

Emotional reactions and regulatory responses to negative and positive events: Associations with attachment and gender

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Abstract In two studies, we examined inter-individual variability in responses to both negative and positive events. In the first study, participants (119 college students) reported on negative and positive events from their own lives. The second was an experiment in which participants (133 college students) were given either negative or positive feedback about their personality. With negative events, more insecure individuals, especially anxiously attached, evidenced more intense negative emotional reactions and greater processing of (i.e., ruminating on) negative experiences. With positive events, securely attached individuals and less anxiously attached engaged in greater processing of positive experiences (maximized), whereas more insecure individuals tended to minimize positive experiences. Gender differences for emotion regulation were moderated by either attachment or event type. Findings for negative events generally coincide with prior research, and those for positive events provide new evidence that attachment style could affect how people react to positive events and emotions.

Keywords Attachment · Gender · Emotion regulation · Coping · Positive emotions

Introduction

Although emotions are an innate, universal experience, how people choose to regulate or even interpret felt emotions could be learned as a result of extrinsic influences, such as socialization from parents or broader cultural norms (e.g., Fox and Calkins 2003). In this paper, we sought to understand inter-individual variability in people's emotional experiences by focusing on attachment style and gender. Although substantial research has shown that emotional development is affected by one's gender (Brody 1985, for a review) or attachment history (Mikulincer and Shaver 2007, for a review), we extend the literature by focusing on both immediate emotional reactions and regulatory strategies used in response to positive as well as negative events.

Emotion regulation (ER) involves how people may change the intensity, duration, or expression of activated emotions (e.g., Cole et al. 2004; Thompson 1994). Regulation of negative affect (NA) can be studied by examining coping responses to negative events. While some responses are adaptive (e.g., problem-solving, reappraisal; e.g., John and Gross 2004), others, such as rumination or avoidance, do not effectively downregulate NA (e.g., Nolen-Hoeksema et al. 1993; Wenzlaff and Wegner 2000). ER strategies can also be used with positive emotions, though much less is known about these types of responses (Thompson 1994). Maximizing responses, such as savoring (using strategies that enhance positive affect; Bryant 1989), capitalizing (expressing and marking positive events; Langston 1994), and positive rumination (thinking good things about oneself or how one feels; Feldman et al. 2008), have been linked to greater positive affect (PA) over time or high self-esteem (Gable et al. 2004; Wood et al. 2003). In contrast, minimizing responses, such as thinking that the feelings will not last, are associated with low self-esteem or

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depressive symptoms (Feldman et al.; Wood, et al.). Thus, greater reflection on or discussion about positive events or emotions may be an adaptive response that could enable people to reap more benefits of positive experiences.

Attachment

Attachment theory can be applied to understand the development of individual differences in ER (Bowlby 1973; Cassidy 1994). When parents are consistently responsive, children are likely to develop a secure attachment in which there is open communication of emotion and a readiness by the child to rely on the parent when distressed. However, unresponsive parents may result in children developing avoidant attachments where they minimize the emotional displays and attempt to become self-reliant. Inconsistent parenting may produce ambivalent or preoccupied attachments (also called anxious attachment) in which children heighten attachment behaviors and displayed affect in an attempt to elicit care or other responses (Cassidy 1994). When parents are abusive or psychologically unavailable, children may develop disorganized attachments where they come to fear the parent or develop both avoidant and anxious strategies. By adolescence, repeated experiences with multiple attachment figures become integrated into a general model of attachment (e.g., Kerns et al. 2005; Main et al. 1985).

In adulthood, attachment is similarly related to experiences of negative emotions. Secure individuals report relatively low to moderate negative emotional reactions compared to anxious and avoidant individuals (e.g., Pietromonaco and Feldman Barrett 1997), and they often rely on active or support-seeking strategies to cope with distress (e.g., Mikulincer et al. 1993). By contrast, insecure individuals report more intense reactions and rely on less adaptive strategies. Anxiously attached individuals tend to ruminate and have difficulty not thinking about negative experiences, whereas avoidantly attached individuals try to suppress or avoid thinking about NA and experiences (e.g., Fraley and Shaver 1997; Mikulincer and Orbach 1995; Saffrey and Ehrenberg 2007). Individuals with a fearful attachment style, which might have developmental origins with disorganized attachment (Simpson and Rholes 2002), tend to share characteristics of both anxious and avoidant attachment (Bartholomew and Horowitz 1991).

To our knowledge, ER with positive emotions has not been examined in relation to attachment, but research suggests that attachment security may be associated with a greater capacity to experience or reap benefits from PA (Diamond and Aspinwall 2003; Kerns et al. 2007; Mikulincer and Sheffi 2000). More secure individuals report more frequent or intense positive moods than insecure individuals (e.g., Bartholomew and Horowitz 1991; Magai

et al. 1995; Shiota et al. 2006). Also, relative to insecure individuals, secure adults have greater accessibility to memories of positive experiences (Mikulincer 1998b; Mikulincer and Orbach 1995) and do not later underestimate how good they felt after positive experiences (Gentzler and Kerns 2006). One possible explanation to be investigated in this study is that secure individuals engage in greater processing of positive experiences through reflection or discussion (i.e., more maximizing).

Gender

Family, peers, and culture define and encourage particular gender roles for emotional expression or regulation (Brody 1985; Eagly and Wood 1999). Parents communicate expectations about the value and appropriateness of emotions and ER to their children, and consequently, children learn to conform to these expectations (e.g., Fivush 2007; Wood et al. 1997). In U.S. culture women are expected to be more emotional than are men (e.g., Briton and Hall 1995; Plant et al. 2000). When interacting with their daughters compared to with sons, parents are more likely to focus on emotion and ER, and discuss emotions in more detail and in an interpersonal context (e.g., Dunn et al. 1987; Fivush 1991; Fivush and Sales 2006). Thus, parents differentially socialize their sons and daughters to express and regulate their emotions based on culturally prescribed gender roles (e.g., Garside and Klimes-Dougan 2002; Klimes-Dougan et al. 2007).

