

THE INFLUENCE OF ATTACHMENT REPRESENTATIONS  
ON EMOTION ENCODING AND MEMORY

by

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## Abstract

The influence of adult attachment representations on two aspects of cognitive processing - emotion encoding and memory - was examined. In Study 1, 154 students from introductory psychology courses completed self-report attachment measures and then rated four types of facial expressions (happy, sad, angry, and fearful) for emotion intensity. Contrary to predictions, intensity ratings did not differ as a function of attachment schemas (secure, preoccupied, fearful, and dismissing). In Study 2, 106 students from introductory psychology courses completed self-report attachment measures and then imagined themselves in, and later recalled, hypothetical events. Events varied in attachment-relevancy and tapped five themes: high anxiety, low anxiety, approach, avoidance, and happiness. Only some hypothesized associations between attachment schemas and memory were supported. Consistent with preferential processing of schema-consistent information, security was associated with increased recall, and fearfulness and dismissiveness were associated with decreased recall of attachment-relevant happy events. In addition, dismissiveness was associated with increased recall of attachment-relevant avoidant events. Discussion focusses on the strengths and weaknesses of studying attachment related individual differences in cognitive functioning within a laboratory context.

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## The Influence of Attachment Representations on Emotion Encoding and Memory

Bowlby (1973) conceptualized internal working models of attachment as cognitive representations that allow one to predict and interpret an attachment figure's behaviour, as well as helping one to plan one's own behaviour. He argued that people develop beliefs and expectations about themselves and others on the basis of their childhood experiences with primary caregivers. Bowlby (1973) proposed that after childhood, these working models continue to guide how people operate in their relationships and how they construe their social worlds.

Consistent with these ideas, a growing body of research in adult attachment has revealed differences in how people with different attachment representations feel and behave in their close relationships (Shaver & Hazan, 1993). However, few studies have focussed on attachment associated individual differences in cognitive functioning. Studying differences in cognitive responses among individuals with different attachment schemas seems important given research in social cognition showing the effects of schemas on individuals' processing of information (Fiske & Taylor, 1991). Thus, the primary purpose of this research was to examine the influence of adults' attachment representations on two aspects of cognition: encoding of affective information and memory over a short period of time. Study 1 focussed on how attachment representations influence the encoding of affective information from facial expressions of emotion. Study 2 examined whether individuals are better able to recall hypothetical events which are consistent with their attachment schemas.

### Adult Attachment Theory and Research

Bowlby (1973) identified two key features of attachment representations: (a) whether the self is perceived to be worthy of love and attention, and (b) whether others are viewed as warm and responsive. Hazan and Shaver (1987) were the first to extend Bowlby's attachment theory to the study of adult love relationships.

They developed a categorical self-report measure to differentiate between three adult attachment classifications, paralleling three infant attachment patterns identified by Ainsworth and her colleagues (Ainsworth, Blehar, Waters, & Wall, 1978). Individuals with secure models hold representations characterized by ease of trusting and getting close to others. Ambivalent (or preoccupied) individuals have representations characterized by a desire to merge with a partner, combined with a fear of not being loved. And lastly, avoidant individuals hold representations characterized by discomfort in trusting and becoming too close to others.

Expanding upon the work of Hazan and Shaver (1987), Bartholomew (1990; Bartholomew & Horowitz, 1991) developed and validated a new framework for adult attachment with *four* prototypic attachment patterns. This four-category model is based on the intersection of two underlying dimensions: positivity of self-model (or anxiety about love-worthiness) and positivity of other-model (or intimacy-avoidance). See Figure 1. In addition to secure and preoccupied prototypes, this framework incorporates two patterns of avoidance - fearful and dismissing. Fearful individuals hold representations characterized by a desire for social contact that is inhibited by fears of rejection, whereas dismissing individuals hold representations characterized by a defensive denial of the need or desire for intimate contact.

### Attachment Representations and Emotion

Attachment theory is fundamentally about emotional experiences, and as a result, attachment representations are expected to be heavily affect-laden (Bowlby, 1973; Main, 1991; Main, Kaplan, & Cassidy, 1985). This affect may be automatically triggered whenever attachment schemas are activated (Fiske & Pavelchack, 1986). Evidence for the notion that differences in attachment representations are associated with variations in the regulation of emotions and emotional experience in adults derives from several studies. For example, in a study of young adults, Kobak and Sceery (1988) reported that security was

associated with the ability to constructively modulate negative feelings in problem solving and social contexts. In addition, individuals with secure models were rated by their peers as being less anxious in comparison to individuals with insecure models, and as being less hostile than those with dismissing models. Simpson (1990) found that secure attachment representations were associated with more positive emotions in dating relationships, whereas individuals with anxious and avoidant attachment representations had relationships characterized by more frequent occurrences of negative emotion. In a study where participants recorded their social interactions in a diary over a one week period (Tidwell, Reis, & Shaver, 1996), secure individuals reported more positive emotions across various types of social interactions than did preoccupied or avoidant individuals. In addition, avoidant people reported more negative emotions than did secure and preoccupied people. In another study (Collins, 1996), participants scoring high in anxiety about love-worthiness were more likely to experience distress and nervousness in response to hypothetical relationship events, whereas those individuals who rated themselves as comfortable with closeness and able to depend on others were less likely to respond with strong negative emotions. Recent research has also suggested that individuals with different attachment representations have qualitatively different jealousy experiences (Sharpsteen & Kirkpatrick, 1997; Radecki-Bush, Farrell, & Bush, 1993).

Variations in the regulation and experience of emotion across attachment groups may result, at least in part, because people with different attachment representations create very different types of relationships for themselves. Results consistently show that individuals differing in attachment schemas report different relationship experiences (see Shaver & Hazan, 1993 for a review). For example, secure individuals generally characterize their relationships as satisfying and intimate, whereas avoidant individuals report low levels of satisfaction and intimacy.

Preoccupied individuals tend to report high levels of conflict. These differences in self-reports of relationship quality may be explained by information processing biases which predispose people to see the world in ways which confirm their existing schemas (Swann & Read, 1981). However, partner reports of relationship quality have also confirmed the above findings (Shaver & Hazan, 1993), suggesting that relationship experiences *do* vary as a function of attachment representations.

It has also been suggested that individuals with different attachment representations may vary in their strategies for acknowledging emotional distress (Collins & Read, 1994). Thus, independent of relationship functioning, variations in the regulation and experience of emotion may result because people with different attachment schemas appraise and label their emotional experiences differently. For example, preoccupied individuals may have a tendency to react negatively in, and perhaps misinterpret, many situations because they are likely to focus on the negative aspects of a situation. An interesting empirical question concerns the extent to which one or both of these explanations delineates attachment differences in affective responses. One of the purposes of the present research was to examine the impact of attachment schemas on emotion appraisal.

#### Attachment Representations and Cognitive Processing

In addition to directing emotional responses across situations, Bowlby (1973) and others (e.g., Main, 1991; Main et al., 1985) have suggested that attachment representations function to guide cognitive responses, such as selective attention to particular events. Collins and Read (1994) have recently generated a framework for studying the functions of attachment representations whereby attachment schemas are predicted to have a direct impact on both the cognitive processing of social information and on emotion appraisal. Collins and Read (1994) suggest that the impact of attachment representations on behaviour across various situations is largely mediated by individuals' cognitive interpretations of situations. In support of

the idea that attachment schemas influence inference and explanation processes, Collins (1996) found that preoccupied and avoidant individuals were more likely than secure individuals to attribute partner behaviours, as described in hypothetical events, to something about themselves and their relationship. Preoccupied and avoidant individuals were also more likely than secure individuals to view the partner as having behaved intentionally and as having been negatively motivated.

In addition to influencing inference processes, it has been suggested that attachment representations may play a role in the storage and retrieval of memories for new information, as well as previous relationship experiences (Collins & Read, 1994). One of the most robust findings in research on social cognition is that existing knowledge structures shape what gets stored in memory, and what is later recalled or reconstructed (Fiske & Taylor, 1991). Research suggests that strong, well-established schemas bias memory towards schema-relevant or schema-consistent information (Higgins & Bargh, 1987). People not only preferentially notice information for which they have relevant schemas, they also show greater ability to recall this information at a later time. For example, Markus (1977) found that individuals with self-schemas for dependency generated more memories for specific events in which they acted in a dependent manner than individuals with self-schemas for independence.

From an attachment perspective, these findings imply that individuals with different attachment representations may remember different kinds of information, or may vary in the ease with which they access certain information. For example, individuals with insecure representations who have negative self-esteem and who expect to be rejected by others may be particularly attuned to any interactions that could be construed as rejecting, or indicating that they are unworthy of others' love. In contrast, individuals with secure representations who have a positive self-regard may focus on interactions that could be construed as confirming this perception.

Thus, one might expect individuals with fearful and preoccupied schemas to recall more instances of rejection or to access any such instances stored in memory faster than those with secure or dismissing schemas since such events are consistent with or confirm their working models of self as unworthy of others' love.

To date, little research has examined the role attachment representations play in individuals' recall of events. However, two recent studies assess the preferential processing of *new* schema-consistent information within the attachment domain. Using a sample of 3-year-olds, Belsky, Spritz, & Crnic (1996) found that children with secure attachment histories recalled positive social events depicted in puppet shows more accurately than negative social events. In contrast, children with insecure attachment histories recalled negative social events more accurately than positive social events. Mikulincer (1995) had high school students rate whether a number of positive and negative adjectives were self-descriptive. Participants were then unexpectedly asked to recall as many adjectives as possible. He found that preoccupied individuals recalled more self-referent negative adjectives than secure or avoidant people.

Another recent study conducted by Mikulincer and Orbach (1995) demonstrates that individuals with different attachment representations vary in the speed with which they recall certain types of early childhood experiences. Participants completed Hazan and Shaver's (1987) Attachment Scale and then were asked to recall early personal experiences associated with anger, anxiety, sadness, and happiness. Although the three attachment groups did not differ in the number of seconds it took them to retrieve angry and happy experiences, avoidant people took longer to retrieve anxious and sad experiences than did preoccupied people. Secure individuals fell in between these two groups.

Mikulincer and Orbach (1995) explain these differences in accessibility to memories in terms of how individuals differing in attachment representations defend

themselves against negative affect. Specifically, they suggest that individuals with different attachment representations display different patterns of *repressive defensiveness*, an individual difference construct. This construct is defined by two dimensions: (a) the tendency to avoid awareness of negative affects and impulses (defensiveness), and (b) the level of manifested anxiety (Weinberger, 1990; Weinberger, Schwartz, & Davidson, 1979). Mikulincer and Orbach (1995) found that avoidant people showed the highest levels of defensiveness and moderate levels of anxiety. In contrast, preoccupied people showed the lowest levels of defensiveness and highest levels of anxiety. Secure individuals showed moderate levels of defensiveness and the lowest levels of anxiety. Thus, Mikulincer and Orbach (1995) argue that avoidant individuals have difficulty accessing negative memories because they employ a defensive strategy. On the other hand, preoccupied individuals show very high accessibility to negative memories because they have difficulty in regulating inner distress (i.e., they are unable or unwilling to repress negative affect). Their tendency to ruminate on negative experiences keeps their memories "close to the surface." Like preoccupied individuals, securely attached individuals are also able to access negative memories but they do so without being overwhelmed by the negative affect associated with these memories.

Repressive defensiveness offers one explanation for differences in memory accessibility across various attachment dimensions. However, another possible explanation for these attachment differences in memory accessibility may lie in the degree to which these types of memories confirm or are consistent with individuals' attachment representations. For example, preoccupied individuals' attachment representations revolve around the premise that they are unworthy of other people's love, engendering feelings of anxiety and sadness. In contrast, dismissing avoidants' attachment representations do not contain such feelings because they do not worry about how they measure up in the eyes of others. Thus, preoccupied



individuals may find it easier to access memories of sadness and anxiety than dismissing avoidants because such memories are relevant to, or consistent with, their attachment schemas.

In addition to assessing the accessibility of their participants' memories, Mikulincer and Orbach (1995) asked participants to rate the intensity of dominant and non-dominant emotions for each experience recalled. Their interest in differentiating between dominant and non-dominant emotions is based on previous work examining the effects of repressive coping style on recall (Davis, 1987; Davis & Schwartz, 1987; R. D. Hansen & Hansen, 1988).

Consistent with the theoretical assertion that repression operates to keep painful, unpleasant experiences out of conscious awareness, researchers have found that repressors (operationally defined by a pattern of low anxiety and high defensiveness) take longer to retrieve and recall fewer negative emotional experiences than non-repressors (Davis, 1987; Davis & Schwartz, 1987). Davis and Schwartz (1987) postulated that repressors' decreased ability to access negative affective experiences may be related to the intensity with which these experiences were originally encoded or to the emotional intensity of the memories at time of retrieval. However, when participants rated recalled experiences for emotion intensity (e.g., rated how sad they were when the sad experience took place and how sad they were when they thought about the event right now), repressors did not differ from non-repressors.

Based on findings that memories for events may evoke complex patterns of *several* emotions (e.g., Schwartz & Weinberger, 1980), R. D. Hansen and Hansen (1988) refined the intensity hypothesis to propose that repressors may differ from non-repressors in the *pattern* of emotion intensity. They argued that a limiting feature of the Davis and Schwartz (1987) paradigm was that participants were only asked to rate the intensity of a single, dominant emotion for each affective

experience recalled (e.g., anger for an angry memory, fear for a fearful memory). However, because repressors may engage in less elaborate processing of emotional experiences (Davis, 1987), R. D. Hansen and Hansen (1988) suggested that repressors may differ from non-repressors in the blends of non-dominant emotions associated with recalled experiences (e.g., sadness and anger for a fearful memory). To test their hypotheses, R. D. Hansen and Hansen (1988) had participants think of past situations or events in which they felt one of four emotions: angry, sad, fearful, or embarrassed. After recalling an experience, participants then rated ten emotions in terms of how they had felt when this situation occurred. Consistent with their hypotheses and the findings of Davis and Schwartz (1987), R. D. Hansen and Hansen (1988) found no difference between repressors and non-repressors in the intensity of dominant emotions evoked by negative memories (e.g., anger for an angry experience, sadness for a sad experience). However, many non-dominant emotions appeared less intense for repressors than non-repressors (e.g., shame, embarrassment, and anger for a sad experience). C. H. Hansen, Hansen, and Shantz (1992) introduced the term *repressive discreteness* to describe the pattern of repressors' intensity ratings in which only dominant emotions are rated as high in intensity.

