therefore, the collapse of deactivating strategies under high cognitive load may render an avoidant person defenseless against reactivation of negative self-representations. This effect may be most notable following fruitless attempts to suppress separation-related thoughts, because these unwanted thoughts may reactivate feelings of rejection and worthlessness experienced by avoidant individuals during important separations, which in turn may automatically arouse negative self-representations. We hypothesized that the imposition of a high cognitive load following suppression of separation-related thoughts would impair avoidant individuals' ability to maintain a positive self-image.

Study 1

Study 1 was designed to determine whether more avoidant individuals are more able to block the rebound of suppressed separation-related thoughts even under high cognitive load conditions. The study consisted of two sessions. In the first session, participants completed the Experience in Close Relationships Scale (ECR; Brennan et al., 1998), which measures attachment-related avoidance and anxiety. In the second session, participants were asked to recall a painful breakup with, or separation from, a romantic partner and to perform a 5-min stream-of-consciousness task. For this task, they were randomly assigned to one of two conditions (suppression, control), which determined whether they were instructed to suppress thoughts about the recalled separation. All participants then performed a 192-trial Stroop task. On each trial they were asked to indicate the color in which a word was printed by pressing a corresponding response key, and their reaction times (RTs) were recorded. Half of the participants performed this task under low cognitive load (while remembering and repeating aloud a 1-digit number throughout the trials), whereas the remaining participants performed under high cognitive load (remembering and repeating a 7-digit number).

The Hebrew words in the Stroop task belonged to one of three categories: separation-related words (e.g., *separation, rejection*), negatively valenced attachment-unrelated words (e.g., *war, fraud*), and neutral words (e.g., *table, blanket*). These three categories were chosen based on the following rationale: First, separation words were the main target words for examining the implicit activation of separation-related thoughts. Second, neutral words were included to control for possible nonspecific effects of the cognitive load and suppression instructions. Third, negatively valenced attachment-unrelated words were included to control for the possibility that color-naming latencies for separation words are due to the affective negativity of these words rather than their attachment-related meanings.

In the data analyses, we examined the unique and interactive effects of attachment orientations (scores on the avoidance and anxiety dimensions), suppression/control instructions, and cognitive load (low, high) on the implicit accessibility of separation-related thoughts in the Stroop task. The main dependent variable was the average color-naming reaction time (RT) for separation-related words (the higher the mean RT, the higher the accessibility of separation-related thoughts). Mean RTs for negative and neutral words were statistically controlled when examining the effects on mean RT for separation-related words, because there are many extraneous reasons for individual differences in overall RTs in the Stroop task. We predicted that (a) attachment avoidance would be associated with a smaller rebound effect following suppression instructions (a lower color-naming mean RT for separation-related words) in the low cognitive load condition and that (b) this rebound-inhibiting effect of attachment avoidance would be notably weakened in the high cognitive load condition.

Although not the main focus of our study, the effects of attachment anxiety on the implicit accessibility of separation-related thoughts were also examined. Previous studies (e.g., Fraley & Shaver, 1997) suggested that anxiously attached individuals keep painful thoughts active in working memory and have difficulty repressing painful memories (see Mikulincer & Shaver, 2003, for a review). Therefore, it seemed likely that anxiety would be associated with the accessibility of separation-related thoughts, which in turn would interfere with color-naming performance in all experimental conditions, regardless of cognitive load and instructions to suppress thoughts of a remembered breakup or separation.

Method

Participants. The sample consisted of 120 Israeli undergraduates (83 women and 37 men, ranging in age from 19 to 36 years, *Mdn* = 22 years), who were recruited to participate in a study of "unwanted thoughts" in exchange for credit in their psychology courses.[1] Participants were randomly divided into four experimental conditions, with 30 participants in each. Additional participants were run but their data were not used in the analyses; 4 of them were unable to recall an unwanted breakup of a romantic relationship, and 2 did not maintain a 95% accuracy rate on the Stroop task.

[1] In both studies reported here, statistical analyses revealed no significant gender differences in any of the variables. Furthermore, inclusion of gender as an additional factor in the analyses did not notably change the reported findings, and none of the interactions between gender and the other predictor variables were significant. We therefore say no more about gender.

Materials and procedure. The study was run in two sessions. The first session was conducted during regular class time; participants completed a Hebrew version of the ECR Scale. Participants rated the extent to which each item was descriptive of their feelings in close relationships on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*). Eighteen items tapped attachment anxiety (e.g., "I worry about being abandoned") and 18 items tapped attachment avoidance (e.g., "I prefer not to show a partner how I feel deep down"). The reliability and validity of the scale have been demonstrated (e.g., Brennan et al., 1998). In the current sample, Cronbach alpha coefficients were high for the 18 anxiety items (.88) and the 18 avoidance items (.92), so two scores were computed by averaging items on each subscale. The two attachment scores were not significantly associated, $r(118) = -.04$, supporting the intended orthogonality of the two dimensions. Statistical analyses revealed no significant differences between experimental conditions on the attachment dimension scores.

Another research assistant, who was blind to participants' attachment scores, conducted the second session 2 to 3 weeks later. This session was conducted on an individual basis and was presented as a study of social cognition. The materials and procedure for this experimental session were based on studies by Fraley and Shaver (1997) and Wegner et al. (1993).

After receiving general instructions, participants were asked to think of a painful, unwanted breakup of a romantic relationship experienced in recent years and to write a brief description of it. They then provided information about the duration (in months) of the recalled relationship ($M = 41.94$, $SD = 40.39$, $mdn = 24$, minimum = 12, maximum = 120) and how much time (in months) had passed since the separation ($M = 20.21$, $SD = 19.82$, $mdn = 12$, minimum = 6, maximum = 108).

Participants then performed a 5-min stream-of-consciousness task, in which they were instructed to write continuously about whatever thoughts, feelings, and memories they were currently experiencing. Participants received a notebook and a pen and were randomly assigned to one of two conditions. Half were asked to spend the 5-min period suppressing thoughts about the recalled separation and trying not to think about it (suppress condition). The other half did not receive any particular instructions concerning the remembered separation (control condition). In both conditions, participants were asked to place a checkmark in the margin of their stream-of-consciousness report every time they thought about the recalled breakup. The number of checkmarks was used to check the effectiveness of the suppression instructions and to examine attachment-related variations in the explicit activation of separation-related thoughts during the stream-of-consciousness task.

At the end of the 5-min period, participants performed a computerized 192-trial Stroop task which involved naming the color in which a target word was presented on the monitor. The task was conducted on a Pentium IBM-PC with an SVGA color monitor. The target words were 12 Hebrew words, each displayed in one of four colors (red, blue, green, or yellow) on a white background in the middle of the screen. Each combination of 1 of the 12 target words and one of the four colors was shown four times, resulting in 16 presentations of each target word in a total of 192 trials (12×16). The order of presentation and the color of each target word were randomly determined for each participant, subject to the constraint that no two consecutive words were displayed in the same color. Participants worked at their own pace. They were first given 10 practice trials and then 192 experimental trials. The target words in the practice trials were different from those used in the experimental trials.

Each trial began with an "X" in the middle of the screen (for 500 ms) followed by one of 12 target words, which appeared on the screen until either the participant pushed one of four color-response keys (on a four-key box) or 2,000 ms had elapsed. The trial then ended and the next trial began. As mentioned previously, the 12 target words came from three categories. The separation category consisted of four Hebrew words that explicitly denote separation from a relationship partner (*separation, abandonment, rejection, leaving*). These Hebrew words have primarily interpersonal connotations. Different words are used in Hebrew to characterize, for example, a wall or barrier "separating" things. The negative category consisted of four Hebrew words with affectively negative connotations that are not directly associated with attachment or separation (*fraud, theft, war, illness*). The neutral category consisted of four Hebrew words that have no obvious affective connotation and no direct association with attachment or separation (*picture, table, office, blanket*). The words were matched for number of letters.

