



The Social Context of Social Loss: Interpersonal Mediators and Moderators of Emotional Adjustment to a Romantic Breakup

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THE SOCIAL CONTEXT OF SOCIAL LOSS: INTERPERSONAL MEDIATORS AND
MODERATORS OF EMOTIONAL ADJUSTMENT TO A ROMANTIC BREAKUP

by

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“There has been an alarming increase in the number of things I know nothing about.”
— Winnie the Pooh

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ABSTRACT

The breakup of a non-marital romantic relationship is a common experience, yet we know little about the factors associated with coping and recovery. Even less is known about the social context in which these breakups occur, such as how the ongoing relationship between two people (who were formerly in a relationship) impacts emotional adjustment. Relationship breakups are not always a definitive event, but rather a process that unfolds over time. By studying these associations, as well as the influence of other supportive people in shaping recovery, research can move beyond individual variables to cast a truly social or interpersonal light on this topic. With this broad goal in mind, my dissertation addresses four specific aims that are designed to: (1) Understand how specific forms of ex-partner contact are associated with variability in emotional adjustment following a romantic breakup; (2) Examine the moderators and mediators of these associations; (3) explore the associations between the social support efforts of close friends/family and participants' emotional adjustment with a specific focus on evaluating the correlates of target participants' received support with respect to informants' reports of support provided; and (4) explore the implications of having a friend/family member report on participants' responses to the separation in altering a target participant's self-report of adjustment over time. One-hundred forty-five ($n = 25$ men) participants provided reports of contact with ex-partners and emotional adjustment over a 5-week period, half of whom were randomly assigned to participate in the study with an informant. Out of 73 participants in this condition, 48 informants agreed to participate on behalf of their target participant also reporting the participant's ex-partner contact behaviors and emotional adjustment. For men and/or those with high attachment anxiety and avoidance, ex-partner contact is not associated with poorer emotional adjustment. Support also was found for two mechanisms, longing and rumination,

which explain the association of ex-partner contact and emotional adjustment, as well as for attachment anxiety as a moderator of part of the indirect effect. No support was found for invisible support analyses or for cognitive reappraisal as a potential mechanism that explains the effects of invisible support, and the lack of findings is addressed. Finally, findings suggest that inclusion of informants may impact the validity of target participants' responses, insomuch as participants may alter their behaviors and/or the extent to which they are truthful about their behaviors due to knowing an informant was reporting on their behaviors.

1. BACKGROUND AND RATIONAL

Romantic relationships among young adults are associated with high levels of well-being (Connolly & Goldberg, 1999) but the end of a romance can lead to a host of negative outcomes, including depression, substance abuse and suicide risk (Asarnow et al., 2008; Haydon & Halpern, 2010; Monroe, Rohde, Seeley, & Lewinsohn, 1999; Vajda & Steinbeck, 2000). Breakups are quintessentially social experiences, unfolding between two people in a dyadic context that itself is nested in the larger social context of friends and families. With relatively few exceptions, however, researchers tend to study *the intrapersonal dimensions* of how people cope with breakups; to be sure, there is clear evidence that individual differences in personality and attachment, for example, are associated with patterns of adjustment over time (Davis, Shaver, & Vernon, 2003). What is not yet clear, however, is how elements of the social context are associated with emotional adjustment following a breakup. Part of the problem in conducting this research is that it would be exceptionally difficult to get reports from *both* members of a separating couple, but approximations of this (truly dyadic) approach can be made by simply asking people to report more specifically on their interactions with their ex-partners and friends/family in the wake of a separation. Focusing research more squarely on the interpersonal dimensions of a romantic breakup has the potential to reveal a great deal of new information about how people cope with this life event, in particular, and stressful interpersonal events in general.

Despite the fact that the interpersonal dynamics of breakups are not widely studied, there is evidence to suggest that the interpersonal contact between two former romantic partners can alter emotional adjustment. Recent work highlights the cyclical nature of breakups and suggests that social factors such as disappointing experiences with alternative romantic partners and post-

dissolution contact with an ex-partner increase the likelihood of renewing a dissolved relationship (Dailey, Rossetto, Pfister, & Surra, 2009). Other research finds that contact with former partners is associated with poorer emotional outcomes over time (Sbarra, 2006; Sbarra & Emery, 2005).