In contrast to recent studies in repression, Mikulincer and Orbach (1995) found attachment differences in emotion intensity for both dominant and non-dominant emotions. Specifically, they found that both secure and preoccupied people reported more intense dominant emotions in the sadness, anxiety, and anger episodes than did avoidant people. However, preoccupied individuals experienced more intense non-dominant emotions than secure or avoidant people (e.g., depression, embarrassment, anger, and sadness in the anxiety-arousing episode). This emotional contagion experienced by preoccupied individuals may be explained by their hypervigilance to distressing situations and repetitive rumination on

negative experiences (Kobak & Sceery, 1988; Mikulincer, Florian, & Tolmacz, 1990; Mikulincer, Florian, & Weller, 1993; Shaver & Hazan, 1993).

In sum, findings from Mikulincer and Orbach's study (1995) suggest that attachment differences exist in the recall of emotional memories, and perhaps also in the emotional architecture of these memories. However, as Mikulincer and Orbach (1995) indicate, their study does not supply information about the source of these differences. For example, it could be that people with different attachment schemas differ in the frequency with which they experience negative emotional events. It could also be the case that people with different attachment schemas differ in the way they encode and label their emotional experiences. Lastly, individual differences in attachment may relate to differences in the retrieval of affective experiences.

A similar pattern of arguments can be made to explain differences in the recall of affective experiences of repressors and non-repressors. In an attempt to address one of these interpretations, C. H. Hansen et al. (1992) designed a study to examine the repressive discreteness effect at the time stimuli are appraised and encoded. Specifically, C. H. Hansen et al. (1992) had participants view facial expressions of emotion (happy, sad, angry, and fearful) and rate each face for the degree to which it expressed happiness, sadness, anger and fear. Consistent with their repressive discreteness hypothesis, they found that repressors judged the dominant emotions in these faces (e.g., sadness in a sad face, anger in an angry face) as no less intense than non-repressors. However, repressors rated the blend of non-dominant emotions (e.g. fear in a sad face, anger in a sad face) as less intense than non-repressors. C. H. Hansen et al. (1992) interpreted these findings as evidence for the repressive discreteness effect in appraisal and encoding.

## Study 1

Study 1 was designed to examine whether attachment representations are related to the appraisal and encoding of emotional stimuli. This study was conducted to attempt to explain previous findings of variation in regulation and expression of emotions across attachment groups. As suggested earlier, people with different attachment schemas may manage their emotions differently because they initially appraise and label emotional experiences in different ways. Thus, one purpose of this study was to examine attachment differences in appraisals of facial expressions of emotion. Additionally, this study was designed to shed light on whether the encoding interpretation is plausible to explain previously found attachment differences in recall.

Attachment representations are thought to be highly accessible constructs that will be activated automatically whenever attachment-related issues are raised (e.g., thinking about your degree of comfort when discussing problems with your partner). Once activated, it is expected that attachment representations will have a direct impact on the emotional appraisal of social information (Collins & Read, 1994). Thus, participants first completed a series of questionnaires designed to get them thinking about their interpersonal relations with close others. On these measures, individuals reported on the problems they experienced in their relationships, their dependency on others, and attachment-related ways of thinking and behaving in close personal relationships. One of the self-report measures of attachment was used to categorize individuals into attachment groups. In an adaptation of C. H. Hansen et al.'s (1992) paradigm, participants were then exposed to facial expressions displaying four primary emotions: happiness, sadness, anger, and fear. For each facial expression, they rated the face for the intensity of four emotions: happiness, sadness, anger, and fear.

Given that the facial expressions used in this study have been previously judged as depicting single primary emotions (Ekman & Friesen, 1975), it was expected that intensity ratings would be higher for dominant than non-dominant emotions. However, consistent with Mikulincer and Orbach's (1995) findings, attachment differences in intensity ratings were predicted for both dominant and non-dominant emotions. Specifically, it was expected that individuals with dismissing attachment representations would give lower intensity ratings for dominant emotions (e.g., sadness for a sad facial expression, happiness for a happy facial expression) than those individuals with secure, preoccupied, or fearful representations given that the prototypical dismissing individual is believed to defend against emotional experience (Bartholomew, 1990). Hence, one could argue that dismissing individuals' tendency to guard against emotional experience leads them to process or encode emotional information at a lower level of intensity. For non-dominant emotions (e.g., anger for a sad facial expression, fear for an angry facial expression), it was expected that preoccupied and fearful individuals would score highest on intensity ratings, especially with the facial expressions of negative emotion (i.e., sadness, anger, and fear), because attention to negative emotion is characteristic of their attachment profiles. Specifically, preoccupied and fearful individuals' concerns about love-worthiness and fear of rejection suggest a hypervigilance to negative emotions. Such hypervigilance to emotions may blur distinctions between specific emotions leading to high intensity ratings for both dominant and non-dominant emotions. Individuals with dismissing attachment were expected to give the lowest intensity ratings for non-dominant emotions. This prediction was made given that dismissing individuals are theoretically similar to repressors in their defense against emotional experiences, and on the basis of previous research suggesting that repressors rate non-dominant emotions as less intense than non-repressors. Individuals with secure attachment representations

were expected to give intensity ratings falling somewhere in between the two extremes.

## Method

### Participants

One hundred and fifty-four students from introductory psychology courses (105 women and 49 men) participated in this study in large groups. They ranged in age from 17 to 49 ( $M = 23.1$  years); 37% were White, 50% Asian, 8% East Indian, 3% First Nations, and 2% Black.<sup>1</sup> Fifty-three percent of these students were currently in a romantic relationship ( $M$  relationship length = 29 months).

### Procedure

Participants were asked to participate in a study on personality and the understanding of emotional expression. Participants answered a series of questionnaires. These measures included: (1) a demographics questionnaire, (2) the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964), (3) the Taylor Manifest Anxiety Scale - Revised (TMAS; Suinn, 1968)<sup>2</sup>, (4) the Inventory of Interpersonal Problems (IIP; Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988), (5) the Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977), (6) the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994a), and (7) the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991). This last measure (RQ) was used to categorize participants into attachment groups, as well as to stimulate participants' thinking about attachment relationships. Measures 4, 5,

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<sup>1</sup> Although there is no current evidence for ethnicity differences in adult attachment, research does suggest that Asian women may be especially likely to experience anxiety over certain issues related to intimacy with individuals outside the family group (Lee & Cochran, 1988). Because the sample consisted of a large number of Asian participants, the Non-Asian ethnic categories were combined to create a Non-Asian comparison category and initial analyses were run with ethnicity included as an independent variable.

<sup>2</sup> The Taylor Manifest Anxiety Scale and the Marlowe-Crowne Social Desirability Scale were included in order to allow for comparison of the results in the current sample with repression findings in Mikulincer and Orbach's (1995) study and C. H. Hansen et al.'s (1992) study.

and 6 (IIP, IDI, and RSQ) were employed to stimulate participants' thinking about relationships and how they interact with others. After completing the questionnaires, participants participated in a face appraisal task in which they were asked to view various facial expressions of emotion and to rate the intensity of emotions displayed.

### Measures

Demographics Questionnaire. This measure included several questions about current and past relationship experience (e.g., number of previous romantic relationships, marital status), as well as items assessing gender, age, and ethnicity.

Inventory of Interpersonal Problems (IIP). This measure consists of 127 items designed to assess interpersonal difficulties in many interpersonal domains (Horowitz et al., 1988). Participants rated the amount of distress that they have experienced from each problem on a 5-point scale ranging from "not at all" (0) to "extremely" (4). In this study, the IIP was solely used to stimulate participants' thinking about relationship experiences. Thus, it was not scored.

Interpersonal Dependency Inventory (IDI). This questionnaire contains 47 items (Hirschfeld et al., 1977) assessing three components of interpersonal dependency: emotional reliance on another, lack of social self-confidence, and assertion of autonomy. Respondents rated on a 4-point scale the extent to which they agreed/ disagreed with each item. This measure has been shown to be differentially associated with various patterns of adult attachment (Bartholomew & Bartel, 1995). It was not scored as its sole function was to stimulate thinking about attachment relationships.

Relationship Scales Questionnaire (RSQ). Participants completed a measure of their attachment representations - the Relationship Scales Questionnaire. The RSQ consists of 38 items drawn from the paragraph descriptions in Hazan and Shaver's (1987) attachment measure, Bartholomew and

Horowitz's (1991) Relationship Questionnaire, and Collins and Read's revised Adult Attachment Scale (Collins, 1996). Respondents rated 38 items on a 5-point scale in terms of how well each item fit their general orientation towards close relationships. In this study, the RSQ was not scored but was used only to stimulate thinking about attachment relationships. This decision was made since the purpose of this study was to examine mean differences in intensity ratings for facial expressions of emotion as a function of predominant attachment style, and the RSQ was designed to assess attachment dimensions as opposed to attachment groups (Griffin & Bartholomew, 1994a).

Relationship Questionnaire (RQ). Adapted from Hazan and Shaver's (1987) attachment measure, this questionnaire consists of four short paragraphs describing Bartholomew's four attachment prototypes (Bartholomew & Horowitz, 1991). See Appendix A. Respondents rated on a 7-point scale the degree to which they resembled each of these four prototypes. Participants were categorized into attachment groups based on their highest score on these four ratings. For example, a participant rating the secure paragraph as 3, the preoccupied paragraph as 5, the fearful paragraph as 7, and the dismissing paragraph as 3, would be classified as fearful.

#### Face Appraisal Task

This task was based on a procedure developed by C. H. Hansen et al. (1992). Participants viewed 20 faces - projected photographic slides (Ekman & Friesen, 1975) - for 15 seconds each. Sixteen of the faces depicted one of four primary emotions: happiness, sadness, anger, and fear. Another four depicted "neutral" faces which had previously been judged to depict combinations of emotions (Ekman & Friesen, 1975). Four models displayed each of the four primary and neutral emotions. Thus, participants viewed each primary and a neutral emotion four times. The order of presentation of faces was randomized across



groups of participants. In a 15 second interval after viewing each face, participants rated the facial expression for the extent to which it depicted four emotions: happiness, sadness, anger, and fear. Each of these intensity ratings was made on a 7-point scale, ranging from "not at all" to "extremely."

### Results

Intensity ratings of each emotion for the four types of facial expressions were correlated across the four models. For example, intensity ratings for happiness in facial expressions depicting happiness were related across the four facial expressions of happiness (i.e., the happiness facial expressions modelled by four different individuals). Therefore, participants' intensity ratings of happiness, sadness, anger, and fear for each facial expression of emotion were summed across models. Alphas are reported in Table 1.

#### Analyses for Attachment Groups Across Facial Expressions of Emotion

In order to examine attachment differences in intensity ratings for dominant and non-dominant emotions, analyses were first conducted across facial expressions of emotion. A separate 4 (Attachment Group) x 4 (Face Type) ANOVA<sup>3</sup> with repeated measures on the face type variable was conducted on each of the emotion intensity ratings: happiness, sadness, anger, and fear. Contrary to predictions, these analyses produced no significant Attachment Group x Face Type interactions on appraisals of happiness, sadness, anger, or fear,  $F_s(9,375) = .38, .60, .97, \text{ and } .44$ , respectively, ns.

However, consistent with Ekman and Friesen's research (1975), these analyses did yield significant main effects for face type on all of the emotion intensity ratings, suggesting that participants were able to accurately identify primary facial expressions of emotion. Specifically, all participants across

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<sup>3</sup> All analyses for attachment group were also conducted including gender and ethnicity as independent variables. However, no significant effects emerged for emotion intensity ratings as a function of gender or ethnicity.

attachment groups rated happy faces highest on happiness,  $F(3, 375) = 883.17$ ,  $p < .001$ ; sad faces highest on sadness  $F(3, 375) = 215.28$ ,  $p < .001$ ; fearful faces highest on fear  $F(3, 375) = 207.54$ ,  $p < .001$ ; and angry faces highest on anger  $F(3, 375) = 214.32$ ,  $p < .001$ . The mean intensity ratings for each facial expression of emotion are presented in Table 2.

#### Analyses for Attachment Groups Within Facial Expressions of Emotion

To further explore attachment differences in intensity ratings for dominant and non-dominant emotions, separate MANOVAs were conducted on emotion intensity ratings within each of the four face type conditions, using Attachment Group as a between-subjects factor (cf. C. H. Hansen et al., 1992). Mean emotion intensity ratings for different faces across attachment groups are presented in Figure 2. Contrary to hypotheses, there were no attachment differences in participants' ratings of dominant and non-dominant emotions for happy, sad, angry, and fearful faces. Effects of overall MANOVAs for each face, as well as univariate effects for each emotion intensity rating within each face are presented in Table 3. For each facial expression, participants consistently rated dominant emotions as highest in intensity across attachment groups. Likewise, same non-dominant emotions for each facial expression received similar intensity ratings across attachment groups. For example, angry ratings for fearful faces were similar across attachment groups<sup>4</sup>.

#### Analyses for the Impact of Repression on Emotion Encoding

Because no attachment differences in emotion intensity ratings were found, an attempt was made to replicate C. H. Hansen et al.'s findings (1992) examining the influence of repression on emotion encoding. Specifically, C. H. Hansen et al.

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<sup>4</sup> Given previous research showing the impact of ambiguous stimuli on the processing of social information (Fiske & Taylor, 1991), it was reasoned that attachment differences in emotion intensity ratings may also show up for neutral faces as well as primary emotion facial expressions. However, exploratory analyses yielded no significant attachment differences in emotion intensity ratings for neutral faces.

(1992) found that repressors rated non-dominant emotions as less intense than non-repressors. After the fashion of previous research (Davis, 1987; Davis & Schwartz, 1987; R. D. Hansen & Hansen, 1988), analyses were conducted using median splits on the Taylor Manifest Anxiety Scale and the Marlowe-Crowne Social Desirability Scale, creating high/ low anxiety and high/ low defensiveness groups, respectively.