To validate our categorization of the target words, a sample of 10 undergraduate psychology students rated the extent to which each of the 12 words (a) reflected themes related to interpersonal relationships and (b) had a negative affective meaning. These ratings were performed on a 6-point scale ranging from 1 (*not at all*) to 6 (*very much*). Ratings by each participant were averaged within word categories, and we performed analyses of variance (ANOVAs) for repeated measures to examine differences between the categories. Separation words were rated as reflecting more interpersonal relationship themes ($M = 4.46$) than negative and neutral words ($M = 2.45$, $M = 2.13$, respectively), $F(2, 27) = 19.32$, $p < .01$, $\eta^2 = .14$. In addition, separation and negative words were rated as having more negative meanings ($M = 4.76$, $M = 4.81$) than neutral words ($M = 2.04$), $F(2, 27) = 36.83$, $p < .01$, $\eta^2 = .21$. Thus, our category assignments were validated.

During the Stroop task, participants were randomly assigned to one of two cognitive load conditions. Half of the participants (high-load condition) were given a 7-digit number and asked to memorize it and repeat it aloud during each of the 192 color-naming trials. The remaining participants (low-load condition) were asked to memorize only a 1-digit number and repeat it aloud during the color-naming trials. The experimenter recorded participants' utterances during the color-naming trials to see whether participants complied with the instructions. Participants made no errors in repeating their number and had no problem in memorizing this number. No significant difference in color-naming accuracy was found between the two load conditions. Following the Stroop task, participants were debriefed and thanked for participating.

Results and Discussion

Data were analyzed by hierarchical regressions in which we examined the unique and interactive effects of suppression instructions, cognitive load, and the two attachment dimensions. To avoid a high Type II error rate, and given the fact that predictions involved interactions between manipulated conditions and the attachment dimensions, not interactions between the attachment dimensions themselves, we excluded from the regressions interactive terms that were not relevant to our predictions. In this way, we reduced the number of terms included in the regressions and obtained an estimated power of .80 ($\alpha = .05$). In the first step of these regressions, we included the main effects of suppression instructions (a dummy variable comparing the suppression condition with the control condition), cognitive load (a dummy variable comparing the high- and low-load conditions), attachment anxiety, and attachment avoidance. In the second step, we examined the two-way interactions between the two manipulated variables (suppression and cognitive load) and between each of these variables and each attachment dimension (a total of five interactive terms). In the third step, we examined the three-way interactions between the two manipulated variables and each attachment dimension (a total of two interactive terms). Following Aiken and West's (1991) recommendation, each predictor was centered in relation to its mean.[2]

[2] In both studies reported here, the inclusion of all possible interactions in the regression analyses did not notably change the reported findings, and none of the unreported interactions were significant.

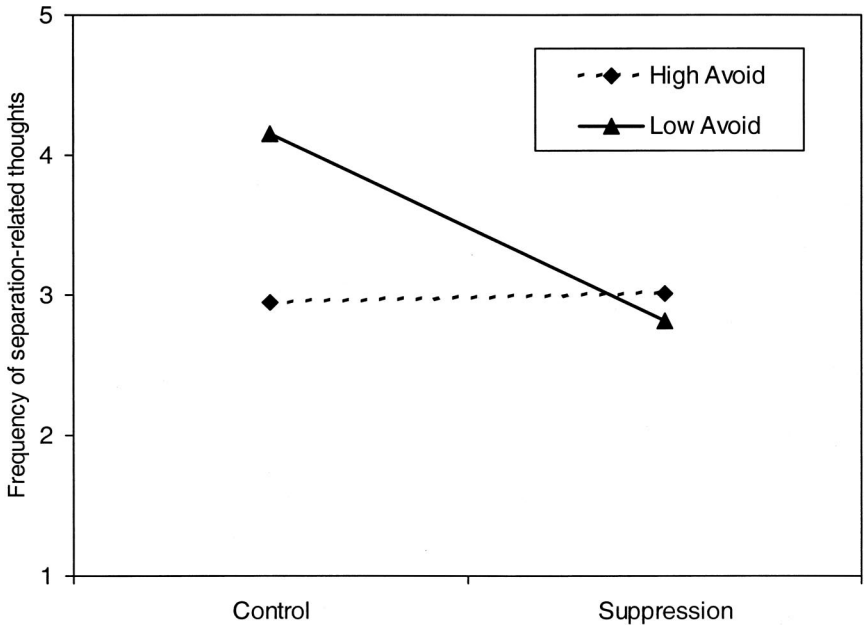

Figure 1. Predicted values of the frequency of separation-related thoughts during the stream-of-consciousness task according to suppression instructions and attachment avoidance. High Avoid = 1 *SD* above the mean score on attachment avoidance; Low Avoid = 1 *SD* below the mean.

Thoughts about separation during the stream-of-consciousness task. The regression analysis for the frequency of separation-related thoughts during the stream-of-consciousness task (number of checkmarks a participant made) revealed that, together, the manipulated variables and attachment dimensions contributed significantly to predicting thought frequency, $F(11, 108) = 2.51$, $p < .01$, $R^2 = .20$. The main effect for suppression instructions was significant, $\beta = -.24$, $t(115) = -2.73$, $p < .01$. Participants complied with the instructions: Those in the suppression condition reported less often than those in the control condition that they thought about the recalled separation. The main effect for attachment anxiety was also significant, $\beta = .22$, $t(115) = 2.57$, $p < .01$, indicating that more anxious participants more often reported having separation-related thoughts. No other main effects were significant.

Interestingly, the interaction between suppression instructions and attachment avoidance was significant, $\beta = .42$, $t(110) = 2.68$, $p < .01$. No other interactions were significant. To examine the nature of the significant interaction, we conducted simple slope analyses (Aiken & West, 1991). In this procedure, the slope of the regression of separation-related thought frequency on suppression instructions was calculated twice according to the value of attachment avoidance that was entered into the regression equation—1 *SD* above the mean of attachment avoidance and 1 *SD* below this mean. In other words, we did not conduct separate regression analyses using subsamples of people scoring high versus low on avoidance. Rather, we computed the regressions for the entire sample while adjusting the values of attachment avoidance according to Aiken and West's (1991) suggestions. These regressions revealed that suppression instructions led to less frequent separation-related thoughts when the value of attachment avoidance was 1 *SD* below the mean, $\beta = -.47$, $t(110) = -4.32$, $p < .01$, but not when the value of attachment avoidance was 1 *SD* above the mean, $\beta = .01$.

As shown in Figure 1, the regression line for low avoidance scores (a value of 1 *SD* below the mean) revealed that suppression instructions led to a decrease in the incidence of separation-related thoughts in comparison to the control condition. However, the regression line for high avoidance scores (a value of 1 *SD* above the mean) revealed a relatively low incidence of separation-related thoughts in the two conditions, regardless of whether participants were instructed to suppress these thoughts.

Stroop color-naming RTs. For each person, color-naming RTs (for correct responses) were averaged according to type of target word (separation, negative, neutral).[3] We then conducted hierarchical regression analyses predicting these averaged RTs. The regression conducted on RTs for neutral words yielded no significant main effects or interactions. Similarly, the regression on RTs for negative words (with RTs for neutral words controlled as covariates) yielded no significant main effects or interactions.

The regression conducted on RTs for separation words (with RTs for negative and neutral words controlled as covariates) indicated that the set of manipulated variables and attachment dimensions accounted for a significant amount of the variance, $F(13, 106) = 3.89$, $p < .01$, $R^2 = .23$. The main effect for suppression instructions was significant (see Table 1), indicating that these instructions led to longer color-naming latencies for separation words (higher accessibility of separation-related thoughts) than the control condition. This is a classic rebound effect. In addition, attachment anxiety was significantly associated

[3] In both studies reported here, RTs exceeding 3.3 *SD*s from the mean ($p = .001$ in a normal distribution) were identified as outliers. We assigned these outliers a value 1% higher than the next-highest nonextreme value to decrease the influence of extreme values. The average percentage of trials in which these outliers were recorded was low in both studies (1.8%, 1.3%, respectively), and they were randomly distributed across target words.

