

Effective Reaction to Danger: Attachment Insecurities Predict Behavioral Reactions to an
Experimentally Induced Threat Above and Beyond General Personality Traits

Tsachi Ein-Dor Mario Mikulincer

The New School of Psychology, Interdisciplinary Center Herzliya

Phillip R. Shaver

Department of Psychology, University of California, Davis

Running head: EFFECTIVE REACTION TO DANGER

Word Count: 4983

Please address all correspondence to: Tsachi Ein-Dor, School of Psychology,
Interdisciplinary Center Herzliya, P.O. Box 167, Herzliya, 46150, Israel. Email:
teindor@idc.ac.il .

Abstract

People who score high on attachment anxiety or avoidance display poorer adjustment than secure individuals in various social, emotional, and behavioral domains. Yet it may be advantageous for groups to include insecure as well as secure members. We tested predictions from Social Defense Theory concerning advantages to groups of including members with different attachment patterns. Forty-six groups were unobtrusively observed in a threatening laboratory situation: The room gradually filled with smoke, apparently because of a malfunctioning computer. Attachment anxiety was associated with quicker detection of the danger and therefore with greater group effectiveness. Attachment-related avoidance was associated with speedier escape responses to the danger once it was detected and therefore with greater group safety. The results remained significant even when extraversion and neuroticism, two possible confounds, were statistically controlled. Implications of the findings for theory and research concerning group processes, threat detection, and individual differences in attachment are discussed.

Effective Reaction to Danger: Attachment Insecurities Predict Behavioral Reactions to an Experimentally Induced Threat Above and Beyond General Personality Traits

Attachment theory (Bowlby, 1973, 1980, 1982), one of the most influential contemporary theories in developmental, personality, and social psychology (Mikulincer & Shaver, 2007), proposes that human beings possess an innate psychobiological system (the *attachment behavioral system*) that motivates them to seek proximity to significant others (*attachment figures*) when they need protection from threats. When attachment figures regularly respond sensitively to a person's needs, he or she develops a sense of attachment security while acquiring constructive strategies for coping with threats and regulating negative emotions. When attachment figures are often unavailable, unreliable, or rejecting of bids for support, a person may become chronically insecure with respect to close relationships. The main insecure attachment patterns in adulthood are *avoidance*, marked by extreme independence, lack of intimacy and self-disclosure, and “deactivating” emotion-regulation strategies; and *anxiety*, marked by extreme dependence and hyperarousal (“hyperactivating” emotion-regulation strategies). These attachment orientations are relatively stable over time but can be changed through natural life experiences or effective psychotherapy (see Mikulincer & Shaver, 2007, for a review).

According to both theory and research, attachment security confers adaptive advantages, compared with insecurity, in a variety of social, emotional, and behavioral domains (Mikulincer & Shaver, 2007). For example, secure individuals tend to have more lasting and satisfying close relationships as well as fewer psychological problems. They are also viewed by others as more ideal relationship partners (e.g., Klohnen & Luo, 2003). These benefits of security caused researchers to wonder why a substantial portion of all large samples studied in various countries are insecure with respect to attachment. Belsky and colleagues were the first to argue that under certain conditions attachment insecurity has

adaptive benefits, because it is associated with earlier menarche in females and earlier reproduction (e.g., Belsky, Steinberg, Houts, & Halpern-Felsher, 2010).

Theory and research also suggest, however, that survival rather than early reproduction might be the major reason for the emergence of the attachment behavioral system during mammalian, especially primate, evolution (Cassidy & Shaver, 2008; Ein-Dor, Mikulincer, Doron, & Shaver, 2010). Threats (e.g., natural signs of danger or threats to a close relationship; Bowlby, 1982) activate the attachment system, which is adaptive because it increases the likelihood of protection, support, and survival (e.g., Mikulincer, Birnbaum, Woddis, & Nachmias, 2000; Mikulincer, Gillath, & Shaver, 2002). Therefore, we (Ein-Dor et al., 2010) proposed Social Defense Theory (SDT), which is based on the possibility that each of the major attachment orientations (secure, anxious, and avoidant) confers unique adaptive advantages that increase the *inclusive fitness* (see Hamilton, 1964) of members of groups that include insecure as well as secure attachment patterns. These advantages might also contribute to group-level selection (e.g., Wilson, Vugt, & O’Gorman, 2008), although group-level selection remains controversial (see Ein-Dor et al., 2010). In the study reported here, we examined some of SDT’s predictions regarding possible benefits of insecure attachment using behavioral measures.

