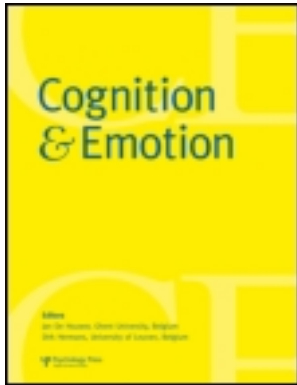


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### Implicit negative evaluations about ex-partner predicts break-up adjustment: The brighter side of dark cognitions

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## BRIEF REPORT

# Implicit negative evaluations about ex-partner predicts break-up adjustment: The brighter side of dark cognitions

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Using a subliminal priming lexical decision task, the present research investigated whether individuals who show negative implicit evaluations of an ex-partner immediately after a break-up show superior post-break-up emotional adjustment. As expected, individuals whose reaction times indicated negative implicit evaluations of their ex-partner showed reduced depressive affect immediately after the break-up. Individuals who did not initiate their break-up demonstrated less negative implicit evaluations of their ex-partners as well as more depressive affect. Finally, increased negative implicit evaluations of ex-partners over a one-month period were associated with corresponding improvements in adjustment. The findings demonstrate a critical role for implicit evaluations in post-break-up adjustment.

*Keywords:* Relationship dissolution; Implicit priming; Stressful life events; Emotions.

Romantic break-ups are frequently cited as one of life's most stressful events. People who experience a break-up are at heightened risk for a variety of poor mental-health outcomes (Kendler, Hettema, Butera, & Gardner, 2003). Previous work examining relationship dissolution has identified

personality characteristics and coping styles that contribute to poor break-up adjustment (Davis, Shaver, & Vernon, 2003; Sbarra, 2006). Yet little work has systematically examined individuals' cognitive representations of their ex-partners after a break-up, and how such representations

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are associated with emotional adjustment. Many models of relationship dissolution have proposed that people do not emotionally adjust to a loss until they fundamentally change the way in which they cognitively represent the lost person (Bowlby, 1979; Rollie & Duck, 2006). Yet there has been little empirical work documenting such changes. A few narrative-based studies have suggested that people rationalise and reassess how they think about their ex-partner in order to emotionally adjust (see Rollie & Duck, 2006). However, most of the relevant changes in cognitive representations of ex-partners probably occur at an implicit level (see Smith & Kirby, 2001, for a review on changes in appraisal). Such changes have never before been investigated. In this brief report, I fill this gap in the literature by investigating associations between individuals' implicit cognitive evaluations of ex-partners and their post-break-up adjustment, both immediately after the break-up and over a one-month period.

This paper's theoretical approach to post-break-up adjustment is guided by appraisal theory. Appraisal theory suggests that differences in appraisal account for individual differences in emotional responses to various experiences (Arnold, 1960). Specifically, this theory suggests that it is an individual's *interpretation* of an experience, rather than objective features of the experience itself, that triggers different emotions. Hence, two individuals might undergo the same experience, but appraise it differently and therefore experience different emotions as a result. Furthermore, as individuals change their evaluations of specific experiences over time, they experience different emotions.

The primary dimension that determines whether these emotions are positive or negative is whether an individual evaluates his/her current situational state as *motive-inconsistent* or *motive-consistent* (Roseman, 2001), or more simply, *wanted* or *unwanted*. Application of this perspective to the break-up context is relatively straightforward: If an individual appraises his/her current romantic relationship as motive-inconsistent (i.e., unwanted), he or she will appraise the break-up of

this relationship as motive-consistent (i.e., wanted) and will therefore experience considerably less negative affect after the break-up than someone who does not evaluate their ex-partner as motive-inconsistent.

If this is the case, then it suggests that one route to post-break-up adjustment is to change one's evaluation of the lost relationship. Specifically, the more that an individual evaluates the lost relationship as negative and unwanted, the better he/she should feel. People who break up with their ex-partner or view the break-up as mutual likely do this before individuals who report being dumped; however, regardless of break-up status, all individuals must view their lost relationship negatively in order to emotionally adjust.