Beyond the interpersonal contact with an ex-partner, the availability of social support (when people face difficult events) is associated with a host of beneficial psychosocial and health-relevant outcomes (Cohen, Kamarck, & Mermelstein, 1983; Gramer & Reitbauer, 2010; Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003; Phillips & G., 2009; Uchino, 2004). In a study of newly married couples, for example, lack of social support from a spouse is associated with poorer long-term outcomes including divorce (Sullivan, Pasch, Johnson, & Bradbury, 2010). This particular study focused on social support within intact marriages, but romantic relationships occur within the context of other friend and family relationships. The influence of these other supportive relationships might greatly impact a person's adjustment when their relationship ends, but to date, the supportive role of close others after a breakup is not examined well enough.

This dissertation study examines the social context in which relationship dissolution occurs by investigating the role of contact with ex-partners and the social support efforts of close others. The study also explores questions relative to informant methodology. The following sections describe the rationale and background relative to these areas of research.

Contact with Ex-partners

Guiding theory. This study is grounded in theory that seeks to understand the importance of romantic relationships in maintaining physical health and psychological well-being. Using Bowlby's concept of infant-caregiver attachment, Hazan and Shaver (1987)

extended this theory to the formation of attachment within romantic relationships. Though the target of attachment is different, an essential feature of attachment in both relationships is to stabilize a person's sense of felt security using a secure base (Sroufe & Waters, 1977). When this felt security is threatened, individuals respond differently according to their attachment style by employing either hyperactivating or deactivating emotion regulation strategies (Shaver & Mikulincer, 2002). In romantic breakups, the greatest threat to felt security is the loss of a romantic partner, and the distress experienced following this separation can elucidate features of an attachment relationship that maintain felt security. Said differently, examining the consequences of relationship disruptions, provides an important means of understanding the significance of attachment for a specific person (see Sbarra & Hazan, 2008). Bowlby (1982) posited a classic stress response that follows separation and loss of an attachment figure that begins with protest, which is yearning for, and arousal centered around, contact with the attachment figure. This study rests upon the idea that in adult romantic relationships protest reactions can be measured via contact with an ex-partner.

Emotional impact on individuals post-relationship. Research is limited when examining contact between former romantic partners and focuses primarily on post-relationship friendships. The majority of people are able to maintain friendships with former romantic partners (Kaplan & Keys, 1997; Wilmot, Carbaugh, & Baxter, 1985), though these relationships may be maintained out of social necessity (Schneider & Kenny, 2000). The bulk of this research, however, says little about the potential emotional consequences of maintaining contact with one's ex-partner. In the few studies that have addressed this topic, contact with a former partner slowed decreases in feelings of love (for one's ex-partner) and sadness (Sbarra, 2006; Sbarra & Emery, 2005); and even imagined contact via photographs of ex-partners is associated with

emotional (neural) dysregulation (Kross, Egner, Ochsner, Hirsch, & Downey, 2007). Two important substantive questions remain to be answered. First, what is the direction of the association between contact and emotional adjustment? Contact with former partners is commonly considered a unidirectional event. It is possible, however, that people in distress seek out an attachment figure, and if the attachment figure is unavailable, these efforts may have the unintended effect of increasing distress (Davis et al., 2003; Pistole, 1995; Sbarra & Emery, 2005). Therefore, this study attempts to address this issue by examining the contact-emotional adjustment association in a bidirectional manner. Does contact lead to poorer emotional adjustment, or do feelings of sadness (or other forms of psychological maladjustment) lead to contact seeking behavior?

In addition to examining the direction of the contact-emotional adjustment association, this work investigates the forms of contact that are associated with worse emotional adjustment. Is resulting emotional adjustment affected by the type (i.e. written versus in-person) or frequency of contact? If the contact is interactive (i.e. in-person, talking on the phone, etc.), as opposed to solitary (i.e. viewing the ex-partner's social networking site), will there be differences in emotional adjustment? The current study seeks to replicate past research (Sbarra, 2006; Sbarra & Emery, 2005) and to deepen our understanding of the typology of contact with an ex-partner that is associated with the poorest emotional adjustment.