Contemporary Attachment Theory and Research

Social and personality psychologists generally conceptualize adult attachment patterns as regions in a continuous two-dimensional space (e.g., Brennan, Clark, & Shaver, 1998). One dimension, attachment-related *avoidance*, reflects the extent to which a person distrusts relationship partners’ goodwill, strives to maintain independence, and relies on deactivating strategies for dealing with threats and negative emotions. Avoidant people cope with threats by deemphasizing distress and vulnerability and by attempting to cope independently, without seeking others’ help (e.g., Fraley & Shaver, 1997). The second dimension,

attachment-related *anxiety*, reflects the extent to which a person worries that others will not be available or helpful in times of need. Anxiously attached individuals exaggerate their sense of vulnerability and insistently call on others for help and care, sometimes to the point of being intrusive (e.g., Feeney & Noller, 1990).

Attachment security is defined by low scores on both anxiety and avoidance. Secure people generally cope with threats by relying on internal resources developed with the help of security-enhancing attachment figures or by effectively seeking support from others or collaborating with them (Shaver & Mikulincer, 2002). Secure individuals generally have high self-esteem, trust other people, and perceive the world as a relatively safe place (see Mikulincer & Shaver, 2007, for a review).

Social Defense Theory

According to SDT (Ein-Dor et al., 2010), each of the three major attachment patterns—secure, anxious, and avoidant – confers special adaptive advantages that tend to increase the inclusive fitness of people in groups that contain members of all three kinds. Each pattern also has distinct disadvantages, which may decrease inclusive fitness if they are not complemented by contributions by people with different attachment styles (see Nettle, 2006, for an analysis of the adaptive value of personality variability).

Attachment research has shown that secure individuals benefit the groups to which they belong. For example, they are generally better than insecure people at leading and coordinating group activities (Davidovitz, Mikulincer, Shaver, Ijzak, & Popper, 2007) and work more effectively with other group members when solving problems (Rom & Mikulincer, 2003; Smith, Murphy, & Coats, 1999). What attachment researchers call “felt security” (Sroufe & Waters, 1977), however, does not always reflect actual physical security. In times of danger, a sense of felt security can be maladaptive if it hinders rapid recognition of a threat or retards assembly of a rapid, effective response.

Conversely, as compared with people who are secure with respect to attachment, those who score higher on anxious or avoidant attachment often perform relatively poorly in groups (Rom & Mikulincer, 2003). Nevertheless, the strategies characteristically used by insecure people to deal with threats may be beneficial to inclusive fitness in certain kinds of threatening situations. For example, people who score high on attachment anxiety are vigilant in monitoring the environment for threats and are emotionally expressive and desirous of support when a threat is detected (e.g., Cassidy & Kobak, 1988; Feeney & Noller, 1990). According to SDT, anxious individuals may offset some of the deficiencies of secure group members by reacting quickly and vocally to early, perhaps ambiguous, cues of danger, a reaction we call *sentinel behavior*.

Avoidant people, in contrast, are accustomed to looking out for their own interests and taking care of themselves, even if this sometimes occurs at other people's expense (e.g., B. Feeney & Collins, 2001); thus, they are more likely to rely on self-protective fight-or-flight responses in times of danger, without hesitating or needing to deliberate with other group members. For example, an avoidant person may identify and enact the quickest protective maneuver or quickly notice the best escape route from a threatening situation, reactions we call *rapid fight-or-flight behavior*. This kind of behavior may sometimes save other group members' lives by thwarting a threat or identifying an escape route, thereby promoting inclusive fitness even if the avoidant person cares little about other group members' welfare.

