

EXPERIMENTALLY INDUCED SECURITY INFLUENCES RESPONSES TO PSYCHOLOGICAL PAIN

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We tested the hypothesis that experimentally induced security changes people's response to psychological pain (operationalized in terms of hurt feelings) in ways that depend on their attachment style. Seventy undergraduates were randomly assigned to receive (a) security-enhancing subliminal primes (the words love, secure, affection) or (b) neutral subliminal primes (lamp, staple, building). As expected, interactions emerged between priming condition and attachment style. In the neutral priming condition, avoidant attachment was associated with a tendency to dismiss hurtful events, inhibit expressions of distress, and react hostilely; as expected, security priming caused avoidance to be associated with greater openness to the pain of a hurtful experience. A significant interaction also emerged between attachment anxiety and security priming. In the neutral priming condition, attachment anxiety was associated with less constructive reactions and more intense feelings of rejection, more crying, and more negative emotions; these associations were weaker and generally insignificant in the security-priming condition. Thus, security priming influenced people's response to psychological pain in different ways, depending on their particular attachment style and the defenses associated with it.

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According to the conceptual model guiding much current psychotherapy, improvement depends on helping a troubled client remain open to the experience of psychological pain so that it can be constructively processed and resolved. Emotion-processing therapy, for instance, which requires confronting and examining painful experiences, has proven effective in treating PTSD (Foa, Rothbaum, & Furr, 2003), and emotion-focused couples therapy, which involves helping couples identify and articulate their "attachment injuries" and hurt feelings in a supportive context, has been shown to reduce marital conflict (Johnson, 2003). Within the past decade, empirical support for a model in which openness to psychological pain is key has emerged across different therapeutic approaches to a variety of disorders (e.g., humanistic-experiential therapy, acceptance-based behavioral approaches, cognitive-behavioral therapy, and psychodynamic therapies; see Littrell, 1998; Mennin, 2005; and Whelton, 2004, for reviews).

One common assumption of this influential conceptual model is that the therapeutic context, and in particular a security-enhancing relationship with the therapist, helps a client feel safer and thus better able to explore distressing emotions (e.g., Greenberg, 2002; see also Bowlby's, 1988, description of the therapist as a "secure base"). Although several clinical studies have demonstrated the importance of the therapeutic context, including the therapeutic alliance, for reducing symptomatology (for reviews, see Norcross, 2002), there has been no experimental examination of the link between an increased sense of security and response to psychological pain, which we define as a set of feelings including hurt, vulnerability, sadness, and isolation resulting from events such as loss, trauma, rejection, and abandonment.

Attachment theory (Bowlby, 1982; see Cassidy & Shaver, 2008, for an overview) is useful for conceptualizing this issue. Secure attachment, which rests on an experience-based expectancy that support will be available if needed, allows a person to access the full range of emotions, including painful ones, and yet to recover from distress relatively easily. Attachment security is associated with a history of successfully seeking and receiving support from one or more attachment figures, and these experiences are thought to contribute to mental representations of the self as able to elicit care (as well as able to engage in self-soothing routines learned in interactions with attachment figures) and of others as responsively providing effec-

tive care (Mikulincer & Shaver, 2004, 2008; Shaver & Mikulincer, 2007). Confidence that painful emotions are manageable because of both the responsiveness of others and one's own capacities is thought to make defensive strategies to shut out these painful emotions much less likely to be deployed (Shaver, Mikulincer, Lavy, & Cassidy, 2009). In contrast, insecure attachment is associated with one of two major patterns of coping with painful emotions, both of which reflect a lack of confidence in the availability of a responsive attachment figure when needed. As demonstrated in hundreds of experimental and correlational studies (reviewed by Mikulincer & Shaver, 2007a), avoidant attachment is associated with suppression and denial of threats and stressors and withdrawal from relationship partners, whereas anxious attachment is associated with magnifying threats and stressors and obsessively ruminating about problems.