Table 1
Regression Analysis of Reaction Times of Separation Words as Predicted by Manipulated Variables and Attachment Score, Study 1

Effect	*B*	*SE*	β	*t*
Suppression instructions	55.23	15.98	.29	3.45**
Cognitive load	17.01	16.46	.09	1.03
Anxiety	24.80	8.03	.26	3.09*
Avoidance	6.01	7.67	.07	0.78
Suppression × Load	16.08	31.93	.07	0.50
Suppression × Anxiety	−1.53	16.90	−.01	−0.09
Suppression × Avoidance	−36.46	16.63	−.33	−2.19*
Load × Anxiety	−12.21	17.09	−.08	−0.71
Load × Avoidance	31.44	16.19	.24	2.01*
Suppression × Load × Anxiety	41.50	33.64	.16	1.24
Suppression × Load × Avoidance	−4.64	33.78	−.03	−0.14

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

with longer color-naming latencies for separation-related words (see Table 1). The main effects for attachment avoidance and cognitive load were not significant. However, the two-way interactions of Suppression × Attachment Avoidance and Cognitive Load × Attachment Avoidance were significant (see Table 1). No other interactions were significant.

The source of the significant interactions was examined by simple slope analyses (Aiken & West, 1991). To examine the source of the Suppression × Avoidance interaction, we calculated the slope of the regression of RTs for separation words on suppression instructions twice according to the value of attachment avoidance that was entered into the regression equation—1 *SD* above or below the mean of attachment avoidance. The findings indicated that the regression slope of RTs for separation words on suppression instructions was significant (slope different from zero) when the value of attachment avoidance was 1 *SD* below the mean, $\beta = .47$, $t(108) = 4.89$, $p < .01$, but not when this value was 1 *SD* above the mean, $\beta = .02$.

To examine the source of the Load × Avoidance interaction, we calculated the slope of the regression of RTs for separation words on cognitive load twice according to the value of attachment avoidance that was entered into the regression equation—1 *SD* above or below the mean of attachment avoidance. The regression slope of RTs of separation words on cognitive load (longer RTs in high than low cognitive load conditions) was significant when the value of attachment avoidance was 1 *SD* above the mean, $\beta = .28$, $t(108) = 2.31$, $p < .05$, but not when it was 1 *SD* below the mean, $\beta = .01$.

The pattern of findings is summarized in Figure 2. For low attachment avoidance scores (a value of 1 *SD* below the mean), suppression instructions led to longer RTs for naming the colors of separation words (higher accessibility of separation-related thoughts) whether cognitive load was low or high. For high attachment avoidance scores (a value of 1 *SD* above the mean), the pattern of effects was completely different. First, suppression instructions had no significant effect on color-naming RTs for separation words. Second, relatively short RTs for separation words were found when cognitive load was low. That is, for high avoidance scores, a relatively weak activation of separation-related thoughts was found in the low-load condition even after receiving suppression instructions. Third, relatively long RTs for separation words were found when cognitive load was high. That is, when avoidance was relatively high, the addition of a cognitive load heightened access to separation-related thoughts even when there was no instruction to suppress such thoughts.

Overall, the findings provided important information about the effectiveness of avoidant deactivating strategies. In the low cognitive load condition, participants scoring high on attachment avoidance evinced relatively low accessibility of separation-related thoughts following a mental suppression task. That is, their deactivating strategies seemed to be effective in inhibiting the rebound of previously suppressed material. However, the addition of a more demanding cognitive task impaired the effectiveness of deactivating strategies and led to the intrusion of suppressed thoughts even among participants scoring high on attachment avoidance. Interestingly, these participants reacted to the addition of a cognitive load with heightened accessibility of separation-related thoughts in the Stroop task even when they had not previously been asked to suppress them (in the control condition). We deal with this somewhat surprising finding in the General Discussion section.

Alternative interpretations. Although the findings were generally consistent with our predictions, they are open to alternative interpretations. In this section, we address these alternatives.

One of the complexities of asking participants to think about and report on their own past experiences (e.g., relationship separation) is that we cannot entirely control for the characteristics of the targeted experience and the quality of the recollections. Moreover, these experiences and recollections may systematically vary as a function of participants' attachment history and orientations. For example, it is possible that highly avoidant participants were thinking about relationship separations that were not equivalent to those reported by less avoidant participants. Moreover, people differing in attachment avoidance may differ in the extent to which they were engaged in writing about their recalled separation, the vividness of their recollections, and the separation-related distress they expressed in these recollections. As a result, these variations might account for the observed effects of attachment scores on the frequency of separation-related thoughts in the stream-of-consciousness task and the color-naming RTs for separation words in the Stroop task.

To deal with this possibility, we took the following analytic steps. First, we analyzed variations in participants' own reports of the duration of the recalled relationship and the time that had elapsed since the separation. Second, we content-analyzed participants' written descriptions of the recalled separation to reveal possible attachment-style differences in the quality of the recollections. Specifically, two graduate students in psychology, who were blind to attachment scores as well as to participants' scores on the stream-of-consciousness task and the Stroop task, independently read each participant's account and rated (a) the vividness of the description and (b) the level of distress expressed in the description. These ratings were made on 5-point scales, ranging from 1 (*very vague, no distress*) to 5 (*very vivid, intense distress*). Pearson correlations between the ratings provided by the two judges were high, rs = .84 and .87, ps $< .01$, indicating adequate interjudge reliability. We therefore computed a vividness score and a distress score for each participant by averaging the two judges' ratings for each variable. Third, we assessed the extent to which participants seemed engaged in the writing task by counting the number of words and sentences they wrote.

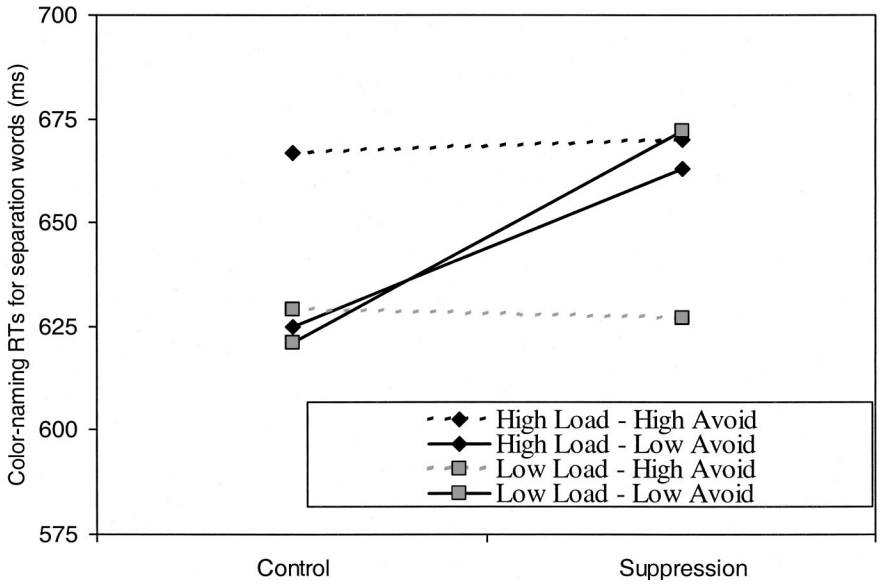

Figure 2. Predicted values of color-naming reaction times (RTs) for separation words according to suppression instructions, cognitive load, and attachment avoidance. High Avoid = 1 *SD* above the attachment-avoidance mean; Low Avoid = 1 *SD* below the mean.

Pearson correlations revealed that the two attachment scores were not significantly associated with relationship duration, time since separation, vividness of the recollection, distress expressed in the recollection, or number of words and sentences participants wrote, *r*s $< .08$. Furthermore, ANOVAs revealed no significant differences between experimental conditions in any of these variables, *F*s < 1. Finally, including each of these variables as a covariate in the regression analyses of the main study variables did not appreciably change the reported findings. We therefore conclude that the observed effects of attachment avoidance on the frequency of separation-related thoughts and color-naming RTs of separation words cannot be credibly explained by variations in relationship duration, time since separation, vividness of the recollection, distress expressed in the recollection, or length of the description.[4] Of course, although these findings help us to reject the main alternative explanations, there might be unmeasured characteristics of the targeted relationship and recalled separation that are relevant to explaining the findings. Future research should assess these characteristics in detail.