In sum, the presence of people who score high on measures of attachment insecurity in human groups may have been beneficial to themselves and others over the course of human evolution. This suggests that a group that contains people with different attachment patterns – secure, anxious, and avoidant members – might be superior to other groups in dealing with threats and survival problems. Groups marked by attachment-style diversity

should detect potential problems and threats quickly (with anxious members acting as sentinels); act quickly without much deliberation, negotiation, or compromise (with avoidant members serving as models of rapid self-protection); and manage complex social tasks (with secure members acting as leaders and coordinators of the group). In the case of a simple threat situation, in which complex or coordinated leadership is unnecessary, security might not even contribute significantly to group effectiveness in dealing with the danger.

We (Ein-Dor, Mikulincer, & Shaver, in press) found, in a study of individuals' cognitive self-schemas and schema-related actions, that people who score relatively high on anxious attachment possess readily accessible and well-organized sentinel schemas – implicit knowledge about monitoring and reacting quickly to potential threats, alerting others to danger, and seeking proximity to others. In an experimentally induced threatening situation, the most anxious person in a group was the most likely to detect the danger. Avoidant attachment, neuroticism, and extraversion were not related to the probability of detecting danger. We also found that people who scored relatively high on avoidant attachment possessed accessible and well-organized fight-or-flight schemas – implicit knowledge about how to act rapidly to preserve oneself without deliberating or coordinating with other people or seeking help from them.

Despite the promising initial evidence for SDT, we did not report in that previous paper a test of the key proposition that insecure group members contribute to greater group effectiveness under conditions of threat. Here, we hypothesize that groups with more attachment-pattern diversity—that is, having at least one secure member (i.e., low on both anxiety and avoidance), one member high on attachment anxiety, and one high on avoidance—will be more effective in dealing with threats than other kinds of groups. We also predicted that having some members who are high on attachment anxiety or avoidance (or both) will be associated with group effectiveness in dealing with threats. Moreover, groups

with members scoring high on attachment anxiety will be quicker to identify threats than groups with members scoring lower on attachment anxiety. Groups with members scoring higher on avoidant attachment will be faster to approach the source of danger or to escape the danger once it has been detected than groups with members scoring low on avoidance.¹

Measures of attachment anxiety and avoidance have previously been associated with two general personality traits, neuroticism and extraversion (Nofhle & Shaver, 2006). Because these traits are more general and more familiar to most psychologists than the two attachment-insecurity dimensions, we examined the associations between the two kinds of attachment insecurity and sentinel and rapid fight-flight behaviors while statistically controlling for neuroticism and extraversion.

Method

Participants

One hundred thirty-eight Israeli undergraduates (89 women and 46 men aged 19-27, $Mdn = 22$) participated in the study in exchange for credit in psychology courses.

Materials and Procedure

The study spanned two sessions. In the first session, participants completed two randomly ordered scales. We assessed participants' attachment orientation with a Hebrew version of the Experiences in Close Relationships scales (ECR; Brennan et al., 1998). Participants rated the extent to which each item was descriptive of their experiences in close relationships on a 7-point scale ranging from *not at all* (1) to *very much* (7). Eighteen items assessed attachment anxiety and 18 assessed attachment-related avoidance. The reliability and validity of the scales have been repeatedly demonstrated (see Mikulincer & Shaver, 2007, for a review). In our study, Cronbach α was .89 for the anxiety items and .90 for the avoidance items.

Participants also completed the neuroticism and extraversion subscales of a Hebrew version of the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991). They rated the extent to which each item described them on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5). In this study, Cronbach α was .86 for neuroticism and .76 for extraversion.

The second session was conducted two weeks later by a different experimenter who was unaware of participants' scores on the first-session measures. Participants (who did not know each other well or at all) were invited to the laboratory three at a time (resulting in 46 groups). All gender combinations within a group were allowed. When the participants had all arrived at the laboratory, the experimenter told them a cover story, according to which they were going to play an Internet-based game. The experimenter then took the participants to a large room, sat them beside a long table, and asked them to complete a battery of questionnaires regarding their daily habits while he went to another room to prepare the computers for the experiment. He told them he would notify them via an intercom when the computers were ready, and he left the room, closing the door behind him.