Gender differences in emotional experiences and ER show continuity into adulthood. Women report experiencing both positive and negative emotions more intensely than do men (e.g., Barrett et al. 1998; Fujita et al. 1991; Kring and Gordon 1998), though these differences may not hold when participants report immediate emotional reactions to events. In terms of ER, women are more likely to ruminate and seek social support than are men (e.g., Baker and Berenbaum 2007; Nolen-Hoeksema et al. 1993; Ptacek et al. 1994; Tamres et al. 2002). Studies on positive ER are limited, but women have reported a greater capacity to maximize positive outcomes and do specific savoring strategies (i.e., share PA, express emotions, and count blessings) compared to men (Bryant et al. 2005; Bryant and Verhoff 2007).

The present studies

The goal of this research was to investigate attachment and gender differences in how people vary in their emotional reactions and ER strategies. We extended the literature by examining emotional responses and ER in response to positive as well as negative emotional events. We examined our questions using two different methodologies. In our first study, we enhanced ecological validity by collecting

information on everyday events. Specifically, participants completed daily report forms on which they described events from their own lives and their emotional reactions. Several days later, they reported their ER responses to two of their events. Because participants' events could have been interpersonal or non-interpersonal, we also considered if emotional responses varied as a function of event type. We expected that attachment and gender differences would be stronger for interpersonal experiences than for noninterpersonal events, given that both develop within interpersonal contexts. In the second study, we enhanced internal validity by experimentally manipulating a target event. Participants were exposed to either a negative or positive interpersonal event, and we measured their immediate emotional reactions and ER. Exposing participants to a standard event minimized extraneous event characteristics not accounted for in the first study.

Hypotheses were that insecure individuals, especially those more anxiously attached, would report more intense negative emotional reactions, whereas those more securely attached (lower on both anxiety and avoidance) would report more intense positive emotional reactions. Gender differences were not expected in immediate reports of emotional reactions. Of particular interest with ER is how much individuals ruminate or reflect on emotional events. For participants' ER responses to negative events, we expected that more anxiously attached individuals would engage in more rumination, avoidantly attached individuals would engage in more avoidance, and securely attached individuals would report the highest levels of support-seeking. In response to positive events, we hypothesized that securely attached individuals would use more maximizing strategies (thinking or talking about positive events and emotions) compared to those less secure, whereas more avoidant individuals would minimize positive emotions and experiences. Regarding gender, we expected women to do more rumination, support-seeking, and maximizing compared to men.

Study 1

Method

Sample

Participants were 119 undergraduate students (58% women, $N = 69$) enrolled in general psychology classes, who volunteered for the study for class credit. Participants' ages ranged from 18 to 47 years ($M = 20.9$ years). The racial distribution of the sample was 79.8% Caucasian, 16.8% African-American, 1.7% Asian-American, .8% Latino-American, and .8% who did not specify ethnic

background. The original sample consisted of 133 participants, but 14 participants' data were excluded because the data were incomplete or because participants did not follow the procedure properly. Non-completers did not differ from completers on age, sex, or ethnicity, but non-completers did score lower on anxiety ($M = 2.73$) than completers ($M = 3.48$), $t(131) = -2.42$, $p < .05$.

Procedure

As part of a larger study (Gentzler and Kerns 2006), participants completed two lab sessions and 4 days of daily report forms. During the first session, participants completed an attachment measure and received forms and instructions for completing the daily-reports. They then completed daily report forms on their own across four consecutive days. They described their most negative and positive event within three time periods (morning, afternoon, and evening), and rated their immediate emotional reaction to each event. They were asked to complete each form at the end of each time period (i.e., at 1:00 pm, 6:00 pm, and before going to sleep) and told to skip a scheduled report if they did not fill it out within the designated time period. Participants were retained in the sample if they completed 75% of their daily reports.

About 8–10 days after completing and turning in their daily report forms, participants returned for a second session to complete additional questionnaires. They were given descriptions of the negative event that elicited the most intense negative emotional reaction and the positive event that elicited the most intense positive emotional reaction. If more than one event evoked the same emotional intensity response, an event was chosen at random. They then completed questionnaires to assess their ER responses to the events. One participant could not remember his positive event and two other participants' most intense positive events were more than 3 SDs below the mean in the immediate PA intensity, so these participants were excluded from the positive event analyses.

Measures

Attachment style At the first session, participants completed the Experiences in Close Relationships Questionnaire (ECR; Brennan et al. 1998). This 36-item questionnaire, with items rated from 1 (*strongly disagree*) to 7 (*strongly agree*), assesses avoidance and anxiety about close relationships. Scales of avoidance ($\alpha = .93$; $M = 2.87$, $SD = 1.15$) and anxiety ($\alpha = .90$; $M = 3.41$, $SD = 1.12$) about close relationships were computed by averaging the corresponding 18 items for each scale. Men were marginally higher on avoidance ($M_{\text{women}} = 2.72$; $M_{\text{men}} = 3.11$), $t(117) = -1.92$, $p = .06$, and were comparable to

women on anxiety ($M_{\text{women}} = 3.58, M_{\text{men}} = 3.35$), $t(117) = 1.15, p = .25$.

Emotional reactions On participants' daily report forms they briefly described the most negative and positive event that happened to them within each time period, and rated their immediate emotional reaction to each event using the *Positive and Negative Affect Schedule (PANAS; Watson et al. 1988)*. The measure consists of 10 negative emotions (e.g., upset; distressed) and 10 positive emotions (e.g., excited; enthusiastic) that participants rated using 7 point-scales (1 = *not at all*, to 7 = *extremely*). Scores were averaged to derive scales of NA ($\alpha = .80$) and PA ($\alpha = .82$). We only report on the participants' immediate emotional reaction for the one negative and positive event for which participants also reported their ER responses.

ER strategies At the second session, participants completed ER measures about one negative and positive event. Because we were particularly interested in further processing of events and emotions (or lack thereof) we included the rumination and avoidance scales, whereas support-seeking was examined because of its expected association with attachment security. Participants were instructed to answer questions only in relation to what they did for the particular event using a 7-point scale (1 = *did not do this at all*, to 7 = *did this a lot*).

