Attachment Working Models and Cognitive Openness in Close Relationships: A Test of Chronic and Temporary Accessibility Effects

Mario Mikulincer and Daphna Arad
Bar-Ilan University

In 3 studies the authors explored the impact of chronic and temporary accessibility of attachment working models on cognitive openness in the realm of close relationships. In Study 1, participants rated their attachment style and perceptions of their romantic partner. In Study 2, they recalled a relationship defined by a particular attachment orientation and rated perceptions of the targeted partner. Study 3 was similar to Study 1, but secure attachment was primed for half of the participants. In all the studies, cognitive openness was assessed by changes in the perception of the partner after being exposed to information that disconfirmed expectations. Secure attachment was related to higher cognitive openness and better recall of expectation-incongruent information, mainly when this information was positively valued. The discussion emphasizes the implications of the chronic and contextual aspects of attachment working models for information processing.

One basic aspect of information processing is the integration of new information within existing knowledge. This activity requires openness to new data and cognitive flexibility, and it helps people to develop realistic views of the world, make data-driven judgments, and revise faulty knowledge. How this aspect of cognitive functioning relates to attachment working models was the focus of our study. An understanding of such a link is extremely important, because the existence of individual differences in cognitive processing is one of attachment theory's main explanations for the impact attachment style has on the way people relate to others and cope with stress (Mikulincer & Florian, 1998; Shaver & Hazan, 1993).

Previous studies have already found attachment-style differences in cognitive openness (e.g., Mikulincer, 1997). However, these studies have focused only on a person's typical attachment style and have failed to deal with the complex structure of attachment working models and the possible impact of contextually accessible attachment schemas. Moreover, they have not examined whether and how variations in cognitive openness are manifested in close relationships (e.g., perception of a romantic partner). Our study goes a step further and examines the chronic and temporary accessibility effects of attachment schemas on cognitive openness within close relationships.

Mario Mikulincer and Daphna Arad, Department of Psychology, Bar-Ilan University, Ramat Gan, Israel.

Correspondence concerning this article should be addressed to Mario Mikulincer, Department of Psychology, Bar-Ilan University, Ramat Gan 52900, Israel. Electronic mail may be sent to mikulm@mail.biu.ac.il.

Attachment Theory and Research

Bowlby's attachment theory (1969, 1973) is based on three tenets. First, human infants are born with a repertoire of behaviors aimed at maintaining proximity to others, who help them to survive and provide a "secure base" for exploring the environment. Second, proximity maintenance also depends on the responsivity of other persons to one's attachment needs. Third, experiences with significant others are internalized into mental working models of the world and the self and generalized to new relationships. Bowlby (1988) claimed that these models are the building blocks of people's attachment styles—stable patterns of relational cognitions and behaviors. Several studies suggest that these models are the main source of continuity between attachment experiences and subsequent feelings and behaviors throughout the life span (e.g., Arend, Gove, & Sroufe, 1979; Fraley, 1998; Sroufe, 1983).

Following Bowlby's (1969, 1973) premises, Ainsworth, Blehar, Waters, and Wall (1978) delineated three prototypical attachment styles in infancy (secure, avoidant, and anxious–ambivalent), and Hazan and Shaver (1987) constructed a self-report scale tapping these styles in adulthood. Hazan and Shaver defined the secure style as being characterized by comfort with closeness and confidence in others' responses; the avoidant style by insecurity with respect to others' intentions and a preference for distance; and the anxious–ambivalent style by insecurity with respect to others' responses, a strong desire for intimacy, and chronic fear of rejection and separation.

Using self-reports of adult attachment style, extensive research has shown theoretically congruent attachment-style differences in the experience of love (e.g., Feeney & Noller, 1990, 1991; Kirkpatrick & Davis, 1994), self-disclosure (Mikulincer & Nachshon, 1991), conflict resolution (Pistole, 1989), self-image (Mikulincer, 1995), social perception (Collins, 1996), coping with stress (Miku-

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lincer & Florian, 1998), emotional architecture (Mikulincer & Orbach, 1995), and psychopathology (Brennan & Shaver, 1995). There is also initial evidence on the association between attachment style and information processing (Mikulincer, 1997). This is the main focus of our study.

Adult Attachment Style and Information Processing

One basic hypothesis advanced by Bowlby (1988) is that attachment working models are related to the cognitive exploration of the environment. In his terms, secure infants can move away from their caregiver without being anxious about his or her availability, can return to him or her when dangers arise, and can recommence exploration as the proximity of the caregiver is reestablished. Avoidant and anxious–ambivalent infants show problems in exploration because they have serious doubts about the caregiver's capability to be a secure base when exploration becomes dangerous. These ideas receive strong support in studies with infants and children (e.g., Ainsworth, Bell, & Stayton, 1973; Arend et al., 1979; Cassidy & Berlin, 1994; Hazen & Durrett, 1982).

Following this reasoning, Mikulincer (1997) hypothesized that secure adults would be more prone to open their schemas to new information than insecure adults. Being confident in their ability to deal with distress (Mikulincer & Florian, 1998), secure people may be able to incorporate new data at the price of experiencing a temporary state of confusion and ambiguity. They may believe that this state, like other distressing experiences, is reversible and that they have the necessary skills to revise schemas and to avoid disorganization. Moreover, their basic optimistic attitude and their sense of mastery (Shaver & Hazan, 1993) may allow secure people to make adaptive and flexible changes in their knowledge. In Cialdini, Trost, and Newsom's (1995) terms, these persons may show no inherent preference for consistency and their judgments may be relatively free from prior expectations, commitments, and choices.

On the other hand, anxious–ambivalent persons' negative self-views (Collins & Read, 1990), their tendency to appraise environmental transactions as imminent threats (Mikulincer & Florian, 1998), and their failure to control accessibility of negative affect (Mikulincer & Orbach, 1995) may block the incorporation of new information. For these persons, the potential confusion inherent in new data may exacerbate their chronic sense of insecurity and distress, which, in turn, may overwhelm the cognitive system and impair the processing of the information. This tendency may be further accentuated by anxious–ambivalent persons' way of regulating affect: hypervigilance with respect to threat-related cues and mental rumination on distress-related material (Mikulincer & Florian, 1998). These persons may be so preoccupied with the threatening aspects of new data as well as with the potential disorganization of knowledge that they do not have sufficient available resources to process information. Although they may be potentially open to new information because of a lack of effective defenses (Mikulincer & Orbach, 1995), they may lack resources to process it.

Avoidant persons may also fail to process new information because of their habitual way of regulating affect: defensive exclusion of any distress-related cues, repression of painful memories, and cognitive blocking of threat-related cues (Mikulincer & Florian, 1998). These strategies may be applied in dealing with new data, because the incorporation of any new piece of evidence that minimally challenges prior knowledge may lead to confusion and may result in distress. Moreover, avoidant persons' overemphasis on self-reliance (Bowlby, 1988) may lead them to reject any evidence that demands a revision of their beliefs. For these persons, this kind of information may be a threat to their self-confidence and thus should be removed from the cognitive system. On this basis, avoidant people may develop rigid beliefs and reject any inconsistent evidence (Collins & Read, 1994).

In line with the above reasoning, secure children have been found to show higher cognitive flexibility than insecure children (Arend et al., 1979; Cassidy, 1986). Moreover, secure attachment in adulthood has been found to be positively related to integrative views of the world, the self, and marital relationships, as assessed by self-report scales, interviews, or cognitive tasks (Collins & Read, 1994; Kobak & Hazan, 1991; Main, Kaplan, & Cassidy, 1985; Mikulincer, 1995).

Recently, Mikulincer (1997) provided support for the association between adult attachment style and cognitive openness. In one study, participants completed Hazan and Shaver's (1987) Adult Attachment Style Scale and measures of cognitive closure, dogmatism, and tolerance of ambiguity. Secure persons, as compared with avoidant and anxious–ambivalent persons, showed more tolerance of unpredictability and ambiguity as well as more reluctance to endorse rigid beliefs. In two other studies (Mikulincer, 1997), participants were classified according to attachment style, were exposed to new evidence that contradicted either initial impressions or ethnic stereotypes about a target person, and then were asked to rate this person in relevant domains. Results showed that secure persons were more prone than insecure persons to integrate new data in their social judgments. Specifically, secure persons were less likely to show initial impression effects and to rely on ethnic stereotypes following the presentation of new evidence.

Similar results were found by Green-Hennessy and Reis (1998). Participants reported on their attachment style and were presented with two sets of information about a target person: one set presenting the person as insecure and the other presenting him or her as secure. Then they rated the target person on a list of adjectives twice, first after the first set of information and then again after the second set. Cognitive openness was defined as the absolute difference between the ratings. As expected, secure persons showed higher cognitive openness than avoidant persons. The anxious–ambivalent group was in between the two other groups and did not significantly differ from them.

The Current Study

The current study continued the above line of research and attempted to expand it in three directions. First, it examined the link between attachment style and cognitive openness within close relationships. Every person involved in a relationship has expectations about how his or her partner will behave in this relationship. However, reality does not always fit a person's expectations. There are cases in which the partner behaves as expected, but there are other cases in which partner's behaviors disconfirm a person's expectations. The question here is how people react to these expectation-incongruent behaviors. Specifically, to what extent are

people open to processing expectation-incongruent information about the partner and to revising their beliefs?

We hypothesized that people differing in attachment style would differ in their reactions to expectation-incongruent behaviors of the partner. On the one hand, secure people, who tend to be unafraid of ambiguity and confusion (Mikulincer, 1997), would be prone to revise their knowledge following changes in partner's behaviors. As a consequence, their relational expectations would be reality tuned. On the other hand, insecure people, who are unable or unwilling to open schemas to new evidence (Mikulincer, 1997), would be less prone to revise their beliefs when faced with expectation-incongruent behaviors of the partner.