These two patterns of emotion regulation (also called deactivating and hyperactivating attachment strategies) are similar to two forms of response to painful emotions seen in clinical settings (e.g., under-engaging and over-engaging; Rauch & Foa, 2006), which interfere with the attainment of successful psychotherapeutic outcomes. We reasoned, based on attachment theory, that if the links between attachment insecurity and responses to psychological pain take different forms, with some people suppressing or denying distress and others heightening it, then an experimental security induction should cause some people (the relatively avoidant ones) to more willingly acknowledge distress following psychologically painful experiences and others (the relatively anxious ones) to reduce the extremity of their complaints.

The present study tests the proposition that heightened security will change people's responses to psychological pain in particular ways depending on their dispositional attachment style. If security influences responses to painful experiences, then an experimental manipulation that enhances felt security—by experimentally activating security-related mental representations through cognitive priming—should affect how people access and process painful experiences, and the effect should be moderated by attachment style. In a series of experiments reviewed by Mikulincer and Shaver (2007b), it was found that subliminally priming concepts related to love and support (with words or pictures) temporarily enhanced the sense of security even in otherwise insecure people, with mea-

surable effects on their altruistic behavior (Mikulincer, Shaver, Gillath, & Nitzberg, 2005), their assessments of out-group members (Mikulincer & Shaver, 2001), and the transfer of positive affect from a subliminal prime to a neutral stimulus (a Chinese ideograph; Mikulincer, Hirschberger, Nachmias, & Gillath, 2001). In the present study we examine the role of security in response to psychological pain by exploring whether security priming influences a person's responses to "hurt feelings" (Feeney, 2004, 2005) by diminishing the tendency to reduce or heighten reactions to a painful social experience.

The results were expected to be somewhat complicated. The buffering effect of security priming might be less evident among dispositionally secure people because they can mobilize security-enhancing mental representations and caring qualities within themselves even in the absence of external cues (Mikulincer & Shaver, 2004), and they are likely to have done so when faced with painful feelings. We thought it likely that a security priming intervention would have its most notable effects on insecure people because they lack a reliable, stable sense of safety, security, and personal value. Thus, our hypotheses centered on the responses of two groups of insecure people: those high on avoidant attachment and those high on attachment anxiety.

Moreover, because these two kinds of insecure people are thought to have different sets of cognitive, affective, and behavioral strategies for shutting out painful emotions, we expected that security priming would affect their responses in different ways. For people who score high on avoidant attachment, who suppress painful emotions in order to avoid experiencing them (Feeney, 2004, 2005), priming with words related to safety and protection might allow them to acknowledge painful feelings, reduce their anger toward the person who hurt them, and reduce their tendency to disengage emotionally from their relationship with this person. For people who score high on attachment anxiety, who tend to heighten psychological distress, the same subliminal security primes should reduce the intensity of their reactions to a hurtful event. If these hypotheses are supported, it may mean that in therapeutic situations, both kinds of shift in response to psychological pain would help clients deal more realistically and effectively with problematic emotional and behavioral tendencies in their relationships.

METHOD

PARTICIPANTS

Participants were 70 undergraduates at a large American university (51 women, 19 men; age range: 17-25, *Mdn* = 19 years). Most were Asian-American (45.7%), White (30%), or Hispanic (8.6%). Thirty-three (47.1%) were currently involved in a meaningful romantic relationship that had lasted for a mean of 8.74 months (*SD* = 12.56). Most of the remaining participants had been involved in such a relationship in the past.

PROCEDURE

During individual 25-minute sessions, participants completed a standard measure of dispositional attachment anxiety and avoidance, commonly called the ECR (an acronym for the title of the measure as actually presented to participants: Experiences in Close Relationships; Brennan, Clark, & Shaver, 1998). Eighteen 7-point items assessed attachment anxiety (e.g., "I worry about being abandoned"; $\alpha = .92$) and 18 assessed avoidant attachment (e.g., "I prefer not to show a partner how I feel deep down"; $\alpha = .93$).

Next, participants wrote (while working alone in a laboratory room) about an incident in which a close relationship partner hurt their feelings. They answered four open-ended questions asking what was hurtful about the partner's actions, the context in which the event occurred, the participant's reaction, and the event's repercussions. The purpose of these questions was to bring the episode fully to mind so that questions could later be asked about it.