The 7 rumination items ($\alpha = .77$) were a subset of items from the rumination scale in the Responses Styles Questionnaire (Nolen-Hoeksema and Morrow 1991). We selected items that described thinking about feelings or the event, rather than items more specific to symptoms of depression (e.g., feeling unmotivated or fatigue). Also for some items we replaced the words, sad or depressed, with general terms (e.g., 'I thought about how sad I feel' became 'I thought about how I felt') because participants' negative events elicited a range of negative emotions not exclusive to sad or depressed feelings. Scores for the rumination scale ranged from 1.00 to 6.43 ($M = 3.17, SD = 1.29$). The 7 avoidant items ($\alpha = .68$) and 8 support-seeking items were obtained from the Ways of Coping Checklist (Lazarus and Folkman 1984) or were derived from affect regulation responses from Parkinson and Totterdell (1999). The avoidant items focused on consciously trying not to think about one's negative emotions or the event (e.g., I tried to put it out of my mind). Scores ranged from 1.00 to 5.57 ($M = 3.03, SD = 1.13$). We dropped two support-seeking items because their inclusion lowered the scale reliability and they assessed being around others rather than specifically turning to others for support about the event. For this 6-item support-seeking scale ($\alpha = .87$), scores ranged from 1.00 to 7.00 ($M = 3.11, SD = 1.75$).

For the positive event, participants reported on the degree to which they maximized or minimized the event and their emotions. We defined maximizing responses as those where individuals expressed their feelings to others, marked the event's occurrence, or thought about the event or their feelings. Two items (i.e., I let others know about the event; I expressed my feelings in public) were obtained from Langston (1994). Authors created 6 other items designed to capture interpersonal sharing (e.g., I told friends or family what happened), or the continued processing of the positive event or feelings (e.g., I thought about how good I felt), which is similar to emotion-focused positive rumination (Feldman et al. 2008). We averaged responses to the 8 items to create the maximizing response to positive events scale ($\alpha = .82$). Scores ranged from 1.25 to 7.00 ($M = 3.99, SD = 1.30$). The minimizing scale included 5 author-created items and assessed the lack of reflection of or a dismissing response toward the event or one's feelings (e.g., I did not think about the event after it occurred; I decided the event was not that significant). Participants' responses to these 5 items were averaged ($\alpha = .77$), and scores ranged from 1.00 to 7.00 ($M = 2.24, SD = 1.35$). Maximizing and minimizing were negatively correlated, $r(116) = -.26, p < .01$, but not enough to warrant creating a single scale, which is consistent with other studies (e.g., with savoring and dampening, Wood et al. 2003).

Coding system for events Events were later coded based on whether they were interpersonal or non-interpersonal events. An event that mentioned another person(s) was coded as *interpersonal*, whereas an event that did not explicitly mention another person(s) was coded as *non-interpersonal*. Two individuals, blind to participants' other data, coded the events. Also, a subsample ($n = 116$) of events was independently coded by both people to assess reliability. The percent agreement in codes was 91.4% ($\kappa = .82$). Discrepancies were discussed and reconciled between the coders. For the negative events, 43 events (36.1%) were coded as interpersonal and 76 events (63.9%) were coded as non-interpersonal. For the positive events, 57 (47.9%) were coded as interpersonal, and 62 (52.1%) were coded as non-interpersonal. Whether participants reported on interpersonal or non-interpersonal negative or positive events was unrelated to their anxious and avoidance attachment scores and to their gender.

Results

We conducted a series of seven hierarchical regression equations using each emotional reaction and ER response as outcome variables. Predictors entered in the first step were event type, gender, and attachment dimensions (anxiety and avoidance). Interaction terms were entered in

Table 1 Results for hierarchical regression analyses predicting intensity of emotion reactions and emotion regulation responses in response to negative life events

	Responses to negative event ($N = 119$)							
	Negative affect		Ruminate		Avoid		Support-seek	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.17***		.10*		.05		.18***	
Gender		-.14		-.08		.05		-.23**
Event type		-.05		.17		-.14		.16
Anxiety (Anx.)		.33***		.26**		.13		.17
Avoidance (Avd.)		.16		-.05		.09		-.22*
Step 2	-		-		-		.03*	
Gender \times Event		-		-		-		-.26*

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

Event type: 0 = non-interpersonal; 1 = interpersonal. Gender: 0 = Females; 1 = Males

the second step using a stepwise procedure so that only significant terms remain in the models. All continuous variables were centered (Aiken and West 1991).

Responses to participants' most intense negative event

As shown in Table 1, anxiety was positively associated with more intense immediate negative reactions and greater levels of rumination. Higher avoidant attachment was related to less support-seeking. Women reported greater amounts of support-seeking, but this finding was qualified by an interaction with event type (see Fig. 1). Follow-up analyses indicated that women reporting on an interpersonal event used more support-seeking than women reporting on a non-interpersonal event, $F(1, 67) = 5.48$, $p < .05$, but for men, the type of event did not affect their level of support-seeking, $F(1, 48) = .00$, $p = .96$. Also, gender differences were significant for those reporting on an interpersonal event, $F(1, 41) = 10.18$, $p < .01$, but not

those reporting on non-interpersonal events, $F(1, 74) = 2.91$, $p = .09$.

Responses to participants' most intense positive event

For the intensity of immediate positive emotional reactions and maximizing responses to positive events, no main effects were found, but Gender \times Event Type \times Avoidance interactions emerged (see Table 2). Follow-up analyses (Event \times Avoidance interactions, separately by gender) were conducted to unpack these interactions. However, there were no significant simple effects, possibly due to the reduced power when examining subsets of the dataset. Therefore these results are not discussed further. For minimizing responses to the positive event, results indicated that participants reporting on a non-interpersonal event did more minimizing than those reporting on an interpersonal event. Also, higher levels of anxiety and avoidance were associated with more minimizing.¹

Discussion

Responses to negative events

For negative events, the findings were mostly consistent with prior research and our hypotheses. We found that for their most negative event across the 4-day period, more