The second purpose of our study was to examine attachment-style differences in the recall of expectation-incongruent information. Research in person memory has shown that people are more likely to recall schema-congruent than schema-incongruent information about others (Fiske & Taylor, 1991). However, this tendency seems to be moderated by the proneness to open schemas to new data (Kruglanski, 1989). On this basis, we hypothesized that secure people, who tend to appraise new information in benign terms (Mikulincer, 1997), would be prone to encode and integrate it within existing schemas. Insecure people, who tend to appraise new data in threatening terms, would be unable to allocate sufficient resources for information processing or would tend to defend themselves by suppressing it or encoding it in a shallow manner. As a result, they would show poorer recall of expectation-incongruent information than secure people.

The third purpose of our study was to examine the effects of the temporary accessibility of attachment working models on cognitive reactions to expectation-incongruent data. To date, most attachment studies have focused on a person's typical attachment style. However, although people hold a somewhat stable attachment style, they also have cognitive access to other attachment schemas representing different ways of relating to others (Shaver, Collins, & Clark, 1996). In fact, every person may have directly or vicariously experienced both secure and insecure relationships over the life span and may have encountered persons with whom he or she felt secure and others with whom he or she felt avoidant or anxious–ambivalent. As a result, he or she may hold secure, avoidant, and anxious–ambivalent working models, with the attachment style reflecting the most typical and accessible model (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996).

The above ideas received empirical support in a recent study (Baldwin et al., 1996). Participants were asked to think about their most impactful relationships and to indicate which attachment pattern best characterized their feelings in each relationship. Findings showed that most of the participants reported having experienced all three attachment patterns in their relationships. However, although people held multiple working models, they reported more relationships that fit their style and had more access to these relationships.

The above findings imply that the typical attachment style may be more chronically accessible than other alternative schemas. However, they also imply that these schemas are still available in the memory network and that a host of external and internal factors can influence their momentary accessibility. For example, being involved in a warm relationship may make accessible the secure schema even among persons with insecure styles. The question here is whether these temporary variations in the accessibility of working models may affect cognitive openness. This resembles Baldwin et al.'s (1996) basic question about "whether different attachment orientations could be activated and if this would influence the way people process relational information, leading them to respond in ways congruent with the behavior of those who report that orientation on a more chronic basis" (p. 103).

Study 1

Study 1 focused on a person's attachment style and his or her cognitive reactions to the expectation-incongruent behaviors of his or her current romantic partner. It consisted of two sessions. In the first session, participants completed attachment style scales, provided a description of their current romantic partner, and reported on their expectations about the behaviors of this partner in 10 dyadic episodes.

In the second session, participants received 6 of the above 10 dyadic episodes together with hypothetical behaviors of their current partner in each episode. These behaviors were constructed idiographically for each participant. They were divided into three categories, according to the extent to which the partner's behavior was congruent with the expectation a participant reported in the first session (congruent, ambiguous, incongruent). For each scenario, participants were asked to describe their partner in light of his or her hypothetical behavior. The amount of absolute change in partner's description from the description provided in the first session was taken as a measure of cognitive openness. Then participants were asked to recall the hypothetical behaviors of the partner. Our predictions were that (a) changes in perception of the partner following expectation-incongruent information would be higher among secure persons than among avoidant and anxious–ambivalent persons and (b) secure people would show better recall of expectation-incongruent information than would anxious–ambivalent and avoidant people.

Although no ad hoc prediction could be made, Study 1 was also designed to explore (a) whether attachment groups would differ in their cognitive responses to ambiguous and congruent information and (b) whether the valence of partner's behavior (positive–negative) would be relevant to understanding reactions to incongruent information. With regard to the valence issue, one might suspect that secure persons would be more prone to process positive rather than negative incongruent information about the partner as a means of strengthening the relationship. In fact, previous studies have shown that secure persons tend to attribute partner's transgressions to external and unstable causes and to dismiss the importance of these negative episodes (e.g., Mikulincer, 1998). The role these biases may play in secure persons' reactions to incongruent information is one of our research questions.

Method

Participants. Eighty undergraduate students from Bar-Ilan University (49 women and 31 men), ranging in age from 20 to 39 years (*Mdn* = 24), volunteered to participate in the study without any reward. The only inclusion criterion was to have cohabited with their current romantic partner for at least 1 year (47% of the participants were married).

Materials and procedure. In the first session, participants were approached during regular class time and completed several self-report scales. The order of the scales was randomized across participants.

Attachment style was assessed using two instruments in order to obtain both categorical and continuous scores. Both instruments were based on Hazan and Shaver's (1987) descriptions of how people feel in close relationships. Details of these instruments were reported by Mikulincer, Florian, and Tolmacz (1990). First, participants received the three Hazan and Shaver descriptions of feelings and cognitions about attachment styles and were asked to endorse the description that best described their feelings. Seventy-one percent of the participants classified themselves as secure (n = 57), 18% as avoidant (n = 14), and 11% as anxious–ambivalent (n = 9).[1] Second, they received 15 statements (5 per style) that were constructed by separating Hazan and Shaver's descriptions (see details in Mikulincer et al., 1990). Participants rated, on a 7-point scale ranging from 1 (*not at all*) to 7 (*very much*), the extent to which each item applied to them. This scale has been validated in previous studies (e.g., Mikulincer et al., 1990).

Although the 15-item scale was originally constructed to tap the three attachment styles, we decided to analyze it according to Brennan, Clark, and Shaver's (1998) two dimensions of attachment: anxiety and avoidance. On the basis of an extensive analysis of self-report scales, Brennan et al. concluded that security and anxiety items are inversely associated and reflect two poles of a single dimension. Indeed, previous studies using the current 15-item scale have also found a significant correlation between security and anxiety items (e.g., Mikulincer et al., 1990; Mikulincer & Erev, 1991). Our decision was also based on the fact that a detailed examination reveals that our security and anxiety items roughly correspond to Brennan et al.'s relevant items and that our avoidance items correspond to Brennan et al.'s avoidance items.

In the current sample, a two-factor-solution factor analysis with varimax rotation explained 68% of the 15-item scale variance. Whereas the first factor (44.8% of explained variance) included the 5 security items (after reversing the scales) and the 5 anxiety–ambivalence items (loading > .40), the second factor (23.2%) included the 5 avoidance items. This factor analytic solution was indeed similar to Brennan et al.'s (1998) solution. Thus, we computed two total scores by averaging items that loaded high on each factor. Higher scores reflect higher anxiety and higher avoidance. Importantly, the anxiety and avoidance scores were not significantly associated, $r(78)$ = .14.

Participants were asked to think about their current romantic relationship and to rate the extent to which each one of eight traits was descriptive of their partner (flexible, warm, caring, indifferent, unsupportive, disrespectful, hostile, open to other's opinions). Each trait was rated on an 8-point scale, ranging from *not at all* (1) to *very much* (8). After we reversed scales, the Cronbach's alpha coefficient was .77, indicating acceptable internal consistency. On this basis, a baseline partner's description score was computed by averaging the eight items. Higher scores reflected a more positive view of the partner.

Participants also read 10 episodes that dealt with five areas of dyadic relationships (support in times of need, conflict resolution, division of labor, decision making, and autonomy). Then they were asked to freely report on their expectations about the behaviors of their current partner in each of the episodes. For example: "Your boss had unrealistic expectations and asked you to accomplish impossible missions. You returned home angry and frustrated. How will your partner behave in this situation?" After reading each episode, participants freely wrote their expectations on six empty lines.

Two weeks later, participants were individually scheduled for an ostensibly unrelated study. The experimenter, who was blind to participants' answers in Session 1, explained to them that they would be asked about their reactions to partner's behaviors. Then participants received 6 scenarios that were chosen from the 10 episodes described above. Each scenario included a description of the episode (similar to that presented in the first session) and a hypothetical behavior of the participant's partner. These behaviors were idiographically constructed for each participant in accordance to the expectations he or she had reported.

The scenarios were divided into three categories (two scenarios per category). In the expectation-congruent category, partner's behavior was similar to that written by the participant in Session 1. In the ambiguous category, partner's behavior was not similar to that expected by the participant, but it did not necessarily imply a refutation of the participant's expectation. In the expectation-incongruent category, partner's behavior resembled an opposite pattern of behavior to that expected.

The following example illustrates the way the above three categories were constructed. One episode deals with the receipt of a very attractive but unexpected job proposal that requires moving to a new city. One participant freely wrote that his or her current partner would eagerly hear the news, would encourage him or her to accept the proposal, and would be ready to move to the new city despite the problems involved in such a move. In the expectation-congruent category, the partner was described as attentive to the news, glad about the proposal, and responsive to the participant's career needs. In the expectation-incongruent category, the partner did not want to hear the news, expressed hostility toward the proposal, and did not agree to move to a new city. In the ambiguous category, the partner heard the news, was surprised by the proposal, and asked for time to think about it.

The scenarios were constructed as follows: Participants' expectations were read by the two authors, who were blind to their attachment style. Then together they chose six episodes based on two criteria. First, an effort was made to choose episodes in which a participant's expectations were clear and coherent so that different types of partner's behaviors could be easily constructed. In general, most of the expectations were clearly and coherently written (around nine responses per person), and no observable attachment-style difference was found in the writing (e.g., length of text, coherence of the text). Second, an effort was made to choose both episodes in which the partner was expected to behave in a positive way and episodes in which he or she was expected to behave in a negative way. This was done in order to control for potential attachment-related biases in the valence of the expectations (see the *Results and Discussion* section for an analysis of these biases).

After choosing the six scenarios, the two authors divided them into congruent, ambiguous, and incongruent categories. An attempt was made to include in each category both positive and negative expectations. However, there were cases in which most of a participant's expectations were either positive or negative. In these cases, an effort was made in order to represent the two types of expectations in the incongruent category, which was the main focus of our study. After allocating two episodes to each category, the two authors separately constructed hypothetical behaviors in the manner described above. Then they compared the behaviors each of them constructed, and a final list was arrived at following a thoughtful discussion about the fit of the behaviors to the categories.