Analyses Across Facial Expressions of Emotion. A 2 (Anxiety) x 2 (Defensiveness) x 2 (Gender) x 2 (Ethnicity) x 4 (Dominant Facial Emotion) MANOVA with repeated measures on the dominant facial emotion variable was conducted on emotion intensity ratings. This analysis yielded some significant effects for gender and ethnicity. However, these effects did not qualify the Anxiety x Defensiveness x Dominant Facial Emotion interaction. Although the overall MANOVA yielded a significant Anxiety x Defensiveness x Dominant Facial Emotion interaction,  $F(12,82) = 2.44, p = .009$ , univariate tests on emotion intensity ratings of happiness, sadness, anger, and fear were not significant.

Analyses Within Facial Expressions of Emotion. To further explore repression differences in intensity ratings for dominant and non-dominant emotions, separate 2 (Anxiety) x 2 (Defensiveness) MANOVAs were conducted on emotion intensity ratings within each of the four dominant facial emotion conditions (cf. C. H. Hansen et al., 1992). Given that C. H. Hansen et al. (1992) revealed differences between repressors and non-repressors, the same comparisons were made in this study. Mean emotion intensity ratings for different faces for repressors versus non-repressors are presented in Figure 3. As suggested by these means, there were no differences between repressors and non-repressors in participants' ratings of dominant and non-dominant emotions for happy, sad, angry, or fearful faces.

Because a few lower order effects for gender and ethnicity were significant in the overall between facial expressions' MANOVA, separate analyses were also

conducted for gender and ethnicity within facial expressions of emotion. Although some significant effects emerged for gender and ethnicity, no consistent findings emerged across facial expressions.

As in the attachment findings above, substantial dominant facial emotion main effects were observed on all of the emotion intensity ratings, confirming participants' ability to accurately identify dominant facial expressions of emotion.

### Discussion

This study failed to reveal any evidence for the influence of attachment representations on the encoding of affective information, as presented in facial expressions of emotion. Rather, participants consistently rated dominant emotions high in intensity. Such a finding is not terribly enlightening, given extensive research on the identification and communication of facial expressions of emotion (Ekman, 1993). It merely confirms that there seems to be a subset of basic emotions which people find easy to identify when expressed facially. It is more difficult to understand why attachment differences in the encoding of emotional information were not observed in this study. It may be that attachment differences in the encoding of emotions and emotional experiences do not exist despite theoretical assertions to the contrary, or that attachment differences in the encoding of facial expressions of emotion were obscured because of problems inherent in the present study.

Beginning with the latter possibility, there do seem to be characteristics of the present study which may have undermined obtaining significant findings. First, it is possible that the emotion encoding task was too far removed from an attachment context. For example, it was presumed that completion of attachment questionnaires would serve to stimulate participants' thinking about relationships and attachment issues, and it was expected that participants' active thoughts about their interpersonal functioning would carry over to the facial expression appraisal

task. However, it is possible that the effects from completing questionnaires about attachment representations did not carry over to the emotion encoding task because this task was largely impersonal and irrelevant to individuals' perceptions of themselves in relationship functioning. In Mikulincer and Orbach's study (1995) where differences in intensity ratings for dominant and non-dominant emotions varied across attachment groups, the intensity ratings were made on individuals' own ratings of early childhood memories of emotional experiences.

One way to alter the task that may reveal attachment differences in intensity ratings for dominant and non-dominant emotions would be to present emotional expressions in an interpersonal context. For example, participants could be asked to imagine that the people depicted in the slides are relationship partners or close friends and to imagine that a certain event has occurred, such as that the partner or friend has been fired from their job, before participants are asked to identify the intensity of emotions displayed in the person's face.

Another potential explanation for the absence of differences among attachment groups in emotion encoding involves the measurement of attachment. Although the attachment measure employed in this study (the RQ) has been partially validated elsewhere (Griffin & Bartholomew, 1994a), it is unclear whether items on this questionnaire had the same meaning for current participants as in previous studies. Given the ethnic diversity of the sample, it is possible that some individuals for whom English is a second language had difficulty comprehending, or interpreting, questionnaire items, or even interpreted items differently than previous participants. Unfortunately, no assessment of participants' English language comprehension was included in the study so it was impossible to test this hypothesis, or to remove such individuals from the analyses. In addition, no measures were included to assess the validity of the RQ in this study.

Because differences in emotion intensity ratings were not observed across attachment groups, an attempt was made to replicate research reporting differences in emotion encoding for repressors versus non-repressors (C. H. Hansen et al., 1992). Results failed to replicate this previous research. As with attachment groups, diversity of the current sample may have contributed to the lack of observed differences between repressors and non-repressors in emotion encoding. Recent findings in the repression literature seem to consistently show that negative emotional information is less accessible for repressors versus non-repressors (Davis, 1987; Davis & Schwartz, 1987; R. D. Hansen & Hansen, 1988; C. H. Hansen et al., 1992). However, these findings are obtained using different methods for creating repression groups, such as using median splits (C. H. Hansen et al., 1992) or selecting extreme scores (R. D. Hansen & Hansen, 1988). These studies also compare repressors with different groups of non-repressors. For example, some studies have reported significant findings when comparing repressors to low-anxious and high-anxious individuals (Davis & Schwartz, 1987), whereas others have compared repressors to various combined groups of non-repressors (R. D. Hansen & Hansen, 1988, C. H. Hansen et al., 1992). Such variability in creating and comparing repression groups suggests that the effects for repression are not always readily apparent, but are perhaps more subtle, and at times, difficult to find.

Of course, it is possible that attachment differences in the encoding of emotions and emotional experiences do not exist. Although one study seems to offer some empirical support for the idea that people with different attachment representations differentially access, and perhaps encode, emotional experiences (Mikulincer & Orbach, 1995), a closer examination of its findings suggest cautious interpretation. Recall that Mikulincer and Orbach (1995) found that avoidants were less able to access emotional information and rated emotional experiences as less intense than secure or preoccupied individuals. Although consistent with

attachment theory, this finding poses a problem in that it contradicts repression research. According to the repression literature, repressors (i.e., those low in anxiety and high in defensiveness) have greater difficulty accessing negative affective information as compared to non-repressors and they rate non-dominant emotions as less intense than non-repressors. However, Mikulincer and Orbach (1995) found that avoidants who scored high in defensiveness but high in anxiety (i.e., who would be identified as defensive high-anxious in repression research, *not* as repressors) were the ones who differed in accessibility of negative affective experiences and on emotion intensity ratings. In fact, the secure attachment group who exhibited the same profile as repressors (i.e., low in anxiety and high in defensiveness) had *less* difficulty than the avoidants (or non-repressors) in accessing negative emotional information. Given the contrary findings, it is unclear how results from Mikulincer and Orbach's (1995) study should be interpreted.

Although Mikulincer and Orbach's (1995) research seems to suggest a link between attachment and repressive defensiveness, exploratory analyses of the associations between attachment and repressive defensiveness did not replicate these authors' findings. Defensiveness means did not differ across attachment groups in the present sample. Such disparate findings across studies may be attributable to differences in the assessment of attachment and sample characteristics. Specifically, Mikulincer and Orbach (1995) assessed attachment representations as a tripartite system (Hazan & Shaver, 1987), whereas the present study assessed attachment representations according to Bartholomew's (1990) four prototypes. In addition, Mikulincer and Orbach's study (1995) was conducted in Israel, where Jewish students completed attachment questionnaires which had been translated into Hebrew. In contrast, the present study was conducted with a Canadian sample of Asians and Non-Asians who completed questionnaires presented in English.

In addition, the tasks employed in the two studies were very different. As mentioned previously, Mikulincer and Orbach's (1995) task required participants to recall and rate the intensity of early childhood memories associated with specific emotional experiences. Such a task is likely more salient and emotionally powerful than having participants rate emotion intensity for static facial expressions of emotion. As well, as suggested previously, the problem posed by Mikulincer and Orbach's (1995) autobiographical memory task comes in interpreting whether differences in emotion intensity ratings for these memories are due to differences in the initial encoding of the memories, due to differential recall, or due to differences in actual experiences across attachment groups. Unfortunately, results from the present study do not clarify this issue.

On the basis of these differences between studies, it seems premature to fully discount the possibility that attachment differences do exist in the encoding of emotions and emotional experiences. However, the empirical study of this relationship seems problematic. Specifically, researchers are faced with the challenge of designing a study within an attachment context that assesses actual encoding abilities in a laboratory setting while simultaneously making the task emotionally salient and powerful.

## Study 2

Although Study 1 found no effect for the influence of attachment schemas on the appraisal or encoding of emotional information as presented in facial expressions, perhaps attachment schemas more readily relate to memory for *new* information. Thus, the purpose of Study 2 was to examine whether adults are more likely to recall new information that is consistent rather than inconsistent with their attachment schemas. It employed a paradigm adapted from research by Pietromonaco and Markus (1985) in which mildly depressed and nondepressed participants were presented with a series of sentences describing happy or sad and



social or nonsocial events. Participants were asked to form a mental picture of themselves in each event and later to recall as many of the events as possible. Analyses revealed that nondepressed individuals recalled more social than nonsocial events. In contrast, depressed individuals recalled equal numbers of social and nonsocial events. Depressed individuals' inhibited recall of social events was interpreted as mirroring, and perhaps contributing to, their negative social interactions (Pietromonaco & Markus, 1985).

In the present study, participants completed a series of questionnaires. As in Study 1, some of these measures were administered solely to stimulate thinking about interactions in close, personal relationships. Whereas Study 1 employed a categorical measure of attachment, in Study 2 attachment representations were measured using continuous ratings of Bartholomew's four prototypic attachment patterns. Continuous ratings provide more information than discrete ratings. Rather than assuming that individuals are exclusively characterized by *one* particular attachment prototype, continuous ratings reflect that individuals' attachment representations can be a combination of two or more attachment patterns (Collins & Read, 1990; Griffin & Bartholomew, 1994a; Simpson, Rholes, & Phillips, 1996). Continuous ratings also have the advantage of increased power over discrete ratings. In the present study, continuous attachment ratings from two self-report measures of attachment were combined to form a composite attachment measure.

In addition, because of concerns raised in Study 1 regarding the validity of the attachment self-reports, two additional measures were included in Study 2 to validate the composite attachment measure. The two measures assessed self-esteem and aspects of attachment experiences in close relationships. Previous research has shown how attachment latent variables, constructed from interview and self-report measures of Bartholomew's attachment prototypes, relate to other

self-report measures of attachment (Griffin & Bartholomew, 1994b). However, no previously published work has explored how the composite attachment measure employed in this study relates to other self-report measures of attachment. This seems an important issue to address given concerns over the measurement of attachment (Bartholomew, 1994).

After completing questionnaires designed to stimulate thinking about interpersonal functioning and attachment relationships, participants engaged in a free recall task in which they were presented with a series of sentences describing various events. After viewing each event, participants answered a series of questions designed to enhance processing of the event. After viewing all events, participants were asked to recall as many sentences as possible. The number of sentences recalled was recorded for various types of events.

Half of the sentences dealt with attachment-relevant events (i.e., incidents of separation, emotional intimacy, etc.). The other half were attachment-irrelevant (i.e., incidents centering around competency at work, car problems, etc.).

Approximately equal numbers of attachment-relevant and irrelevant events revolved around five themes: approach, avoidance, high anxiety about love-worthiness, low anxiety about love-worthiness, and happiness. The first four of these event themes were chosen because they directly corresponded to the four poles in Bartholomew's (1990) two-dimensional model of attachment. The fifth event theme was chosen to capture characteristics differentiating security from all types of insecurity given recent research suggesting that secure individuals report more positive social interactions than insecure individuals (Tidwell et al., 1996).

Attachment-relevant sentences dealing with approach-avoidance were designed to tap the extent to which an individual does or does not expect others to be available and supportive, paralleling the intimacy-avoidance or other-model dimension. For instance, going to your partner to talk about problems is an

example of an event assessing expectations about others' supportiveness.

Attachment-relevant sentences dealing with high and low anxiety focussed on issues of love-worthiness and fears of separation and abandonment, corresponding to Bartholomew's anxiety dimension or self-model. For example, becoming upset when you see your partner having lunch with one of his/ her former partners is an event associated with fear of abandonment. Attachment-relevant events dealing with happiness described positive experiences concerned with issues of support, trust, warmth, etc. For example, feeling good when your partner gives you a backrub is an event engendering characteristics of felt security, such as warmth and comfort.

High scores on security were expected to relate to recall of attachment-relevant happy events. This prediction was made given that secure individuals have relatively positive and rewarding relationship histories (e.g., Collins & Read, 1990; Bartholomew & Horowitz, 1991), and more positive expectations about relationships. Based on Bartholomew's (1990) prototypes, the attachment schemas of dismissing and fearful individuals should be characterized by thoughts of avoidance of intimacy in close relationships. In contrast, the attachment schemas of secure and preoccupied individuals should contain thoughts dealing with the importance of intimacy. Thus, high scores on dismissing and fearful ratings were expected to be associated with high recall of attachment-relevant avoidant events. High scores on secure and preoccupied ratings were expected to be associated with the recall of attachment-relevant approach events. High scores on preoccupied and fearful scales, attachment ratings consistent with a negative model of self or anxiety about love-worthiness, were expected to be associated with recall of attachment-relevant high anxiety events. High scores on secure and dismissing scales, attachment ratings consistent with a positive model of self or low anxiety

about love-worthiness, were expected to be associated with recall of attachment-relevant low anxiety events.

Prior to recall, participants also completed a mood adjective checklist. This checklist was included both as an intervening task and to examine the potential association between mood and attachment representations. A large body of research suggests that mood has an impact on recall (e.g., see Blaney, 1986 for a review). Specifically, individuals are more likely to recall material that is consistent or congruent with mood at time of recall. It was a concern that mood may be a confounding factor in the present study because attachment representations differ in affective tone. For example, individuals scoring high on preoccupied and fearful ratings may recall attachment-relevant high anxiety events *not* because these events are consistent with these types of attachment schemas but because the task put them in a negative mood and they are likely to recall events consistent with that mood. Likewise, individuals scoring high on the secure dimension may recall attachment-relevant happy events not because these events are consistent with secure schemas of warmth, support, etc., but because the task put them in a positive mood and they are likely to recall events consistent with that mood.

## Method

### Participants

One hundred and six students from introductory psychology courses (65 women and 41 men) participated in this study for course credit. Participants completed the procedure in groups of approximately ten people. Participants ranged in age from 17 to 48 ( $M = 20.2$  years); 49% were White, 36% Asian, 11% East Indian, and 4% Other. Fifty percent of these students were in a romantic relationship at the time this study was conducted ( $M$  relationship length = 25 months).