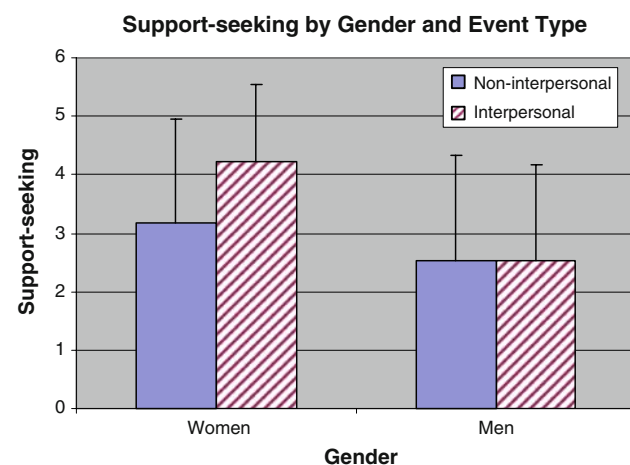


Fig. 1 Mean levels of support-seeking by gender and event type

¹ Most studies examine average levels of emotional intensity rather than levels from peak events as we did. As a result, we also examined average levels of NA and PA (across the 12 negative events and 12 positive events). For average NA intensity, both anxiety ($\beta = .33$, $p < .001$) and avoidance ($\beta = .22$, $p < .01$) predicted more intense NA, with the anxiety finding paralleling our result for NA intensity for the worst event. For the average PA, anxiety predicted more intense reactions ($\beta = .24$, $p < .05$) and similar to our finding for the peak, positive event there was a Gender \times Event type \times Avoidance interaction ($\beta = -.21$, $p < .05$).

Table 2 Results for hierarchical regression analyses predicting intensity of emotion reactions and emotion regulation responses in response to positive life events

	Responses to positive event ($N = 116$)					
	Positive affect		Maximize		Minimize	
	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.04		.09*		.17***	
Gender		-.08		-.17		-.08
Event type		-.05		.15		-.24**
Anxiety (Anx.)		.18		.02		.19*
Avoidance (Avd.)		.02		-.15		.25**
Step 2	.03*		.06**		–	
Gender \times Event \times Avd.		.26*		.28**		–

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

Event type: 0 = non-interpersonal; 1 = interpersonal. Gender: 0 = Females; 1 = Males

anxiously attached individuals reported more intense negative emotional reactions and engaged in more rumination. The effects were not stronger for interpersonal events, however, as might be expected due to their preoccupation with relationships. No effects emerged for avoidant coping. This scale tapped conscious suppression of thoughts about the negative event or resulting NA. As posited by Fraley and Shaver (1997), avoidantly attached adults' avoidance of negative thoughts may be automatic, and not require conscious effort to suppress. Support-seeking was negatively related to avoidant attachment, which was expected given that a defining characteristic of avoidant adults is habitual self-reliance and feeling uncomfortable depending on others for support (e.g., Mikulincer and Shaver 2007).

Additionally, women reported more support-seeking than men, but only for those participants who were reporting on an interpersonal event. This pattern is consistent with evidence showing that gender is more relevant for responses to interpersonal than impersonal situations (Eschenbeck et al. 2007). Women reporting on an interpersonal event also engaged in more support-seeking than did women reporting on a non-interpersonal event, consistent with evidence that interpersonal events may elicit more support-seeking than non-interpersonal stressors (Baker and Berenbaum 2007).

Responses to positive events

For positive experiences, our findings were mixed. We expected that those scoring low on both avoidance and anxiety (i.e., more secure) would report more intense PA and higher levels of maximizing, and that women would do more maximizing. Although we did not find attachment differences for intensity of positive affect, results for minimizing responses were mainly in line with hypotheses. People who scored higher on anxious and avoidant

attachment did more minimizing with their positive experiences. Because insecurely attached adults are downplaying the significance of or not thinking about their positive experience, they may not reap as many benefits from positive events that others do. We also found that minimizing was more common for those responding to a non-interpersonal event compared to an interpersonal event. Many non-interpersonal events involved getting a good grade on an exam, thus there may be limited time that a college student can rejoice about a single exam grade in one class given the frequency of evaluations for most college students.

Conclusions

Study 1 had ecological validity because participants were reporting on ER in response to particular events from their own lives. However, we only accounted for one aspect of the situation (interpersonal or not). Differences in reactions and ER may be due to other aspects of the situation that covary with both attachment and ER. For example, more anxious individuals' negative events might actually be more objectively stressful, and as a result, elicit more NA and ER responses. Thus, in a second study, we examined emotional reactions and similar ER strategies using an experimental design to reduce contextual effects, which complemented and strengthened our conclusions from study 1.

Study 2

In this experimental study, participants were randomly assigned to receive either positive or negative feedback from a confederate posing as another study participant. We examined change in affect as a result of the task. Because of our particular interest in people's tendency to further

process negative and positive experiences (similar to ruminating or maximizing), we used a stream-of-consciousness thought report task to measure ER.

A limited number of studies have examined attachment and emotion using an experimental design (Carnelley et al. 2007; Collins and Feeney 2004; Fraley and Shaver 1997; Mikulincer 1998a; Pereg and Mikunlincer 2004; Rholes et al. 1999; Simpson et al. 1992). For instance, Mikulincer (1998a) found that insecure individuals' moods became less positive after failure feedback, but secure individuals' moods were not affected. In a study where couples were unobtrusively videotaped after female participants were told they would have to do a stressful task, participants' emotional expressions and coping responses were related to attachment style (specifically women's support-seeking and expressions of anxiety and anger, and men's support-giving and expressions of anger; Rholes et al.; Simpson et al.).

Hypotheses for the second study mirror those for Study 1. We expected that insecure individuals, particularly those higher on anxiety, would show greater increases in NA (or decreases in PA) as a result of negative feedback. Hypotheses were less clear for the positive feedback condition. Secure individuals may have more positive emotional reactions, but alternatively, they may not show an increase in PA because they have a relatively positive mood at baseline or they are generally less reactive to feedback. Also, if insecure individuals receive better ratings than they expect, they may increase PA more than secure individuals do. Women and men were not expected to differ in their emotional reactions to the feedback.