To examine the validity of the above procedure, we asked a different sample of 15 undergraduate students from Bar-Ilan University (8 women and 7 men) to rate the congruency between a participant's expectation and the correspondent hypothetical behavior of the partner. Judges received 108 pairs of expectation-hypothetical behavior, which were randomly selected from each scenario category (36 pairs per category; 20% of the total number of behaviors). They rated the extent to which the hypothetical behavior was congruent with the participant's expectation on a 4-point scale ranging from *not at all* (1) to *very much* (4). We found that Cronbach's alphas for each category of responses revealed high internal consistency (ranging from .82 to .91). Then we computed for each judge three scores by averaging congruency ratings in each scenario category.

A one-way analysis of variance (ANOVA) for repeated measures yielded a significant difference in congruency ratings between scenario

[1] In all three studies, no gender difference was found in the distribution of attachment style. Moreover, no significant interaction was found between gender and attachment style, and the results were not affected after gender was controlled for as a covariate.

categories, $F(2, 28) = 82.35$, $p < .01$. Post hoc contrast tests for repeated measures indicated that behaviors in the congruent category were indeed rated as more congruent with participants' expectations ($M = 3.09$) than behaviors in the ambiguous category ($M = 2.12$), which, in turn, were rated as more congruent than behaviors in the incongruent category ($M = 1.61$). This finding supports the validity of our construction of partner's behaviors along the congruency dimension.

After reading each scenario, participants were asked what they would think of their current partner if he or she engaged in such a behavior. Then they rated the partner on the eight traits presented in Session 1, using the 8-point scale described above. Participants repeated this procedure for the six scenarios. The order of the scenarios was randomized across participants. On completing this task, participants received a battery of attitude scales aimed at creating a necessary interval for the recall task. This procedure took approximately 10–15 min. Then participants were asked to remember the six hypothetical scenarios and to freely write the partner's behavior they recalled. Finally, they were debriefed. Most of the participants did not recognize that the two sessions of the study were connected. Only 3 participants recognized that the two sessions were connected, and their exclusion from the sample did not affect the results of the analyses.

Results and Discussion

Preliminary analyses. A one-way ANOVA on baseline partner's description yielded a significant attachment effect, $F(2, 77) = 8.03$, $p < .01$. Scheffé tests indicated that secure and avoidant people described their partner in more positive terms (Ms = 6.44 and 6.48) than did anxious–ambivalent people ($M = 5.03$). Accordingly, a Pearson product–moment correlation showed that the attachment anxiety score was significantly and inversely related to baseline partner's description, $r(78) = -.25$, $p < .05$. The higher a person's attachment anxiety, the less positive his or her description of partner. The attachment avoidance score was not significantly associated with baseline partner's description.

The above findings are in line with Collins's (1996) finding that both secure and avoidant persons held positive perceptions of their romantic partner. Collins also noted that although avoidant persons had negative perceptions of fictional persons, they still had positive perceptions of their own partner.

Changes in partner's description. In examining changes in partner's description, we adopted Green-Hennessy and Reis's (1998) scoring of cognitive openness. We computed for each participant the absolute discrepancy between his or her baseline partner's description and his or her description of the partner in each scenario. Then these discrepancy scores were averaged across each scenario category (congruent, ambiguous, incongruent), and our predictions were tested in two ways. First, we conducted a two-way ANOVA for self-classification of attachment style and scenario category, with the last factor as a within-subject measure. Second, we calculated Pearson correlations between the two continuous attachment scores (security, avoidance) and discrepancy scores in each scenario category.

The ANOVA yielded a significant main effect for scenario category, $F(2, 154) = 22.29$, $p < .01$. Scheffé tests indicated that incongruent partner's behaviors led to higher changes in partner's description ($M = 2.57$) than congruent behaviors ($M = 1.59$). The interaction was also significant, $F(4, 154) = 4.43$, $p < .05$. Planned contrasts comparing secure versus insecure persons revealed no significant differences in ambiguous or congruent scenarios ($F < 1$).[2] However, when partner's behaviors were incongruent, secure people showed higher changes in partner's description than avoidant and anxious–ambivalent people, $F(1, 154) = 16.68$, $p < .01$ (see Table 1). This effect was significant after the baseline partner's description was controlled for as a covariate.

Table 1
Means and Standard Deviations of Discrepancy Scores and Recall Measures According to Attachment Style and Partner's Behavior (Study 1)

Partner's behavior	Secure ($n = 57$)		Avoidant ($n = 14$)		Anxious–ambivalent ($n = 9$)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Change in partner's perception						
Congruent	1.54_a	0.81	1.74_a	1.33	1.64_a	0.63
Ambiguous	2.44_a	1.22	2.40_a	1.14	1.93_a	0.91
Incongruent	2.91_b	1.21	1.96_a	1.43	1.32_a	0.98
Recall accuracy						
Congruent	1.46_a	0.70	1.64_a	0.63	1.44_a	0.73
Ambiguous	1.17_a	0.80	1.14_a	0.78	0.67_a	0.71
Incongruent	1.32_a	0.73	0.64_b	0.85	0.33_b	0.70

Note. Means in the same row that do not share subscripts differ at $p < .05$ in simple main effect tests. Change-in-partner's-perception scores reflect the discrepancy between Session 1 and Session 2 descriptions, with higher scores indicating greater discrepancy. Recall accuracy scores could range from 0 to 2, with higher scores indicating better recall.

Pearson correlations showed no significant association between continuous attachment scores and discrepancy scores in congruent and ambiguous scenarios. However, significant correlations were found in incongruent scenarios, $r(78) = -.36$, $p < .01$, for anxiety, and $r(78) = -.25$, $p < .05$, for avoidance. As expected, the higher the attachment anxiety and the higher the avoidant orientation, the lower the changes in the perception of the partner following incongruent information. This pattern of correlations was in line with the ANOVA's findings, highlighting the congruency between categorical and dimensional assessments of attachment styles and strengthening the validity of the results.

Recall of partner's behaviors. For each participant, we counted the number of correctly recalled partner's behaviors in each of the three scenario categories. This score ranged from 0 (no behavior was recalled) to 2 (the two partner's behaviors in a scenario category were correctly recalled). To be counted as a correct recall, a response had to be similar in meaning, but not necessarily in style and wording, to the hypothetical partner's behavior the participant previously received. Two judges independently scored 30% of the recalled behaviors (87), and a high level of agreement was found between them ($\kappa = .58$).

The ANOVA yielded a significant main effect for scenario category, $F(2, 154) = 9.50$, $p < .01$. Scheffé tests indicated that people showed better recall for congruent scenarios ($M = 1.49$)

[2] Combining attachment style differences in discrepancy scores for ambiguous and congruent scenarios across the three studies through meta-analysis (Rosenthal & Rosnow, 1984) yielded no significant effect.

than for ambiguous (M = 1.11) or incongruent scenarios (M = 1.09). The ANOVA also yielded a significant interaction, $F(4, 154) = 4.19$, $p < .01$. Planned contrasts revealed that secure people showed better recall of incongruent data than avoidant and anxious–ambivalent people, $F(1, 154) = 19.17$, $p < .01$ (see Table 1). No significant difference was found in the recall of ambiguous or congruent scenarios ($F < 1$).[3] These effects remained unchanged after controlling for baseline partner's description.

Pearson correlations indicated a significant association between recall of incongruent information and attachment scores, $r(78) = -.23$, $p < .05$, for anxiety, and $r(78) = -.39$, $p < .01$, for avoidance. As expected, the higher the attachment anxiety and the higher the avoidant orientation, the worse the recall of incongruent information. These associations were not significant in congruent or ambiguous scenarios. Again, the findings were in line with the self-classification of attachment style.

The valence of partner's behavior. Because of the idiographic nature of the study, we could not plan a complete factorial design for Expectation-Congruency × Valence and thus could not entirely avoid potential attachment-related biases in expectations of partner's behaviors (see Shaver & Hazan, 1993, for a review). In examining this issue, we asked three undergraduate psychology students, who were blind to participants' attachment style, to independently rate the valence of the expectations participants generated in Session 1. Judges read each of the 10 dyadic episodes, followed by each of the participant's expectations, and rated the extent to which a response reflected a positive expected behavior from the partner on a 7-point scale ranging from *not at all* (1) to *very much* (7). Judges received instructions that a positive behavior of a partner should reflect a caring, loving, sensitive, and responsive attitude toward a participant's needs.

We found that interjudge correlations were high (ranging from .58 to .65). Then we computed a total score for each participant by averaging the three judges' ratings across the 10 episodes. A one-way ANOVA examining attachment-style differences in the valence of expectations yielded a significant attachment effect, $F(2, 77) = 9.71$, $p < .01$. Scheffé tests revealed that the expectations of secure and avoidant persons were rated as more positive (Ms = 5.61 and 5.10) than those of anxious–ambivalent persons (M = 4.05). In addition, a Pearson correlation showed that the attachment anxiety score was significantly and inversely related to the valence of expectations, $r(78) = -.22$, $p < .05$. The higher a person's attachment anxiety, the less positive his or her expectations of partner's behaviors. The attachment avoidance score was not significantly associated with valence of expectations. As can be seen, previously found attachment-related biases (Shaver & Hazan, 1993) were present in the expectations participants freely generated about partner's behavior.

As mentioned in the *Method* section, we attempted to deal with the above bias by including both positive and negative expectations among the six scenarios participants received in Session 2. Special attention was given to allocating both types of expectations to the incongruent category. In evaluating these efforts, another group of three undergraduate psychology students, who were blind to participants' attachment style, rated the valence of all 480 hypothetical behaviors of the partner that we constructed for Session 2. Instructions and scaling were identical to those used in the valence ratings of expectations.