Yet tracking ex-partner evaluations is problematic given that individuals may report having "realised" that the lost relationship was bad all along (in an attempt to save face and maintain pride) but may not actually believe this. Hence, simply asking individuals to assess the quality of their former romantic relationship may not reliably reveal their underlying appraisal of the relationship. Rather, it is important to assess individuals' implicit evaluations about the former relationship.

The current study employed a subliminal priming methodology to assess implicit evaluations about one's ex-partner. Researchers have proposed affective priming as a way to tap into individuals' *implicit* evaluations (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Priming methods provide a way for researchers to assess attitudes that may be nonverbal, unconscious, or distorted by the participant due to self-presentation concerns (Banse, 2001). Priming methods have recently been used to evaluate relationship attitudes and structure (Banse, 1999, 2001; Mikulincer, Gillath, & Shaver, 2002).

In the present investigation, I examined the degree to which individuals implicitly associate their ex-partner with negative evaluations indicative of moving away from an undesirable state. Appraisal models suggest that negative evaluations that are indicative of moving away from an

undesirable state are most likely elicited when individuals appraise a person or situation as unwanted (e.g., Roseman, 2001). Hence, I expect that individuals who will experience the most successful emotional adjustment to a break-up (i.e., the lowest levels of depressive affect) will be those who associate their ex-partner with negative valenced words. Among such individuals, the break-up should be experienced more positively because it represents moving *away* from an unwanted, undesirable state.

I made three related hypotheses. First, immediately after a break-up, individuals with more negative implicit evaluations about their ex-partner (i.e., who show greater cognitive accessibility of the ex-partner after being subliminally primed with negative valenced primes compared to neutral valenced primes) will have better post-break-up adjustment (i.e., less depressive affect). Second, individuals who report that they were dumped will show less negative implicit evaluations than individuals who were not dumped (because the “dumpees” will more likely be in a motive-inconsistent state than the “dumpers”, and people who view the break-up as mutual). The third hypothesis was based on that premise that increased negative evaluations about one’s ex-partner should be associated with decreased depressive affect. The third hypothesis was that over a four-week period, increases in individuals’ implicit negative evaluations about their ex-partner should be directly associated with decreases in depressive affect.

## METHOD

### Participants

The study consisted of two groups of undergraduate students from a large Western university. The first group consisted of individuals who recently experienced the break-up of a relationship that had lasted at least four months, while the second group consisted of individuals who were currently in a romantic relationship that had lasted at least four months (to serve as a control group). In order to recruit people who had just

experienced a break-up, e-mail messages were sent to all registered undergraduate students at the university asking them if they experienced a break-up from a relationship that lasted at least four months in the past two weeks. Furthermore, flyers were posted around campus. People in this group were paid \$12 for each of their visits to the lab. In this group, 108 individuals completed the first assessments, 24 individuals chose not to return for the second assessment for undisclosed reasons, and 9 individuals completed the second assessment but re-established a committed relationship with their partner. The priming data were unusable for 10 participants due to a computer malfunction during the middle of the study; thus, yielding a final sample of 65 individuals in the break-up group completing all study procedures. Individuals who did not complete the follow-up assessment did not significantly differ on any of the Time 1 measures from individuals who did complete the follow-up assessment. In the final sample of 65 individuals, 17 indicated that they initiated the break-up, 21 participants indicated that their partner chose to end the relationship, and 27 participants reported that the break-up was mutual. The average length between break-up and first assessment was 16.43 days ( $SD = 8.8$  days). The average relationship length was 23 months ( $SD = 8.32$ ,  $range = 4-60$  months). Overall, the final sample consisted of 24 males, 41 females, on average, 22 years of age ( $SD = 2$  years; 2 months,  $range = 18-30$  years).