Participants were filmed by hidden cameras throughout the session and could be viewed from an adjacent room. Ten feet behind the participants' table was another table on which there was a computer monitor displaying a generic desktop graphic (indicating that the computer was turned on). Nearby, on the floor, was an apparently attached PC with stacks of envelopes sitting on top of it. The screen was controlled by a computer in the control room, and the group's PC computer was a disguised party smoke machine. Exactly one minute after the experimenter departed, he began sending smoke into the room through the bogus computer, making it seem to participants that the computer had caught fire. There was a large open window in the room, which ensured that participants could breathe despite the smoke. The experiment ended when either the participants exited the room or they tried to deal with

the smoking computer. Afterward, they were debriefed and thanked. All said they believed that the computer fire was real. The overwhelmingly common response to the threat was flight (98% of the groups left the room) rather than attempting to deal with the smoking computer, so we were unable to test the possibility that in some situations more avoidant individuals might approach a threat in order to eliminate it.

Scoring procedure. Video-recorded sessions were rated independently by two judges, who were unaware of the study hypotheses and of participants' scores on the first-session measures. Judges recorded (a) the amount of time (in seconds) that elapsed between turning on the smoke machine and participants' detection of smoke in the room (the first member to turn, face the source of the smoke, and express alarm); and (b) the amount of time (in seconds) from detection of the smoke to the conclusion of the session (the last person leaving the room or a participant touching the apparently burning computer, whichever came first). Judges' ratings on these measures were identical ($ICCs = 1.0$). In addition, the judges rated the effectiveness, as they saw it, of each group in dealing with the situation on a 7-point scale ranging from *not at all* (1) to *very much* (7). An intraclass correlation coefficient indicated high inter-rater reliability ($ICC = .82$), so the two judges' ratings were averaged.

For each group, we recorded three scores: (a) the lowest summed anxiety and avoidance score within the group (indicating the most secure group member; this variable was recoded so that higher scores reflected *greater* security); (b) the highest avoidance score within the group (i.e., the score of the most avoidant group member); and (c) the highest attachment anxiety score within the group (i.e., the score of the most anxious group member). For instance, if a group's members scored 1, 3, and 7 on attachment anxiety, the group anxiety score was 7. We also recorded the highest neuroticism and extraversion scores within the group to serve as control variables. Correlations among the measures are shown in Table 1.

To compute a group variability score², we classified each participant as being relatively high on attachment anxiety (above the sample median on anxiety, but lower than the median on avoidance), relatively high on avoidance (above the sample median on avoidance, but lower than the median on anxiety), or relatively secure in terms of attachment (below the medians on both attachment anxiety and avoidance). Next, a group comprising one anxious member, one avoidant member, and one secure member received the highest variability score of 3; a group containing only 2 of the 3 attachment styles (e.g., anxious and avoidant but not secure) received a score of 2; a group containing only 1 pattern—anxious, avoidant, or secure— received a score of 1.³ We also computed a group variability score for neuroticism and extraversion using an equivalent method, with scores ranging from 0 (no neurotic or extraverted members) to 2 (at least one neurotic and one extraverted member).

Results

Predicting Group Effectiveness

To determine whether the three group attachment scores – highest security, anxiety, and avoidance – predicted group effectiveness, we used a linear regression analysis, which yielded a significant result, $F(3, 42) = 9.70, p < .001, R^2 = .18$. Consistent with predictions, the higher a group's highest anxiety and avoidance scores ($\beta = .28, p = .002$, and $\beta = .16, p = .049$, respectively), the greater the group's effectiveness. In addition and unexpectedly, in the situation under study, the higher a group's highest security score, the lower the group's effectiveness ($\beta = -.31, p < .001$). To control for neuroticism and extraversion, we ran a second regression analysis in which we first introduced each group's highest neuroticism and extraversion scores and then added the three group attachment scores. The analysis revealed that the higher a group's highest neuroticism score ($\beta = .32, p < .001$) and the lower the group's highest extraversion score ($\beta = -.17, p = .42$), the greater was the group's effectiveness. The addition of the three group attachment scores significantly increased the

amount of variance accounted for, $\Delta F(6, 39) = 6.06, p < .001, \Delta R^2 = .11$, and the pattern of results was maintained: The higher a group's highest anxiety and avoidance scores [$\beta = .22, p = .033$, and $\beta = .16, p = .066$ (marginally significant), respectively], and the lower the group's highest security score ($\beta = -.27, p < .001$), the greater the group's effectiveness. Adding the group attachment scores in the second step of the analysis substantially reduced the association between group neuroticism and group effectiveness, rendering neuroticism no longer significant, $\beta = .16, p = .11$.