We found that interjudge correlations were high (ranging from .62 to .68). Then we averaged the three judges' ratings for each response and computed three total scores for each participant by averaging valence ratings in each category of partner's behavior (congruent, ambiguous, incongruent). A two-way ANOVA for attachment style and scenario category performed on the valence scores, with the last factor as a within-subject measure, yielded a significant interaction, $F(4, 154) = 4.29$, $p < .01$. Simple main effects tests revealed no significant attachment-style difference for incongruent and ambiguous behaviors of partner ($F < 1$). However, the congruent behaviors of partner that secure and avoidant persons received were rated as more positive (Ms = 3.66 and 3.21) than those anxious–ambivalent persons received (M = 2.61), $F(2, 154) = 5.37$, $p < .01$.

Consistent with the ANOVA's results, a Pearson correlation showed that the attachment anxiety score was significantly and inversely related to the valence of congruent behaviors of partner, $r(78) = -.27$, $p < .05$. The higher a person's attachment anxiety, the less positive the congruent partner's behaviors he or she received. No significant associations were found for the attachment avoidance score as well as for the valence of incongruent and ambiguous behaviors of partner. It seems that we successfully controlled for the valence of partner's behavior in ambiguous and incongruent scenarios. However, we failed to remove attachment-related biases in congruent scenarios.

The success of our efforts was further highlighted by the fact that ANOVAs with valence ratings as covariates yielded significant interactions similar to those found in the original ANOVAs for discrepancy and recall scores, $F(4, 151) = 3.78$, $p < .05$, and $F(4, 151) = 4.17$, $p < .01$. That is, secure persons' relatively high cognitive openness toward incongruent information cannot be accounted for by the valence of this information.

However, it is still possible that the valence of the incongruent information might interact with attachment style in shaping the processing of this information. In examining this possibility, we divided incongruent scenarios into two groups (positive, negative) according to the median of the valence ratings (3.42) and conducted ANOVAs for attachment style and scenario valence.[4] For these analyses, we computed the actual discrepancy between the baseline description of partner and his or her description in the incongruent scenario; we then could assess direction of change—that is, whether secure people, as compared with insecure people, would provide a more positive description of the partner after positive incongruent information and a more negative description after negative incongruent information.

The ANOVA on actual discrepancy yielded a significant interaction, $F(2, 71) = 9.16$, $p < .05$. Planned contrasts showed the following differences: In the positive incongruent scenario, secure people showed more positive change scores (M = 1.03) than both

[3] A meta-analytical procedure that combined attachment style differences in the recall of ambiguous and congruent scenarios across the three reported studies yielded no significant effects.

[4] Six secure persons were dropped from the analyses because the two incongruent scenarios they received were below the median of valence ratings. The analyses yielded similar results when the incongruent scenarios were divided into positive and negative scenarios according to our decision during the construction stage. This similarity of findings was also observed in Studies 2–3.

avoidant ($M = 0.28$) and anxious–ambivalent people ($M = 0.54$), $F(1, 71) = 3.46$, $p < .05$. In the negative incongruent scenario, secure people showed more negative change scores ($M = -3.29$) than both avoidant ($M = -2.39$) and anxious–ambivalent people ($M = -1.13$), $F(1, 71) = 4.30$, $p < .01$. That is, secure persons reacted to incongruent information with more changes in the perception of partner than insecure persons, regardless of the valence of the information.

Importantly, these findings were replicated in Pearson correlations between the two continuous attachment scores and actual discrepancy scores. In the positive incongruent scenario, the higher the attachment anxiety and avoidance, the lower the positive change in partner's description, $r(72) = -.26$, $p < .05$, and $r(72) = -.22$, $p < .05$, respectively. In the negative incongruent scenario, the higher the attachment anxiety and avoidance, the lower the negative change in partner's description, $r(72) = .28$, $p < .05$, and $r(72) = .23$, $p < .05$, respectively.

Beyond their theoretical relevance, the above findings also provide important information about a possible ceiling effect in the analysis of absolute discrepancies. In this analysis, secure persons shifted their rating by 2.91 points in response to incongruent information, but the most they could possibly shift in a positive direction was 1.56 (a perfect 8 minus the 6.44 mean baseline rating). In this way, one could conclude that secure persons' tendency to change the perception of partner was mainly in a negative direction in response to negative incongruent information. However, the analyses of actual discrepancies revealed that secure persons were more likely to change the perception of partner than insecure persons in both positive and negative directions. That is, their cognitive openness was not constrained by a ceiling effect and was observed in incongruent scenarios that contained either positive or negative information about the partner.

The ANOVA on recall scores also yielded a significant interaction, $F(2, 71) = 8.11$, $p < .01$. However, planned contrasts revealed a different pattern of differences: In the positive incongruent scenario, secure people were more likely to recall the partner's behavior ($M = .90$) than both avoidant ($M = .29$) and anxious–ambivalent people ($M = .11$), $F(1, 71) = 32.66$, $p < .01$. In the negative incongruent scenario, however, no significant attachment difference was found ($M = .50$ for secure, $M = .36$ for avoidant, and $M = .22$ for anxious–ambivalent participants). Moreover, simple main effects tests showed that secure persons were more likely to recall positive than negative incongruent information, $F(1, 71) = 31.23$, $p < .01$.

The above findings were replicated by Pearson correlations between the two continuous attachment scores and recall scores. In the positive incongruent scenario, the higher the attachment anxiety and avoidance, the worse the recall of partner's behavior, $r(72) = -.55$, $p < .01$, and $r(72) = -.47$, $p < .01$, respectively. In the negative incongruent scenario, Pearson correlations indicated that the associations between attachment scores and recall scores were not statistically significant. This finding (a) implies that the valence of incongruent information had an impact on secure persons' recall and (b) may reflect a tendency to dismiss relationship-threatening behaviors of the partner.

The ANOVAs revealed similar results when the baseline valence was entered as a covariate.[5] Accordingly, partial correlations between the continuous attachment scores, on the one hand, and discrepancy and recall scores, on the other, controlling for the baseline valence yielded similar associations as those obtained in the reported Pearson correlations. This statistical control for baseline valence did not change the results of the relevant analyses in Studies 2–3.

Conclusions. Overall, the findings were consistent with predictions: Secure people were more likely to change their perception of a current partner following expectation-incongruent behavior and were more likely to recall this behavior than insecure people. Changes in perception were independent of the valence of partner's behavior. However, secure persons were more likely to recall positive than negative incongruent behavior of partner. We address this finding in the General Discussion section.

Interestingly, attachment-style differences in cognitive reactions to ambiguous scenarios were not statistically significant. One might expect that in ambiguous scenarios, in which prior expectations are partially disconfirmed, secure persons would be more likely to change the perception of partner than insecure persons. However, this was not the case. It may be that the disconfirmation of expectations implied in the ambiguous scenarios was not so strong and clear that secure persons would be unable to hold their perception of partner. This ambiguity may activate schema-driven processing and the assimilation of the new evidence to existing schema. Further studies should attempt to quantify the extent to which new information disconfirms prior expectations and to examine the critical level at which people differing in attachment style would be data-driven rather than schema-driven.

It should be noted that the above differences may also reflect the impact of other personality or relational factors. In fact, attachment security has been found to be related to tolerance of ambiguity (Mikulincer, 1997) and relationship satisfaction (Mikulincer & Erev, 1991), which might have accounted for variations in cognitive openness. In fact, a person who is satisfied with a relationship may be tolerant toward the partner and may accept expectation-incongruent behaviors. That is, the findings of Study 1 can be explained by what Cialdini et al. (1995) labeled *preference for consistency.* Moreover, because Study 1 focused on attachment style, no conclusion can be made about the direction of causality. One could equally conclude that attachment security may lead to cognitive openness or that an open cognitive attitude may promote relationship satisfaction and feelings of security. Studies 2–3 dealt with these possibilities.

Study 2

Study 2 explored whether contextual, temporary variations in the accessibility of attachment working models would have an impact on cognitive reactions to expectation-incongruent partner's behavior. Study 2 also explored whether or not this effect would depend on a person's attachment style—that is, whether the cognitive effects of contextual variations in the accessibility of working models would be the same for secure and insecure persons. Finally, Study 2 examined whether the findings of Study 1 could be explained by other factors, such as intolerance of ambiguity or relationship satisfaction.

[5] All the analyses of covariance for repeated measures were conducted along the guidelines of the SPSS (1990) multivariate analysis of variance procedure.

To temporarily vary the accessibility of attachment working models, participants were asked to think of a particular real-life close relationship, which was defined by either secure, avoidant, or anxious–ambivalent feelings, and to report on their cognitive reactions to expectation-incongruent behaviors of their partner in such a relationship. This procedure was based on Baldwin et al.'s (1996) findings that people have no difficulties in recalling and reporting on the above three types of relationship. It was also based on the cognitive premise that asking people to think about a relationship can temporarily increase the accessibility of schemas that fit and define this relationship (relationship-specific working models).

The study consisted of two sessions. In the first one, participants completed the attachment style scale and were randomly assigned to three conditions according to the type of close relationship they were asked to recall: a relationship defined either by secure, avoidant, or anxious–ambivalent feelings. In all conditions, participants provided a description of the partner in the targeted relationship and freely reported on their beliefs about the behaviors of this partner in dyadic hypothetical episodes. They also completed an intolerance of ambiguity scale and reported on their satisfaction with the targeted relationship.

In the second session, participants were asked to think about the relationship they had recalled in the first session. They were presented with four hypothetical scenarios in which the behavior of the targeted partner was congruent with the beliefs they had reported in the first session (congruent scenarios) and four scenarios in which the partner's behavior was incongruent with these beliefs (incongruent scenarios). For each scenario, participants were asked to recall a concrete episode that fit the scenario and to rate attributes that describe the partner in light of his or her behavior in the actually recalled episode.[6] The number of recalled episodes and the amount of change in partner's description from the baseline description were the dependent variables.

Method

Participants. Seventy-five undergraduate students from Bar-Ilan University (52 women and 23 men), ranging in age from 19 to 27 years (*Mdn* = 23), volunteered to participate in the study. All were single and had a history of heterosexual romantic relationships. Forty-two participants were currently involved in a romantic relationship. They were randomly assigned to three conditions (25 participants per group).