Mechanisms producing the negative consequences of contact. Although past research establishes the link between contact and emotional adjustment, much remains to be known about the factors that explain this association. Appraisals of a stressful event impact emotional coping (Folkman, Lazarus, Gruen, & DeLongis, 1986; Lazarus & Folkman, 1984) and specific to the non-marital breakup literature, people who appraise a breakup as a desirable experience less

negative emotion (McCarthy, Lambert, & Brack, 1997). Therefore, it is reasonable to hypothesize that contact may alter how a person evaluates their breakup, and that this evaluation, in turn, affects the individual's emotional response. Specific to relationship dissolution, the experience of longing and rumination following contact with an ex-partner may be two key experiences that alter how people appraise their breakup. Longing is defined as a blend of love and sadness resulting from separation with a loved individual (P. Shaver, Schwartz, Kirson, & O'Connor, 1987) and connotes a desire for, and preoccupation with, an ex-partner. This cognitive-affective state alone may not capture the effects of all types of contact, however. Maladaptive rumination differs from longing in that it generally manifests in negative thoughts about or brooding over relationship regrets; in addition to longing, rumination may also lead to poorer adjustment in people recovering from a breakup (Nolen-Hoeksema, 1998; Saffrey & Ehrenberg, 2007).

Research on rumination is extensive, whereas research on longing is sparse. At least one study suggests that in relation to non-marital breakups, those who do not initiate the breakup experience greater rumination relative to those who report they initiated the end of the relationship (Perilloux & Buss, 2008). No gender differences were observed for this effect, though one significant difference is that the use of rumination as a coping process is more prevalent among women than men, and it is believed that greater use of rumination can explain gender differences in depression (Nolen-Hoeksema & Jackson, 2001); thus, any analysis that includes rumination must take into account this apparent gender disparity. In the current study I examine whether these variables serve as possible mediators of the association between contact and emotional adjustment. Since longing could be considered a variant of rumination, in that it is experienced as pervasive thoughts about the loved individual, a path analysis is proposed

whereby the primary indirect effect of interest is contact leading to longing, then longing leading to rumination, which results in emotional distress.

Potential Moderators of the Contact-Emotional Adjustment Association

Relationship specific factors. As demonstrated in prior research, factors such as feelings of love for a former partner, contact with former partners, who initiated the breakup and non-acceptance of the breakup may affect the predictions of how one will recover and the time-course of recovery following a romantic breakup (Eastwick, Finkel, Krishnamurti, & Loewenstein, 2008; Perilloux & Buss, 2008; Sbarra & Emery, 2005; Sprecher, Felmlee, Metts, Fehr, & Vanni, 1998). In the current study, assessments of these relationship specific factors will be included with previously used measures of relationship length and time since the breakup (e.g. Sbarra & Emery, 2005). Attachment theory suggests that romantic relationships stabilize a person's sense of felt security when the romantic partner is viewed as a secure base (Sroufe & Waters, 1977). Successful coping then is the ability to maintain this security when the secure base is no longer available (Mikulincer & Shaver, 2007; Sbarra & Hazan, 2008). Therefore, current feelings of attachment for an ex-partner may be a more sensitive moderator of the contact-emotional adjustment association than broad measures and provide a measure of how significant a role an ex-partner still plays in stabilizing felt security. Research into this distinction highlights the possibility that broad measures of attachment style (preoccupation with relationships) and narrow measures of attachment to specific people (peers) function differently in predicting feelings of loneliness, hopelessness, perceived stress and general symptomology (Moller, Fouladi, McCarthy, & Hatch, 2003). Narrow measures of attachment to peers uniquely predicted feelings of loneliness and hopelessness in hierarchical regression models that included broad measures of adult attachment, as well as specific attachment to mothers and fathers,

whereas the broad measure uniquely predicted perceived stress. These results provide good evidence that different measures of attachment style will have varying degrees of predictive utility for the same outcomes (Moller et al., 2003). In the current study I use a modified attachment questionnaire to assess the degree to which people feel specifically connected to their former-partner.