In the control group 68 individuals who were in an intact romantic relationship of at least a 4-month duration ( $M = 42.5$ ,  $range = 4-71$  months) were recruited from the psychology subject pool and compensated for participating with course credit. Sixty-five of these individuals completed both assessments. Individuals who did not complete the follow-up assessment did not significantly differ on any of the Time 1 measures from individuals who did complete the follow-up assessment. Overall, this final sample consisted of 20 males, 45 females, on average, 21 years of age ( $SD = 2$  years; 8 months,  $range = 18-28$  years).

## Procedure and measures

Participants completed two laboratory visits, approximately 4 weeks apart ( $M = 33$  days,  $SD = 10$  days). The night before their first laboratory visit, participants filled out an online questionnaire containing a measure of their romantic partner or ex-romantic partner (depending on the group they were in). They also provided: (a) the name of someone they utilised for security and support; (b) the name of a best friend; and (c) the name of a casual acquaintance (such as a classmate) for use in the priming task.

When participants visited the lab, they underwent a computer-based priming task. Altogether, participants completed 10 practice trials followed by 288 experimental trials (the stimuli used in the practice trials were different from those in the experimental trials). Before each trial, participants attended to the centre of the screen where the letter X was presented. Each trial consisted of a subliminal (i.e., less than 20 ms, below the threshold for conscious detection) presentation of either a negative valenced word, or a neutral word, followed by a masking stimulus (XXX) for 500 ms (to ensure that no afterimages of the prime words would remain active in the peripheral parts of the visual system), and then followed by the presentation of target letter strings for 1000 ms (i.e., long enough for conscious detection). Participants were instructed to press one of two different keys to indicate whether the target letter string was a word or a nonword. The length of time (in ms) that it took them to make this judgement and press the key was the dependent variable. To ensure that the prime words were not visible, before any participants in the control group or break-up group participated in the study, ten additional participants participated in a pre-test and were unable to detect the subliminal primes even after repeated presentation (see Mikulincer, Birnbaum, Woddis, & Nachmias, 2000, for a review of this methodology).

The three negative prime words were *pain*, *failure*, and *fear*. The three neutral words were *hat*, *shoe*, and *popcorn*. The primary criteria for negative prime word selection were that they would be

negative in valence and indicative of moving away from an undesirable state according to Roseman and Smith's (2001) structural models of emotion. The negative prime words were then chosen based on their relatively similar negative valence (Bradley & Lang, 1999), and matched according to syllable and approximate word length with neutrally valenced words. The different target letter strings presented to participants (on which they made their "word/nonword" judgements) included the first name of the ex-partner, 4 other people they knew to varying degrees (described in more detail above), as well as a selected name of a person they did not know. These five names were included as fillers (so that the task did not consist exclusively of deciding between the name of their ex-partner and a nonword) and additional controls (i.e., to ensure that the effects were only observed for the name of the ex-partner). In addition, there were 16 nonwords, generated by scrambling common English words. Altogether, there were 32 different target letter strings. Each prime's alpha level was above .90. After the priming task, participants filled out a packet of self-report questionnaires.

*Relationship quality.* Relationship quality was assessed with the Quality of Relationship Inventory (QRI). This is a 25-item measure that assesses the quality of one's close relationship (Pierce, Sarason, & Sarason, 1991). All items are answered on a 4-point Likert scale (1 = *not at all* and 4 = *very much*). This measure assesses the degree of support, depth, and conflict in close relationships. For the current study, I consolidated these dimensions into one scale of overall index relationship quality ( $\alpha = .86$ ).

*Depressive affect.* Depressive affect was assessed with the negative affect portion of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Respondents were asked to rate the extent to which they have experienced each particular emotion within a specified one-week time period, with reference to a 5-point scale (1 = *very slightly or not at all*;

2 = a little; 3 = moderately; 4 = quite a bit; and 5 = very much). The PANAS has been shown to be stable at appropriate levels over a two-month time period. Cronbach's alpha for negative affect was .89 for Time 1 and .88 for Time 2.