Materials and procedure. In Session 1, participants were approached during class time and completed a series of randomly ordered scales. Among them, they received the attachment scale described in Study 1 and MacDonald's (1970) Tolerance of Ambiguity Scale.[7] In MacDonald's scale, participants rated whether or not each of 20 items (e.g., "I do not like to work on problems that could have more than one solution") was self-descriptive. In our sample, the Cronbach's alpha coefficient for the scale was .78, implying appropriate internal consistency. A total score was then computed by averaging the 20 items.

Participants were also asked to recall a specific close relationship that had an impact on their lives and were randomly divided into three groups. In the secure condition, participants read Hazan and Shaver's (1987) secure attachment description and were asked to think of a close relationship in which they felt that way. In the avoidant condition, participants were presented with Hazan and Shaver's avoidant attachment description and were asked to think of a close relationship in which they felt that way. In the anxious–ambivalent condition, participants read Hazan and Shaver's anxious–ambivalent attachment description and were asked to think of a close relationship in which they felt that way. Six persons who failed to recall the targeted relationship were dropped from the sample.

In all the conditions, participants wrote the name of the partner; indicated the type of the relationship (family, friend, romantic) and whether it was a past or current relationship; and rated the importance they attached to it during the relationship (on a 6-point scale), the satisfaction they felt with it during the relationship (on a 6-point scale), and the extent to which eight traits were descriptive of the targeted partner during the relationship (see Study 1 for items and scaling). Then a baseline partner's description score was computed by averaging the eight items (α = .83). Participants also received eight hypothetical episodes (similar to those of Study 1) and freely wrote about the way the targeted partner might behave in each of the episodes.

The second session was conducted 2 weeks later. Participants were asked to think about the relationship they had described in Session 1 and received eight hypothetical, idiographically based scenarios related to the episodes presented in the first session. In four scenarios (congruent scenarios), the targeted partner was described as reacting in the way participants believed he or she might have reacted to the episodes. In the remaining scenarios (incongruent scenarios), the partner's behavior was the opposite to that expected by participants. The way the scenarios were constructed was identical to that described in Study 1. The order of presentation of the scenarios was randomized across participants.

Participants were asked to read each scenario and to try to remember a particular concrete episode in which the targeted partner behaved in the way described. If they could not remember such an episode, they were asked to read the next scenario. If they recalled such an episode, they wrote a brief description in order to bring to mind a concrete picture of the episode. Then they rated the partner on the eight traits described in Study 1 in that particular episode (indicating what they would think of this partner on his or her engagement in such a behavior).

Results and Discussion

In examining the data, we took into account individual differences in attachment style and conducted ANOVAs for type of targeted relationship and attachment style. However, because of the small number of anxious–ambivalent participants in each condition, we collapsed the avoidant and anxious–ambivalent styles into a single insecure style (n = 31). A chi-square test revealed no significant attachment-style differences across the three types of targeted relationship (see Table 2).

Preliminary analyses. Chi-square analyses revealed no significant association between experimental condition or attachment style, on the one hand, and whether the relationship was past or present and whether it was friend, family, or romantic, on the other. The ANOVA for intolerance of ambiguity revealed only a significant main effect for attachment style, $F(1, 69) = 5.85$, $p < .05$. As expected, insecure persons reported more intolerance of ambiguity (M = 0.61) than secure persons (M = 0.52). The ANOVA for relationship importance revealed no significant effects. However, the ANOVA for relationship satisfaction revealed significant main effects for attachment style, $F(1, 69) = 8.44$, $p <$

[6] In order to increase the validity and generalizability of the findings, the recall task tapped personal recollections of actual episodes that fit the given hypothetical scenarios instead of the retrieval of hypothetical episodes learned during the experiment.

[7] In Studies 2 and 3, we collected only categorical data on attachment style. However, we think that the results would likely have been similar using dimensional data, given that the categorical and dimensional results were so similar in Study 1.

Table 2
Means and Standard Deviations of Dependent Variables According to Type of Relationship, Attachment Style, and Scenario Category (Study 2)

Scenario category	Secure		Avoidant		Anxious–ambivalent	
	Sec. (n = 15)	Ins. (n = 10)	Sec. (n = 16)	Ins. (n = 9)	Sec. (n = 13)	Ins. (n = 12)
Number of recalled scenarios						
Expectation-congruent						
M	3.53_a	3.70_a	3.50_a	3.67_a	3.76_a	3.58_a
SD	0.52	0.48	0.63	0.50	0.43	0.51
Expectation-incongruent						
M	2.93_a	2.90_a	1.94_b	1.78_b	2.08_b	1.92_b
SD	0.88	0.87	0.77	0.67	0.64	0.79
Change in partner's perception						
Expectation-congruent						
M	0.94_a	1.00_a	0.81_a	1.25_a	0.87_a	1.12_a
SD	0.79	0.22	0.48	1.02	0.42	0.65
Expectation-incongruent						
M	2.78_a	1.81_a	$1.58_{a,b}$	1.36_b	2.21_a	1.09_b
SD	1.33	0.73	0.94	0.99	1.20	0.62

Note. Sec. = secure style; Ins. = insecure style. Means in the same row that do not share subscripts differ at $p < .05$ in simple main effect tests. Change-in-partner's-perception scores reflect the discrepancy between Session 1 and Session 2 descriptions, with higher scores indicating greater discrepancy. Number-of-recalled-scenario scores could range from 0 to 4.

.01, and type of relationship, $F(2, 69) = 8.22$, $p < .01$. Secure people reported on a more satisfactory relationship ($M = 4.66$) than insecure people ($M = 3.94$), and secure and avoidant relationships were rated as more satisfactory (Ms = 4.96 and 4.44) than anxious–ambivalent relationships ($M = 3.68$).

The ANOVA for baseline partner's description also yielded significant main effects for type of relationship, $F(2, 69) = 3.49$, $p < .01$, and attachment style, $F(1, 69) = 5.02$, $p < .01$. Partners in secure relationships ($M = 6.17$) were perceived more positively than partners in anxious–ambivalent relationships ($M = 5.32$), and secure people perceived their partner more positively ($M = 5.98$) than insecure people ($M = 5.39$).

Number of recalled scenarios. A three-way ANOVA for type of relationship, attachment style, and scenario category (congruent, incongruent) was conducted on the number of recalled scenarios. The last factor was a within-subject measure. These recall scores were approximately normally distributed. Table 2 presents relevant means and standard deviations. The ANOVA yielded a significant main effect for scenario category, $F(1, 69) = 152.69$, $p < .01$, with participants recalling more congruent scenarios ($M = 3.61$) than incongruent scenarios ($M = 2.26$). In addition, the two-way interaction for Type of Relationship × Scenario Category was significant, $F(2, 69) = 9.36$, $p < .01$. Planned contrasts comparing secure versus insecure relationships indicated that people recalled more expectation-incongruent scenarios in the secure relationship ($M = 2.92$) than in both the avoidant ($M = 2.00$) and anxious–ambivalent relationships ($M = 1.88$), $F(1, 69) = 17.13$, $p < .01$. No significant difference ($F < 1$) was found in the recall of expectation-congruent scenarios ($M = 3.60$ for secure relationship, $M = 3.68$ for avoidant relationship, and $M = 3.56$ for ambivalent relationship). Importantly, this effect was significant even after intolerance of ambiguity, relationship satisfaction, and baseline partner's description were statistically controlled for as covariates.

Changes in partner's perceptions. For each participant, we computed an absolute discrepancy score between his or her baseline description and his or her description of the partner in each recalled scenario. Then these discrepancies scores were averaged for each scenario category (congruent, incongruent), and a three-way ANOVA for type of relationship, attachment style, and scenario category was conducted on these scores. The ANOVA yielded a significant main effect for scenario category, $F(1, 69) = 41.45$, $p < .01$, with incongruent scenarios leading to more changes in partner's perception ($M = 1.86$) than congruent scenarios ($M = 0.98$). The interactions for Type of Relationship × Scenario Category, $F(2, 69) = 4.18$, $p < .05$, and for Attachment Style × Scenario Category were also significant, $F(2, 69) = 13.74$, $p < .01$.

Planned contrasts revealed no significant effects of type of relationship or attachment style in congruent scenarios ($F < 1$). However, more changes in partner's perceptions were recorded following incongruent behaviors of the partner in the secure relationship ($M = 2.39$) than in avoidant ($M = 1.67$) and anxious–ambivalent ($M = 1.49$) relationships, $F(1, 69) = 8.90$, $p < .01$. Moreover, in line with Study 1's findings, secure people showed higher changes in partner's perception following incongruent behaviors of a partner ($M = 2.17$) than insecure people ($M = 1.40$), $F(1, 69) = 9.19$, $p < .01$. Again, these effects of type of relationship and attachment style were significant after intolerance of ambiguity, relationship satisfaction, and baseline partner's description were statistically controlled for as covariates.

The valence of partner's behavior. Three undergraduate psychology students, different from those of Study 1, rated the valence

of partner's behaviors we constructed for Session 2 in the same way as described in Study 1. Interjudge correlations were high (ranging from .65 to .69), implying acceptable reliability and allowing computation of the valence scores described in Study 1. A three-way ANOVA for type of relationship, attachment style, and scenario category performed on the valence ratings yielded no significant effects, reflecting a successful control of attachment-related biases in the valence of partner's behaviors. Moreover, ANOVAs with valence ratings as covariates yielded similar significant interactions for Type of Relationship × Scenario Category to those found in the original ANOVAs, $F(2, 67) = 8.34, p < .01$, for discrepancy scores, and $F(2, 67) = 4.07, p < .05$, for recall scores. That is, the valence of partner's behavior cannot account for the effects of type of relationship on cognitive reactions to incongruent information.