Individual Differences. The present study also aims to deepen our knowledge of which people are associated with good or poor adjustment following dissolution of their relationship. In an effort to understand individual differences, adult attachment style and feelings of loneliness will be investigated as potential predictors of ongoing emotional adjustment and as moderators of the contact and emotional adjustment association, as well as any potential mediating processes that unfold over time.

Attachment style is widely studied and often used to explain how people function within romantic non-marital relationships as well as following a breakup (Davis et al., 2003; Feeney & Noller, 1992; Fraley & Shaver, 1999; Sbarra, 2006; Sbarra & Emery, 2005; Spielmann, MacDonald, & Wilson, 2009). Shaver and Mikulincer (2002) suggest that when faced with emotional upheavals anxiously and avoidant attached people will display distinct emotion regulation strategies, hyperactivating and deactivating, respectively. Hyperactivating strategies attempt to establish security by proximity-seeking of the attachment figure, while deactivating strategies attempt to distance the individual from any attachment-related thoughts or actions. Research on these self-regulation efforts suggests that hyperactivating strategies may have the unintended consequence of increasing anxiety (Davis et al., 2003; Pistole, 1995; Sbarra & Emery, 2005). Interestingly, more recent research suggests that one strategy employed by anxious people to dampen anxiety is to seek a new romantic partner, which is characteristic of

so-called 'rebound' relationships (Spielmann et al., 2009), this strategy is successful in the short term for letting go of the ex-partner as an attachment figure but little is known about the long-term consequences of this behavior. This finding is inconsistent with prior work demonstrating that people high in attachment anxiety are more likely to seek contact with their former partner, and the use of hyperactivating strategies by these people are proposed to explain this finding (Sbarra & Emery, 2005). The same study, however, was unable to find support for attachment style serving as a moderator of the contact and emotional adjustment association and remains the only study to date to explore this empirical question.

In the present study, adult attachment style provides a broad measure of how people regulate affect in close relationships, and I seek to replicate of the general finding that attachment anxiety is related to worse adjustment in the aftermath of a romantic breakup. Adult attachment style, specifically attachment anxiety, also is of interest in examining longing and rumination as potential mechanisms of the contact-emotional adjustment association. Longing and rumination, by their very nature, are cognitive-affective states that connote preoccupation with a former relationship and/or ex-partner, and this preoccupation might be one form of proximity seeking in the absence the attachment figure. Thus, it is reasonable to question whether these mechanistic pathways operate differently for people with more anxious and/or avoidant attachment styles. In light of this possibility, the association between the interaction term of contact and both attachment subscales and poor emotional adjustment (i.e. distress) will be modeled with longing and rumination, separately and in tandem, as mediators.

Perceptions of loneliness may also evidence unique associations with emotional adjustment following a breakup. Recent research suggests that loneliness can be divided into three mental representations that include isolation, relational connectedness, and collective

connectedness (Hawkley, Browne, & Cacioppo, 2005). Feelings of loneliness may intensify the experience of having lost the companionship a relationship provides and is a common experience following the end of a relationship. Pilot data from a similar breakup paradigm in our lab indicates that loneliness is a common experience, when asked “How often have you felt lonely and wished for more friends in the past two weeks?” (Social Adjustment Scale – Self Report, Weissman & Bothwell, 1976) 27% of the sample ($n = 100$) endorsed feeling lonely half of the time or more frequently. From this result I reason that measures of loneliness will provide enough variability to be detectable in standard statistical analyses.

Social Support

Invisible support. Coping with difficult life events is clearly related to peoples’ perceptions of their social support resources (Bolger, Zuckerman, & Kessler, 2000; Bolger & Amarel, 2007; Cohen et al., 1983; Shrout, Herman, & Bolger, 2006; Uchino, 2004) but how these resources function following the breakup of a non-marital relationship has yet to be examined. A major finding in the social support literature is that there exists a clear distinction between being aware of social support resources that are available (associated with beneficial outcomes) and using the resources that are available (associated with neutral and even negative outcomes; see Cohen & Pressman, 2006). Understanding this discrepancy is impossible unless one examines both the social support being provided by close others and the perceptions of social support experienced by the recipients. Though relatively little research addresses this issue Bolger, Shrout and colleagues (2000, 2006) studied couple reports of social support and identified so-called *invisible support* (defined as supportive actions offered by a close other that are not necessarily recognized by the support recipient) as one avenue through which emotional distress can be alleviated outside of the receiver’s explicit awareness (Bolger & Amarel, 2007;