The finding that avoidant participants exhibited increased accessibility of separation-related thoughts under high cognitive load is also open to an alternative explanation. Specifically, this finding may be due to a priming effect of the Stroop stimuli themselves. In other words, avoidant participants might have experienced activation of general separation concerns upon seeing the Stroop task separation words in the high-load condition rather than experiencing a rebound of the separation-related thoughts they had suppressed during the stream-of-consciousness task. This explanation can particularly account for the unexpected finding that highly avoidant participants evinced higher accessibility of separation-related thoughts than less avoidant participants in the control/high-load condition, when they had not previously been asked to engage in mental suppression.

To evaluate this possibility, we ran an additional group of participants (34 Israeli undergraduates, 25 women and 9 men ranging in age from 19 to 32 years, *mdn* = 22 years) in a condition that was similar to the original control/high cognitive load condition, but in which the participants were not asked first to think about a relationship separation. Specifically, these new participants, who had completed the ECR Scale in a prior session, were asked to think about and report on a neutral episode (going to a drugstore), complete the 5-min stream-of-consciousness task without any suppression instructions, and perform the Stroop task under high cognitive load. (The entire procedure was identical to that described in the *Method* section). In this new condition, we assumed that no spontaneous suppression of separation-related thoughts preceded the Stroop task, because there was no specific or salient incident to suppress. Therefore, if the observed avoidant persons' heightened accessibility to separation-related thoughts in the Stroop task was due to a rebound of previously suppressed thoughts, it should not occur in the new condition.

To test this idea, we contrasted the new condition with the earlier control/high-load condition in which participants had been asked first to think about a relationship separation. Specifically, we conducted a hierarchical regression analysis of RTs for color naming of separation words (with RTs of neutral and negative words controlled as covariates) with condition (a dummy variable contrasting the two targeted conditions), attachment avoidance, and their interaction as the predictors. The results for the analysis as a whole were significant, $F(3, 58) = 3.63$, $p < .01$, $R^2 = .15$. There were no significant main effects for condition and attachment avoidance. However, the interaction of condition and avoidance was significant, $\beta = .57$, $t(58) = 3.02$, $p < .01$. Whereas the slope of the regression of RTs for separation words on avoidance was significant when participants were asked to think about a relationship breakup, $\beta = .40$, $t(58) = 3.25$, $p < .01$, it was not significant when participants were asked to think about a neutral,

[4] The findings were replicated in Study 2.

nonrelationship issue, $\beta = -.08$. This finding indicates that avoidant persons' heightened accessibility to separation-related thoughts in high-load conditions cannot be explained by a mere priming effect caused by the Stroop stimuli.

Study 2

Study 2 was designed to examine the self-image implications for avoidant individuals of failed deactivating strategies. Specifically, we asked whether introduction of a high cognitive load following suppression of separation-related thoughts would heighten avoidant participants' access to negative self-traits and make their usual emphasis on positive self-traits more difficult. In this study, we assessed participants' attachment styles, manipulated three variables in a between-subjects $2 \times 2 \times 2$ design—suppression instructions (yes, no), cognitive load (high, low), and type of targeted thoughts (separation, neutral)—and then measured the accessibility of negative and positive self-traits in a Stroop task.

The type of targeted thoughts was manipulated by asking participants to recall either a painful separation episode (as in Study 1) or a more neutral experience (the last time they were in a drugstore) and then asking them to suppress or not to suppress thoughts about the recalled episode. We manipulated this variable to test the hypothesis that the collapse of avoidant defenses under high cognitive load would heighten the mental accessibility of negative self-traits and reduce the accessibility of positive self-traits mainly when this collapse facilitated the rebound of suppressed thoughts about a painful attachment-related experience (separation-related thoughts). Memories of a painful separation experience are likely to have important implications for a person's self-concept (Bowlby, 1973), because they are often associated with thoughts of feeling rejected, unworthy, and vulnerable. In contrast, the rebound of more neutral thoughts about visiting a drug store has no important implications for one's self-image and should not generally activate negative self-representations following the collapse of avoidant defenses.

The study consisted of two sessions. In the first session, participants were asked to complete the ECR Scales and generate five positively valued self-descriptive traits and five negatively valued self-descriptive traits. In the second session, they were asked to recall either a painful breakup with a romantic partner or a more neutral experience (being at a drugstore) and to perform a 5-min stream-of-consciousness task. In this task, they were randomly assigned to one of two conditions (suppression, control), which determined whether they were instructed to suppress thoughts about the just-recalled episode. All participants then performed a 256-trial Stroop task, while at the same time carrying out a relatively easy or relatively demanding cognitive task (the cognitive load manipulation).

The words in the Stroop task came from one of four categories: negative self-traits, positive self-traits, self-irrelevant negative traits, and self-irrelevant positive traits. The self-relevant traits were taken from the ones supplied by the participant in the first session of the study. The self-irrelevant traits were taken from the lists of traits that other participants generated in the first session, with the stipulation that they not be semantically similar to the traits generated by the participant under consideration. The self-irrelevant traits were included to control for nonspecific effects of cognitive load and mental suppression.

In the data analyses, we examined the effects of attachment orientation (avoidance, anxiety), type of targeted thoughts (separation, neutral), suppression or control instructions, and cognitive load on the implicit activation or accessibility of self-relevant traits in the Stroop task. The main dependent variables were the mean color-naming RTs for negative and positive self-traits. We predicted that highly avoidant participants, as compared with less avoidant persons, would show lower accessibility of negative self-traits and higher accessibility of positive self-traits in most of the experimental conditions, which would be compatible with the typically observed defensive maintenance of a positive self-image (Mikulincer, 1995, 1998). We also expected, however, that highly avoidant persons would show an increase in the accessibility of negative self-traits and a reduction in the accessibility of positive self-traits when they had suppressed separation-related thoughts and then performed the Stroop task under a high cognitive load. In this case, we expected the addition of a cognitive load to impair the suppression of separation-related thoughts, which, in turn, would hinder avoidant persons' defensive maintenance of a positive self-image.

Method

Participants. The sample consisted of 200 Israeli undergraduates (138 women and 62 men, ranging in age from 18 to 35 years, *Mdn* = 22 years), who volunteered to participate in the study. They were randomly assigned to eight experimental conditions, with 25 participants in each. Additional participants who were run through the procedure but whose data were not used in the analyses included 4 who were unable to recall an unwanted breakup of a romantic relationship and 2 who did not achieve 95% accuracy in the Stroop task.

Materials and procedure. The study was run in two sessions. The first session was conducted during a regular class period, at which time participants performed two tasks. First, they completed a Hebrew version of the ECR scale (see Study 1). In this sample, Cronbach alpha coefficients were high for the 18 anxiety items (.88) and the 18 avoidance items (.89), so two scores were computed by averaging items on each subscale. As in Study 1, the two attachment scores were not significantly correlated, $r(198) = -.09$. Statistical analyses revealed no significant differences between experimental conditions on the two attachment scores. Second, participants were asked to describe themselves by providing qualities or traits that accurately characterized their personality. Specifically, they were asked to provide 5 positively valued self-descriptive traits and 5 negatively valued self-descriptive traits. No participant seemed to have trouble providing the requested 10 traits.[5]

Another research assistant, who was blind to participants' attachment scores, conducted the second session 2 to 3 weeks later. This session was conducted on an individual basis and was presented as a study of social cognition. The materials and procedure of this session were similar to those of Study 1.