## Procedure

Participants were asked to participate in a study on personality and memory. In order to stimulate thinking about attachment-related issues, participants answered the same series of questionnaires completed in Study 1 and two additional measures. The order of presentation of questionnaires was as follows: (1) a demographics questionnaire, (2) the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1964), (3) the Taylor Manifest Anxiety Scale - Revised (TMAS; Suinn, 1968)<sup>5</sup>, (4) the Inventory of Interpersonal Problems (IIP; Horowitz et al., 1988), (5) the Rosenberg Self-Esteem Inventory (SEI; Rosenberg, 1965), (6) the Experiences in Close Relationships Questionnaire (ECR; Brennan, Clark, & Shaver, 1996), (7) the Interpersonal Dependency Inventory (IDI; Hirschfeld et al., 1977), (8) the Relationship Questionnaire (RQ; Bartholomew & Horowitz, 1991), and (9) the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994a). Two of these measures were used solely to enhance participants' thinking about relationships and, thus, were not scored (IIP and IDI). Two others were included to validate the composite attachment measure (SEI and ECR). After completing these questionnaires, participants engaged in a free recall task where they viewed various sentences describing interpersonal events and tried to recall as many of the events as possible.

## Measures

The two additional measures included in Study 2 are described below.

Rosenberg Self-Esteem Inventory (Rosenberg, 1965). This measure is a 10-item scale that assesses global self-esteem ( $\alpha = .90$ ). High scores indicate high self-esteem. A sample item is "I certainly feel useless at times." Because positivity of the self is one of the dimensions differentiating Bartholomew's attachment

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<sup>5</sup> As in study 1, the Taylor Manifest Anxiety Scale and the Marlowe-Crowne Social Desirability Scale were included to allow for future comparison of the relationship between these measures and ratings of attachment with the pattern of associations found in Mikulincer and Orbach's (1995) study.

prototypes, this questionnaire was included as a validity check on the continuous ratings of attachment, described below.

Experiences in Close Relationships Questionnaire. This measure consists of 142 items designed to assess a number of dimensions associated with attachment (Brennan et al., 1996). Participants rated on a 7-point scale the extent to which they agreed/ disagreed with each item. Ten subscales were scored including: partner as a good attachment figure, separation anxiety, self-reliance, discomfort with closeness, anger at partner, uncertainty about feelings for partner, discomfort with dependence, self-reliance, trust, lovability/ relational self-esteem, repellent desire to merge with partners, tough independence (i.e., the degree to which a person derogates the importance of attachment relationships), and fear of abandonment. This questionnaire was scored to examine the associated components of individuals' attachment ratings.

#### Construction of Four Continuous Attachment Ratings

Using participants' responses to the 38-item RSQ (described in Study 1), four subscales (each with 4 or 5 items) were scored corresponding to Bartholomew's (1990) four attachment prototypes. The Secure subscale measures the extent to which a person values intimate relationships and maintains close relationships without losing personal autonomy. The Dismissing subscale assesses the degree to which a person downplays the importance of close relationships and emphasizes independence and self-reliance. The Preoccupied subscale measures the degree to which a person is over-involved in close relationships and depends on other people's acceptance for a sense of personal well-being. The Fearful subscale assesses the extent to which a person avoids close relationships because of a fear of rejection and has a sense of personal insecurity and a distrust of others.

Correlations between participants' RQ single-item, continuous ratings of attachment prototypes (described in Study 1) and their corresponding scores on

each of the RSQ secure, preoccupied, dismissing, and fearful subscales were .73, .69, .56 and .71, respectively. Due to the strength of these correlations, corresponding scores on the RQ and RSQ were standardized, using a z-transformation, and averaged to produce composite scores for the secure, preoccupied, dismissing, and fearful prototypes. Intercorrelations among the four dimensions are presented in Table 4. This pattern of associations among attachment dimensions is consistent with previous research (Bartholomew & Horowitz, 1991).

#### Validation of the Composite Attachment Measure

Validity of the composite attachment measure was examined by correlating the above four continuous ratings with the Rosenberg self-esteem scale and the ten subscales on the ECR. Consistent with theoretical expectations and prior findings (Bartholomew & Horowitz, 1991; Brennan & Morris, 1997), the Rosenberg Self-Esteem Inventory correlated positively with those ratings of attachment associated with a positive self-model (i.e., the secure and dismissing ratings;  $r_s = .42$  and  $.25$ , respectively,  $p < .01$ ) and correlated negatively with those attachment ratings associated with a negative self-model (i.e., the preoccupied and fearful ratings;  $r_s = -.34$  and  $-.28$ , respectively,  $p < .01$ ).

The correlations between each of the ECR subscales and the four continuous ratings of attachment are reported in Table 5. In general, these correlations appeared consistent with theory (e.g., Bartholomew, 1990) and prior research (e.g., Brennan & Shaver, 1995; Brennan et al., 1996), confirming the construct validity of the continuous self-report ratings of attachment employed in this study. For example, the pattern of associations for continuous ratings of security revealed that high scores on security were related to positive attitudes towards partners, and trust, self-confidence, and comfort in close relationships. Preoccupied ratings were associated with desires for extreme emotional closeness and fears about separation

and abandonment. Fearful ratings were associated with fears about rejection, separation, and abandonment, and discomfort with emotional closeness.

Dismissing ratings were associated with self-reliance and emotional independence.

### Free Recall Task

This task was based on a procedure developed by Pietromonaco and Markus (1985). The stimuli consisted of 30 slides of sentences that described different interpersonal events. Sixteen of the sentences centred around *attachment-relevant* events. These events were designed to tap into central attachment issues, such as intimacy, emotional availability, and separation. The remaining sentences were *attachment-irrelevant*. They were designed to be "neutral" in the sense that they were not expected to tap into attachment themes. In addition, twelve of the sentences dealt with issues related to approach and avoidance, twelve sentences dealt with issues that do and do not raise anxiety, and six sentences were concerned with happiness.

Thus, there were a total of *ten* different types of sentences: attachment-relevant approach (e.g., You cry in front of a friend), attachment-irrelevant approach (e.g., You go door to door canvassing for your favourite charity), attachment-relevant avoidance (e.g., You go for a run to get your mind off your problems), attachment-irrelevant avoidance (e.g., You avoid a tourist asking for directions on the street), attachment-relevant high anxiety (e.g., You are upset when your friend leaves you standing alone at a party), attachment-irrelevant high anxiety (e.g., You get a flat tire on a deserted street), attachment-relevant low anxiety (e.g., You enjoy spending some time alone when your partner goes out of town for the weekend), attachment-irrelevant low anxiety (e.g., You feel very competent on the first day of your job), attachment-relevant happy (e.g., You feel good when your partner gives you a backrub), and attachment-irrelevant happy (e.g., You go on a shopping spree buying things you like). See Appendix B.



For each interpersonal event, participants were instructed to "try and form a mental picture of yourself in the event and visualize it as clearly as possible." Each slide was presented for 20 seconds while participants imagined experiencing the event. In a 20 second interval between each slide, participants rated the previous sentence on three 7-point scales. Similar scales have been used in previous research (Pietromonaco & Markus, 1985) and were employed in the present study to stimulate thinking about each of the events. One scale assessed the clarity of participants' mental picture (1 = extremely fuzzy to 7 = extremely vivid). On the second scale, participants made a judgement about the likelihood that the event would happen to them (1 = extremely unlikely to 7 = extremely likely). Participants also rated how they would feel if the event happened to them on a scale ranging from 1 = very sad to 4 = indifferent to 7 = very happy.

After viewing the 30 sentences, participants completed a mood adjective checklist as an intervening task. This questionnaire also served as a check for the potentially confounding effects of mood on participants' recall. Participants were asked to rate the extent to which they felt 18 emotions on a 7-point scale, ranging from "not at all" to "extremely." Negative and positive emotions were included. The negative emotions scale included nine adjectives (anxious, angry, afraid, hurt, sad, jealous, worried, rejected, and confused;  $\alpha = .81$ ). The positive emotions scale included four adjectives (happy, pleased, loved, and appreciated;  $\alpha = .78$ ).

Participants were then given ten minutes to recall and write down as many events as possible. Participants were instructed to reproduce the meaning of the original sentence. A sentence was scored as correctly recalled if the meaning of the recalled sentence captured the meaning of the original sentence. Inter-rater agreement on the coding of sentences for 50% of the sample was .96 (Cohen's kappa). The number of sentences correctly recalled by individuals was tallied for each of the following categories: overall attachment-relevant, overall attachment-

irrelevant, attachment-relevant approach, attachment-irrelevant approach, attachment-relevant avoidance, attachment-irrelevant avoidance, attachment-relevant high anxiety, attachment-irrelevant high anxiety, attachment-relevant low anxiety, attachment-irrelevant low anxiety, attachment-relevant happy, and attachment-irrelevant happy.

## Results

### Proportion of Events Recalled for Each Event Type

Proportions were computed as total number of events recalled out of total number of events for each event type. For example, proportion of attachment-relevant events recalled was computed by summing total number of attachment-relevant events recalled and dividing by total number of attachment-relevant events used in the study (i.e., 16). Means and standard deviations for proportions recalled of each event type are presented in Table 6. As suggested by these means, participants were reasonably successful in recalling all types of events with one exception: Participants seemed to recall relatively few attachment-irrelevant approach events. Proportion of attachment-relevant events recalled was positively correlated with proportion of attachment-irrelevant events recalled ( $r = .35, p < .001$ ).

### Mood Ratings

To examine the potential impact of mood on event recall, participants' ratings of positive and negative emotions on the Mood Adjective Checklist were correlated with continuous ratings of attachment (see Table 7). As revealed by these correlations, high scores on negative emotion ratings assessed after visualizing events and prior to sentence recall were positively correlated with high scores on the preoccupied and fearful ratings. These moderate associations may be interpreted in one of two ways. First, it may be that the tasks of completing relationship questionnaires and imagining oneself in relationship events enhanced

negative affect in those individuals scoring high on the preoccupied and fearful dimensions. Second, these moderate associations could reflect that those scoring high on preoccupation and fearfulness tend to have negative moods in general (Carnelley, Pietromonaco, & Jaffe, 1994). Also noteworthy is that scores on positive emotion ratings were positively correlated with scores on security. Again, these moderate associations may be interpreted to mean that the task of completing relationship questionnaires and imagining oneself in relationship events enhanced positive affect in those individuals scoring high on the secure dimension, or that those scoring high on security have positive moods in general.

#### Associations Between Attachment Ratings and Event Recall

In order to control for the above mood effects as an explanation for any relationship found between attachment ratings and sentence recall<sup>6</sup>, partial correlations between attachment ratings and number of different sentence types recalled were calculated, partialing out overall positive and negative affect. These partial correlations are presented in Table 8.

As shown in Table 8, none of the correlations between attachment ratings and recall of attachment-irrelevant events were significant. Consistent with the idea that thinking about attachment schemas should have an impact on the recall of attachment-relevant events, all significant correlations occurred for relationships between attachment ratings and recall of attachment-relevant events. As predicted, scores on ratings of attachment security were positively correlated with the number of attachment-relevant happy events recalled. In addition, recall of these types of sentences was negatively correlated with participants' ratings of fearfulness and dismissiveness. Partially consistent with predictions, high scores on dismissiveness were related to the recall of more attachment-relevant avoidant

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<sup>6</sup> Negative emotion ratings were positively correlated with the recall of attachment-relevant high anxiety events,  $r = .20$ ,  $p = .04$ , and positive emotion ratings were negatively correlated with attachment-irrelevant approach events,  $r = -.21$ ,  $p = .03$ .

events. However, fearfulness scores were unrelated to the recall of avoidant events. Contrary to predictions, individuals' ratings on the preoccupied dimension were *negatively* correlated with the recall of attachment-relevant high anxiety events, and fearfulness was unrelated to the recall of this type of event. In addition, there were no significant relationships between attachment ratings and the recall of either attachment-relevant approach events or attachment-relevant low anxiety events.<sup>7</sup>

### Post-hoc Analyses of Attachment and Event Recall as a Function of Relationship Status

In the demographics questionnaire, participants were asked to state whether they were currently in a romantic relationship or not. It is possible that attachment schemas and their effects on memory are modulated by current relationship status. In particular, those *not* in a relationship may respond in a manner consistent with imagining a hypothetical partner in the event imagery task. In contrast, those in a relationship may respond more in a manner consistent with imagining their actual current partner in the event imagery task. In order to explore the possible influence of relationship status, a series of separate analyses examining associations between attachment dimensions and event recall was conducted for those individuals currently in and not in romantic relationships. Findings from these analyses are presented in Table 9. Only results for attachment-relevant events are reported as none of the correlations between attachment ratings and the recall of attachment-irrelevant events were significant at  $p < .05$ .

When examining the associations between attachment and event recall for those currently in romantic relationships and those not in relationships, more significant correlations (7) emerged for those not in relationships, as opposed to

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<sup>7</sup> Zero-order correlations between attachment dimensions and event recall are presented in Appendix C.

those in relationships (3). In particular, this pattern was apparent for the preoccupied and dismissing dimensions. Specifically, high scores on the preoccupied dimension were positively correlated with the number of attachment-relevant approach events for people not currently in relationships. Also, whereas no previous association was found between preoccupied ratings and recall of attachment-relevant happy events for the combined sample, high scores on preoccupation were positively correlated with the recall of attachment-relevant happy events for those not currently in relationships. For those currently in relationships, no association was found between these two variables. Significant associations between dismissiveness and event recall emerged only for those not currently in relationships. Specifically, dismissiveness was negatively associated with the recall of attachment-relevant happy and approach events and positively associated with the recall of avoidant events. The associations for attachment-relevant happy and avoidant events were consistent with those that emerged from analyses for the combined sample.

In contrast to the preoccupied and dismissing ratings, the pattern of associations between the other two attachment dimensions (security and fearfulness) and event recall did not appear to be stronger for those who were not in a relationship, as opposed to those who were. Security was positively associated with the recall of attachment-relevant happy events, regardless of relationship status. These associations were consistent with original hypotheses and results from the combined sample. Also consistent with the pattern of findings for the combined sample, fearfulness was negatively associated with the recall of attachment-relevant happy events but only for those currently in relationships.