The incongruent scenarios were then divided into two groups (positive, negative) according to the median of the valence ratings (3.38), and three-way ANOVAs for Type of Relationship × Attachment Style × Valence of Incongruent Scenario were conducted.[8] One ANOVA was performed on the percentage of recalled scenarios within each valence category. This ANOVA yielded a significant two-way interaction for Type of Relationship × Valence of Incongruent Scenario, $F(2, 52) = 5.58, p < .01$. The main and interactive effects for attachment style were not significant. Planned contrasts showed that people recalled more positive incongruent scenarios in the secure relationship ($M = 90.47$) than in the avoidant ($M = 55.26$) and anxious–ambivalent relationships ($M = 52.77$), $F(1, 55) = 32.84, p < .01$. No significant difference ($F < 1$) was found in the recall of negative incongruent scenarios ($M = 69.84$ for secure relationship, $M = 61.40$ for avoidant relationship, and $M = 62.03$ for ambivalent relationship). In fact, people reporting on a secure relationship were more likely to recall positive than negative incongruent scenarios.

The three-way ANOVA for actual discrepancy scores also yielded a significant interaction between type of relationship and scenario valence, $F(2, 52) = 7.21, p < .01$. Planned contrasts showed the following differences: In positive incongruent scenarios, more positive changes in partner's perceptions were recorded in the secure relationship ($M = 1.66$) than in avoidant ($M = 1.12$) and anxious–ambivalent ($M = 0.92$) relationships, $F(1, 55) = 5.75, p < .01$. In negative incongruent scenarios, more negative changes in partner's perceptions were recorded in the secure relationship ($M = -2.50$) than in avoidant ($M = -2.01$) and anxious–ambivalent ($M = -1.38$) relationships, $F(1, 55) = 3.87, p < .05$.

The ANOVA also yielded a significant interaction between attachment style and scenario valence, $F(2, 52) = 8.60, p < .01$. In positive incongruent scenarios, more positive changes in partner's perceptions were recorded among secure persons ($M = 1.36$) than among insecure persons ($M = 1.09$). In negative incongruent scenarios, more negative changes in partner's perceptions were recorded among secure persons ($M = -2.48$) than among insecure persons ($M = -1.36$). As in Study 1, the findings imply that the association between secure attachment and cognitive openness, as measured by changes in partner's perception but not in recall, is independent of the valence of partner's behavior.

Conclusions. Our findings suggest that relationship-specific working models have an impact on the openness of relational knowledge to expectation-incongruent information. They also indicate that these effects were independent of a person's typical attachment style and were not explained by relationship satisfaction. Both secure and insecure persons who reported on a secure relationship were more likely to revise the knowledge they held about the partner in such a relationship than their counterparts who reported on insecure relationships. As in Study 1, the valence of the incongruent information played an important role in the recall of this information.

The findings also indicate that a person's attachment style had a significant effect on the revision of partner's perception, but not on the recall of expectation-incongruent information. Moreover, the significant effect was independent of a person's intolerance of ambiguity, relationship satisfaction, and relationship-specific working models. We address this effect in the General Discussion section.

Before ending this discussion, it should be noted that the recall tasks in Studies 1 and 2 were different. Whereas in Study 1 there is some equivalence of the material being recalled across participants, in Study 2 the task assessed recall of actual events. In this case, there is no way to know whether the observed differences across relationship types were due to actual differences in experiences within those relationships or memory biases. However, the fact that similar results were found in the two studies may warrant increased confidence in the validity of the findings.

A note of caution is also required because of the novelty of our manipulation of the contextual accessibility of working models. It was necessary to attempt to replicate our findings while manipulating other factors that can influence the accessibility of these models. Moreover, it should be recognized that we had no control over the specific real-life relationships a person recalled, and most of the participants focused on past relationships, which could be affected by memory biases. These limitations could be overcome by replicating the design of Study 1 (thinking about a current relationship) and adding a contextual priming of working models, which would be unrelated to the relationship in question. These were the methodological steps taken in Study 3.

Study 3

Previous studies have shown that it is possible to prime (make temporarily accessible) relational schemas by asking participants to visualize particular situations (Baldwin, 1994; Baldwin & Holmes, 1987; Baldwin et al., 1996). In Study 3, the main question is whether such an experimental priming of the secure working model would have an impact on cognitive openness, leading people to respond in a way that fits the reactions of securely attached persons.

The study consisted of two sessions, similar to those of Study 1. The single methodological difference between Study 3 and Study 1 consisted in the priming of the secure working model. Before assessing cognitive openness in Session 2, participants performed a guided imagination task and were randomly divided into two

[8] Fifteen participants were dropped from the analyses (4 in the secure condition, 6 in the avoidant condition, and 5 in the anxious–ambivalent condition) because they failed to retrieve either a positive or a negative expectation-incongruent episode.

groups. In the experimental condition, the secure working model was primed by standard instructions that guided a person's imagination to an episode of attachment security (receiving support from sensitive and responsive persons in times of need). In the control condition, participants received instructions focusing imagination on attachment-irrelevant issues. In order to avoid a possible confounding effect between priming of the secure working model and positive mood, participants also reported on their current mood after the imagination exercise.

Method

Participants. Fifty students from Bar-Ilan University (31 women and 19 men), ranging in age from 19 to 28 years (*Mdn* = 23), participated in the study without any reward. All had cohabited with a partner for at least 1 year (57% were married). Participants were randomly assigned to two conditions (25 participants per group).

Materials and procedure. Session 1 was similar to that described in Study 1. Participants were approached during regular class time, completed the Adult Attachment Style scale (see Study 1), and were asked to think about their current romantic relationship and to rate the extent to which eight traits were descriptive of their partner (see the description of traits and scaling in Study 1). Then a baseline partner's description score was computed by averaging the eight traits (α = .76). Participants also wrote their expectations about the behaviors of their current partner in each of the 10 dyadic episodes described in Study 1.

Participants rated the importance they attached to their current relationship (on a 6-point scale) and the satisfaction they currently felt with it (on a 6-point scale). They also read Hazan and Shaver's (1987) attachment descriptions and were asked to choose the description that best described their current relationship—that is, to indicate whether they defined this relationship as secure, avoidant, or anxious–ambivalent.

The second session was conducted 2 weeks later. This session consisted of two parts. In the first part, participants were told that they would perform a guided imagination exercise, were given written and tape-recorded instructions that guided them through the imagination task, and were randomly assigned to two conditions.

In the security-priming condition, participants were instructed as follows: "Imagine a situation in which you deal with a life problem that you cannot solve on your own. Close your eyes, try to visualize such a situation, and write a brief description of what you are seeing on the blank sheet you have in front of you." On writing such a description, participants were given the following instruction: "Now, imagine that there are other persons in your surroundings who are sensitive and responsive to your distress, want to help you only because they love you, and they leave other activities to assist and support you. Close your eyes, try to picture the faces of these persons and imagine being with them." Then participants wrote the thoughts the exercise elicited in order to give a plausible justification for the task (Baldwin et al., 1996).

In the control condition, participants were instructed to "think about a movie you saw in the last month and imagine being one of its protagonists." Then participants freely wrote a brief description of the movie and the thoughts and feelings that the instructions elicited.

On completing the above task, all participants rated their current mood on a 7-point scale, ranging from *very negative* (1) to *very positive* (7). The procedure was then similar to that described in Study 1. Participants were asked to think about their current romantic partner and to read six idiographically constructed, hypothetical scenarios related to the dyadic episodes presented in the first session. The way the scenarios were constructed was identical to that described in Study 1. In three of these scenarios, the partner's responses were congruent with those expected by the participant (expectation-congruent). In the other three scenarios, partner's responses were incongruent with participant's expectations (expectation-incongruent). After reading each scenario, participants were asked what they would think of their partner if he or she were to engage in such a behavior and then rated the partner on the same eight traits presented in the first session. The order of the scenarios was randomized across participants. Then, after a brief interval of 10–15 min in which they filled out a battery of attitude scales, participants were asked to recall partner's behaviors in each of the six scenarios and to freely write about these behaviors. Only 2 participants recognized that the two sessions were connected, and their exclusion from the sample did not affect the results of the analyses.

Results and Discussion

In examining the data, we took into account individual differences in attachment style and in the attachment orientation of the current romantic relationship. Due to the small number of anxious–ambivalent participants (n = 5) and anxious–ambivalent relationships (n = 3), we collapsed the avoidant and anxious–ambivalent patterns into a single insecure pattern. Chi-square tests revealed no significant differences in the distribution of attachment styles as well as in the distribution of type of relationships across experimental conditions. These tests also revealed a significant association between attachment style and attachment orientation of current relationship, $\chi^2(1, N = 50) = 19.39$, $p < .01$. Seventy-two percent of secure people defined the relationship as secure, and 90% of insecure people defined it as insecure.

Preliminary analyses. Preliminary one-way ANOVAs revealed no significant difference between experimental conditions in the reported importance and satisfaction with the current relationship as well as in the baseline partner's perception. Additional ANOVAs revealed that the reported importance of the current relationship was not significantly related to attachment style as well as to the attachment orientation of the current relationship. However, relationship satisfaction was significantly related to attachment style, $F(1, 48) = 9.23$, $p < .01$, and attachment orientation of the relationship, $F(1, 48) = 9.84$, $p < .01$. Replicating previous findings, (a) secure people were more satisfied with their relationship (M = 4.27) than were insecure people (M = 3.38), and (b) secure relationships were scored as more satisfactory (M = 4.39) than insecure relationships (M = 3.48). A significant association was also found between attachment orientation of current relationship and the baseline perception of the partner, $F(1, 48) = 5.90$, $p < .01$. Partners in secure relationships were perceived more positively (M = 6.62) than those in insecure relationships (M = 6.01).

Ratings of current mood were significantly related to the priming of secure attachment, $F(1, 48) = 5.16$, $p < .05$. A security-priming induction led to more positive mood (M = 4.92) than the control condition (M = 4.16). Additional ANOVAs revealed no significant effects of attachment style and attachment orientation of the current relationship on mood ratings.