For the ER task, participants engaged in a 5-min stream-of-consciousness thought report after receiving the feedback and rating their emotional reactions, similar to Fraley and Shaver's (1997) procedure used to assess thought suppression. The method provides data on how much attention individuals focus on the event and their emotions, similar to the ruminating and maximizing scales in the first study. Hypotheses were that for the negative feedback condition, more anxious individuals would have more thoughts about the feedback, whereas more avoidant individuals would have fewer thoughts about the feedback. For the positive feedback condition, more securely attached individuals (those scoring low on both avoidance and anxiety) were expected to show evidence of greater processing of the positive event or their emotions. Women were expected to display greater processing of the experience due their tendency to focus on emotions with interpersonal experiences. However, gender may interact with attachment and feedback condition, such that more securely attached women think more about positive feedback, whereas more anxiously attached women think more about negative feedback.

Method

Participants

Participants were 133 undergraduate students (55.6% women) between 18 and 30 years of age ($M = 19.05$). The racial distribution was: 85.7% Caucasian, 10.5% African-American; 1.5% Latino-American; .8% Asian-American; and 1.5% not specified. They were enrolled in general psychology and recruited from mass testing sessions across two semesters. Although 134 students completed the study, one participant was dropped because during the debriefing he explained that a previous participant had told him the true purpose of the study.

Procedure

At mass testing sessions at the beginning of each semester, participants completed the Relationship Questionnaire (RQ; Bartholomew and Horowitz 1991) where respondents select the attachment style (secure, preoccupied, dismissing, or fearful) that is most descriptive of them. We used the brief RQ questionnaire to select participants so that we could recruit sufficient numbers of participants fitting different attachment groups. However, as in the first study we used the ECR measure, which is given at the experimental session, for analyses. Students who were contacted and agreed to participate came to the lab individually to complete the study.

The sessions involved one participant and one same-sex confederate. The confederate was blind to the participant's condition (negative or positive). The experimenter informed participants (and confederates) that the study was about first impressions. They first completed mood and attachment measures in separate rooms. Participants then had a 5-min conversation with the confederate. The dyad was informed to have a conversation as they would in normal, everyday life when meeting someone for the first time (similar to Wilson and Henzlik 1986). The experimenter set the timer for 5 min and returned when the time expired.

After the conversation, the participant and confederate returned to separate rooms to complete remaining questionnaires. Participants were asked to rate the confederate using a list of 12 positive characteristics (e.g., friendly, intelligent, likeable) on a 9-point Likert scale (1 = *not at all descriptive*, and 9 = *very descriptive*). Once participants rated the confederate, they were told that because accuracy of first impressions is an important component of the study, they would get to see how the other person rated them. Instead, they were randomly given a standard rating sheet that was either *positive feedback* or *negative feedback*. For the positive feedback condition, all ratings were at the high end of the scale (7's, 8's and 9's), whereas

ratings for the negative feedback condition were relatively low (3's, 4's, and 5's). After viewing the feedback, participants completed a second mood measure, thought report, and other questions.

At the end of the experiment, the experimenter fully debriefed participants by explaining that they were randomly assigned to receive standard ratings which were not written by the confederate or based on their conversation. Participants were also told that the confederates were not shown how participants had rated them. Confederates remained in the room during the debriefing, which validated the experimenter's explanation of the study's true purpose.

Measures

Attachment Participants completed the same ECR Questionnaire from Study 1 (Brennan et al. 1998). Scales of avoidance ($\alpha = .94$; $M = 2.86$, $SD = 1.13$) and anxiety ($\alpha = .93$; $M = 3.67$, $SD = 1.19$) about close relationships were derived. Men and women did not differ on these scales.

Initial mood and emotional reactions Participants completed the PANAS (Watson et al. 1988) at the beginning of the session prior to having the conversation with the confederate and immediately after viewing the feedback. Participants were instructed to complete the questionnaire based on how they feel "right now, at the present moment." The 10 positive emotions and 10 negative emotions, rated from 1 (*not at all*) to 7 (*extremely*), were averaged to create scales of PA (PA pre-task, $\alpha = .87$; PA post-task, $\alpha = .87$) and NA (NA pre-task; $\alpha = .88$, NA post-task, $\alpha = .88$). We examined post-task scores (while controlling for pre-task) to index their affective reactions to the feedback.

Stream-of-consciousness thought report Participants then completed a 5-min stream-of-consciousness thought report task. They were asked to write down every thought they had for the next 5 min regardless of what the thought pertained to. The experimenter timed participants and informed them when to begin and end writing.

Responses were later coded. Coders were blind as to the participants' other data and feedback condition. Responses were first broken into thought units, which most often were separate sentences. One research assistant scored thought units for all participants. A second person scored data from 30 participants (22.6%) to assess reliability. The percentage of agreement was 95.4%, based on the final number of thought units.

Each thought unit was coded by its subject matter and affective valence. Three subject categories were used: *feedback-related* (thoughts related to the feedback received

or their conversation with the confederate); *experiment-related* (thoughts related to the experiment more generally), and *unrelated* (thoughts not related to the experiment). These categories were further differentiated by their affective valence: *negative*, *positive*, or *neutral*. Thus, each thought unit was placed into one of nine mutually exclusive categories. One person coded all thought units into one of the 9 categories. To assess reliability of the codes, a second person coded 36 participants' data (27.1%). The coders matched on 83.9% of codes ($\kappa = .77$).

Because participants varied in the number of thought units (ranged from 4 to 19), percentages of coded thought units were analyzed rather than frequencies. Also, because the percentage data were positively skewed, an arcsine transformation was performed. The transformed data are used in all analyses, but for ease of interpretation, the means for untransformed data are used in figures. Also, although we coded three neutral categories, we only analyze the positive and negative thoughts because of their relevance to our hypotheses.

Accuracy of feedback and view of the confederate At the end of the protocol, participants were asked two questions about the accuracy of the ratings that they received. These two items, which were correlated ($r(131) = .54$, $p < .001$), were averaged to obtain an *accuracy* index. Also, to get a sense of participants' view of the confederate after seeing the feedback, participants were asked two questions about how much they enjoyed the conversation and would like to see the confederate again. These two items were correlated, $r(131) = .58$, $p < .001$, and were averaged as an *enjoyment* index. Items were answered on 7-point scales, with higher scores indicating greater agreement. We report on these indices as a manipulation check to show whether our task and feedback condition were effective.