#### Post-hoc Analyses for Clarity, Likelihood, and Feeling Ratings

In addition to examining associations between attachment ratings and the recall of attachment-relevant and attachment-irrelevant events, post-hoc analyses

were conducted on participants' ratings of clarity of mental image, likelihood of occurrence, and feelings evoked for each event.

Clarity Ratings. Participants' responses to the question regarding clarity of mental picture were moderately correlated across events, so a total clarity score was computed for attachment-relevant events ( $\alpha = .86$ ) and for attachment-irrelevant events ( $\alpha = .82$ ). A post-hoc hypothesis was that recall would be higher for individuals with clearer mental images. However, the total clarity rating for attachment events was unrelated to either the total number of attachment-relevant events recalled ( $r = -.04$ , ns) or the total number of attachment-irrelevant events recalled ( $r = -.05$ , ns). In addition, the total clarity rating for attachment-irrelevant events was unrelated to either the total number of attachment-relevant events recalled ( $r = .04$ , ns) or the total number of attachment-irrelevant events recalled ( $r = .02$ , ns).

Additional post-hoc analyses revealed that total clarity ratings for attachment-relevant and attachment-irrelevant events were positively correlated with security ratings ( $r = .24$ , and  $r = .23$ , respectively,  $p < .02$ ). Such findings seem to be consistent with theory suggesting that security is associated with coherency of thought and expression, a characteristic which presumably relies upon the ability to think logically and clearly about ideas (Main, 1991). Clarity ratings for attachment-relevant and attachment-irrelevant events were also negatively related to the preoccupied dimension ( $r = -.24$ , and  $r = -.22$ , respectively,  $p < .03$ ). Again, such findings seem to be consistent with the idea that incoherency of thought is characteristic of preoccupation with close relationships (Main, 1991).

Likelihood Ratings. Post-hoc analyses were also conducted on individuals' ratings of likelihood that each event would happen to them. Because event recall may be related to the salience of an event (Baldwin, 1992) and events with a greater likelihood of occurrence may be more salient, I postulated that individuals

would rate those events most consistent with their attachment schemas as most likely to occur. For example, given that approach events are consistent with attachment representations of security and preoccupation, it seemed plausible that those individuals scoring high on these dimensions would also rate these types of events as high in likelihood of occurrence. Unfortunately, these hypotheses could not be tested because likelihood ratings within event-type were largely uncorrelated ( $\alpha$ 's ranged from  $-.01$  to  $.37$ ). An examination of correlations between individual likelihood scores for each event and attachment ratings revealed no consistent patterns.

Correlations between likelihood ratings for attachment-relevant and attachment-irrelevant events were weak to moderate so two total likelihood ratings were computed by summing across these two types of events ( $\alpha = .47$  and  $\alpha = .60$ , respectively). Total likelihood ratings for attachment-relevant events correlated modestly with total clarity ratings for attachment-relevant events ( $r = .24$ ,  $p < .05$ ). Total likelihood ratings for attachment-irrelevant events also correlated modestly with total clarity ratings for attachment-irrelevant events ( $r = .46$ ,  $p < .05$ ). In accordance with previous rationale regarding event salience, a post-hoc hypothesis predicted that total attachment-relevant and attachment-irrelevant likelihood ratings would be positively associated with the number of attachment-relevant and attachment-irrelevant events recalled, respectively. In fact, neither of these associations was significant ( $r = -.09$ ,  $ns$ ;  $r = .10$ ,  $ns$ , respectively). Associations between total likelihood scores and attachment ratings were not examined because they were not deemed theoretically meaningful.

Rating of Feelings. Post-hoc analyses were also conducted on individuals' ratings of how they would feel if each event happened to them. Post-hoc predictions about whether individuals would react positively or negatively to different types of events varied as a function of attachment schemas. For example, given

that approach events are consistent with attachment representations of security and preoccupation, it seemed plausible that those individuals scoring high on these dimensions would also rate these types of events especially positively. In the case of high anxiety events, it was predicted that individuals scoring high on attachment representations consistent with these event types (i.e., preoccupied and fearful), would rate these events especially negatively. Unfortunately, as in the case of likelihood ratings, ratings of feelings within event-type were largely uncorrelated ( $\alpha$ 's ranged from -.21 to .23). An examination of correlations between individual feeling scores for each event and attachment ratings revealed no consistent patterns. Total feeling scores for attachment-relevant versus attachment-irrelevant events were not calculated because they were not deemed theoretically meaningful.

#### Discussion

Only a few associations emerged between attachment and event recall for analyses based on the entire sample. Specifically, consistent with original hypotheses, high scores on security were positively related to the recall of attachment-relevant happy events, whereas high scores on fearfulness and dismissiveness were negatively related to the recall of such events. Also as predicted, high scores on dismissiveness were related to the recall of attachment-relevant avoidant events. However, contrary to original predictions, high scores on preoccupation were *negatively* associated with the recall of attachment-relevant high anxiety events.

The association between recall of attachment-relevant happy events and ratings of security is consistent with the findings of three previous studies. In one study, also assessing attachment differences in recall, Mikulincer (1995) found that secure individuals recalled more positive self-descriptive adjectives than preoccupied individuals. However, avoidant individuals did not differ from secure individuals in their recall of positive self-descriptors. This latter finding seems



inconsistent with results in the present study revealing that both avoidant dimensions were associated with decreased recall for attachment-relevant happy events. This inconsistency may be explainable in terms of differences in the nature of the recall tasks. In Mikulincer's (1995) study, the items recalled were adjectives which had previously been identified as self-descriptive or not. Given that some avoidants may defend against negative information about themselves and be more likely to present themselves in a positive light (Bartholomew, 1990), it may be expected that they should recall as many positive adjectives as secure individuals.

Two additional studies are also consistent with the present association between security and increased recall of attachment-relevant happy events, although these studies differ in many ways from the present one. Recall that Belsky et al. (1996) conducted a laboratory study and observed that children with secure attachment histories recalled positive events depicted in puppet shows more accurately than negative social events. In another study, not directly related to memory but focussing on differences in reaction times as a function of attachment schemas, Baldwin, Fehr, Keedian, Seidel, & Thomson (1993) reported that secure individuals were quicker to identify words representing positive interpersonal outcomes (i.e., words consistent with the attachment schemas of secure individuals) than avoidants. Taken together, this research may imply that an important feature in distinguishing secure representations from other insecure representations is their "happy" content. I will return to a discussion of this issue later.

The finding that preoccupation was associated with decreased recall of attachment-relevant high anxiety events was puzzling, especially in light of the fact that this relationship occurred after effects due to negative emotional arousal were removed. One possible explanation for this negative relationship combines the idea that individuals need to reconstruct relationship experiences in order to maintain felt

security (Murray & Holmes, 1993) with Main's (1991) suggestion that people with attachment schemas may simultaneously hold two contrasting mental models of relationships - one on the conscious level, the other at the unconscious level. Main (1991) suggests that these multiple models can be conflicting in contents. For example, an individual may hold two conflicting models of a partner - one of the partner as loving and supportive, and one of the partner as rejecting and unsupportive. Whereas one model is accessible to conscious awareness and discussion, the other tends to be defensively excluded from awareness. She reasons that multiple models function to provide emotional relief because the individual is excluding representations that cause painful feelings (e.g., my partner is rejecting, I fear that my partner will leave).

Consistent with Main's ideas (1991), it may be that, on the surface, preoccupied individuals hold an idealized view about their relationship experience and attempt to maintain that view by reconstructing negative relationship experiences into positive ones. Hence, their most salient experiences about relationships are held in positive relationship schemas which are not consistent with high anxiety events. Relationship schemas that are consistent with these high anxiety events may be less accessible to conscious experience because they exist on a deeper level. In fact, the negative association between preoccupation and high anxiety recall may reflect the fact that those scoring high in preoccupation overcompensate at their present level of awareness to keep the negative, deeply-rooted, unconscious thoughts at bay.

Although the above findings were encouraging, the fact remains that few of the predicted associations emerged between attachment and event recall when examining the combined sample. One explanation for these limited findings may lie in differences between those who are and those who are not currently involved in romantic relationships. Consequently, I examined the associations between

attachment and event recall for these two separate groups. More significant associations were found between attachment and recall for those who were not in a relationship, as opposed to those who were. In terms of attachment dimensions, this pattern of stronger findings for those imagining hypothetical partners, as opposed to real partners, was observed for ratings of preoccupation and dismissiveness.

On the dismissing dimension, significant associations were found between dismissiveness and decreased recall of happy and approach events, and increased recall of avoidant events for those not in relationships. However, none of these associations were significant for those currently in romantic relationships. This pattern of findings may be explained by differences in imagined partners and partner responses to events for those who were not in relationships, as opposed to those who were. Specifically, those scoring high on dismissiveness who are not in relationships may respond more homogeneously on the event recall task than those who are in relationships because they imagine similar hypothetical partners and hypothetical partner responses. Congruent with a negative other-model, individuals scoring high in dismissiveness may tend to imagine hypothetical partners who are too demanding of time and attentions. Perhaps these negative views of hypothetical partners function to keep highly dismissing individuals out of relationships (which may explain why they are not currently in a relationship<sup>8</sup>), or these dismissing individuals may have had recent, negative relationship experiences which confirm these views (which may have resulted in breakups with previous partners and also explain why they aren't currently in a relationship). In contrast, the imagined responses of real partners for those individuals scoring high on dismissiveness may vary extensively, depending on individuals' relationship

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<sup>8</sup> Interestingly, higher scores on dismissiveness were associated with not currently being in a relationship ( $r_{pb} = .25, p = .01$ ). In contrast, higher scores on security were associated with being in a relationship ( $r_{pb} = -.21, p = .03$ ).

experiences. For example, some real partners may respond positively to low demands for attention, whereas others may be offended by and react quite negatively to such perceived inattention. These differing partner responses are likely to be incorporated into the present event imagery task so that individuals scoring high in dismissiveness who are currently in relationships may be imagining very different types of partner responses for the same events.

An alternative explanation for the different pattern of findings obtained for dismissiveness ratings for those in and not in relationships may pertain to differences in accessibility of event schemas. Collins (1996) also reported different patterns of findings for those who were in relationships, as opposed to those who were not, in her research on individuals' interpretations of relationship events. Specifically, she found factors related to avoidance, such as discomfort with closeness and emotional independence, predicted event interpretations for participants not currently in romantic relationships, but failed to predict event interpretations for those in relationships. Collins (1996) suggested that these contrasting findings may be due to avoidant adults being more willing to indicate relationship disturbance and instability within an hypothetical relationship than in the context of real relationships. She argued that thinking about hypothetical relationships and partners is possibly not as threatening as thinking about real relationships and partners, so avoidants do not need to defend against such negative thoughts like they do against thoughts about real, negative, relationship experiences. Consistent with Collins' (1996) line of reasoning, an alternative explanation for the differing pattern of findings for the dismissing dimension as a function of relationship status could concern accessibility of event schemas. It may be that people not in romantic relationships who score high in dismissiveness have schemas containing avoidant events readily available for access. In contrast, those scoring high in dismissiveness who are currently involved in romantic relationships

may suppress or defend against representations about real avoidant experiences because these types of events are typically associated with negative partner responses (e.g., partner criticisms about not being supportive enough). Instead, they may maintain schemas that idealize their current relationships and partners, and hence, not recall avoidant events because such events are not consistent with their most readily available schemas.

More associations were also observed between preoccupied ratings and event recall for those who were not in a relationship, as opposed to those who were. It is interesting to note that high scores on preoccupation were associated with increased recall of attachment-relevant happy events for those individuals not currently in relationships. However, this association was not significant for those who were in relationships. In the original predictions for the combined sample, security was the only attachment dimension that was predicted to relate to increased recall of attachment-relevant happy events. This prediction was made on the basis that these events were designed to describe secure aspects of relationship functioning. However, recall for these type of events related to security and preoccupation scores (which share positive views of others) and related fairly consistently in the opposite direction to fearful and dismissing scores (which share negative views of others). Such a pattern of findings may indicate that the attachment-relevant happy events were more representative of the other-model than some unique aspect of attachment schemas which distinguishes security from insecurity.

As in the case of the dismissing dimension, it could be argued that those individuals scoring high on the preoccupied dimension who were not in relationships responded more homogeneously on the event recall task than those in relationships because they imagined hypothetical partners and partner responses. For example, congruent with their desire for intimacy, individuals scoring high in preoccupation

who are not in relationships may imagine positive partner responses, such as hugging and kissing, when going for a romantic walk on the beach. However, individuals scoring high in preoccupation who are in relationships may imagine quite variable real partner responses to events depending upon characteristics of their current relationship or partner. For example, some individuals scoring high in preoccupation may imagine positive responses from their real partners to walking on the beach. However, other individuals scoring high in preoccupation may imagine quite negative partner responses to this event, such as the partner resenting the walk because of the constant demands made on their time (perhaps realistic complaints on the partner's behalf given the clinginess and dependence characteristic of preoccupation). These differing partner responses imagined for similar events may decrease the likelihood of obtaining an association between preoccupation and recall of attachment-relevant happy events for those individuals currently involved in romantic relationships.

The finding that preoccupation was associated with increased recall of attachment-relevant approach events for those people not currently in relationships, but decreased recall of attachment-relevant approach events for those individuals currently in relationships, was also interesting. These different associations may be explained in terms of qualitative differences between imagined event responses of hypothetical and real partners. It may be that individuals not in relationships who score high on the preoccupied rating recall approach events because they imagine *positive* hypothetical partner responses to such events (such as responsiveness and supportiveness) that are consistent with their idealized expectations about intimacy. However, those scoring high in preoccupation who are in relationships and imagining their real partners in such approach events may recall few of these events because they associate such events with *negative* responses from their partners, such as rejection, or their partner not being supportive enough. One could

argue that these negative experiences are inconsistent with their prototypical attachment schemas which contain idealized scripts for approach events similar to those individuals not in relationships. However, individuals scoring high in preoccupation who are currently involved in romantic relationships may actually recall fewer approach events because these events, as imagined with negative partner responses, are actually inconsistent with their idealized scripts for how approach events should be.