After receiving general instructions, participants were randomly assigned to one of two conditions, which determined the type of personal experience they were asked to recall (separation, neutral). In the separation condition, participants were asked to remember a painful, unwanted

[5] Two judges (graduate students in psychology) independently read the traits generated by participants and were asked to decide whether each of the traits was semantically related to relationship separation (e.g., lonely, alone, single, distant, independent, self-reliant). This procedure revealed that only 17 participants generated traits that were relevant to the separation category (one trait per participant). The distribution of these traits across participants was not significantly associated with participants' attachment scores or their assignment to experimental conditions.

breakup of a meaningful romantic relationship during recent years. In the neutral condition, participants were asked to remember the last time they went to a drugstore. In both conditions, participants were instructed to write a brief description of the remembered episode. All participants then performed the 5-min stream-of-consciousness task described in Study 1 after being randomly assigned to one of two conditions that determined the instructions they received (suppression, control). The instructions given to participants were identical to those described in connection with Study 1. All participants were asked to place a checkmark in the margin of their stream-of-consciousness report every time they explicitly thought about the recalled episode (separation, neutral).

At the end of the 5-min period, all participants were instructed to begin a computerized 256-trial Stroop task. The instructions, materials, and procedure were similar to those of Study 1. In Study 2, the targets were 16 Hebrew words, each displayed in one of four colors (red, blue, green, or yellow). Each combination of 1 of the 16 target words and one of the four colors was shown four times, resulting in 16 presentations of each target word in a total of 256 trials (16×16).

The set of 16 target words was different for each participant and was constructed on the basis of the traits he or she generated in the first session. This set consisted of four categories: (a) positive self-traits (four positive traits provided by the participant 2 to 3 weeks earlier); (b) negative self-traits (four negative traits provided earlier by the participant); (c) self-irrelevant positive traits (four positive traits generated by other participants in the first session); and (d) self-irrelevant negative traits (four negative traits generated by other participants in the first session). As mentioned earlier, the self-irrelevant traits were ones that did not overlap semantically with a particular participant's self-traits.

During the Stroop task, participants were further divided randomly into two conditions according to the cognitive load that was superimposed on the Stroop task (high, low). The cognitive load manipulation was identical to that described in Study 1 (to hold in memory either a 7-digit or a 1-digit number). As in Study 1, participants had no problem repeating and memorizing their assigned number, and there was not a significant difference in color-naming accuracy between the two load conditions. Following the Stroop task, all participants were debriefed and thanked.

Results and Discussion

Data were analyzed by hierarchical regressions. As in Study 1, we excluded from the analyses interactive terms that were not relevant to our predictions. In this way, we reduced the number of terms included in the regressions and obtained an estimated power of .80 ($\alpha = .05$) for the analyses. In the first step of these regressions, we examined the main effects of targeted thoughts (a dummy variable in which we assigned a value of 1 to the separation condition and a value of 0 to the drugstore condition), suppression (the dummy variable described in Study 1), cognitive load (the dummy variable described in Study 1), attachment anxiety, and attachment avoidance. In the second step, we examined the two-way interactions between the three manipulated variables (targeted thoughts, suppression, and cognitive load) and between each of these variables and each attachment dimension (a total of nine interactive terms). In the third step, we examined the three-way interaction between the manipulated variables and between pairs of these variables and each attachment dimension (a total of seven interactions). In the fourth step, we examined the four-way interactions between the manipulated variables and each attachment dimension (a total of two interactions). All predictors were centered in relation to their mean.

Thoughts during the stream-of-consciousness task. The regression conducted on the number of checkmarks participants made to indicate that they had thought about the recalled episode during the stream-of-consciousness task indicated that the set of manipulated variables and attachment dimensions had a significant effect, $F(23, 176) = 7.90$, $p < .01$, $R^2 = .34$. This regression revealed a significant main effect for suppression instructions, $\beta = -.45$, $t(194) = -7.74$, $p < .01$, with participants in the suppression condition reporting fewer instances than participants in the control condition of thinking about the recalled episode. The regression analysis also revealed significant main effects for type of targeted thoughts, $\beta = .26$, $t(194) = 4.49$, $p < .01$, and attachment anxiety, $\beta = .25$, $t(194) = 4.42$, $p < .01$. Participants who recalled a separation episode reported thinking about this event more frequently than participants who recalled a neutral episode. In addition, higher attachment anxiety was associated with more frequent thoughts about the recalled episode. The analysis also yielded significant two-way interactions for type of targeted thoughts and attachment anxiety, $\beta = .45$, $t(185) = 5.70$, $p < .01$, and type of targeted thoughts and attachment avoidance, $\beta = -.18$, $t(185) = -2.34$, $p < .05$. No other interactions were significant.

An examination of the significant interactions revealed that the type of targeted thoughts significantly moderated the association between attachment anxiety and frequency of targeted thoughts. Simple-slope analyses conducted for the entire dataset according to Aiken and West's (1991) procedure revealed that attachment anxiety was significantly associated with higher frequency of thoughts when the value of targeted thoughts (0, 1) entered into the regression equation represented the recall of a separation, $\beta = .51$, $t(185) = 7.72$, $p < .01$, but not when this value represented the recall of a neutral episode, $\beta = -.09$. The type of targeted thoughts also significantly moderated the association between attachment avoidance and the frequency of targeted thoughts. Attachment avoidance was significantly associated with lower frequency of thoughts when the value of targeted thoughts entered into the regression equation represented the recall of a separation, $\beta = -.17$, $t(185) = -2.24$, $p < .05$, but not when this value represented the recall of a neutral episode, $\beta = .09$. These findings imply that both the excitatory effects of attachment anxiety and the inhibitory effects of attachment avoidance on thought occurrence were more notable when these thoughts concerned a painful separation episode rather than a neutral event.

Stroop color-naming RTs. For each person, color-naming RTs (for correct responses) were averaged according to type of target word (positive self-traits, negative self-traits, self-irrelevant positive traits, self-irrelevant negative traits). We then conducted the regressions on these averaged RTs. The analyses of RTs for self-irrelevant positive traits and self-irrelevant negative traits yielded no significant main effects or interactions.

The regression analysis of RTs for negative self-traits (with RTs for self-irrelevant negative traits statistically controlled) indicated that the set of manipulated variables and attachment dimensions had a significant effect, $F(23, 176) = 4.13$, $p < .01$, $R^2 = .27$. This regression yielded significant main effects for type of targeted thoughts and attachment anxiety (see Table 2). Participants who were asked to recall a separation episode exhibited longer color-naming RTs (higher accessibility) for negative self-traits than did participants who were asked to recall a neutral episode. This finding indicates that thinking about being rejected activated negative self-traits. In addition, higher attachment anxiety scores were associated with higher accessibility of negative self-traits. The regression analysis also revealed significant two-way interactions

Table 2
Analysis of Reaction Times (RTs) of Separation Words as Predicted by Manipulated Variables and Attachment Scores, Study 2

Effect	RTs of negative self-traits				RTs of positive self-traits			
	B	*SE*	β	*t*	*B*	*SE*	β	*t*
Targeted thoughts (Thou)	40.06	13.29	.20	3.01**	−0.59	11.42	−.01	−0.05
Suppression (Supp)	15.58	13.28	.07	1.17	4.88	11.40	.03	0.43
Cognitive load	21.38	13.29	.13	1.65	−6.82	11.41	−.04	−0.60
Anxiety (Anx)	27.02	6.03	.30	4.48**	4.94	5.18	.07	0.95
Avoidance (Avo)	−6.25	5.96	−.07	−1.09	4.08	5.13	.06	0.80
Thou × Supp	20.53	25.62	.09	0.80	21.84	23.09	.11	0.95
Thou × Load	43.59	25.52	.19	1.71	3.52	23.01	.02	0.15
Supp × Load	−18.93	25.66	−.08	−0.74	10.48	23.14	.06	0.45
Thou × Anx	0.01	11.73	.01	0.01	−4.27	10.57	−.04	0.40
Thou × Avo	31.32	11.44	.26	2.74**	23.68	10.32	.24	2.29*
Supp × Anx	−9.86	11.75	−.07	−0.84	−4.16	10.60	−.04	−0.39
Supp × Avo	0.30	11.52	.01	0.03	−6.07	10.39	−.05	−0.58
Load × Anx	−14.81	11.74	−.11	−1.34	−7.51	10.58	−.08	−0.71
Load × Avo	37.19	11.45	.30	3.25**	−16.21	10.32	−.16	−1.57
Thou × Supp × Load	−77.66	50.92	−.25	−1.53	−33.18	46.31	−.14	−0.72
Thou × Supp × Anx	−26.21	23.24	−.15	−1.13	32.29	21.14	.23	1.53
Thou × Supp × Avo	−35.33	22.59	−.19	−1.56	−18.86	20.55	−.13	−0.92
Thou × Load × Anx	1.67	23.29	.01	0.07	16.67	21.19	.12	0.79
Thou × Load × Avo	71.33	22.40	.43	3.18**	−45.73	20.38	−.35	−2.24*
Supp × Load × Anx	3.39	23.31	.02	0.15	25.76	21.21	.18	1.22
Supp × Load × Avo	−25.31	22.61	−.14	−1.12	−35.10	20.57	−.23	−1.71
Thou × Supp × Load × Anx	−28.54	46.78	−.11	−0.61	−48.67	42.62	−.24	−1.14
Thou × Supp × Load × Avo	−58.71	45.34	−.23	−1.29	−14.79	41.30	−.07	−0.36

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

for type of targeted thoughts and attachment avoidance and for cognitive load and attachment avoidance as well as a significant three-way interaction for type of targeted thoughts, cognitive load, and attachment avoidance (see Table 2). No other effects were significant.