Gleason, Iida, Shrout, & Bolger, 2008; Iida, Seidman, Shrout, Fujita, & Bolger, 2008; Shrout et al., 2006). Increases in both feelings of closeness to the support provider and in negative mood are consistently identified as one consequence of support receipt (Bolger et al., 2000; Shrout et al., 2006) and potential explanations of this association suggest that support equity (both the receipt and provision of support by the target participant), as well as the individual differences of both people may explain these associations (Gleason et al., 2008). Additional analysis of this data further showed that explicit support seeking was not associated with the provision of support by close others, but that recipient self-reported negative mood and stressful events were associated with the supportive efforts of a close other (Iida et al., 2008). Thus, supportive acts that are not explicitly sought may be most effective in helping people cope with difficult circumstances (especially when they are unrecognized). These effects will be mitigated, however, by how supportive/supported the recipient feels, as well as by individual differences of both provider and recipient. One such individual difference implicated in this work is adult attachment style (Gleason et al., 2008); how an individual responds to the supportive acts of a close other depend on how one perceives close relationships in general. In the present study, I seek to replicate and extend the findings in this field by using more sensitive measures of support provision that focus on explicit support behaviors.

Attachment as a moderator of invisible social support. Discussion of how social support acts are evaluated by a receiver and consequent changes in affect would be incomplete without also exploring if aspects of individual differences moderate these associations. Gleason and colleagues (2008) suggested attachment style as one potential moderator of the support-improved emotional adjustment association. This individual trait seems to be an ideal candidate because how an individual responds to the supportive acts of a close other may depend on how one

perceives close relationships in general. An avoidant individual, for example, who has a trait propensity to deactivate or distance themselves from attachment figures may be less likely to respond favorably towards a friend's efforts to comfort them than an anxiously attached individual who has a tendency towards proximity-seeking attachment figures. Attachment, therefore, may not only moderate an individual's awareness of the social support efforts of others, but also the degree to which these acts influence reappraisal and impart improved emotional adjustment.

Practical and emotional support. Beyond the distinction between invisible and visible support, the proposed study will explore how different types of support function within the invisible support framework. Social support behaviors can be differentiated into two distinct domains, practical and emotional. Practical support behaviors are tangible and work to free up physical resources (Wills & Shinar, 2000), whereas emotional support behaviors entail listening to, comforting, or providing words of encouragement to stressed people (Bolger et al., 2000). Shrout et al. (2006) established that practical support outside of participants' awareness, but not received emotional support, led to more positive outcomes. This is the only study to examine the effect of type of support within the invisible support framework. Therefore, the current study seeks to replicate and extend findings related to the effects of different forms of support on emotional adjustment.

Cognitive reappraisal. As discussed relative to longing and rumination, cognitive appraisal may play a role in increasing emotional distress but this same mechanism also has been implicated in understanding how social support aids in emotional adjustment (Cohen & Pressman, 2006). Social support behaviors from close friends may lessen physical or emotional demands so that people alter the appraisal of their coping resources, which, in turn, allows them

to experience less emotional distress (Thoits, 1986). There is preliminary evidence in the field of supportive communication to support this idea. Burleson and Goldsmith (1998) suggest that comforting forms of communication lead to positive changes in emotional states by way of an appraisal-based mechanism rooted in stress and coping theory (Lazarus & Folkman, 1984). A recent test of this theory posited that comforting leads to increases in emotional expression, which facilitate cognitive reappraisals and lead to improved emotional adjustment (Jones & Wirtz, 2006). This approach suggests that cognitive processing of an event is necessary to experience less negative emotion (Frijda, 1993). Jones and Wirtz (2006) tested a path model of cognitive reappraisal that suggests person centeredness (the degree to which a supporter validates negative feelings) is associated with increased use of positive emotion words, which leads to greater cognitive reappraisal, and ultimately, to affective change. Results of this path model confirmed the hypothesized associations and support the idea that one process linking support and resulting affective change is through cognitive reappraisal. Some potential disadvantages of this study were the reliance on self-report data for all of the included measures, the cross-sectional nature of the study and obtaining data from only the receiver of the supportive acts. In the current study I aim to remedy these issues with the inclusion of both supporter and receiver reports of supportive acts, testing the proposed relationships across several weeks and assessing reappraisal by changes in participant reports of coping efficacy.