*Terminator status.* Participants were asked to choose one of the following items that best described the break-up: "I terminated the relationship (I dumped my partner)"; "My partner terminated the relationship (I was dumped)"; or "The break-up was mutual". For the purpose of this study, a score of 1 indicated that the participant was dumped, and a score of 0 indicated that the participant was not dumped (i.e., they terminated the relationship or felt the break-up was mutual).

*Data analysis.* With this subliminal priming paradigm, for each person, reaction times (RTs) to the various stimulus names (ex-partner names and other names) were averaged within the negative prime conditions ( $\alpha = .88$ , Time 1;  $\alpha = .91$ , Time 2) and within the neutral prime conditions ( $\alpha = .87$ , Time 1;  $\alpha = .92$ , Time 2).<sup>1</sup> *Within-assessment* difference scores were calculated to represent the specific degree to which individuals' RTs to their ex-romantic partner were "speeded up" when presented with negative valenced words rather than neutral words (this difference score will subsequently be referred to as the "negative implicit evaluations" for the remainder of the results section). This is a common approach to calculate cognitive accessibility and has been used in previous subliminal priming studies using a lexical decision task (e.g., Banse, 2001; Wittenbrink, Judd, & Park, 2001). Of note, another commonly used statistical test in this experimental paradigm is the test of the prime by target interaction; it is equivalent to the main effect of the difference scores used here.

The current methodology is based on *affective matching* (see Klauer & Musch, 2002, for a review). Specifically, if an individual does not implicitly associate his or her ex-partner with negative-evaluation words, then he or she should respond slower (when making an affirmative response) to his or her partner's name when primed with negative-evaluation words rather than corresponding neutral words because the negative-evaluation words would be evaluatively inconsistent. However, if an individual implicitly associates his or her ex-partner with negative-evaluation words, then he or she should respond more quickly (when making an affirmative response) to his or her ex-partner's name when primed with negative-evaluation words rather than neutral words because the negative-evaluation words would be evaluatively consistent (resulting in a positive difference score).<sup>2</sup>

## RESULTS

Means and *SDs* for all study variables are presented in Table 1. Zero-order correlations of all study variables are presented in Table 2. Hypothesis 1 stated that individuals who just experienced a break-up with their romantic partner and exhibited greater negative implicit evaluations would experience less depressive affect. I examined the association between negative implicit evaluations and depressive affect in the group of individuals who recently experienced a break-up by regressing depressive affect on the negative implicit evaluations. In accord with Hypothesis 1, individuals in the break-up group who exhibited greater negative implicit evaluations experienced less depressive affect,  $\beta = -.27$ ,  $p < .05$ . An identical analysis was conducted in the control group; the association between negative implicit evaluations and depressive affect in

<sup>1</sup> Analyses were conducted on RTs for correct responses only. I removed RTs that were more than three standard deviations above or below the mean, which consisted of less than 1% of the data. RTs were relatively normally distributed and log-transformations did not change the significance level of any of the results.

<sup>2</sup> All subsequent analyses were performed on the other five names included in the priming task. None of the subsequently reported significant associations existed in these conditions.

**Table 1.** Means and standard deviations of all study variables

Variable	<i>M</i>	<i>SD</i>
Negative implicit evaluations Time 1 (Break-up Group)	2.51	25.65
Negative implicit evaluations Time 1 (Control Group)	1.85	21.06
Negative implicit evaluations Time 2 (Break-up Group)	5.17	20.15
Negative implicit evaluations Time 2 (Control Group)	1.98	26.63
Retrospective relationship quality (Break-up Group)	2.89	0.43
Depressive affect Time 1 (Break-up Group)	2.62	0.86
Depressive affect Time 1 (Control Group)	2.08	0.81
Depressive affect Time 2 (Break-up Group)	2.13	0.71
Depressive affect Time 2 (Control Group)	2.12	0.75
Days from break-up & first assessment (Break-up Group)	16.44	8.83
Gap between first & second assessment (Both Groups Combined)	33.77	11.80