To examine whether diversity in attachment scores predicted group effectiveness, we ran a regression analysis with group variability scores (attachment and general personality traits) as the predictors and group effectiveness as the outcome. Consistent with our prediction, the more diverse a group in terms of attachment patterns ($\beta = .18, p = .049$), and in terms of neuroticism and extraversion ($\beta = .25, p = .01$), the more effective was the group (without controlling for group variability in neuroticism and extraversion, diversity in attachment scores still predicted group effectiveness, $\beta = .21, p = .021$).

Predicting the Time Taken to Detect Danger

The mean time taken to detect the presence of smoke in the room was 79.8 seconds ($SD = 38.43$). We predicted that a group's highest attachment anxiety score would be inversely related to the time taken by a group to detect the presence of danger. To test this hypothesis, we conducted a two-step regression analysis like the one described above. Consistent with predictions, controlling for more general personality traits, the higher a group's highest attachment anxiety score, the less time it took the group to detect the presence of smoke in the room, $b = -11.5, \beta = -.29, p = .003$. A one point increase in attachment anxiety was associated with an 11.5 second decrease in detection time (and the results were quite similar if we did not control for neuroticism and extraversion: $\beta = -.28, p = .008$). The analysis also revealed a significant effect of the group's highest neuroticism score,

$b = -10.10$, $\beta = -.26$, $p = .017$: The higher a group's highest neuroticism score, the less time it took to detect the presence of smoke. These results indicate that attachment anxiety and neuroticism both affected the time taken to detect danger, and they were not redundant. Group's avoidance ($\beta = -.08$, $p = .41$), security ($\beta = -.06$, $p = .55$) or extraversion ($\beta = -.09$, $p = .32$) scores did not significantly predict the time taken to detect danger.

Predicting Time Taken to React Effectively to the Danger

The mean time taken to deal with the danger once it was detected, was 4.51 seconds ($SD = 1.84$). We predicted that a group's highest score on avoidant attachment would be associated with a rapid response to danger, either getting out of the room or attempting to confront the problem (e.g., by trying to turn off the smoking computer), whichever occurred first. To test this hypothesis, we conducted another two-step regression analysis like the ones already described.

Consistent with our prediction, the analysis revealed that the higher a group's highest score on avoidant attachment, the faster was the group's response to the danger, $b = -1.54$, $\beta = -.23$, $p = .016$. Thus, a one point increase in avoidance was associated with a 1.54 second decrease in reaction time (without controlling for neuroticism and extraversion, the association between avoidance and time to react was marginally significant: $\beta = -.18$, $p = .071$). The analysis also revealed a significant unique effect of a group's highest scores on attachment anxiety and extraversion ($b = -1.40$, $\beta = -.23$, $p = .025$ and $b = 1.56$, $\beta = .32$, $p = .003$, respectively): A group's highest attachment anxiety score predicted a speedier response to the danger; a group's highest extraversion score predicted a slower response to the danger. Neither the group's security score ($\beta = .09$, $p = .32$) nor its neuroticism score ($\beta = -.05$, $p = .60$) predicted the time taken to react effectively to the danger.

Discussion

SDT (Ein-Dor et al., 2010) proposes that groups containing insecure members are likely to be more effective than groups with all members scoring lower on measures of insecurity, at least when dealing with threats and survival problems. In threatening situations, people who score high on attachment anxiety may react emotionally and thereby alert other group members to the danger and the need for protection or escape. Avoidant attachment may be associated with responding quickly to a threat that has been detected; and this quick reaction may increase the survival chances of all group members. Supporting this line of reasoning, we found that a group's highest scores on attachment anxiety and avoidance predicted group effectiveness when groups were confronted with a computer that seemed to be on fire. The results remained significant when extroversion and neuroticism – two relevant but more general personality traits – were statistically controlled. Our findings imply that for a group to be more effective in dealing with threats it helps to have insecure members in the group.