Participants (still working alone) then completed a short computerized "cognitive categorization" task, which was a "cover" for the subliminal security-priming procedure. They rated, for 20 pairs of pieces of furniture (e.g., table and chair), how associated the two items were. Before seeing each pair of pieces of furniture, participants were subliminally exposed to either a security-related prime (one of three words used in previous studies: love, secure, and affection; Mikulincer et al., 2005) or one of three neutral primes

roughly matched in length with the secure primes (lamp, staple, or building). Each prime word was presented for 22 ms and followed, first, by a 500 ms "mask" (a visual noise pattern that eliminated the image of the prime on the participant's retinas) and then by a pair of pieces of furniture. (Subliminal rather than supraliminal priming was used to discourage consciously defensive or socially desirable responding.) Random assignment resulted in 34 participants (25 women, 9 men) receiving secure primes and 36 (26 women, 10 men) receiving neutral primes.

Finally, immediately after the priming trials, the computer screen directed participants to a nearby (face-down) packet containing instructions to think again about the hurtful event described earlier and to respond to several questions. Participants used 7-point scales to rate how hurtful this kind of event would be if it happened now, how rejected they would feel, how constructively they would handle the situation, and how the event would cause them to feel about themselves. In order to tap the two dimensions of positive and negative self-feelings, we used six positive and ten negative self-relevant adjectives (Feeney, 2004; Leary, Springer, Negel, Ansell, & Evans, 1998; Vangelisti, Young, Carpenter-Theune, & Alexander, 2005). This *a priori* decision to create positive and negative scales from these items was supported by an exploratory factor analysis of the 16 ratings followed by varimax rotation. Two main factors emerged, accounting for 57.4% of the explained variance. The first factor (31.8% of the variance) was defined by the ten negative feelings (stupid, undesirable, dislikeable, humiliated, unattractive, helpless, incompetent, disrespected, foolish, and vulnerable). The second factor accounted for 25.6% of the variance and was defined by the six positive feelings (intelligent, wise, likeable, attractive, competent, and desirable). Based on this analysis, we computed two scores for each participant by averaging ratings of the items that loaded above .40 on a factor. (The resulting scales had alpha coefficients of .88 and .91, respectively.)

In order to tap three underlying dimensions of behavioral response, we asked participants to use a 7-point scale to rate how much each of nine action descriptions fit their likely behavioral response to the hurtful event. We used items gathered from previous studies that we expected to tap three dimensions: defensive/hostile responses, constructive responses, and crying (Feeney, 2004; Leary et al., 1998; Vangelisti & Young, 2000; Vangelisti et al., 2005). The scale ranged

from 1 (*I wouldn't do that at all*) to 7 (*That's pretty much exactly what I would do*). Again, a conceptually based exploratory factor analysis of the nine behavioral responses revealed, as expected, three main factors (accounting for 66.2% of the explained variance). The first factor (28.2% of the variance) was defined by four items indicating defensive and hostile reactions to an offending partner (express anger, argue or defend myself, say something vengeful or nasty, distance myself from the person). The second factor (19.4% of the variance) was defined by three items indicating more constructive reactions (tell the person I was hurt, try to discuss the matter calmly, and deliberately keep my feelings to myself [reverse-scored]). The third factor (18.6% of the variance) included two items about crying (cry in front of the person, cry later when I was alone). For each participant we computed three scores by averaging items that loaded higher than .40 on a particular factor. Higher scores reflected more defensive/hostile, constructive, and crying reactions (alpha coefficients were .69, .71, and .71, respectively).

RESULTS

The data were analyzed with 2-step hierarchical regressions examining the unique and interactive effects of the two attachment insecurity dimensions (anxiety and avoidance) and the security priming manipulation (a dummy variable, with 1 indicating security priming and -1 indicating neutral priming) on each dependent variable. In the first step of the analyses, we included attachment anxiety, avoidance, and security priming as predictors. In the second step, we added the interaction of each attachment insecurity dimension with the security-priming manipulation. In the first step, two significant main effects emerged: Attachment anxiety (in keeping with attachment theory and prior research) was positively associated with stronger feelings of rejection and other negative emotions (see Table 1).