this group was non-significant,  $\beta = .04$ ,  $p = ns$ . In order to provide an inferential test between these two groups, Fisher's  $r$  to  $z$  transformation was employed. Then, by making use of the sample size employed to obtain each coefficient, these  $z$ -scores were compared. There was a significant difference between these two independent correlation coefficients,  $Z = -1.76$ ,  $p < .05$  (one tailed). Of note, in the break-up group, retrospective self-reported relationship quality was associated with implicit negative evaluation of one's ex-partner; however, it was not associated with depressive affect (see Table 2). Furthermore, when depressive affect was regressed on both negative implicit evaluations and retrospective relationship quality, negative implicit evaluations remained significant,  $F(2, 62) = 3.475$ ,  $p < .05$ ;  $\beta = -.32$ ,  $p < .05$ , while retrospective relationship quality was not,  $\beta = -.17$ ,  $p = ns$ .

The next regression analysis examined whether terminator status was associated with poor emotional adjustment immediately after the break-up (Hypothesis 2). Negative implicit evaluations was regressed on terminator status. Terminator status was significantly associated with the negative implicit evaluations such that individuals who were dumped were significantly less likely to show heightened negative implicit evaluations than individuals ( $M = -10.64$ ,  $SD = 24.90$ ) who

were not dumped ( $M = 8.14$ ,  $SD = 23.22$ ),  $\beta = -.35$ ,  $p < .01$ . Given that terminator status was also associated with initial depressive affect (see Table 2), an ancillary analysis was conducted to determine whether a causal pathway linking terminator status, negative implicit evaluations, and depressive affect could be established. However, when terminator status and negative implicit evaluations were simultaneously included in the regression analysis predicting depressive affect, both variables were marginally significant ( $p < .10$ ). Thus, there was too much collinearity to establish a causal pathway, which is not surprising given the relatively small sample size (see Fritz & MacKinnon, 2007).<sup>3</sup>

The next set of analyses examined changes in negative implicit evaluations over a one-month period of time. Before examining how changes in implicit evaluations are associated with changes in depressive affect, it was of interest to examine the stability of the measures between time points. As can be seen in Table 1, in the break-up group, there was a significant positive association between depressive affect from Time 1 to Time 2; however, there was not a significant association between the negative implicit evaluations from Time 1 to Time 2. In the control group, there was a significant positive association between depressive affect from Time 1 to Time 2,  $\beta = .69$ ,  $p < .001$ ; there was also

<sup>3</sup> When accounting for gender and days from break-up and first assessment, the association between terminator status and depressive affect was mediated by negative implicit evaluations following Baron and Kenny's (1986) four steps to establish mediation followed by a Sobel test ( $Z = 2.25$ ,  $p < .05$ ). However, given the small sample size and the fact that mediation could not be established without these covariates included in the model, it seemed premature to confirm this causal pathway.

**Table 2.** Zero order correlations of all study variables in break-up group

	1	2	3	4	5	6	7	8
1. Negative-partner-association Time 1	—							
2. Negative-partner-association Time 2	-.05	—						
3. Dumped	-.35**	-.04	—					
4. Retrospective relationship quality	-.27*	-.01	.28*	—				
5. Depressive affect Time 1	.27*	.12	.25*	-.09	—			
6. Depressive affect Time 2	.06	-.03	.04	-.10	.57**	—		
7. Male = 0, female = 1	.04	-.14	-.09	.09	.07	.06	—	
8. Days from break-up & first assessment	-.05	-.14	.00	-.02	-.16	-.08	-.05	—
9. Number of days between first & second assessment	.08	-.08	-.14	.11	.08	-.08	.02	-.25*

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

a significant positive association between negative implicit evaluations from Time 1 to Time 2,  $\beta = .32$ ,  $p < .05$ .