We also found that a group's highest attachment security score was associated with lower group effectiveness. We (Ein-Dor et al., 2010) argued that group effectiveness might sometimes be positively related to secure members acting as leaders and coordinators of complex group tasks. In simple threat situations like the one studied here, however, secure members might slow a group's escape from a dangerous situation if they felt unthreatened or if they focused on making sure everyone else was aware of the danger and able to escape. Our result concerning security in a laboratory threat situation is consistent with the possibility that a sense of felt security can sometimes be maladaptive if it hinders rapid recognition of a threat and slows the mounting of an effective response. Our fairly simple experimental setting may have overemphasized the value of responding quickly and underemphasized the need for calm leadership and complex coordination of group tasks. We also found, however, a linear trend relating diversity in attachment scores with group effectiveness. This implies that

although secure members might be perceived by judges as ineffective, they might still contribute to the effectiveness of the group as a whole. Future studies should examine these issues using group tasks that require more coordination and cooperation, or that provide a payoff for calm deliberation before choosing a safe response to a group threat.

We expected that groups with a member or members scoring high on attachment anxiety would be quicker to detect a threat than groups with members scoring lower on attachment anxiety. Consistent with this prediction, the score of the highest group member on attachment anxiety was associated with the time taken for the group to detect the presence of danger. Thus, attachment anxiety may serve an important “sentinel” function in threatening situations. We also predicted that, following the detection of a threat, a group’s highest score on avoidant attachment would be associated with a quicker group response to it. Supporting this hypothesis, we found that groups with a member or members scoring high on avoidant attachment were quicker than other groups to respond to the threat of a smoking computer. The effects of the group’s highest anxiety and avoidance scores were not explained by two more general personality traits, extraversion and neuroticism.

In the setting we created, we were able to show only that avoidant attachment is related to quicker escape from threatening situations, but not to “fight” reactions – that is, to approaching a threatening situation in order to defuse or overcome it. In the present study, nearly all of the groups left the room rather than attempt to deal with the smoking computer.

The fact that most groups chose to escape the threat rather than confront it directly may be related to the unexpected finding that groups containing members with high scores on attachment anxiety not only detected the danger more quickly but also responded to it more quickly after it was detected. According to SDT, attachment anxiety should increase the tendency to detect danger and the propensity to flee, but it should not necessarily increase the tendency to respond effectively to a detected threat. The setting we created may have made

flight very easy, allowing attachment anxiety to be helpful for escaping the danger. Notably, Ein-Dor and colleagues (in press) have shown that the most attachment anxious person in a group is the one most likely to detect the presence of smoke, but not the one most likely to react effectively following detection. Still, future studies should examine our hypotheses in experimental settings that enable or encourage more varied responses to a threat.

We also found that groups with members scoring high on neuroticism detected the presence of danger in the room sooner than groups with members scoring lower on this trait. Because neuroticism includes hyper-vigilance and intense responses to threats (John & Srivastava, 1999), it is not surprising that groups with more neurotic members detected a threat quickly. Controlling for neuroticism, however, did not eliminate the effects of attachment anxiety. Future studies should explore the relation between neuroticism and attachment anxiety in more detail to map the similarities and differences between these constructs in relation to threat detection.

We found that extroversion was related to lower group effectiveness and a slower effective response to danger once the danger was detected. Extraversion is partially defined by sociability and is often negatively correlated with neuroticism, attachment anxiety and avoidance (Nofle & Shaver, 2006). Research on behavior in actual disaster situations consistently shows that people in groups are slower to react to danger than people who respond in a more self-serving manner (e.g., Proulx, 2003; Sime, 1985). High levels of extraversion and sociability combined with lower levels of vigilance to threat may hinder quick detection of threats and effective responses to them.