Results

Manipulation check

Results showed that participants in positive feedback condition ($M = 4.80$) viewed their feedback as more accurate than those in the negative condition ($M = 2.66$), $t(131) = 11.50$, $p < .001$, and experienced more enjoyment of the task ($M = 5.72$) than those in the negative condition ($M = 4.37$), $t(131) = 10.04$, $p < .001$. These findings suggest that the two conditions were viewed as we intended. Gender and attachment were unrelated to these indices.

Emotional reactions

To examine how individuals reacted to the feedback, two hierarchical regression analyses were run using post-test

Table 3 Results for hierarchical regression analyses predicting intensity of emotion reactions and emotion regulation responses using the thought report task in response to personal feedback ($N = 133$)

	Post-task emotional reactions				Emotion regulation (percentage of thoughts)					
	Negative affect (NA)		Positive affect (PA)		Negative feedback-related		Positive experiment-related		Negative unrelated	
	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2	β
Step 1	.57***		.64***		.13***		.07		.15***	
Gender (Gen.)		-.07		.07		-.12		.03		-.07
Condition (Cond.)		.06		-.24***		.33***		-.19		-.03
Anxiety (Anx.)		.20**		-.04		.11		-.14		.33***
Avoidance (Avd.)		.03		.01		.11		-.14		-.20*
Pre-task NA		.66***		–		–		–		–
Pre-task PA		–		.76***		–		–		–
Step 2	–		–		.07***		.07**		.04*	
Cond. \times Gen. \times Avd.		–		–		.28***		–		–
Cond. \times Anx.		–		–		–		.36**		–
Anx. \times Avd.		–		–		–		–		-.19*
Step 3	–		–		–		.03*		–	
Anx. \times Avd.		–		–		–		.17*		–

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

Condition: 0 = positive; 1 = negative. Gender: 0 = Females; 1 = Males

PANAS scores as outcomes and using feedback condition, gender, attachment scores (anxiety and avoidance), and the pre-task PANAS score (to control for initial mood) as predictors. As shown in Table 3, pre-task NA strongly predicted post-task NA, but anxiety also was significantly related. Participants scoring higher on anxious attachment had greater increases in NA, regardless of whether they received positive or negative feedback in the experiment. For PA reactions, pre-task PA was a strong predictor, and feedback condition also predicted change in PA. Participants in the negative condition showed a greater decrease in PA intensity compared to those in the positive feedback condition.

Emotion regulation (thought report task)

To examine participants' thoughts, data again were analyzed using hierarchical regression analyses, with gender, feedback condition, and attachment dimensions entered in the first step, and their interactions entered stepwise in the second block. No significant results were found for positive feedback-related thoughts, negative experiment-related thoughts, or positive unrelated thoughts. Significant results are shown in Table 3.

For negative feedback-related thoughts, a feedback condition effect indicated that the percentage of these thoughts was higher in the negative than positive condition. Also, a Condition \times Gender \times Avoidance interaction emerged (see Fig. 2). To follow up the interaction,

regression analyses first were run for men and women separately. No significant associations were found for women, but a Feedback \times Avoidance interaction emerged for men, $R^2 = .29$, $F(4, 54) = 5.61$, $p < .001$, $\beta = .53$, $t = 3.47$, $p < .001$. Regression analyses computed separately by condition showed that avoidance was unrelated to negative feedback-related thoughts for men in the positive condition, but it was related in the negative condition, $R^2 = .29$, $F(2, 27) = 5.63$, $p < .01$. Specifically, higher avoidance predicted a higher percentage of negative feedback-related thoughts for men in the negative condition, $\beta = .48$, $t = 2.98$, $p < .01$.²

For positive experiment-related thoughts, two interactions were found: Condition \times Anxiety, and Anxiety \times Avoidance. Follow-up tests for the first indicated that anxiety was unrelated to positive thoughts about the experiment in the negative condition, $R^2 = .02$, $F(1, 65) = 1.02$, $p = .32$, but was related in the positive feedback condition, $R^2 = .15$, $F(1, 64) = 11.07$, $p < .001$ (see Fig. 3).

² We had expected these thoughts to be self-focused thoughts characteristic of rumination and thus more prevalent for anxiously attached individuals. A posthoc interpretation of our findings was that these negative feedback-related thoughts instead comprised disparaging remarks toward the confederate, which is consistent with avoidant individuals being viewed as hostile (Kobak and Sceery 1988). Posthoc coding of these thoughts, based on whether they reflected negatively on the self versus the confederate, showed that for men in the negative condition, higher levels of avoidance related marginally to a higher number of negative thoughts about the confederate, $r(10) = .59$, $p = .057$, but not about the self, $r(10) = .04$.

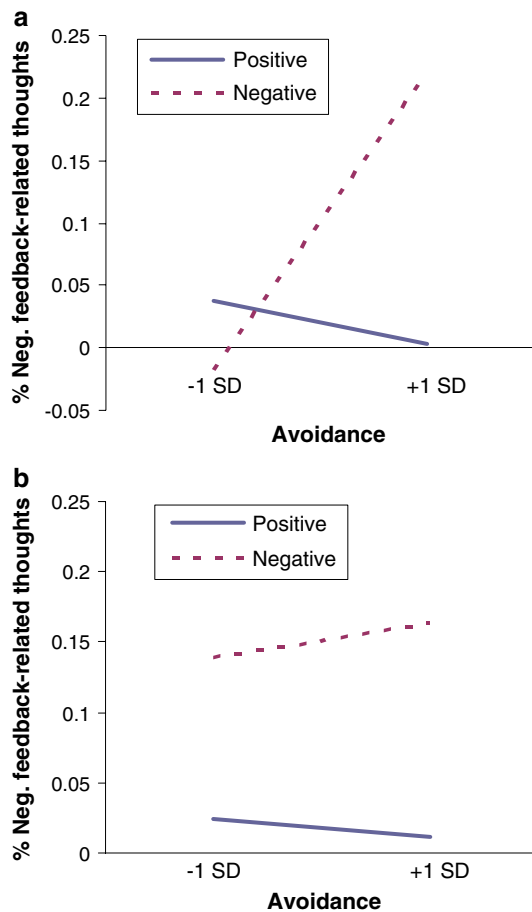


Fig. 2 Negative feedback-related thoughts for men (a) and women (b)