It is noteworthy that in previous research examining attachment differences in another area of cognitive processing - interpretations of and attributions about hypothetical relationship events (Collins, 1996; Poole, 1995) - findings have been strongest for events related to the anxiety dimension but relatively weak or inconsistent for events related to approach or dependence. Examining event types corresponding to these dimensions (i.e., approach, avoidance, high anxiety, and low anxiety), a contrasting pattern emerges in the present study: Results tended to be stronger for those events related to the underlying dimension of approach-avoidance. One potential explanation for this pattern of findings is that events related to the avoidance dimension (i.e., attachment-relevant avoidant and attachment-relevant approach events) were more salient because they reflect actions. Perhaps people have stronger convictions about what they and their relationship partners do and do not do in relationships, as opposed to what they and their partners feel.

It is also interesting that of all the significant correlations obtained between attachment dimensions and event recall, slightly more than half of these were obtained for attachment-relevant happy events. The consistent pattern of associations for this type of event is somewhat surprising given recent assertions that one should expect attachment findings to be strongest for negative events because attachment schemas are most likely to be activated in anxiety-provoking

situations (Simpson et al., 1996). As suggested earlier, research is beginning to suggest that happiness may be a key aspect of the attachment representations of secure individuals (Baldwin et al., 1993; Mikulincer, 1995). This "happy" component may be an important characteristic which distinguishes secure attachment representations from insecure ones. Of future interest is whether secure individuals have more positive representations because they have more positive experiences, or they filter incoming information to include only positive information, or both. Given research on the positive aspects of optimism (or thinking happy thoughts) on physical health (Scheier & Carver, 1987), it seems important to pursue the importance of happy thoughts or information processing biases for happy information in examining long term functioning and outcomes for individuals with secure, as compared to insecure, representations.

Consistent with the idea that attachment representations differ in affective tone, preoccupation and fearfulness were associated with increased negative mood and decreased positive mood, as assessed by a mood adjective checklist administered after participants had imagined themselves in events and before event recall. These associations are consistent with research showing that preoccupied and fearful individuals report more negative affect (Carnelley et al., 1994) and report relationships characterized by more frequent occurrences of negative emotion (Simpson, 1990). Also consistent with previous research (Simpson, 1990), security was associated with positive mood. An interesting question arising out of these findings concerns whether the positive and negative moods resulted as a function of selective attention to events most consistent with attachment schemas (i.e., negative events for preoccupation and fearfulness, and positive events for security) or whether individual differences in mood existed as a function of attachment schemas before the study began. A way to examine this question in future would



be to include a mood inventory at the beginning of the study, as well as after the presentation of events.

Summarizing the above findings in terms of attachment patterns, certain hypotheses were supported, but others were not. For example, although security was associated with increased recall of happy events, it was unrelated to recall of events dealing with the importance of intimacy or low anxiety about love-worthiness (i.e., events associated with Bartholomew's two underlying attachment dimensions). Likewise, fearfulness was only associated with decreased recall of happy events despite predictions that fearfulness would be associated with the recall of events consistent with schemas of high anxiety about love-worthiness and avoidance of intimacy. More significant associations were observed for preoccupied ratings when analyses were analyzed separately according to current relationship status than when relationship status was not taken into account. For those individuals not in relationships, preoccupation was associated with increased recall of events dealing with the importance of intimacy. However, preoccupation was associated with *decreased* recall of events associated with high anxiety about love-worthiness. Dismissiveness was associated with decreased recall of happy events and increased recall of events regarding avoidance of intimacy. However, as in the case of security, dismissiveness was unrelated to events dealing with low anxiety about love-worthiness. Interestingly, when results for the dismissing rating were analyzed separately as a function of current relationship status, the above associations were only significant for those individuals not currently in relationships. In addition, a negative association emerged between dismissiveness and recall of approach events, suggesting that perhaps individuals not in relationships who scored high in dismissiveness defended against information inconsistent with schemas about intimacy-avoidance in close relationships.

In conclusion, although Study 2 provides some support for the notion that attachment schemas influence recall for schema-consistent events, the results are somewhat disappointing. Even when relationship status was taken into consideration, few significant associations emerged. Thus, the issue that must be addressed concerns why the present paradigm produced so few significant associations. One possible answer to this question may lie in the types of events employed. Four of the event types (low anxiety, high anxiety, approach, and avoidance) were generated to correspond to each pole of the two dimensions underlying Bartholomew's (1990) model of attachment. Unfortunately, this manner of deriving events may have been too simplistic. It may be that people do not hold such separate representations of events (e.g., events corresponding to approach alone). It may be more likely that people hold schemas of attachment events which reflect interactions of the self- and other-model. In an extensive theoretical review, Baldwin (1992) argues a similar point. He suggests that people represent their ideas of interpersonal relatedness in relational schemas. These schemas are hypothesized to include interpersonal scripts for interaction patterns, as well as joint representations of self and others in interpersonal situations. Thus, few significant findings may have emerged in the present study because the categorization of events was too simplistic and perhaps not very reflective of the complexity of information in attachment schemas.

Recent research suggests that people may have different attachment representations for various relationship types (Baldwin, Keelan, Fehr, Enns, & Koh-Rangarajoo, 1996). For example, some individuals may have general, overarching, secure models of their interpersonal experiences in which they view most others as trustworthy and dependable. However, they may also simultaneously hold insecure representations of their current relationship partner as untrustworthy, perhaps due to the partner recently violating their trust (e.g., the partner may have had an

extramarital affair). One of the problems with the current study was that individuals were asked to report on their general experiences in close romantic relationships. However, in the memory task, some participants probably then went on to imagine events involving a specific relationship and partner. The possibility that some people may have been imagining events for relationship schemas that were incongruent with their more general attachment schemas may have undermined obtaining significant associations between individuals' self-reports of general attachment schemas and event recall.

### General Conclusions

Over the past decade, research in attachment and adult close relationships has demonstrated that attachment representations influence relationship quality and functioning, generalized beliefs about partners, affective experiences, and how people interact with relationship partners (Shaver & Hazan, 1993). However, to date, few studies have examined the mental processes guiding the operation of attachment schemas in relationships. To address this issue, the present studies examined the influence of attachment schemas on two areas of cognitive processing - emotion encoding and memory.

Study 1 provided no indication that individuals appraise emotional information, as presented in facial expressions, in a manner consistent with their attachment schemas. In contrast, Study 2 did demonstrate a link between attachment and recall of new information. Specifically, some associations between attachment dimensions and event recall suggested that individuals may be likely to preferentially recall information that is consistent with their attachment schemas. However, taken together, the results from these two studies provide limited support for the influence of attachment schemas on cognitive processing.

One limitation of both studies may relate to the presumption that attachment schemas are easily accessible constructs which are activated when people

complete questionnaires about close relationships. In both Study 1 and Study 2, it was assumed that completing a series of questionnaires dealing with experiences, feelings, and expectations in close relationships would activate attachment representations. I expected that the effects of thinking about these attachment-related issues would then carry over to the social perception tasks - appraisal of facial expressions of emotion and event recall. However, it is unclear whether completing attachment-related self-report measures really did make attachment issues more salient for people in either study. Thus, the lack of findings in the two studies may be attributable to the inadequacy of attachment self-report measures in eliciting strong reactions. Future studies could examine the accessibility of attachment schemas and the impact of completing attachment-related self-report measures on social perception by including control groups in which individuals do not complete self-report measures about close relationships before engaging in experimental tasks.

It is important to study cognitive processes within a laboratory context to isolate and understand individual processes through which attachment schemas operate. However, one of the challenges presented by such research is in designing paradigms that have the same powerful impact as real life experiences, and which are as meaningful as real relationship events. For example, although the results of Study 2 do provide some evidence for the recall of schema-consistent information, it is difficult to speculate how such results relate, if at all, to attachment differences in recall of autobiographical memories. Autobiographical memories undoubtedly have a stronger affective component than memories for new information, such as the events presented in the current study. This affective component likely derives from the fact that individuals are active participants when real events occur to them, and thus probably have strong feelings about the events at time of occurrence. These strong feelings then likely become encoded as part of

the event. If autobiographical memories do contain more emotional information, the strategies employed in their retrieval may be quite different than those activated in the retrieval of new, laboratory-generated information.

One of the most important issues raised by the current research concerns how current relationship experiences and partners influence attachment schemas. It seems likely that current partner characteristics (e.g., supportiveness, emotional reactivity in negative situations), relationship quality (e.g., conflictual interactions), and relationship history (e.g., history of relationships where partners leave), in conjunction with attachment representations, have an impact on what information people attend to, encode, and eventually recall. An interesting implication of the analyses by relationship status in Study 2 was that perhaps stronger patterns of associations should be expected for people who are relying on general attachment schemas containing ideas about hypothetical others, as opposed to people who are relying on more relationship specific attachment schemas containing beliefs about particular partners. The weaker patterns of associations for people currently in romantic relationships might be expected, especially in research where people are asked to imagine relationship events, because of the underlying variability in real partner characteristics and behaviours, and the multitude of factors which contribute to relationship dynamics. It is unclear how people incorporate seemingly inconsistent partner behaviours into attachment schemas, and whether people with certain attachment schemas might deal with inconsistent information in different ways.

Related to this issue about the complexity and inter-workings of attachment schemas, it seems important to consider how best to assess these schemas. Because of concerns raised in Study 1 about the validity of the attachment self-report measure (RQ), additional measures were included in Study 2 to examine the validity of the composite attachment measure. The pattern of associations obtained

between the composite ratings and other attachment dimensions was as expected, confirming the construct validity of these continuous ratings of attachment. Despite these findings; however, it is important to be aware of the limitations of self-report indices of attachment. In particular, attachment self-report measures are subject to the operation of participants' self-presentational and self-deception biases (Griffin & Bartholomew, 1994a). Some researchers have suggested that self-reports of attachment schemas may be strongly influenced by current functioning in romantic relationships (Bartholomew, 1994), and have even argued that such attachment measures assess little more than current relationship dynamics, as opposed to any enduring attachment-related schemas (Kobak, 1994). Taking into consideration such comments, perhaps interview methods are more appropriate for assessing the rich complexity of attachment schemas (Bartholomew & Horowitz, 1991; Main, 1991). Although there is some degree of overlap between self-report and interview-derived attachment ratings (Bartholomew & Shaver, in press), the degree to which these different methods do *not* overlap suggests that a multi-method approach to data collection may be more productive in future work (Griffin & Bartholomew, 1994b).

In conclusion, results from the present studies provide limited insight into how attachment schemas shape our processing of social information. Study 1 provided no evidence that attachment schemas influence the appraisal of emotions, as presented in facial expressions. Findings from Study 2 did suggest that attachment schemas have an impact on event recall. However, results from this latter study need to be interpreted cautiously given that only a few significant associations emerged. More importantly, the current research has raised a number of interesting issues. One issue concerns social information processing differences in individuals who are relying on general attachment schemas containing ideas about hypothetical others, as opposed to individuals who are relying on more relationship specific

attachment representations containing beliefs about particular partners. A second issue concerns how to examine the impact of attachment schemas on cognitive processing in a laboratory setting. A challenge of laboratory research is to develop emotionally evocative tasks that are powerful enough to elicit differential responding as a function of attachment schemas.

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## Figure Caption

Figure 1. Bartholomew's Four-Category Model of Adult Attachment

**Model of Self  
(Anxiety)**

		<i>Positive (Low)</i>	<i>Negative (High)</i>
		<b>Secure</b>	<b>Preoccupied</b>
<b>Model of Other (Avoidance)</b>	<i>Positive (Low)</i>		
	<i>Negative (High)</i>	<b>Dismissing</b>	<b>Fearful</b>



Table 1

Alpha Coefficients for Specific Emotion Intensity Ratings for Different Models  
Depicting the Same Emotional Expression

Face Type	Intensity Rating	Alpha Coefficient
Happy	Happy	.83
	Sad	.71
	Anger	.72
	Fear	.77
Sad	Happy	.22
	Sad	.46
	Anger	.70
	Fear	.66
Angry	Happy	.21
	Sad	.76
	Anger	.69
	Fear	.64
Fear	Happy	.30
	Sad	.76
	Anger	.65
	Fear	.73