This study provides the first behavioral evidence for one of SDT's key predictions, that groups including insecure members will be more effective in detecting and dealing with threats than group with members scoring lower on attachment-related insecurity. This result is compatible with SDT's claim that attachment insecurities – anxiety and avoidance – may

have had (and may still have) adaptive advantages. Because this initial study used a correlational design to assess whether the hypothesized effects of anxious and avoidant in a group favorably affect the group's outcomes, it will be important in future studies to manipulate group composition by assigning people with different attachment patterns systematically to groups. But despite the limitations of this study, and pending replication, our findings highlight the potentially adaptive aspects of what in other contexts have seemed to be maladaptive consequences of attachment insecurity.

References

- Belsky, J., Steinberg, L., Houts, R. M., & Halpern-Felsher, B. L. (2010). The development of reproductive strategy in females: Early maternal harshness → earlier menarche → increased sexual risk taking. *Developmental Psychology, 46*, 120-128.
- Bowlby, J. (1973). *Attachment and loss: Vol. 2. Separation: Anxiety and anger*. New York: Basic Books.
- Bowlby, J. (1980). *Attachment and loss: Vol. 3. Sadness and depression*. New York: Basic Books.
- Bowlby, J. (1982). *Attachment and loss: Vol. 1. Attachment* (2nd ed.). New York: Basic Books. (Original ed. 1969)
- Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998). Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 46-76). New York: Guilford Press.
- Cassidy, J., & Kobak, R. R. (1988). Avoidance and its relationship with other defensive processes. In J. Belsky & T. Nezworski (Eds.), *Clinical implications of attachment* (pp. 300-323). Hillsdale, NJ: Erlbaum.
- Cassidy, J., & Shaver, P. R. (Eds.) (2008), *Handbook of attachment: Theory, research, and clinical applications* (2nd ed.). New York: Guilford Press.
- Collins, N. L., & Read, S. J. (1990). Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology, 58*, 644-663.
- Davidovitz, R., Mikulincer, M., Shaver, P. R., Ijzack, R., & Popper, M. (2007). Leaders as attachment figures: Their attachment orientations predict leadership-related mental representations and followers' performance and mental health. *Journal of Personality and Social Psychology, 93*, 632-650.

- Ein-Dor, T., Mikulincer, M., Doron, G., & Shaver, P. R. (2010). The attachment paradox: How can so many of us (the insecure ones) have no adaptive advantages? *Perspectives on Psychological Science*, *5*, 123-141.
- Ein-Dor, T., Mikulincer, M., & Shaver, P. R. (in press). Attachment insecurities and the processing of threat-related information: Studying the scripts involved in insecure people's coping strategies. *Journal of Personality and Social Psychology*.
- Feeney, B. C., & Collins, N. L. (2001). Predictors of caregiving in adult intimate relationships: An attachment theoretical perspective. *Journal of Personality and Social Psychology*, *80*, 972-994.
- Feeney, J. A., & Noller, P. (1990). Attachment style as a predictor of adult romantic relationships. *Journal of Personality and Social Psychology*, *58*, 281-291.
- Fraley, R. C., & Shaver, P. R. (1997). Adult attachment and the suppression of unwanted thoughts. *Journal of Personality and Social Psychology*, *73*, 1080-1091.
- Fraley, R. C., & Waller, N. G. (1998). Adult attachment patterns: A test of the typological model. In J. A. Simpson & W. S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 77-114). New York: Guilford Press.
- Hamilton, W. D. (1964). The genetical evolution of social behaviour: I and II. *Journal of Theoretical Biology*, *7*, 1-52.
- John, O. P., Donahue, E., & Kentle, R. (1991). *The "Big Five" Inventory: Versions 4a and 54*. Technical Report, Institute of Personality Assessment and Research, Berkeley, CA: University of California, Berkeley.
- John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (2nd ed., pp. 102-138). New York: Guilford Press.