There were also significant interactions between avoidant attachment and security priming when predicting feelings of rejection and defensive/hostile responses. When the dependent variables were the appraised severity of the hurtful event and crying, similar interactions between avoidance and security priming approached significance. Simple slope tests revealed the following: In the neutral

TABLE1. Contributions of Attachment Insecurity Scores and Security Priming (Standardized Regression Coefficients, Percent of Explained Variance) to Reactions to the Hurtful Episode

Variable	Security Priming	Attachment Anxiety	Attachment Avoidance	Priming x Anxiety	Priming x Avoidance	Percent of Variance ($R^2 \times 100$)
Appraised severity	-.16	-.01	.05	-.15	.20a	9.4
Emotional reactions						
Rejection feelings	-.07	.26*	.05	-.26*	.35**	23.5**
Negative emotions	-.01	.52**	.06	-.18a	.12	32.1**
Positive emotions	-.11	-.17	.02	.05	-.02	5.8
Coping responses						
Constructive	-.01	-.16	-.05	.30*	-.16	16.5*
Defensive/hostile	-.11	.02	.15	.13	-.33**	13.9a
Crying	-.01	.14	-.16	-.24*	.23a	12.3

Note. ^a $p < .10$; * $p < .05$; ** $p < .01$.

priming condition, higher avoidance scores were associated with less severe appraisals of the hurtful event, less intense feelings of rejection, and less crying, and stronger defensive/hostile reactions, β s of $-.15$, $-.31$, $-.39$, $.48$ (all $ps < .01$, except for the association with the appraised severity of the hurtful event). These findings were similar to ones in previous studies indicating that avoidant people tend to dismiss hurtful events, inhibit expressions of distress, and react defensively and hostilely to hurtful relationship partners (Feeney, 2004, 2005; Mikulincer, 1998).

However, following security priming, avoidance was associated with greater appraised severity of the hurtful event, $\beta = .25$, $p < .05$, more intense feelings of rejection, $\beta = .40$, $p < .01$, and less defensive and hostile responses, $\beta = -.18$, $p = .10$. In addition, following security priming, the negative association between avoidance and crying was no longer significant (and was actually slightly positive, $\beta = .07$). Thus, as expected, security priming not only eliminated the connection between avoidant attachment and the tendency to dismiss hurtful events, inhibit negative feelings, and react defensively and hostilely to an offending partner, it resulted in a positive association between avoidance and openness to the pain of a hurtful experience (i.e., reacting with stronger feelings of rejection and fewer defensive reactions). In order to provide a graphic example of the

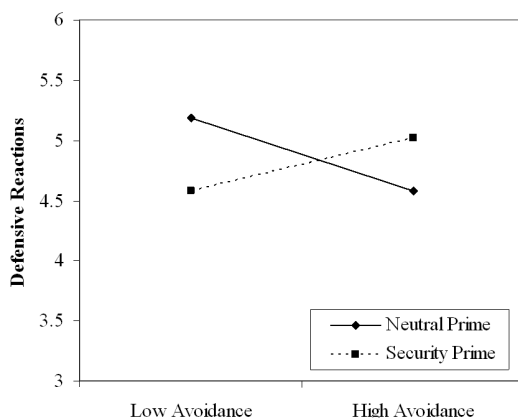


FIGURE 1. Defensive reactions as a function of attachment avoidance and priming group.

significant interactions, we present data showing participants' defensive reactions as a function of attachment avoidance and priming group in Figure 1.

Regression analyses also revealed a significant interaction between attachment anxiety and security priming in predicting constructive reactions, feelings of rejection, and crying (see Table 1). There was a marginally significant interaction between attachment anxiety and security priming in predicting negative emotions. Simple slope tests revealed that in the neutral priming condition, attachment anxiety was significantly associated with less constructive reactions and more intense feelings of rejection, more crying, and more negative emotions, with β s of $-.42$, $.51$, $.38$, $.64$ (all $ps < .01$). These results are compatible with previous studies of attachment-anxious people's reactions to being hurt (Feeney, 2004, 2005). The parallel associations were weaker in the security-priming condition: β s of $-.18$, $.01$, $.10$, $.30$ (only the association between attachment anxiety and negative emotions reached statistical significance; the others were not reliably different from zero). In other words, as expected, security priming reduced the connection between greater attachment anxiety and the tendency to cope badly with a hurtful event, to experience strong feelings of rejection and other negative emotions, and to express vulnerability (i.e., by crying). In Figure 2, we present data

showing participants' defensive reactions as a function of attachment anxiety and priming group.¹