Table 2

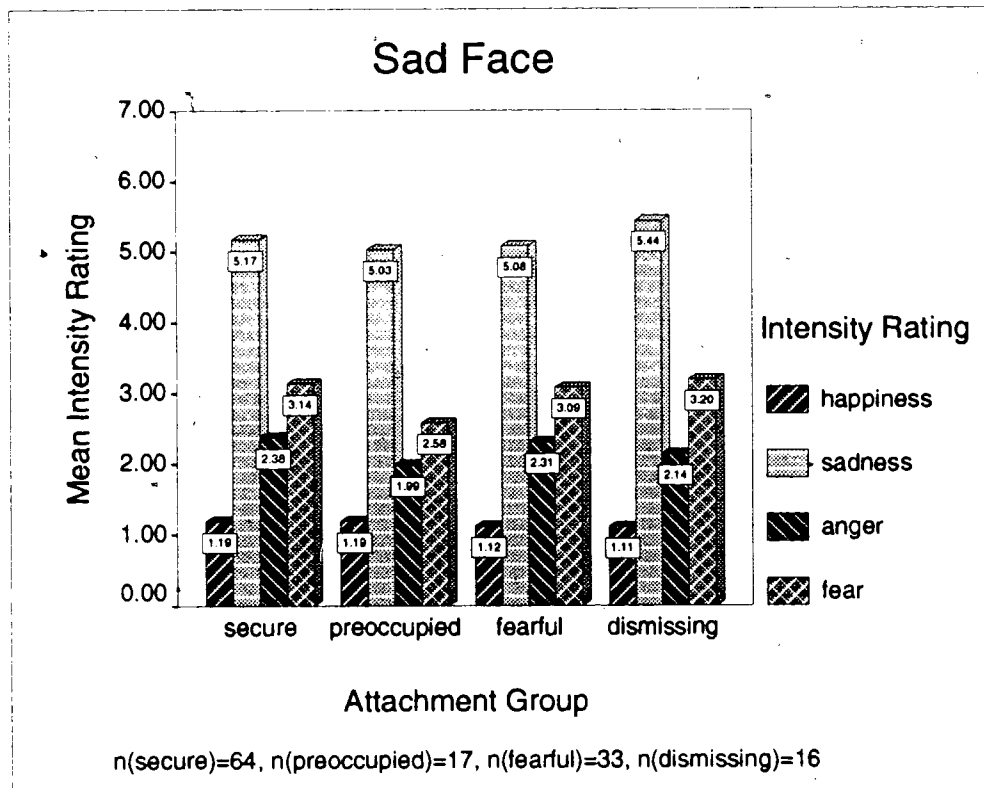
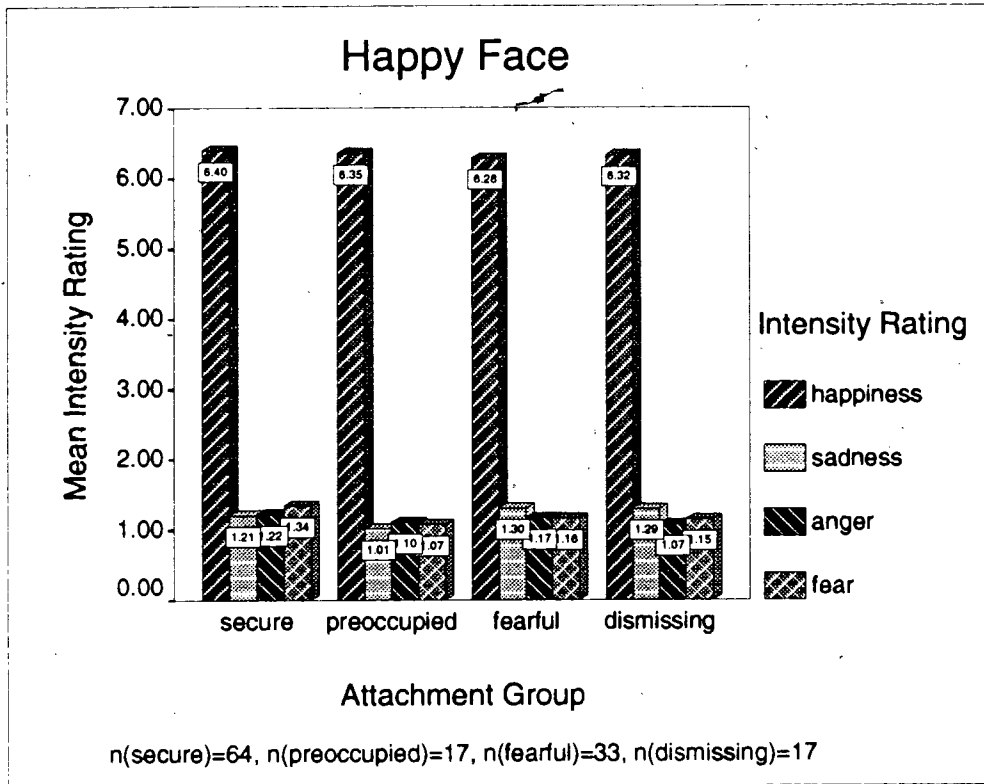
Means for Emotion Intensity Ratings Across Face Type

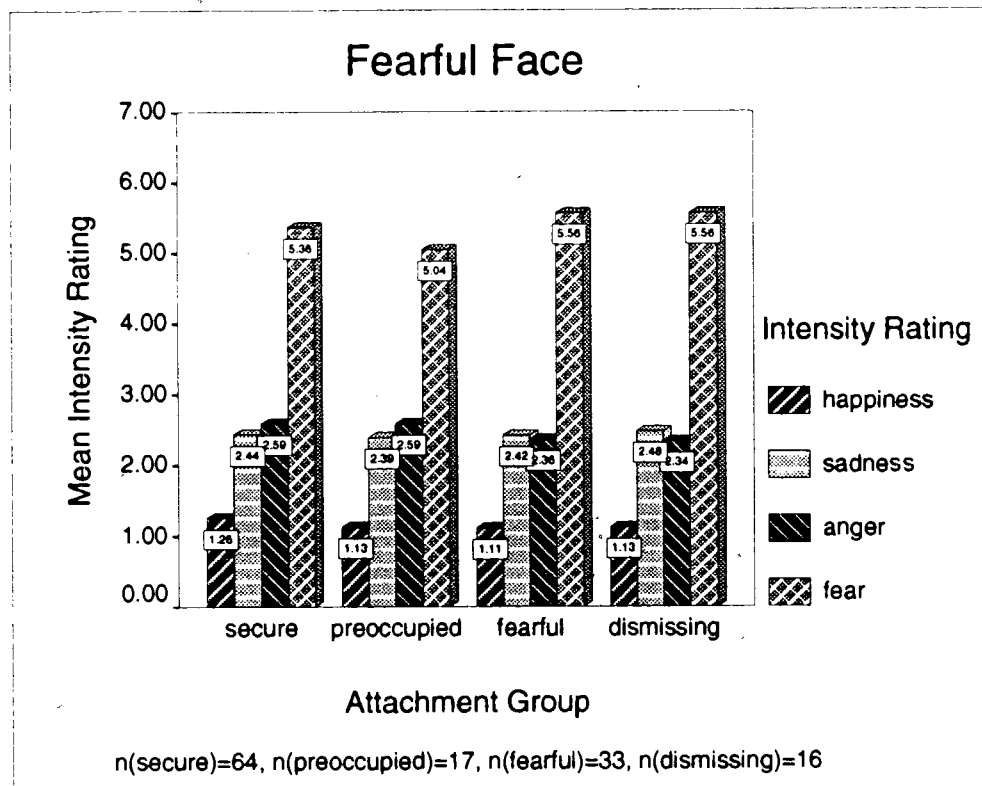
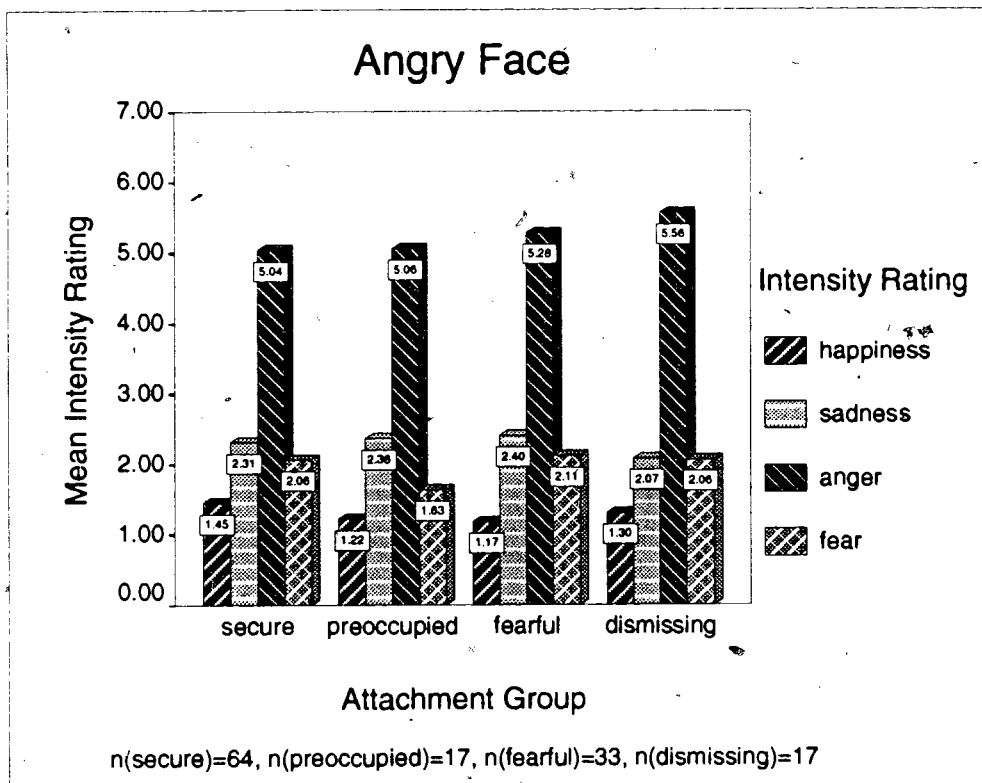
Intensity Ratings	Face Type	Mean
Happiness	Happy face	6.43
	Sad face	1.19
	Angry face	1.35
	Fearful face	1.15
Sadness	Happy face	1.16
	Sad face	5.26
	Angry face	2.45
	Fearful face	2.55
Anger	Happy face	1.15
	Sad face	2.15
	Angry face	5.23
	Fearful face	2.42
Fear	Happy face	1.23
	Sad face	3.23
	Angry face	2.11
	Fearful face	5.41

Figure Caption

Figure 2. Mean Emotion Intensity Ratings for Different Faces By Attachment

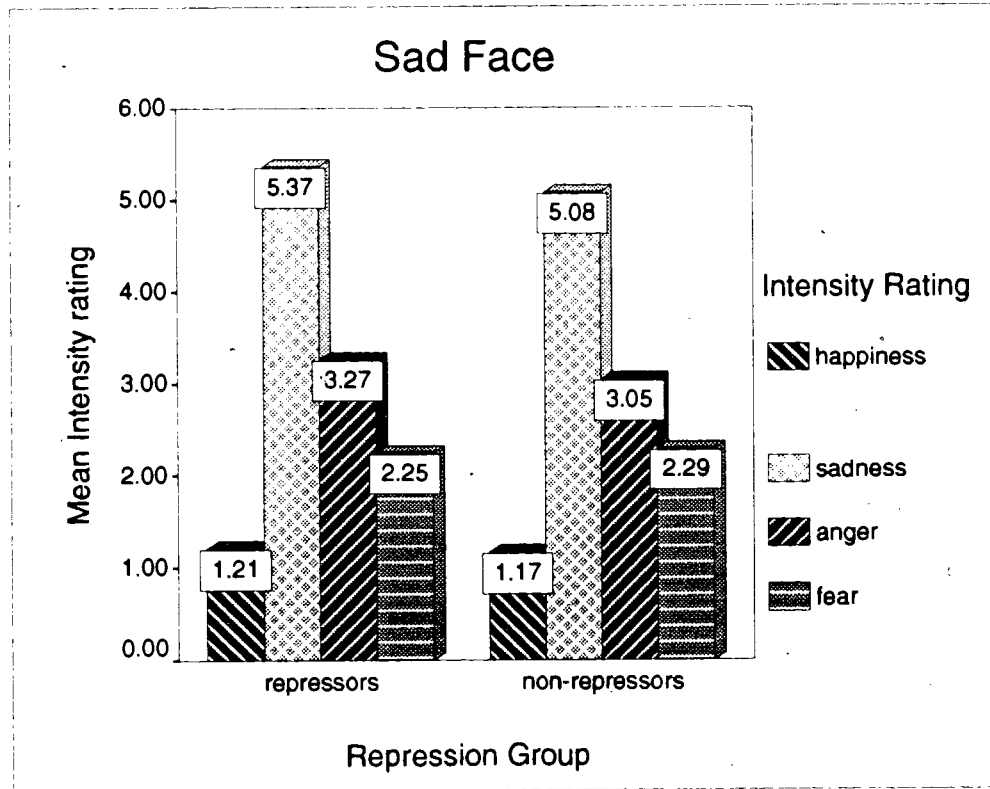
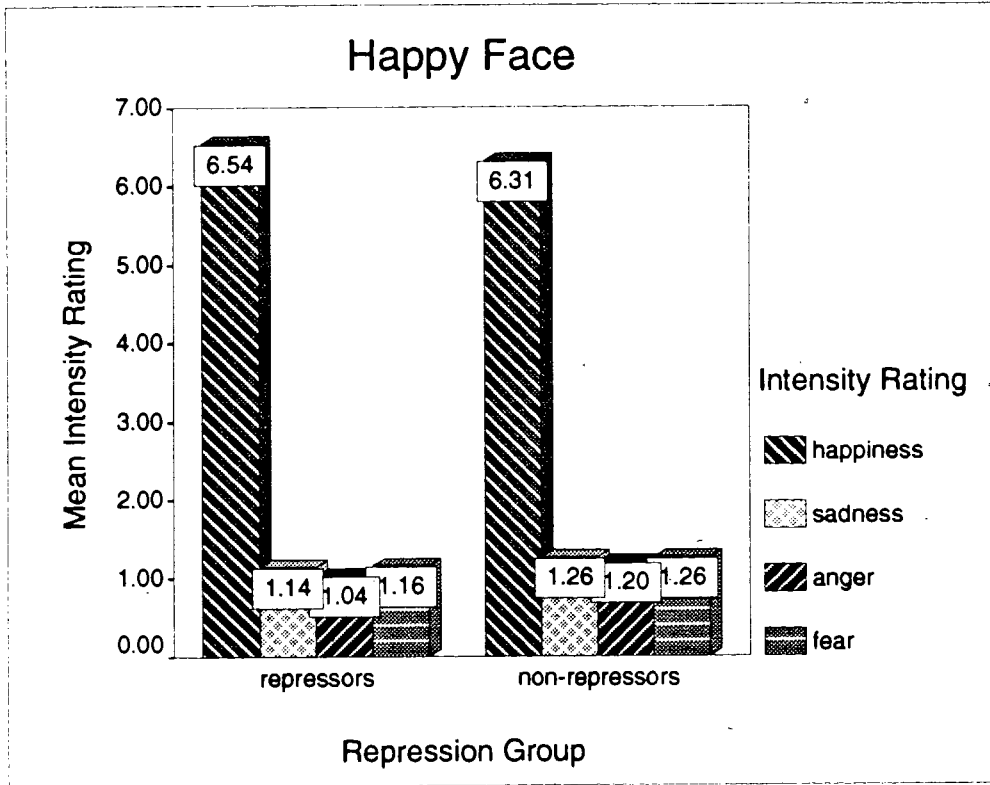
Group





## Figure Caption

Figure 3. Mean Emotion Intensity Ratings for Different Faces By Repressors  
Versus Non-Repressors