In order to test hypothesis 3, within assessment difference scores were calculated such that Time 2 measures were subtracted from Time 1 measures. This reflects the difference in observed scores from Time 1 to Time 2 providing an unbiased estimate of change—an ideal approach for examining relationships between two time varying covariates (Rogosa, 1988; Rogosa, Brandt, & Zimowski, 1982). As hypothesised, in the break-up group, increased negative implicit evaluations were associated with declines in depressive affect from Time 1 to Time 2,  $\beta = -.39$ ,  $p < .001$ .<sup>4</sup> An identical analysis was conducted in the control group. There was no association between negative implicit evaluations and depressive affect in this group,  $\beta = -.07$ ,  $p = ns$ . There was a significant difference between these two independent correlation coefficients,  $Z = -1.90$ ,  $p < .05$  (one tailed).

## DISCUSSION

The current study is the first to assess implicit evaluations of ex-partners after romantic relationship dissolution. The basic premise of the study was that individuals who show negative implicit

evaluations of an ex-partner immediately after a break-up (such that the break-up represents moving *away* from an undesirable state) show superior post-break-up emotional adjustment. As hypothesised, individuals whose reaction times indicated stronger implicit negative evaluations of their ex-partner showed reduced depressive affect immediately after the break-up. The highest levels of depressive affect immediately after the break-up were found among individuals who were dumped. Finally, increased implicit negative evaluations of ex-partners over a one-month period were associated with corresponding improvement in adjustment (i.e., decreased depressive affect).

The findings demonstrate an important role for implicit evaluations in post-break-up adjustment. Specifically, they suggest that it may be emotionally adaptive to view one's ex-partner negatively after a break-up, since negative evaluations of the ex-partner make it possible to recast the break-up as a positive process of moving away from an undesirable negative state (even though the process itself might be painful). However, we do not know what exactly prompts certain individuals to implicitly appraise their romantic relationship as negative. This is a promising direction for future research. Simply dwelling on an ex-partner's faults may be an effective way to change explicit evaluations, and over time, explicit

<sup>4</sup> Both hypothesis 1 and 3 were also supported by combining positive and negative affect into a one-index measure. Yet, it was clear in both analyses that negative affect was driving these associations because when positive and negative affect were evaluated independently, the associations with positive affect and the negative implicit evaluations prime were only significant at trend level ( $p < .10$ ).



evaluations may automatically translate to changes in implicit evaluations. Another option is that one might explicitly dwell on an ex-partner's faults, but maintain an implicit desire for the relationship until an actual negative interaction with an ex-partner (conflict, betrayal, humiliation, etc.) catalyses changes in implicit evaluations.

Given the association between negative evaluations and post-break-up adjustment, researchers investigating relationship dissolution should devote increased attention to appraisal processes when investigating how coping strategies influence post-break-up emotional trajectories. Researchers have made great progress in understanding how specific coping strategies influence break-up adjustment (Davis et al., 2003). However, by assessing these coping strategies without taking into account how one appraises an ex-partner, researchers make a faulty assumption that everyone is coping with the "same type" of post-break-up experience. Yet, in actuality, individuals' appraisals of the break-up necessarily shape the degree to which post-break-up recovery will be easy or difficult, and hence the types of coping strategies that will prove appropriate.

One of the most common ways in which people cope with a break-up is to share their thoughts and feelings about the former relationship with close friends and family members (Weber, 1998). Although friends and family members have been shown to play a significant role in the process and aftermath of relationship dissolution (Sprecher, Felmlee, Schmeeckle, & Shu, 2006), little work speaks to how friends and family members can best help people effectively adjust to a break-up. Given the importance of negative evaluations in post-break-up adjustment, future work should explore whether friends and family members might help people adjust to a recent break-up by drawing attention to the negative aspects of the former relationship.