Changes in partner's perceptions. For each participant, we computed absolute discrepancy scores between the baseline partner's description and the description of the partner in each scenario. Then these scores were averaged across scenario categories, and a two-way ANOVA for condition (security-priming, control) and scenario category was conducted, with the latter factor as a within-subject measure.

The ANOVA yielded a significant main effect for scenario category, $F(1, 48) = 26.19$, $p < .01$, with incongruent scenarios leading to greater changes in partner's description (M = 2.17) than

Table 3
Means and Standard Deviations of Dependent Variables According to Experimental Condition and Scenario Category (Study 3)

Variable	Security priming		Control	
	Expectation-congruent	Expectation-incongruent	Expectation-congruent	Expectation-incongruent
Change in partner's perception				
M	1.11_a	2.58_b	1.16_a	1.75_a
SD	0.49	1.27	0.71	1.51
Number of recalled scenarios				
M	2.72_a	2.48_a	2.68_a	1.96_b
SD	0.46	0.59	0.48	0.84

Note. Means in the same row that do not share subscripts differ at $p < .05$ in simple main effect tests. Change-in-partner's-perception scores reflect the discrepancy between Session 1 and Session 2 descriptions, with higher scores indicating greater discrepancy. Number-of-recalled-scenarios scores could range from 0 to 3.

congruent scenarios ($M = 1.13$). The interaction for Condition × Scenario Category was also significant, $F(1, 48) = 4.77$, $p < .05$. Simple main effects tests revealed no significant difference between conditions in congruent scenarios ($F < 1$). However, the security-priming induction led to more changes in partner's description following incongruent information than the control condition, $F(1, 48) = 4.40$, $p < .05$ (see Table 3). This interaction remained unchanged after statistically controlling for attachment orientation of the current relationship, relationship satisfaction, relationship importance, baseline partner's description, and mood ratings.

The inclusion of attachment style in a three-way ANOVA did not change the significant condition effect. Moreover, no significant interaction was found between attachment style and condition. The only additional significant effect was the interaction for Attachment Style × Scenario Category, $F(1, 48) = 6.77$, $p < .05$. Simple main effects tests revealed more changes in partner's perceptions following incongruent information among secure than insecure people (*M*s = 2.60 and 1.67).

Recall of partner's behaviors. The ANOVA for condition and scenario category performed on the number of correctly recalled scenarios yielded a significant main effect for scenario category, $F(1, 48) = 14.71$, $p < .01$, indicating better recall of congruent scenarios ($M = 2.70$) over incongruent scenarios ($M = 2.22$). In addition, the interaction approximated statistical significance, $F(1, 48) = 3.68$, $p = .06$. Tests for simple main effects revealed no significant difference between conditions when partner's behaviors were expectation-congruent ($F < 1$). However, when these behaviors were expectation-incongruent, participants in the security-priming condition showed better recall than participants in the control condition, $F(1, 48) = 6.44$, $p < .05$ (see Table 3). The inclusion of attachment style in a three-way ANOVA did not change the above effects and yielded no other significant effects. Again, the effects of condition remained unchanged after attachment orientation of the relationship, relationship satisfaction, relationship importance, baseline partner's description, and mood ratings were controlled for as covariates.[9]

The valence of partner's behavior. Three undergraduate psychology students, different from those of Studies 1–2, rated the valence of partner's behaviors we constructed for Session 2 in the same way as described in Study 1. Interjudge correlations were high (ranging from .63 to .69), allowing computation of the valence scores described in Study 1. A three-way ANOVA for condition, attachment style, and scenario category performed on valence ratings yielded no significant effects, reflecting a successful control of attachment-related biases in the valence of partner's behaviors. Moreover, ANOVAs with valence scores as covariates yielded similar Condition × Scenario Category interactions to those found in the original ANOVAs, $F(1, 46) = 4.35$, $p < .05$, for discrepancy, and $F(1, 46) = 3.72$, $p = .06$, for recall. That is, the valence of partner's behavior did not account for the cognitive effects of security priming.

The incongruent scenarios were then divided into two groups (positive, negative) according to the median of the valence ratings (3.32), and ANOVAs for Condition × Valence of Incongruent Scenario were conducted on actual discrepancy scores.[10] This analysis indicated that the interaction approximated statistical significance, $F(1, 39) = 3.29$, $p = .07$. An examination of the means revealed that within positive incongruent scenarios, more positive changes in partner's perceptions were recorded in the security-priming condition ($M = 1.59$) than in the control condition ($M = 1.02$). Accordingly, within negative incongruent scenarios, more negative changes in partner's perceptions were recorded after security priming ($M = -2.08$) than in the control condition ($M = -1.57$). Again, the effect of secure attachment on cognitive openness seems to be independent of the valence of the incongruent information.

The ANOVA performed on recall scores also yielded a significant interaction, $F(1, 39) = 3.90$, $p < .05$. Simple main effects tests indicated that secure attachment was related to selective recall of positive incongruent information. People recalled more positive incongruent scenarios after security priming ($M = 90.34$) than in

[9] Two-way ANOVAs for mood rating (below or above the median) and scenario category on discrepancy and recall scores yielded no main effect for mood and no significant interaction.

[10] Six participants (3 in each condition) were dropped from the analyses because the two incongruent scenarios they received were below the median of valence ratings. The introduction of attachment style in a three-way ANOVA did not change the reported effects and yielded no other significant effect on actual discrepancy and recall scores.

the control condition ($M = 67.30$), $F(1, 39) = 4.18$, $p < .05$. No significant difference was found in the recall of negative incongruent scenarios ($M = 60.12$ for security-priming and $M = 76.92$ for the control condition).

Conclusions. The findings suggested that priming a secure working model led people to react as secure persons: They become more open to incongruent information and were more likely to recall this information. Again, differences in recall were limited to information that had a positive value for the relationship. The effects were independent of attachment style, and they could not be explained by the positive mood that the priming of a secure working model elicited.

General Discussion

The current series of studies provides support for the hypothesized link between attachment security and cognitive openness. First, our findings conceptually replicated Mikulincer's (1997) findings and extended them to the realm of close relationships. Second, the findings showed that attachment working models appear to bias the way people cognitively process new information about their relationship partner. Third, they suggested that cognitive openness depends on chronic and temporary variations in the accessibility of attachment working models.

Findings of the three reported studies showed that secure persons were more likely than insecure persons to change their perceptions of a partner following expectation-incongruent behaviors of this partner. Study 2 showed that the revision of partner's perception following expectation-incongruent evidence was larger in close relationships defined by secure attachment feelings than in close relationships defined by avoidant or anxious–ambivalent feelings. Study 3 found that making a person's secure working model temporarily accessible increased his or her proneness to revise his or her perception of the partner following incongruent information. In general, secure attachment seems to be related to the integration of new data within cognitive structures.

The above conclusion is consistent with Mikulincer's (1997) findings. Together, they suggest that secure attachment, which consists of positive expectations about the benevolence of the world as well as about one's skills to deal with threats (Shaver et al., 1996), may lead people to open their schemas to new information and to flexibly revise their beliefs with a sense of mastery and optimism. In the realm of close relationships, this cognitive attitude may underlie the relatively high adjustment and satisfaction of secure persons (Shaver & Hazan, 1993). It may allow these persons to adjust to changes in the relationship and to develop more realistic expectations about partners, which, in turn, may contribute to their well-being and satisfaction.

The findings also indicate that secure attachment is positively related to the recall of expectation-incongruent information about a partner. However, this association seems to depend on the valence of the incongruent information: Secure attachment was selectively related to the recall of positive incongruent information, but not to the recall of incongruent information about a partner that may have negative implications for the relationship. This finding is consistent with previous findings suggesting that secure persons tend to discount partner's relationship-threatening behaviors as a means of protecting their relationship (e.g., Collins, 1996; Mikulincer, 1998). Overall, it seems that secure persons tend to be cognitively open to incongruent information about a partner and to immediately revise their existing beliefs regardless of the valence of partner's behaviors. However, whereas positive incongruent information, which could reinforce their positive model of others, may be adequately processed and retained in the memory network, negative information, which contradicts their global model of others, may be shallowly processed and easily forgotten.

Along the lines of the above reasoning, secure persons seem to react to incongruent behaviors of a partner in a flexible and adaptive way. On the one hand, they do not deny incongruent information and are prone to revise existing knowledge. On the other hand, they may tend to forget some of these revisions and to maintain a positive model of the partner until incongruent evidence may be accumulated over time and across situations. Further studies using prospective designs are needed in order to understand how secure people cognitively react to recurrent partner's transgressions and how beliefs about a partner are changed over time.

The above findings may imply that an internalized secure base facilitates the development of flexible and coherent cognitive structures, in which different and even antagonistic pieces of positive and negative information can coexist. In this way, a secure base may allow people to compare contradictory pieces of information, appraise their interactions, confront trade-offs, and cope with the changing flux of social reality. Moreover, it may allow people to tolerate ambiguities and contradictions, to successfully cope with conflictual and ambivalent situations, and to recognize that social reality and close relationships are complex phenomena. This conclusion is in line with Main et al.'s (1985) findings about the ability of secure persons to combine both positive and negative feelings toward significant others in a coherent cognitive representation.

The above line of reasoning does not mean, however, that secure persons fail to organize positive and negative pieces of information into separate categories. That is, our reasoning does not imply that these persons show low levels of what Showers (1992) labeled *compartmentalization.* In fact, secure people were found to hold differentiated self-schemas and to sort positive and negative self-aspects into highly differentiated categories (Mikulincer, 1995).

Another important finding was that the association between secure attachment and cognitive openness was not restricted to a person's attachment style. Rather, relationship-specific and experimentally induced secure orientations had similar associations with cognitive openness. Notably, these relationships were found to be independent of the association between attachment style and cognitive openness.