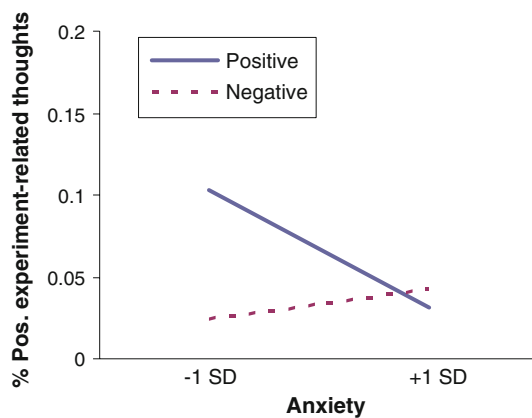


Fig. 3 Positive experiment-related thoughts by anxious attachment and feedback condition

Specifically, those scoring lower on anxious attachment had a higher percentage of positive experiment-related thoughts, $\beta = -.38, t = -3.33, p < .001$, than those higher on anxious attachment. The second interaction emerged because for those scoring high on avoidance, anxiety was unrelated

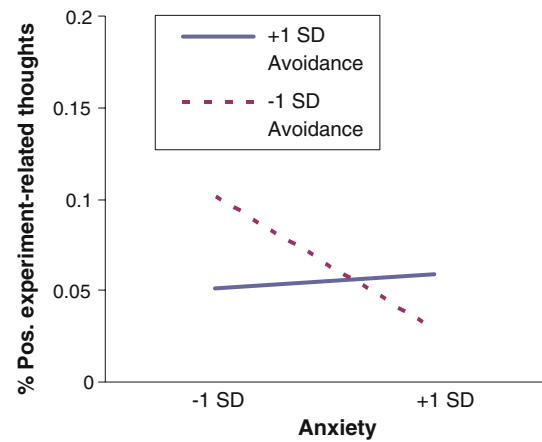


Fig. 4 Positive experiment-related thoughts by anxious and avoidant attachment

to positive experiment-related thoughts, $R^2 = .01, F(1, 55) = .41, p = .53$, but for those low on avoidance, anxiety was related, $R^2 = .17, F(4, 71) = 3.74, p < .01$ (see Fig. 4). Specifically, for those low on avoidance, less anxiety was associated with a higher percentage of positive thoughts about the experiment, $\beta = -.27, t = -2.41, p < .05$. In other words, the more securely attached individuals (those low on anxiety and avoidance) tended to have more positive thoughts about the experiment.

Finally, for negative thoughts unrelated to the experiment, higher levels of anxious attachment and lower levels of avoidant attachment were associated with a higher percentage of unrelated negative thoughts. Additionally, an Anxiety \times Avoidance interaction qualified these effects (see Fig. 5). For those scoring low on avoidance, anxiety was related to a higher percentage of negative thoughts unrelated to the experiment, $R^2 = .14, F(1, 74) = 12.11, p < .001, \beta = .38, t = 3.48, p < .001$, but for those scoring high on avoidance, anxiety was still associated, but less

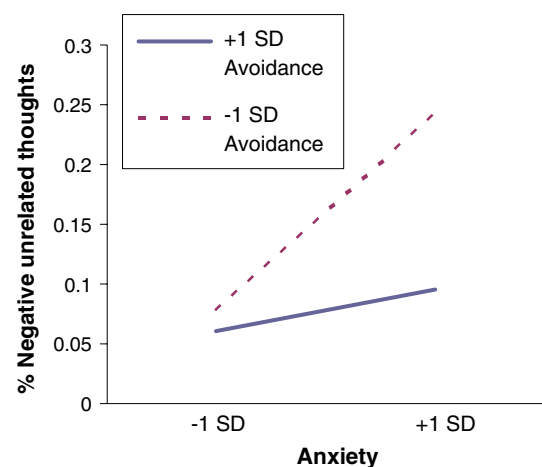


Fig. 5 Negative unrelated thoughts by anxious and avoidant attachment

strongly, with more negative unrelated thoughts, $R^2 = .07$, $F(1, 55) = 4.16$, $p < .05$, $\beta = .27$, $t = 2.04$, $p < .05$. Thus, the relationship between anxiety and a percentage of negative unrelated thoughts was stronger for those who are low on avoidance (i.e., people fitting a preoccupied attachment style).

Discussion

Emotional reactions

Our results for the emotion reports show that more anxiously attached individuals were more reactive to the feedback because their NA intensity increased more than less anxiously attached participants did, which is consistent with prior research (Carnelley et al. 2007; Collins and Feeney 2004). Interestingly, this effect did not interact with feedback condition, suggesting that anxious attachment not only is associated with more intense negative reactions to negative feedback, but it may predispose people to interpret relatively positive or neutral events in a negative light (e.g., Collins 1996). People's level of PA was not influenced by gender or attachment, though it decreased more for those in the negative condition.

Emotion regulation

The stream-of-consciousness thought report task yielded effects for attachment, gender, and experimental condition. First, men who reported more avoidance of close relationships had a higher percentage of negative thoughts that pertained to the feedback or the confederate. This was unexpected because avoidance is usually associated with attempts to disengage from NA to prevent activation of the attachment system (e.g., Fraley and Shaver 1997; Pereg and Mikunlincer 2004). Our posthoc analysis (see footnote 2) suggested that our finding might be due to avoidant men having negative thoughts about the confederate, which may reflect both avoidant individuals' and men's proclivity for outward-directed emotions and regulatory strategies (Brody 1985; Fivush 1991; Kobak and Sceery 1988). However, given the small number of men in the negative condition with negative feedback-related thoughts and the posthoc nature of the analysis, this finding is speculative and requires replication. A second result was that more anxiously attached individuals, particularly those lower in avoidance (i.e., preoccupied), had a higher percentage of negative thoughts unrelated to the experiment, regardless of the feedback condition. The evidence that anxiety about close relationships was associated with more negative thoughts, regardless of condition, presents a compelling argument that preoccupied individuals often maintain negative thoughts through internally generated processes.