DISCUSSION

The data support our reasoning that attachment security, both dispositional and experimentally induced, affects the ways in which people deal with painful feelings. For both individuals who score high on avoidant attachment and those who score high on attachment anxiety, security priming was associated with a different response to psychological pain—leading them to behave more like dispositionally secure individuals. In the neutral prime group, avoidant attachment was associated with lower reports of psychological pain and higher reports of negative behavior following a hurtful event, which fits with previous research linking avoidant attachment to claims of relatively low psychological distress and relatively high levels of antagonistic behavior (see Mikulincer & Shaver, 2007a, for a review). As expected, this avoidant stance of denying painful feelings and reacting destructively to undesired partner behaviors was mitigated by a subliminal security induction. In contrast, attachment anxiety was associated in the neutral prime condition with greater reported distress following a painful event, a result compatible with previous research (Feeney, 2004). As expected, security priming appeared to ease this exaggerated reaction.

In other words, an experimental examination of peoples' responses to events that they have identified as painful revealed that a brief security induction reduced the kinds of responses to psychological pain (under-engagement and over-engagement with negative emotions) that some clinical researchers have identified as interfering with effective psychotherapy (Foa et al., 2003). We propose that both ways of responding to psychological pain are unconscious, over-learned protective strategies that allow a person to avoid thinking clearly about psychological injuries. Moreover, the notion that these protective strategies are likely to have developed during childhood is in line with attachment theory and research (Cassidy & Shaver, 2008). As Cummings and Davis (1999) put it, "Children's concerns

1. All analyses were also conducted with gender and relationship status included. No significant interactions emerged between priming and either of these variables.

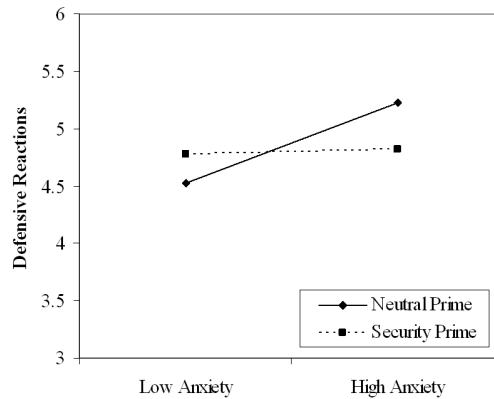


FIGURE 2. Defensive reactions as a function of attachment anxiety and priming group.

about emotional security . . . play a role in their regulation of emotional arousal and in their . . . motivation to respond in the face of interpersonal stressors" (p. 305).

It is easy to see how under-engagement, with its denial of distress, functions to deny or shut out psychological pain. It is less obvious that heightened negative emotionality and intense expression of discontent might also serve to shut out even more painful thoughts and feelings. Yet recent research has indicated that heightened negative emotionality (in the form of worry) is associated with a tendency to avoid or control internal experiences rather than accept them (Roemer, Salters, Raffa, & Orsillo, 2005), and that it actually does prevent effective processing of painful emotions (Borkovec, Alcaine, & Behar, 2004; see also Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Fosha has observed clinically that exaggerated emotional expression can be "a defense against genuine emotion" (2000, p. 118).

A challenge for future research will be to determine whether a security-based reduction in vocalized distress can actually help anxiously attached individuals process primary painful emotions more effectively. For the moment, our findings are compatible with the possibility that the typical responses of both avoidant and anxious individuals to painful or hurtful experiences serve defensive functions, and that the defenses become less necessary following even a small increment in felt security.