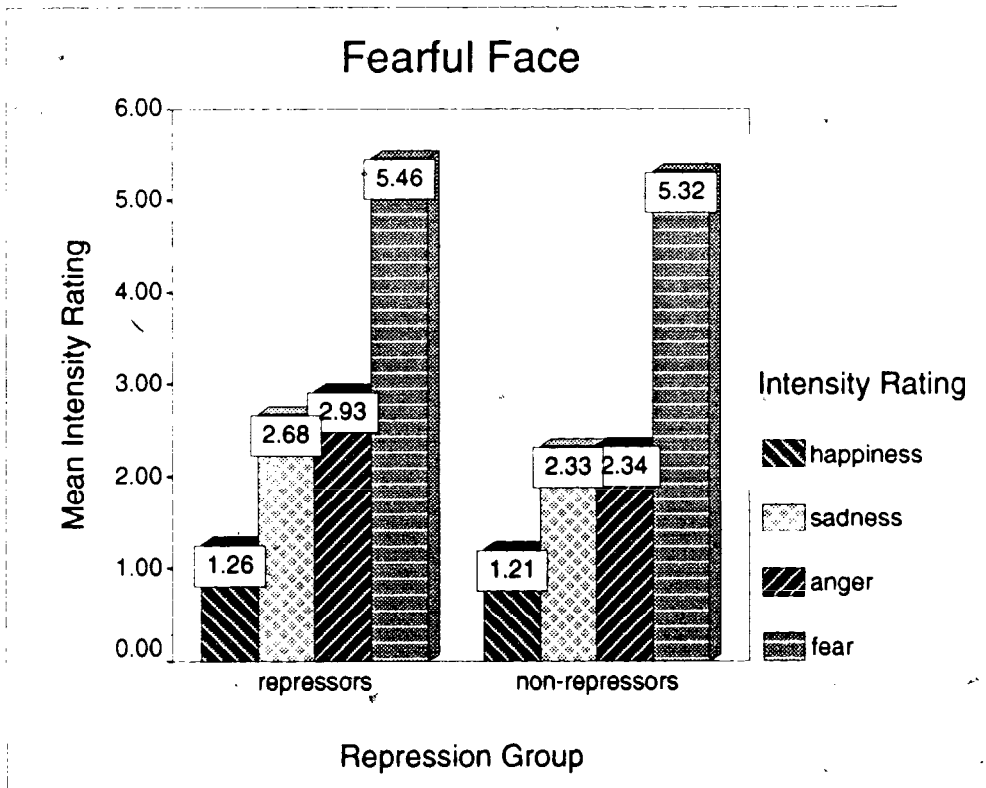
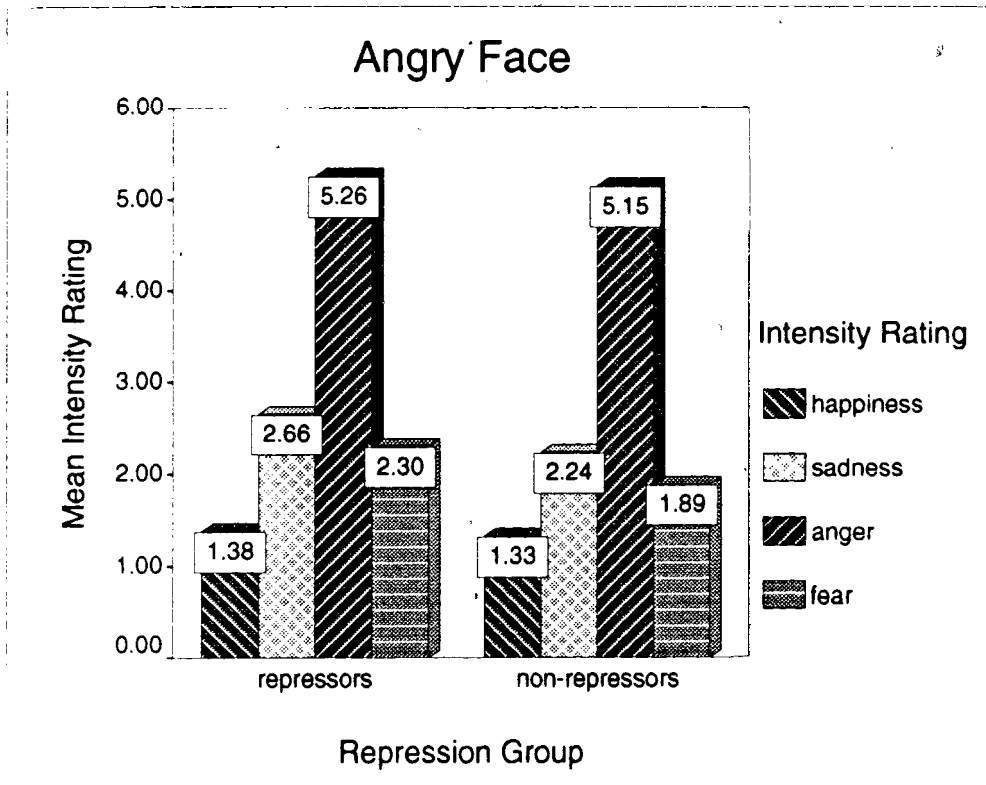




Table 3

Effects of Overall MANOVAs for Each Primary Facial Expression and  
Univariate Effects for Emotion Intensity Ratings Within Each Primary Facial  
Expression

Face Type	df	F
Happy face	(12, 378)	1.61
Happiness rating	(3, 127)	.13
Sadness rating	(3, 127)	1.17
Anger rating	(3, 127)	.49
Fearful rating	(3, 127)	1.58
Sad face	(12, 375)	.51
Happiness rating	(3, 126)	.40
Sadness rating	(3, 126)	.60
Anger rating	(3, 126)	.72
Fearful rating	(3, 126)	.77
Angry face	(12, 378)	1.34
Happiness rating	(3, 127)	2.31
Sadness rating	(3, 127)	.31
Anger rating	(3, 127)	1.35
Fearful rating	(3, 127)	.99
Fearful face	(12, 375)	.59
Happiness rating	(3, 126)	.89
Sadness rating	(3, 126)	.02
Anger rating	(3, 126)	.44
Fearful rating	(3, 126)	.90

Table 4

Correlations Between Four Continuous Attachment Dimensions

	Continuous Attachment Ratings <sup>a</sup>			
	Sécuré	Preoccupied	Fearful	Dismissing
Secure	-----	-----	-----	-----
Preoccupied	-.23*	-----	-----	-----
Fearful	-.68**	.09	-----	-----
Dismissing	-.19*	-.51**	.27**	-----

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

Table 5

Correlations Between Subscales on the ECR and Continuous Ratings of Attachment Representations

ECR Subscales	Continuous Attachment Ratings			
	Secure	Preoccupied	Fearful	Dismissing
Partner good attach. fig. ( $\alpha = .90$ )	.48***	-.19*	-.45***	-.01
Separation anxiety ( $\alpha = .90$ )	.17	.40***	-.18	-.39***
Self-reliance ( $\alpha = .82$ )	-.20*	-.42**	.28**	.70***
Discomfort with close. ( $\alpha = .92$ )	-.65***	-.04	.64***	.33***
Anger with partner ( $\alpha = .88$ )	-.32**	.47***	.42***	-.23*
Uncert. about feelings ( $\alpha = .91$ )	-.51***	.13	.49***	.18
Discomfort with dep. ( $\alpha = .85$ )	-.53***	-.07	.50***	.52***
Trust in partners ( $\alpha = .90$ )	.60***	-.37***	-.64***	-.14
Lovability ( $\alpha = .90$ )	.50***	-.28**	-.36***	.04
Repell. desire to merge ( $\alpha = .87$ )	-.27**	.65***	.27**	-.20*
Tough independ. ( $\alpha = .54$ )	-.19*	-.30**	.12	-.53***
Fear of abandon. ( $\alpha = .91$ )	-.47***	.60***	.42***	-.17

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 6

Means and Standard Deviations for Proportion of Events Recalled for Each Event Type

Event Type	M	SD
<b>Attachment-Relevant</b>		
Overall	.53	.13
Happy	.66	.27
Approach	.45	.24
Avoidant	.41	.30
High Anxiety	.64	.29
Low Anxiety	.53	.27
<b>Attachment-Irrelevant</b>		
Overall	.49	.17
Happy	.56	.35
Approach	.17	.33
Avoidant	.42	.30
High Anxiety	.57	.27
Low Anxiety	.52	.31

Table 7

Correlations Between Participants' Ratings of Positive and Negative Emotions and Continuous Ratings of Attachment

	Continuous Attachment Ratings			
	Secure	Preoccupied	Fearful	Dismissing
Negative emotions	-.18	.36***	.33***	.02
Positive emotions	.36***	-.21*	-.24*	.07

\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Table 8

Partial Correlations Between Attachment Representations and Number of Events  
Recalled, Controlling for Positive and Negative Emotion Effects

Event Type	Continuous Attachment Ratings			
	Secure	Preoccupied	Fearful	Dismissing
<b>Attachment-Relevant</b>				
Happy	.28***	.15	-.27***	-.24***
Approach	.16*	-.01	-.01	-.14
Avoidant	-.16*	.02	.06	.22**
High Anxiety	.06	-.23**	-.08	.07
Low Anxiety	-.06	-.11	.03	.10
<b>Attachment-Irrelevant</b>				
Happy	.04	.00	.00	.10
Approach	-.01	.07	-.07	-.14
Avoidant	.05	-.09	-.03	.12
High Anxiety	-.04	-.18*	.09	.10
Low Anxiety	.05	.04	-.08	-.10

\* $p \leq .10$  \*\* $p < .05$  \*\*\* $p < .01$

Table 9

Partial Correlations Between Attachment Representations and Number of Attachment-Relevant Events Recalled for Those In Versus Not In Relationships, Controlling for Positive and Negative Emotion Effects

Event Type	Continuous Attachment Ratings			
	Secure	Preoccupied	Fearful	Dismissing
In Relationship (n = 47)				
Happy	.34**	-.05	-.41***	-.20
Approach	.21	-.38**	.02	.14
Avoidant	-.10	.18	-.05	.12
High Anxiety	.01	-.20	.03	.16
Low Anxiety	-.10	-.04	.07	.20
Not In Relationship (n = 49)				
Happy	.24**	.38***	-.12	-.32**
Approach	.12	.27**	-.04	-.40***
Avoidant	-.21	-.14	.12	.28**
High Anxiety	.09	-.29**	-.17	.00
Low Anxiety	.02	-.15	-.06	-.05

\*p < .10 \*\*p < .05 \*\*\*p < .01

## Appendix A

**Relationship Questionnaire****PLEASE READ DIRECTIONS!!**

- 1) Following are descriptions of four general relationship styles that people often report. Please read each description and **CIRCLE** the letter corresponding to the style that best describes you or is closest to the way you generally approach close relationships.
- A.** It is easy for me to become emotionally close to others. I am comfortable depending on them and having them depend on me. I don't worry about being alone or having others not accept me.
- B.** I am uncomfortable getting close to others. I want emotionally close relationships, but I find it difficult to trust others completely, or to depend on them. I worry that I will be hurt if I allow myself to become too close to others.
- C.** I want to be completely emotionally intimate with others, but I often find that others are reluctant to get as close as I would like. I am uncomfortable being without close relationships, but I sometimes worry that others don't value me as much as I value them.
- D.** I am comfortable without close emotional relationships. It is very important to me to feel independent and self-sufficient, and I prefer not to depend on others or have others depend on me.
- 2) Now please rate each of the relationship styles above according to the extent to which you think each description corresponds to your general relationship style.

	<b>Not at all like me</b>			<b>Somewhat like me</b>			<b>Very much like me</b>	
<b>Style A.</b>	1	2	3	4	5	6	7	
<b>Style B.</b>	1	2	3	4	5	6	7	
<b>Style C.</b>	1	2	3	4	5	6	7	
<b>Style D.</b>	1	2	3	4	5	6	7	



## Appendix B

Event SentencesAPPROACH - Attachment-relevant

You cry in front of a friend.

You tell your sister/brother how much you appreciate her/his support.

Your partner cries when you are watching a sad movie together.

You call up your sister/brother to talk about your problems.

AVOIDANCE - Attachment-relevant

You go for a run to get your mind off your problems.

You don't reply when your partner tells you he/ she loves you.

You pull away when your partner tries to kiss you in front of a group of friends.

HIGH ANXIETY - Attachment-relevant

You are upset when you overhear a friend saying you are selfish and uncaring.

You feel sad when your good friend leaves you standing alone at a party.

You are upset when you see your partner having lunch with his/her former romantic partner.

LOW ANXIETY - Attachment-relevant

You assume your good friend must be busy when he/she does not telephone you for a week.

You enjoy spending some time alone when your partner goes out of town for the weekend.

You are supportive of your partner accepting a desirable job that will take him/her out of town for six months.

HAPPY - Attachment-relevant

You overhear your sister/brother saying you've been wonderfully supportive.

You feel good when your partner gives you a backrub.

You go for a romantic walk on the beach with your partner.

APPROACH - Attachment-irrelevant

You go door to door canvassing for your favourite charity.

A stranger calls you up on the telephone to ask for donations to a new charity.

AVOIDANCE - Attachment-irrelevant

You avoid a tourist asking for directions on the street.

You stay at home to read a book rather than go to a nightclub.

You decide not to carpool with your co-workers.

HIGH ANXIETY - Attachment-irrelevant

Your credit card gets rejected at the cashier.

You get a flat tire on a deserted street.

You lock your keys in your car.

LOW ANXIETY - Attachment-irrelevant

You feel very competent on the first day of your job.

You are not surprised when you receive a really good evaluation at work.

You feel you can handle any difficult task your boss throws at you on a busy day at work.

HAPPY - Attachment-irrelevant

You go on a shopping spree buying things you like.

You find out you have more money in the bank than you thought.

You plan a vacation in Hawaii on your favourite island.

## Appendix C

Zero-Order Correlations Between Attachment Representations and Number of  
Events Recalled

Event Type	Continuous Attachment Ratings			
	Secure	Preoccupied	Fearful	Dismissing
<b>Attachment-Relevant</b>				
Happy	.30***	.11	-.28***	-.23***
Approach	.15	-.01	-.01	-.14
Avoidant	-.16*	-.01	.08	.23**
High Anxiety	.00	-.13	.02	.07
Low Anxiety	-.08	-.07	.06	.09
<b>Attachment-Irrelevant</b>				
Happy	.05	-.03	-.04	.10
Approach	-.09	.11	-.01	-.16
Avoidant	.05	-.10	-.04	.12
High Anxiety	-.05	-.17*	.08	.10
Low Anxiety	.07	.02	-.09	-.09

\* $p \leq .10$  \*\* $p < .05$  \*\*\* $p < .01$