At a theoretical level, the findings urge the consideration of both chronic and temporary variations in the accessibility of attachment working models. One should recognize that these mental models are not only stable personality dispositions that define a person's orientation in all of his or her relationships. Rather, they may vary across relationships and even within a single relationship. More important, these intraindividual variations may have an impact on a person's cognitive responses. That is, attachment working models may be viewed as a hierarchical network of cognitive representations, which include episodic, relationship-specific, and generalized representations of the self and others as well as relational goals and strategies that guide a person's behaviors at a given moment (Collins & Read, 1994).

The above reasoning is in line with Baldwin et al.'s (1996) suggestions about the structure of attachment working models. In their terms, working models include both *exemplar* and *abstract-generalized* representations that coexist in a hierarchical associative network. At the most basic level, people may have episodic memories of particular interactions with significant others (Baldwin et al., 1996). Each of these memories may be coupled with declarative knowledge about the availability, sensitivity, and responsivity of a significant other as well as about one's own affective, cognitive, and behavioral responses to this person. On this basis, these memories may be organized along dimensions of security–anxiety and approach–avoidance and may become exemplars of secure, avoidant, or anxious–ambivalent episodes within a particular interpersonal relationship.

From a cognitive perspective, the above memories may form excitatory and inhibitory associations with one another (Anderson, 1990). The activation of one memory would then activate other congruent memories and inhibit competing memories. That is, thinking about an episode in which one felt securely attached may increase the accessibility of memories of other episodes of attachment security and make memories of episodes in which one felt insecurely attached less accessible.

With the passage of time and the repeated retrieval of related memories, the above associative links are strengthened and may lead to the formation of more abstract and generalized representations of attachment orientations in a relationship (Baldwin et al., 1996). In this way, secure, avoidant, and anxious–ambivalent schemas of a particular relationship (relationship-specific schemas) may be created, and they may have excitatory and inhibitory links with schemas representing other close relationships. With the consolidation of these associative links, more generic schemas may be formed, representing secure, avoidant, and anxious–ambivalent orientations across relationships. The end product of such a cognitive process would be the formation of a hierarchical associative network, in which episodic memories become exemplars of relationship-specific schemas, which, in turn, become exemplars of generic relational schemas. This hierarchical network is in line with Bowlby's (1973) concept of working models as internalized and generalized representations of real experiences.

Within a particular relationship and across different relationships, people may have exemplar memories of secure, avoidant, and anxious–ambivalent episodes and they may then develop relationship-specific and generic schemas representing each attachment orientation. These schemas would allow a person to think about relationships sometimes in secure terms and sometimes in more avoidant or anxious–ambivalent terms. However, as Bowlby (1973) suggested, one of these schemas may represent the most frequently experienced or most accessible attachment orientation. That is, although people may have multiple schemas of a relationship, one of them may reflect their most typical attachment feelings in this relationship. The same process may occur at the more generic level, in which people may hold a global schema representing their most typical attachment orientation across relationships (attachment style). Then, a person's attachment style could coexist in the hierarchical network with other less typical generic schemas as well as with congruent and incongruent relationship-specific schemas and exemplar memories.

The above view of attachment working models fits with the assessment of attachment styles as continuous dimensions. This assessment assumes that the various working models coexist within a person's cognitive system and that individual differences are a matter of the relative predominance of each attachment orientation. Moreover, this assessment can be conducted at generic, relationship-specific, and exemplar levels. In fact, one implication of the conceptualization of attachment working models as schematic representations is that these models may differ in their level of chronic and temporary accessibility and that these differences may be manifested in the continuous scores a person receives in self-report attachment scales.

In our terms, the activation of the above described hierarchical network and the psychological outcomes of this activation may be a complex product of both chronic and temporary accessibility effects. The chronic accessibility of attachment working models may be manifested in the observed effects of a person's attachment style. Being the most typical generic schema, a person's attachment style may be chronically accessible and may be easily activated in attachment-relevant settings (Baldwin et al., 1996). This activation could make congruent relationship-specific schemas and congruent exemplar memories more accessible. It would also inhibit less typical generic schemas and incongruent relationship-specific schemas and exemplar memories. In this way, a person's entire network would be dominated by semantic and episodic memories that are congruent with his or her typical attachment style. Moreover, a person's cognitions, emotions, and behaviors would be biased in accordance with the mental representations, goals, and rules that characterize his or her attachment style. The psychological effects of this chronic accessibility of attachment working models have been extensively documented (Shaver & Hazan, 1993).

The temporary accessibility of attachment working models has been less investigated, and it may be manifested in the findings of Studies 2–3. Consider, for example, the activation of a particular episodic memory (e.g., asking a person to think about a relational episode in which he or she felt securely attached). This activation would remind the person of similar congruent exemplar memories, inhibit other incongruent memories, bring to mind relationship-specific and generic schemas that are congruent with the activated exemplar memory, and inhibit incongruent relationship-specific and generic schemas. In this way, the activation of a particular memory may spread over the entire hierarchical network, which may become temporarily dominated by congruent relationship-specific and generic schemas. As a result, a person's responses would be temporarily biased in accordance with the activated attachment schemas.

Notably, our findings may suggest that chronic and temporary accessibility of attachment working models can coexist in explaining cognitive openness. First, cognitive openness was related to the chronic accessibility of these models as manifested in the association between a person's secure attachment style and his or her reactions to incongruent evidence. Second, cognitive openness was also related to the temporary accessibility of working models as manifested in the relatively high openness associated with making accessible less generic representations of secure attachment, either relationship-specific or episodic. Third, making accessible an exemplar memory or a relationship-specific schema had the effect of momentarily biasing a person's responses even when it did not fit his or her typical attachment style.

With regard to the recall of expectation-incongruent information, the findings of Studies 2–3 showed that it was mainly related to the activation of a relationship-specific schema or an episodic memory. In fact, temporary accessibility effects were more predominant than chronic accessibility effects in explaining the recall of expectation-incongruent information. Unfortunately, no solid explanation can be offered for this finding. Moreover, one should recall that the observed finding may also depend on the relative strength of the contextual prime and the strength of the chronically accessible schema. This finding should be seen as an initial step in delineating the ways in which chronic and temporary accessibility effects underlie the cognitive action of working models. More research should be conducted before conclusions are drawn concerning the cognitive dynamics of working models.

Before ending this discussion, we should note that the findings allow us to remove alternative explanations. First, Study 2 showed that the association between attachment style and cognitive openness was not a by-product of intolerance of ambiguity. Second, Studies 2–3 showed that the association of working models and cognitive openness within a particular relationship was not a mere reflection of the satisfaction a person felt in this relationship. Third, Study 3 showed that the effects of a momentary activation of the secure working model could not be explained by mood variations. However, one should take into account that satisfaction and mood were each assessed by one single-item measure of unknown reliability and validity. In addition, there are findings showing that the induction of positive mood increases cognitive flexibility (Isen, Daubman, & Nowicki, 1987). Further studies that attempt to induce positive mood rather than simply assessing it and that examine attachment-style differences in reactions to this induction are needed.

Although the current study provides an original and systematic illustration of the cognitive substrata of attachment working models, some methodological limitations should be noted. First of all, one should take into account that the information provided in Studies 1 and 3 was hypothetical in nature. Furthermore, the data collected in Study 2 were retrospective and depended on participants' recollections and memory biases. In fact, differences may be found between the manner in which a person reacts to actual incongruent behaviors of a partner and how he or she anticipates that, hypothetically, he or she might react to such an incongruent behavior if it were to occur. Further studies are needed to replicate the current findings while assessing the way people cognitively react to ongoing relational events.

The hypothetical nature of the study may also raise the possibility of potential alternative explanations. For example, hypothetical dyadic events may produce less emotional involvement than actual dyadic events and may be perceived as less relevant for relationship quality. If this is the case, one can suggest that this lack of involvement might have increased secure person's cognitive openness to incongruent evidence. In fact, the encounter with real and important events may increase secure persons' involvement, which, in turn, may weaken their cognitive openness. However, the reduced involvement produced by hypothetical events might have also increased insecure persons' cognitive openness. Therefore, this alternative interpretation cannot explain the observed attachment-style differences. Rather, the low relevance of hypothetical events might have obscured the attachment-style variations that may occur in cognitive reactions to real-life events. Prior studies have shown that insecure persons react to real-life events with stronger emotional reactions than secure persons (Mikulincer & Florian, 1998), which, in turn, may exacerbate their tendency to reject new evidence.

Another limitation of our studies concerns the use of self-report scales. Further studies are needed to develop observational techniques and to tap other attachment typologies, such as Bartholomew and Horowitz's (1991) dismissing–fearful distinction. Studies are also needed to examine the cognitive effects of attachment working models using nonreactive measures (e.g., reaction times) and paradigms that demand less mental deliberation and awareness (e.g., lexical decision, Stroop test).

Beyond the above limitations, the current series of studies has several methodological and conceptual strengths that should be taken into account when evaluating the findings. First, the studies were conducted in well-controlled and well-designed experimental settings, which increase the internal validity of the findings. We believe that basic theoretical assumptions should first be explored within the psychology laboratory, and then field research should be conducted testing the ecological validity of the experimental findings. Second, a person's perception of his or her partner was assessed in idiographically constructed episodes. This strategy is more valid by far than the nomothetic strategy prior studies have used in assessing attachment-style differences in person perception. In these studies, the same hypothetical events were given to all participants without taking into account their prior expectations (e.g., Collins, 1996). Third, the association between attachment working models and cognitive openness was replicated using categorical and continuous measures of attachment styles as well as different dependent measures (absolute and actual discrepancy in partner's perception, recall of partner's behavior).

Notably, the current research is one of the few adult attachment studies that go beyond individual differences and systematically examine the effects of the temporary cognitive accessibility of attachment working models. In fact, cognitive openness was found to be associated with both individual differences in attachment styles and manipulations of either relationship-specific working models or the momentary salience of secure attachment. On this basis, our findings emphasize the contribution of attachment working models to cognitive functioning and highlight the complex structure of these models.

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