### Limitations and future directions

Perhaps the most important limitation of the current study is that I cannot determine whether negative implicit evaluations actually *facilitate*

changes in adjustment. Although it was found that prospective increases in negative implicit evaluations were associated with corresponding increases in adjustment, we cannot conclude that the former directly influenced the latter. A stronger test of the influence of negative evaluations on adjustment would be provided by experimental research that directly manipulated individuals' negative evaluations about their ex-partners (perhaps by providing them with frequent and persistent reminders of their ex-partners' flaws, or their ex-partners' undesirable features), and then assess corresponding changes in both priming responses and adjustment. The current research is also limited by the fact that participants were relatively young undergraduate students at a university campus. Future research is necessary to determine the degree to which the findings generalise to the dissolution of more mature relationships. For example, in cases where the couple breaking up has children together, it may not be adaptive to appraise one another too negatively, as this may hinder attempts to continue a positive co-parenting relationship.

Another caveat that deserves discussion is that negative implicit evaluations were not significantly associated across time points in the break-up group. Although it is possible that this is due to unreliability, the fact that negative implicit evaluations were significantly associated in the control group makes this highly unlikely. Rather, the lack of correlation in the break-up group is likely due to the fact that people initially low on negative implicit evaluations immediately after the break-up exhibited a differential increase in negative implicit evaluations compared to individuals who were initially high on negative implicit evaluations.

There are a few methodological aspects of the priming procedure that could be modified in future studies that investigate implicit partner evaluations after relationship dissolution. First, the current study focused exclusively on negative implicit evaluations of the ex-partner, and did not examine the degree to which the partner was associated with positive thoughts and feelings. It is plausible that emotional adjustment from a

break-up not only entails formulating negative evaluations but ceasing to form positive evaluations. In fact, an individual who does not exhibit negative implicit evaluations of an ex-partner may nonetheless be interpreted to have positive evaluations (instead of neutral evaluations). In that case, he or she may respond more slowly to trials with negative primes than trials with neutral primes. People that were dumped may be in particular need of relinquishing positive evaluations of their ex-partner. Future research should include positive subliminal primes as well as negative primes to provide a more complete portrait of the role of evaluations in post-break-up adjustment. Furthermore, the current study used the negative or neutral stimuli as the prime and the attitude object as the target. Affective priming procedures can also be conducted in reverse such that the attitude objects are presented as primes and the negative stimuli are presented as targets (e.g., Banse, 2001). It would be interesting to see if the associations presented in the current study would be similar or even considerably stronger if the ordering was reversed.

## Conclusion

Researchers investigating relationship dissolution have long proposed that people do not emotionally adjust to a break-up until they change how they think about their ex-partner (e.g., Rollie & Duck, 2006). Up until now, there has been little empirical work prospectively documenting these changes. Using appraisal theory as an overarching framework, the current study provides evidence that break-up adjustment, both immediately after a break-up and also over time, is directly associated with implicitly representing the relationship as negative (such that the break-up represents moving away from an unwanted state). The study further demonstrates that these implicit negative evaluations are initially more likely among individuals who initiated their break-ups or reported the break-up to be mutual, compared to those who were dumped by their partners. The findings demonstrate that future research on break-up adjustment should assess implicit

evaluations of the relationship and the break-up experience in order to better understand the processes underlying post-break-up adjustment.

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## REFERENCES

- Arnold, M. B. (1960). *Emotion and personality*. New York: Columbia University Press.
- Banse, R. (1999). Automatic evaluation of self and significant others: Affective priming in close relationships. *Journal of Social and Personal Relationships*, 16(6), 803–821.
- Banse, R. (2001). Affective priming with liked and disliked persons: Prime visibility determines congruency and incongruency effects. *Cognition and Emotion*, 15(4), 501–520.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality in Social Psychology*, 51, 1173–1182.
- Bowlby, J. (1979). *The making and breaking of affectional bonds*. London: Tavistock.
- Bradley, M. M., & Lang, P. G. (1999). *Affective norms for English words (ANEW): Instructional manual and affective ratings* (Tech. Rep. C-1). Gainesville: University of Florida.
- Davis, D., Shaver, P. R., & Vernon, M. L. (2003). Physical, emotional, and behavioral reactions to breaking Up: The roles of gender, age, emotional involvement, and attachment style. *Personality and Social Psychology Bulletin*, 29(7), 871–884.
- Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986). On the automatic activation of attitudes. *Journal of Personality and Social Psychology*, 50(2), 229–238.
- Fritz, M. S., & MacKinnon, D. P. (2007). Required sample size to detect the mediated effect. *Psychological Science*, 18(3), 233–239.
- Kendler, K. S., Hettema, J. M., Butera, F., & Gardner, C. O. (2003). Life event dimensions of loss, humiliation, entrapment, and danger in the prediction of onsets of major depression and