Simple slope analyses conducted for the entire dataset according to Aiken and West's (1991) method revealed different slopes for the regression of color-naming RTs of negative self-traits on attachment avoidance depending on the values of targeted thoughts (0, 1) and cognitive load (0, 1) entered into the regression equation. A significant inverse association between attachment avoidance and RTs for negative self-traits was found when these values represented a neutral episode and a low load, $\beta = -.28$, $t(178) = -2.33$, $p < .05$, a neutral episode and a high load, $\beta = -.32$, $t(178) = -2.41$, $p < .05$, and a separation episode and a low load, $\beta = -.27$, $t(178) = -2.14$, $p < .05$. In all these conditions, higher attachment avoidance was associated with less accessibility of negative self-traits. However, when the values of the manipulated variables entered into the equation represented the recall of a separation episode and a high cognitive load, avoidance was significantly associated with longer color-naming RTs (higher accessibility) for negative self-traits, $\beta = .49$, $t(178) = 4.16$, $p < .01$. This positive slope indicated a collapse of avoidant defenses when the cognitive load was high.

As can be seen in Figure 3, when the value of attachment avoidance was low (1 *SD* below the mean), color-naming RTs for negative self-related traits were not affected by targeted thoughts and cognitive load. However, when the value of attachment avoidance was high (1 *SD* above the mean), recalling a separation episode (as compared with recall of a neutral episode) led to longer color-naming RTs (higher activation) for negative self-related traits under high but not low cognitive load.

The regression analysis conducted on color-naming RTs for positive self-traits (with RTs for self-irrelevant positive traits statistically controlled) indicated that the contribution of the set of manipulated variables and attachment dimensions was not significant, $F(23, 176) = 1.23$, $p = .22$, $R^2 = .11$. However, as can be seen in Table 2, this regression yielded a significant two-way interaction between type of targeted thought and attachment avoidance and a significant three-way interaction for type of thought, cognitive load, and attachment avoidance.

Simple slope analyses conducted for the entire dataset according to Aiken and West's (1991) method revealed different slopes for the regression of color-naming RTs associated with positive self-traits on attachment avoidance depending on the values of targeted thoughts (0, 1) and cognitive load (0, 1). A significant positive association between attachment avoidance and RTs for positive self-traits was found when these values represented the recall of a separation episode and a low-load cognitive load, $\beta = .41$, $t(178) = 2.98$, $p < .01$. With other values of recalled episode and cognitive load, however, no significant association was found between attachment avoidance and RTs for positive self-traits, betas ranged from $-.04$ to $-.14$.

As can be seen in Figure 4, when the value of attachment avoidance was low (1 *SD* below the mean), no notable variation in the accessibility of positive self-traits was found across the various experimental conditions. However, when the value of attachment avoidance was high (1 *SD* above the mean), recall of a separation episode led to heightened accessibility of positive self-traits while

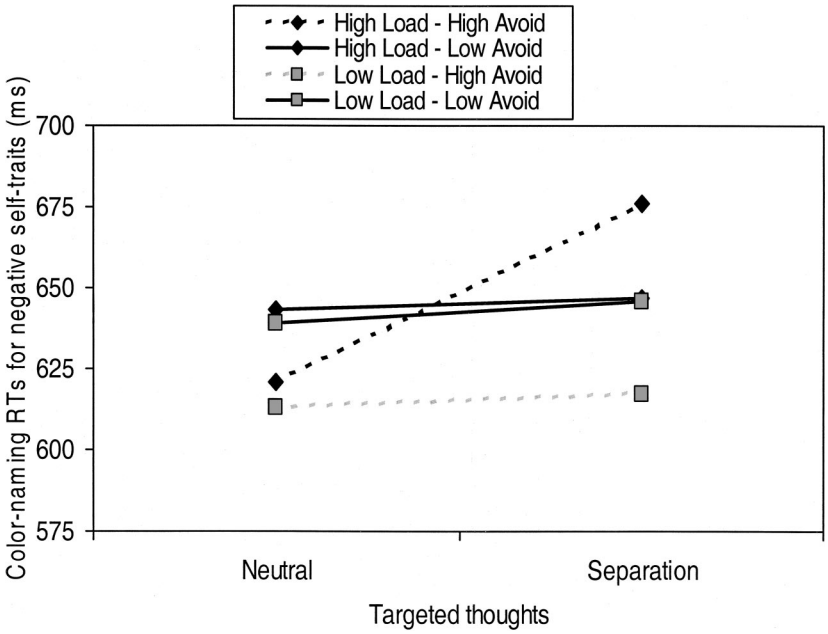

Figure 3. Predicted values of color-naming reaction times (RTs) for negative self-traits according to type of targeted thoughts, cognitive load, and attachment avoidance. High Avoid = 1 *SD* above the attachment-avoidance mean; Low Avoid = 1 *SD* below the mean.

performing the Stroop task under low cognitive load. This reaction was notably weakened when cognitive load was high.

Conclusions. The observed findings supported our predictions. Whereas participants scoring high on attachment avoidance evinced relatively low accessibility of negative self-traits when cognitive load was low, they exhibited heightened access to these traits when asked to recall a relationship separation and perform the Stroop task under high cognitive load. Importantly, this heightened accessibility of negative self-traits was limited to conditions in which participants recalled a separation episode; it was not observed when they recalled a neutral episode. This finding implies that cognitive load by itself does not lead avoidant persons to react with heightened mental accessibility to negative self-traits; rather, this effect depends on the activation of separation-related thoughts.

One finding did not conform to our predictions: When participants were asked to recall a relationship breakup and perform the Stroop task under high cognitive load, attachment avoidance was

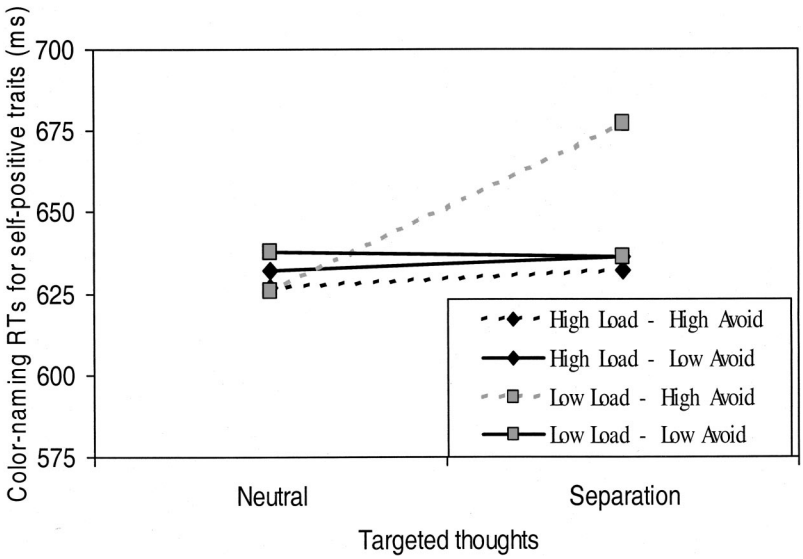

Figure 4. Predicted values of color-naming reaction times (RTs) for positive self-traits according to type of targeted thoughts, cognitive load, and attachment avoidance. High Avoid = 1 *SD* above the attachment-avoidance mean; Low Avoid = 1 *SD* below the mean.

associated with higher accessibility of negative self-traits regardless of the presence or absence of suppression instructions. That is, the mere recall of a painful separation was associated with the heightening of avoidant individuals' negative self-traits when cognitive load was high. This finding resembles the pattern of response observed in Study 1: When cognitive load was high, participants scoring high on attachment avoidance showed heightened accessibility to separation-related thoughts in both control and suppression conditions.