- Killeen, P. R. (2005). An alternative to null-hypothesis significance tests. *Psychological Science, 40*, 12-15.
- Klohnen, E. C., & Luo, S. (2003). Interpersonal attraction and personality: What is attractive-self similarity, ideal similarity, complementarity or attachment security? *Journal of Personality and Social Psychology, 85*, 709-722.
- Kobak, R., Cole, H., Ferenz-Gillies, R., & Fleming, W. (1993). Attachment and emotional regulation during mother-teen problem solving: A control theory analysis. *Child Development, 64*, 231-245.
- Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: Exploring the normative and intraindividual components of attachment theory. *Journal of Personality and Social Psychology, 78*, 509–523.
- Mikulincer, M., Gillath, O., & Shaver, P.R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology, 83*, 881–895.
- Mikulincer, M., & Shaver, P. R. (2007). *Attachment in adulthood: Structure, dynamics, and change*. New York: Guilford Press.
- Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist, 61*, 622-631.
- Noftle, E. E., & Shaver, P. R. (2006). Attachment dimensions and the big five personality traits: Associations and comparative ability to predict relationship quality. *Journal of Research in Personality, 40*, 179-208.
- Perry, R. W. (1994). A model of evacuation compliance behavior. In R. R. Dynes & K. J. Tierney (Eds.), *Disasters, collective behavior, and social organization* (pp. 85–98). Newark, DE: University of Delaware Press.

- Proulx, G. (2002, April 15–16). *Understanding human behavior in stressful situations*. Presented in a workshop on identifying innovative research needs to foster improved fire safety in the United States, National Academy of Sciences, Delegate Binder Section 7, Washington, DC.
- Proulx, G. (2003). Researchers learn from World Trade Center survivors' accounts. *Construction Innovation*, 8(1), 1–3.
- Rom, E., & Mikulincer, M. (2003). Attachment theory and group processes: The association between attachment style and group-related representations, goals, memories, and functioning. *Journal of Personality and Social Psychology*, 84, 1220-1235.
- Sime, J. D. (1983). Affiliative behavior during escape to building exits. *Journal of Environmental Psychology*, 3, 21–41.
- Sime, J. D. (1985). Movement toward the familiar: Person and place affiliation in a fire entrapment setting. *Environment and Behavior*, 17, 697–724.
- Shaver, P. R., & Mikulincer, M. (2002). Attachment-related psychodynamics. *Attachment and Human Development*, 4, 133-161.
- Smith, E. R., Murphy, J., & Coats, S. (1999). Attachment to groups: Theory and management. *Journal of Personality and Social Psychology*, 77, 94-110.
- Sober, E., & Wilson, D. S. (1998). *Unto others: The evolution and psychology of unselfish behavior*. Cambridge, MA: Harvard University Press.
- Sroufe, L. A., & Waters, E. (1977). Attachment as an organizational construct. *Child Development*, 48, 1184-1199.
- Wilson, D. S., Van Vugt, M., & O'Gorman, R. (2008). Multilevel selection theory and major evolutionary transitions. *Current Directions in Psychological Science*, 17, 6–9.

Footnotes

1. Diversity in attachment patterns per se should not be related to the time taken to detect danger (only attachment anxiety) or to the time taken to react effectively following danger detection (only avoidance).
2. We did not include fearful-avoidance in our analysis (i.e., a person above the median on both anxiety and avoidance) because attachment theory views this pattern as a breakdown of attachment strategies rather than a coherent strategy in its own right.
3. Other scholars (e.g., Humphrey, Hollenbeck, Meyer, & Ilgen, 2007) have used the variance of scores to test the notion of diversity. This measure has some shortcomings, however. Consider two groups with no variance in their attachment anxiety scores. In the first group, all members scored 7 on the anxiety scale, and in the second group all members scored 1. We predict that although the variability of anxiety scores is identical in the two groups, the group with members high on attachment anxiety will be quicker to detect the presence of a threat than the group with members who score low on attachment anxiety.

Table 1

Correlations Among Group-level Maximum Scores on Attachment and Personality Measures

	1	2	3	4
1. Attachment anxiety				
2. Attachment-related avoidance	-.10			
3. Security	-.03	-.17		
4. Extraversion	.25*	-.23*	-.06	
5. Neuroticism	.55**	.12	-.28*	.18

Note: * $p < .05$; ** $p < .01$