- generalized anxiety. *Archives of General Psychiatry*, 60, 789–796.
- Klauer, K. C., & Musch, J. (2002). Goal-dependent and goal-independent effects of irrelevant evaluations. *Personality and Social Psychology Bulletin*, 28(6), 802–814.
- Mikulincer, M., Birnbaum, G., Woddis, D., & Nachmias, O. (2000). Stress and accessibility of proximity-related thoughts: Exploring the normative and intraindividual components of attachment theory. *Journal of Personality and Social Psychology*, 78, 509–523.
- Mikulincer, M., Gillath, O., & Shaver, P. R. (2002). Activation of the attachment system in adulthood: Threat-related primes increase the accessibility of mental representations of attachment figures. *Journal of Personality and Social Psychology*, 83(4), 881–895.
- Pierce, G. R., Sarason, I. G., & Sarason, B. R. (1991). General and relationship-based perceptions of social support: Are two constructs better than one? *Journal of Personality and Social Psychology*, 61, 1028–1039.
- Rogosa, D. (1988). Myths about longitudinal research. In K. W. Schaie, R. T. Campbell, W. Meredith, & S. C. Rawlings (Eds.), *Methodological issues in aging research* (pp. 171–209). New York: Springer.
- Rogosa, D., Brandt, D., & Zimowski, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin*, 92(3), 726–748.
- Rollie, S. S., & Duck, S. (2006). Divorce and dissolution of romantic relationships: Stage models and their limitations. In M. A. Fine & J. H. Harvey (Eds.), *Handbook of divorce and relationship dissolution* (pp. 223–240). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Roseman, I. J. (2001). A model of appraisal in the emotion system: Integrating theory, research, and applications. In C. A. Smith, K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 68–91). New York: Oxford University Press.
- Roseman, I. J., & Smith, C. A. (2001). Appraisal theory: Overview, assumptions, varieties, controversies. In C. A. Smith, K. R. Scherer, A. Schorr, & T. Johnstone (Eds.), *Appraisal processes in emotion: Theory, methods, research* (pp. 3–19). New York: Oxford University Press.
- Sbarra, D. A. (2006). Predicting the onset of emotional recovery following nonmarital relationship dissolution: A survival analyses of sadness and anger. *Personality and Social Psychology Bulletin*, 32(3), 298–312.
- Smith, C. A., & Kirby, L. D. (2001). Affect and cognitive appraisal processes. In J. P. Forgas (Ed.), *Handbook of affect and social cognition* (pp. 75–92). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Sprecher, S., Felmlee, D., Schmeeckle, M., & Shu, X. (2006). No breakup occurs on an island: Social networks and relationship dissolution. In M. A. Fine & J. H. Harvey (Eds.), *Handbook of divorce and relationship dissolution* (pp. 457–478). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Weber, A. L. (1998). Losing, leaving, and letting go: Coping with nonmarital breakups. In B. H. Spitzberg & W. R. Cupach (Eds.), *The dark side of close relationships* (pp. 267–306). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.
- Wittenbrink, B., Judd, C. M., & Park, B. (2001). Evaluative versus conceptual judgments in automatic stereotyping and prejudice. *Journal of Experimental Social Psychology*, 37(3), 244–252.