The final effects emerged for positive experiment-related thoughts. People who received positive feedback and scored lower on anxiety also had a higher percentage of positive thoughts related to the experiment. Thus, less anxious people may be able to better maximize a positive experience by reflecting on positive aspects of it. Also, lower scores on both anxiety and avoidance were associated with a higher percentage of positive thoughts about the experiment. This effect was not qualified by feedback condition, thus suggesting that more securely attached individuals reported a relatively high proportion of positive thoughts across both experimental conditions, which may demonstrate both a tendency to savor a positive experience as well as an increased ability to muster positive thoughts to cope with a negative event and emotions.

General discussion

Our research focused on gaining a better understanding of people's immediate emotional reactions and regulatory responses occurring with both negative and positive events. Across both studies we found evidence that attachment impacted people's responses, with our experimental study confirming and extending results from our correlational study. To our knowledge, these studies offer the first evidence that attachment is linked to variations in regulatory strategies (i.e., maximizing and minimizing) with positive events. Gender affected regulatory responses but not emotional reactions, and effects were qualified either by the type of event or attachment.

Attachment

Attachment was shown to be an important predictor of the intensity of immediate negative emotional reactions. People who have a high level of concern of abandonment and jealousy with attachment figures have intense negative reactions, even if the events do not involve attachment figures and in fact are non-interpersonal (Study 1) or involve a new acquaintance's opinion of them (Study 2). Further, this effect was found even when we controlled for the event in Study 2, so differences in intensity are not due simply to preoccupied people experiencing more objectively threatening life events. The conclusion that anxiously attached people are highly reactive is consistent with other research and appears to be robust finding (Brennan and Bosson 1998; Carnelley et al. 2007; Collins and Feeney 2004). Attachment was not related as expected to the intensity of PA reactions. The particular positive emotions on the PANAS measure are mostly activated states (e.g., active, alert; Barrett and Russell 1998). Perhaps more securely attached individuals would have scored higher

than others if we included positive emotions with a lower arousal component (e.g., content, calm).

For ER of NA, highly anxious individuals ruminated more than others as expected. In Study 1, they ruminated more about negative life experiences, and in Study 2, those higher on anxiety and lower on avoidance (i.e., preoccupied) had a greater percentage of negative thoughts unrelated to the study, regardless of they received negative or positive feedback. Although we expected more rumination specifically on negative feedback in Study 2 or for interpersonal events in Study 1, the findings instead suggest that the negative thoughts of anxious individuals are quite pervasive and not necessarily triggered by a preceding event or exclusive to interpersonal problems. Thus, in line with attachment theory, experiencing distress or maintaining negative thoughts about any type of negative experience would serve the purpose of signaling their need for their attachment figures and fit with their tendency to exhibit hyperactivation of their attachment system (Mikulincer et al. 2003).

Regarding ER with PA, our study provided new insight into how these responses vary by attachment style. Although numerous studies have found PA is a correlate of attachment security (e.g., Magai et al. 1995; Park and Waters 1989) and that the attachment bond itself is a source of joy (Bowlby 1979), our research suggests that people who are more secure engage in specific actions that could further enhance their positive feelings. Securely attached individuals may share a tendency to reflect more on a positive experience and an ability to focus on positive aspects of a bad situation, which is consistent with evidence showing that they recall positive information to cope with NA (Pereg and Mikulincer 2004) and engage in antecedent-focused ER strategies (Gross 1998), such as seeking out positive feedback from others (Brennan and Bosson 1998; Brennan and Morris 1997; Cassidy et al. 2003).

Our results for ER with PA also indicated that attachment insecurity was associated with more minimization of positive events and emotions in Study 1, and that anxiety was related to fewer positive thoughts about Study 2 in the positive condition. These findings are important because they suggest that insecurely attached adults are not thinking about or deriving meaning from positive experiences as much as others, and thus are missing out on potential salubrious effects of positive events and emotions. Earlier work also showed that insecure adults underestimate how positively they felt about earlier positive events (Gentzler and Kerns 2006). Because PA is linked to a variety of mental and physical health benefits (see Fredrickson 1998; Lyubomirsky et al. 2005, for reviews), it is critical to better understand individual differences in maximizing and minimizing and how these differences develop over time. Our results suggest that parents of securely attached children

might be socializing their children to enhance their PA and respond effectively to positive experiences (Contreras and Kerns 2000; Diamond and Aspinwall 2003; Feldman 2003), which is likely to produce benefits for their mood or self-worth (Bryant and Verhoff 2007; Langston 1994; Wood et al. 2003).

Gender

As expected, no main effects of gender emerged for mood or intensity of emotional reactions. Gender differences in some aspect of emotions are common, such as emotional expression (reviewed in Brody and Hall 2000) or emotional intensity using global, retrospective measures. The latter may be tapping not only emotional reactions but also beliefs or stereotypes about gender and emotions (Grossman and Wood 1993). However, we assessed emotional reactions immediately following events when gender differences are less common (Barrett et al. 1998), thereby likely precluding gender effects.

In terms of ER, our gender effects for NA were moderated by either event type or attachment and were not replicated across both studies. Design aspects unique to each study likely contributed to the specificity of gender effects. For example in Study 1, women were especially like to seek support in response to an interpersonal event compared to a non-interpersonal event. In Study 2, if we instead had given participants a variety of ER opportunities after viewing the feedback (e.g., talking to the experimenter, distracting activities), results may have provided analogous evidence that women were more likely than men to talk about the negative interpersonal experience. Surprisingly, with ER for PA, gender did not play a role. We expected that women would show more maximizing strategies (i.e., reflecting on, marking and celebrating positive events) because women or girls do more of the analogous responses with negative events and affect (i.e., rumination, co-rumination, and support-seeking; e.g., Rose 2002), and women do more savoring than men (Bryant et al. 2005; Bryant and Verhoff 2007). Further investigation of gender and ER of positive emotions is warranted.

Limitations and conclusions

One limitation of this research is that we can not rule out the possibility that other variables, such as personality characteristics associated with attachment (e.g., neuroticism, Shaver and Brennan 1992), could explain the findings. Also, our homogenous samples restrict generalizability, although our main goal was to determine whether we could detect meaningful differences in emotional responses, particularly with PA (Mook 1983). Despite the limitations, our studies advance the current understanding of how emotional

reactions and response-focused regulation vary as a function of attachment, gender, and situational effects. Response to positive events and emotions, in particular, are worth further study given that we know little about outcomes or developmental precursors of these types of responses.

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