In this context, it is important to note the lack of significant effects of the suppression instructions, which are at odds with the significant effects observed in Study 1, in which we obtained standard thought-suppression rebound effects in participants scoring low on attachment avoidance. This discrepancy might have resulted from differences in the dependent measures in the two studies. In Study 1, participants were asked to suppress separation-related thoughts, and color-naming RTs for separation words were assessed in the Stroop task. There, we expected that the rebound of the suppressed separation-related thoughts would be directly manifested in the color-naming RTs for separation words among participants who do not chronically try to block access to separation-related thoughts (i.e., people low on avoidance). In Study 2, we assessed the effects of instructions to suppress separation-related thoughts on color-naming RTs for self-traits. In this case, the rebound of the suppressed thoughts should not have been directly manifested in color-naming RTs for self-traits unless it automatically spread to the person's self-representation in memory. This seems to have been the case for participants scoring high on avoidance when they were working under a high cognitive load. However, as observed in the two studies, these participants showed heightened accessibility of both separation-related thoughts and negative self-traits regardless of the presence or absence of suppression instructions. In other words, explicit suppression instructions seemed irrelevant for this group, suggesting that they were operating under self-initiated suppression instructions at all times. We deal with this conclusion in the General Discussion.

Interestingly, the debilitating effect of cognitive load on avoidant individuals' deactivating strategies was also observed in color-naming RTs associated with positive self-traits. When cognitive load was low, avoidant individuals reacted to the recall of a painful separation with relatively high availability of positive self-traits—a manifestation of their defensive tendency to inflate their self-image when threatened (Mikulincer, 1998). However, the addition of cognitive load weakened the activation of positive self-traits and interfered with avoidant individuals' tendency to represent themselves positively at an implicit level.

General Discussion

Together, the two studies provide important information about the mental processes of people who score high on attachment-related avoidance. The findings indicate that avoidance is associated with an ability to prevent unwanted reactivation of previously suppressed thoughts about a painful separation. However, they also show that this ability is impaired when the mental resources needed to maintain thought suppression are taxed by a high cognitive load. When cognitively taxed, avoidant individuals are unable to block the rebound of suppressed separation-related thoughts, which allows negative self-representations to become more available in memory. That is, the collapse of avoidant defenses under high cognitive load seems to be associated with a spread of activation from unwanted attachment-related thoughts to negative self-representations. Our findings advance our understanding of the psychological costs and benefits of deactivating strategies, delineating some of the cases in which these strategies are effective in regulating distress, cases in which these strategies are disrupted, and the negative impact of disrupted defenses on avoidant people's implicit self-views.

The findings of Study 1 replicate and extend Fraley and Shaver's (1997) findings concerning the ability of avoidant individuals to suppress painful attachment-related thoughts. When our experimental conditions did not tax participants' cognitive resources, we obtained findings similar to those reported by Fraley and Shaver: Whereas participants scoring low on attachment avoidance who were asked to suppress thoughts about a painful separation exhibited a subsequent rebound of these thoughts, participants scoring high on avoidance evinced little rebound. However, whereas Fraley and Shaver documented this blockage of suppressed thoughts only in participants' stream of consciousness (and in their skin-conductance responses), we observed it at an implicit, preconscious level (interference with color-naming responses). Our findings therefore extend Fraley and Shaver's results and indicate that avoidant individuals are able to inhibit preconscious activation of previously suppressed attachment-related thoughts and prevent these thoughts from interfering with information processing.

Our findings also add considerably to those of Fraley and Shaver (1997) by identifying some of the constraints on avoidant thought suppression. Whereas people who scored high on avoidance showed little rebound of previously suppressed separation-related thoughts when the cognitive load was low, they exhibited relatively high accessibility of these thoughts when the cognitive load was high. That is, the imposition of an effortful cognitive task impaired avoidant individuals' ability to block the reactivation of suppressed thoughts, causing their color-naming performance in the Stroop task to worsen because of the resurgence of these thoughts. The findings clearly indicate that the deactivating strategies used mainly by avoidant people are effective only when cognitive resources are not strained, making thought suppression possible.

The observed effect of cognitive load corresponds well with the results of previous studies of thought suppression, which have documented stronger rebound of previously suppressed thoughts under high rather than low cognitive load conditions (see Wenzlaff & Wegner, 2000, for a review). This effect is also in line with Mikulincer et al.'s (2000) finding that a high cognitive load impaired avoidant individuals' ability to inhibit attachment-related worries following the priming of threat-related cues. At a conceptual level, our findings support Mikulincer and Shaver's (2003) hypothesis that deactivating strategies are associated with a failure to suppress distress-eliciting thoughts during prolonged, highly demanding stressful experiences, which we assume to be both cognitively and emotionally taxing. Although avoidant people often display adequate levels of psychological adjustment and well-being in daily life, they exhibit relatively poor coping and high levels of distress in severely and persistently stressful situations. It is likely that these stressful situations impose harsh demands on the psychological resources, which in turn impair the functioning of avoidant defenses, allow the resurgence of suppressed and troubling or unresolved experiences, and thereby shatter emotional equanimity.

The findings allow us to see some of the psychological costs of deactivating strategies. As shown in Study 2, the addition of a cognitive load led to an impairment of avoidant participants' ability to maintain a defensively positive implicit self-image. Under low cognitive load, our findings indicated that avoidant individuals maintain a defensively positive self-image in reaction to the recall of a painful separation. Specifically, they showed lower accessibility of negative self-traits and higher accessibility of positive self-traits than participants who scored low on avoidance. However, in the present study this defensive stance was seriously damaged by the addition of a cognitive load, which resulted in avoidant participants displaying higher accessibility to negative self-traits than less avoidant ones. Moreover, they exhibited no enhanced access to positive self-traits. That is, the high cognitive load caused avoidant participants to react to the recall of a painful separation with a more negative implicit self-image. Notably, this pattern of responses was not observed among nonavoidant participants, who showed a moderately positive, quite stable pattern of accessible self-representations across all experimental conditions. This allows us to be more confident about portraying the avoidant attachment as truly defensive—that is, as a set of strategies aimed at suppressing negative attachment-related experiences and propping up a threatened self-image, a set of strategies that collapses under high cognitive load. Assuming that the cognitive load we imposed was not nearly as heavy as what might occur under real-life stressful conditions, the vulnerability of avoidant defenses deserves highlighting.

Why did the addition of a cognitive load not cause people scoring low on avoidance to react to the recall of a painful separation with heightened access to negative self-representations? We believe this is because nonavoidant (i.e., more secure) people do not have to suppress negative self-relevant thoughts, but instead can integrate them into their working self-concept (Mikulincer, 1995). Not having to create a facade of extreme autonomy and self-worth, because they have generally been accepted by their attachment figures, they are free to look at themselves fairly realistically (i.e., moderately positively). In fact, nonavoidant participants in Study 2 displayed a moderately positive, quite stable pattern of accessible self-representations under conditions of low and high cognitive load.