The present study, which provides the first experimental evidence that attachment security and specific kinds of attachment insecurity influence people's response to psychological pain should be clinically useful in several ways. First, given that many clinical theories view openness to psychological pain as important for symptom reduction, our finding that security influences responses to psychological pain suggests that helping a client feel more secure in a relationship context will be especially productive. Moreover, although nearly all clinical approaches acknowledge the importance of the therapeutic relationship for symptom reduction, our findings suggest that attention to the secure base function of the therapeutic relationship (Bowlby, 1988) may be particularly beneficial. The notion of the therapist as a secure base was a cornerstone of Bowlby's (1988) clinical approach. According to him, the client's experience of having a secure base, perhaps for the first time, lays a foundation for a new set of experience-based expectations, which in turn guide feelings, behavior, and psychophysiological responses. Second, our findings indicate that experimentally induced security brings about theoretically predicted changes in different ways for different people. The interactions between the security induction and dimensions of attachment insecurity support the possibility that a fairly general therapeutic process will have predictably different effects on different kinds of clients. Third, given clinical reports that remaining open to painful emotions is particularly difficult for some individuals and may contribute to relatively high dropout rates for some therapies (e.g., Hembree, Rauch, & Foa, 2003), enhancing clients' sense of attachment security may reduce client dropout rates. Finally, a clinician's acknowledgement that he/she is asking the client to engage in the very openness to psychological pain that is particularly frightening may prove useful for both the client and the therapist. For the client, feeling understood is part of feeling secure. For the therapist, recognizing and acknowledging the fears with which the client is grappling (as opposed, for example, to focusing solely on disordered cognitions) may help him or her provide a sense of safety and security to the client. When considering the clinical implications of these findings, it is important to note that the data do not provide information about whether the influence of experimentally induced security is short-term or long-term, and there are no data about the length of time needed for therapeutic benefit. Moreover, it is possible that subliminal security enhancement op-

erates differently from supraliminal attempts at security provision within the therapeutic context.

We raise two potential experimental confounds that should be kept in mind when considering our findings. First, inadvertent priming may have resulted from asking participants to answer questions about their own attachment style and a past hurtful event before the security priming took place. It is possible that those earlier assessments contributed to the influence of the security primes. For example, those with heightened attachment anxiety, having been reminded of their typical attachment anxiety by completing the attachment measure, may have been more powerfully affected by a recalled hurt than those who were reminded of their usual security. These different reactions might then have affected responses to subsequent primes. Although possible, this seems unlikely to be the whole story, because many successful priming studies (reviewed by Mikulincer & Shaver, 2007a, 2007b, 2007c) have involved attachment measures administered weeks before the priming procedures. Second, the experience of having first remembered the hurt feelings episode may have affected people's response to the priming—that is, the priming might not have been effective without the initial recall of the hurt feelings episode. For instance, it might be that priming had an effect because a need for security was heightened by remembering being hurt. Relatedly, experimental evidence that social rejection motivates a desire for interpersonal connection (the social reconnection hypothesis; Maner, DeWall, Baumeister, & Schaller, 2007), as well as greater attention to social information (Gardner, Pickett, & Brewer, 2000), also makes it important to consider the possibility that security priming would not have been effective without the initial discussion of hurt feelings. Yet even if this is true, the clinical applications of our findings would likely still be important given that in using security inductions clinically, it would be natural for the context to be one that heightens concern with, memory of, and discussion of painful experiences. These issues need to be addressed in future research.

An additional focus of future work would be people's actual behavior rather than their self-reports of anticipated behavior. The present study indicates that, at the least, induced and naturally occurring security relate to people's beliefs that they will act in more open and positive ways, which may be an important step in therapeutic change. Nonetheless, because of data indicating disparities

between people's anticipated and actual actions and emotions (e.g., Gilbert & Wilson, 2007; Wilson & Dunn, 2004), it will be important in future work to examine both self-reported and observed behavior.

In sum, given the extensive evidence from both clinical and basic science research regarding the benefits of openness to painful memories and experiences, and the problems created by attempting to block these feelings (e.g., Pennebaker & Chung, 2007; Sparrow & Wegner, 2006), further examination of the role played by a socially grounded sense of security in allowing painful experiences to be confronted and resolved is needed. The results will help psychologists move toward an integrative theory of emotion regulation and will prove useful to both researchers and clinicians.

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