The secure strategy of processing information about oneself and one's close relationships allows for the integration of distressing material within the working self-concept and the maintenance of a relatively stable, resilient self-image under cognitively and emotionally taxing conditions (Mikulincer & Shaver, 2004). In contrast, the tendency of avoidant people to suppress distressing thoughts leaves them vulnerable to a rebound of this material whenever environmental demands draw cognitive resources away from thought suppression. As a result, thought suppression not only masks an avoidant person's vulnerable self-image, it ironically makes the person more vulnerable to spreading and intensifying activation of implicit and explicit unwanted thoughts when psychological resources are taxed. This discovery suggests that it would be worthwhile, when working clinically with avoidant individuals, to help them deal with their distressing experiences less defensively and integrate them more completely with other thoughts and memories to reduce the danger of being overwhelmed by this material under conditions of high cognitive and emotional load.

The vulnerability of avoidant defenses is also evident in an unexpected finding that recurred in both of our studies: High cognitive load was found to interfere with avoidant participants' deactivating strategies even when the participants were not explicitly instructed to suppress separation-related thoughts (i.e., in the control conditions). That is, the addition of a cognitive load heightened avoidant participants' access to separation-related thoughts and negative self-representations in both the suppression and control conditions. We believe we know why this might have happened.

Whereas participants who scored low on avoidance reported lower incidence of separation-related thoughts in the suppression than in the control condition, avoidant participants reported a relatively low incidence of these thoughts in both conditions, whether or not they were explicitly asked to suppress such thoughts. That is, even in the control condition, highly avoidant persons spontaneously suppressed separation-related thoughts, which can account for the observed effect of high cognitive load in the control condition. The addition of a cognitive load presumably interfered with avoidant participants' spontaneous suppression of separation-related thoughts, which in turn was associated with the rebound of these thoughts and a consequent activation of negative self-representations during the Stroop task. As in the suppression condition, the heightened accessibility of these negative thoughts in the control condition seems to reflect an impairment of normally occurring deactivating strategies following the imposition of a cognitive load.

This line of reasoning fits well with Wenzlaff and Wegner's (2000) conclusion that "spontaneous suppression leads to the same type of paradoxical effect as does instructed suppression" (p. 72). In fact, previous studies have found spontaneous suppression of distressing thoughts and a subsequent rebound of this material in different samples, including individuals with a recent history of depression and women with eating disorders who were asked to play the role of someone without such a disorder (e.g., Smart & Wegner, 1999; Wenzlaff & Bates, 1998). Evidently, avoidant individuals tend to suppress separation-related thoughts even when they are not instructed to do so and therefore become susceptible, under high cognitive load, to the subsequent ironic intrusion of these thoughts, as well as an unwanted activation of negative self-representations.

This pattern of responses also fits with Mikulincer and Shaver's (2003) conceptualization of deactivating strategies. The goal of these strategies seems to be to encapsulate attachment- and threat-related material into segregated mental structures with little access to information processing and consciousness. These strategies are automatically engaged when an avoidant person encounters information related to rejection, separation, or loss, and he or she is driven to suppress such thoughts even when no instructions to do so have been imposed from outside. However, this does not mean that deactivating defenses are circumscribed to thought suppression. In fact, these defenses seem to include selective attention or inattention, poor encoding of threat-related material, and cognitive reappraisal (Mikulincer & Shaver, 2003). Further research should examine the interplay between spontaneous thought suppression and other defensive strategies and determine whether and, if so, how these strategies compensate for the psychological costs of thought suppression.

We do not mean to imply that avoidant people exhibit a habitual, pervasive suppressive cognitive style regardless of the kinds of

material that seem to be spontaneously suppressed. As shown in Study 2, the tendency of avoidant persons to spontaneously suppress targeted thoughts during the stream-of-consciousness task was mainly observed when these thoughts dealt with a painful separation from a close relationship partner. No spontaneous suppression was noted when the targeted thoughts were affectively neutral and irrelevant to attachment-system activation. That is, avoidant people's spontaneous suppression cannot be viewed as a content-free cognitive style. Rather, it seems to be a fairly specific cognitive means of managing distress and preventing reactivation of the attachment system. Unfortunately, the current studies did not include a negative/nonattachment condition (e.g., asking participants to recall a failure in an important exam), and therefore, we do not know whether this spontaneous suppression is limited to attachment-related threats or can be also activated in response to attachment-unrelated threats. Further research should explore this issue to delineate the specificity and boundaries of avoidant persons' thought suppression. In this context, it is worth mentioning that Mikulincer, Gillath, and Shaver (2002) found that whereas the subliminal priming of an attachment-related threat (the word *separation*) slowed down avoidant people's access to their attachment figures' names, the subliminal priming of an attachment-unrelated threat (the word *failure*) did not.

The pattern of responses of highly avoidant people in our studies resembles that of what Wenzlaff, Rude, Taylor, Stultz, and Sweatt (2001) called "at-risk for depression" individuals (people with prior depressive episodes who are currently nondysphoric). Like our highly avoidant participants, at-risk individuals' mental suppression worked well under low cognitive load, and they displayed no unusual propensity for negative thinking (Wenzlaff et al., 2001). However, the introduction of a high cognitive load disrupted their effort to suppress negative thoughts, and they displayed a strong rebound of these thoughts in an embedded-word task. Wenzlaff et al. concluded "high levels of thought suppression may indicate that the individual has not resolved the negative patterns of thinking that contributed to the previous depressive episode. These patterns of negative thinking are apt to become evident when stress undermines mental control efforts" (pp. 448–449). A similar vulnerability seems to characterize avoidant people, who have not resolved the distress caused by frustrating interactions with rejecting attachment figures and are at risk for a collapse of defenses when high cognitive and emotional demands are encountered.

Although anxious attachment was not the main focus of our study, our findings provide important information about anxiously attached individuals' hyperactivating strategies. First, attachment anxiety was associated with more frequent thoughts about a painful separation during the stream-of-consciousness task even when participants were explicitly instructed to suppress these thoughts. Second, attachment anxiety was associated with higher implicit accessibility of separation-related thoughts and negative self-representations in the Stroop task even when cognitive load was low.

Overall, anxiously attached participants seemed to have difficulty suppressing thoughts about a painful separation and instead retained high access to these thoughts and associated negative self-representations. This pattern of responses fits well with Mikulincer and Shaver's (2003) conceptualization of anxious persons' hyperactivating strategies, which seem designed to maintain the attachment system in a chronically activated state by exaggerating the appraisal of external threats, overemphasizing failed support from attachment figures, and intensifying the experience of distress. Our findings illustrated one specific distress-intensifying maneuver—maintaining free access to distress-eliciting thoughts even when this interfered with a cognitive task (Stroop color-naming).

Interestingly, this pattern of responses also resembles the cognitive reactions Wenzlaff et al. (2001) observed among currently depressed individuals, who failed to suppress negative thoughts even under low cognitive load conditions. This resemblance is not surprising, because attachment anxiety has been consistently associated with depression and similar emotional states, such as grief and loneliness (e.g., Hazan & Shaver, 1987; Mickelson, Kessler, & Shaver, 1997; Wayment & Vierthaler, 2002). Furthermore, attachment anxiety has been associated with low self-esteem and a tendency to criticize oneself (e.g., Bartholomew & Horowitz, 1991; Murphy & Bates, 1997), which are core characteristics of depressive states. Our findings point to a resemblance between attachment anxiety and depression in relation to the processing of distress-eliciting information—failure to engage in thought suppression. Future studies should be conducted to look more deeply into this similarity and examine whether the impairment of thought suppression results from strategic maneuvers or more automatic-associative processes.

Overall, our studies demonstrate that attachment-related defensive strategies are real, and our findings provide potentially useful insights into the psychological costs and benefits of avoidant deactivating defenses. They also reveal some of the dangers inherent in allowing unwanted thoughts to remain unresolved in the background of consciousness and imply that a useful therapeutic intervention with avoidant clients might be to encourage them to reduce their excessive reliance on thought suppression as an affect-regulation strategy. As Pennebaker (1997) has shown, acknowledgment and overt expression of distressing thoughts can sometimes reduce the vulnerabilities associated with thought suppression.

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New Editors Appointed, 2006–2011

The Publications and Communications Board of the American Psychological Association announces the appointment of seven new editors for 6-year terms beginning in 2006. As of January 1, 2005, manuscripts should be directed as follows:

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