Additional research in this area suggests the possibility of a path model wherein the different types of support, emotional and practical, may mediate the support-affect change association in-tandem with cognitive reappraisal. Findings from a recent study of adolescents ranked various types of support behaviors relative to consequent negative emotion alleviation, and found that companionship is evaluated more positively than sympathy, advice giving,

optimism, and minimization as supportive acts (Clark, MacGeorge, & Robinson, 2008). The authors acknowledge that these processes may function differently in adults and adolescents, but the results present the possibility that not all forms of support will be viewed with equivalent usefulness.

Informant Reports. The current study is well-positioned to add to both the substantive literature on coping and adjustment as well as to the methodological literature in the budding area of informant reports. Informant reports allow cross-validation of participant reports of behaviors and can provide more information about the context in which change processes occur (Fraley, 2004; Vazire, 2006), though some criticize the 'halo' effect that may cloud informant reports of personality (Leising, Erbs, & Fritz, 2010). The invisible support framework necessitates the inclusion of informant reports and permits more sensitive measure of support behaviors relative to what has been done in the literature. Reactivity in measurement issues may arise with the inclusion of informant reports; perhaps participants alter their behavior when they know informants are reporting on their well-being. In order to investigate this possibility, participants will be randomly assigned to join the study with or without an informant. No published studies have attempted to conduct an entire longitudinal investigation including data collection from both target participants and informants via the internet. Published studies using informant reports via e-mail have evidenced a response rate between 76-95%, and I expect similar rates of response from informants in this study (Vazire & Gosling, 2004; Vazire, 2006).

The Present Study

This study combined in-person and internet data collection to investigate the social context of non-marital romantic breakup experiences in young adulthood. Four specific aims guided the study design and analyses (see Table 1). First, I examine the associations among

contact with an ex-partner and emotional adjustment. Second, I examine potential moderators and mediators of the ex-partner and emotional adjustment association. Third, I explore the role of social support in ongoing adjustment following a breakup using the invisible support framework, and proposing a moderator and mediator of this association. Finally, I explore the impact of inclusion of informant reports. The primary hypotheses and research questions that will be tested under each aim are included in Table 1.

Table 1
Specific Aims

Aim	Hypothesis/ Exploratory Aim	Specific Question of Interest
1		Examine role of specific ex-partner contact on emotional adjustment
	H1	Ex-partner contact will be associated with poorer future emotional adjustment.
	H2	In-person contact will be associated with poorer emotional adjustment than electronic or written forms of communication
2		Examine moderators and mediators of emotional adjustment association post-dissolution
	H3	Adult attachment style will moderate the strength of the association between contact and emotional adjustment
	H4	Feelings of ex-partner specific attachment will uniquely predict emotional adjustment and moderate the association of contact and emotional adjustment after controlling for adult attachment style
	H5	Longing and rumination (after controlling for gender) will mediate the association of contact and emotional adjustment
	H6	Time-varying perceptions of loneliness will predict poorer emotional adjustment across the assessment period
	H7	The interaction of attachment anxiety and ex-partner contact and emotional adjustment will be mediated by longing and/or rumination
3		Explore social support in context of recovering from a romantic breakup
	EA1	Explore invisible support model with participant and informant reports of support efforts and participant reported adjustment
	EA2	Explore practical and emotional social support as mediators in the invisible support models proposed in EA1
	EA3	Explore target participants' appraisals of coping abilities as a mediator of the association between informant provided social support and emotional adjustment
	EA4	Explore adult attachment style as a moderator of association proposed in EA1, EA2 and EA3
4		Methodology exploration
	EA5	Explore impact of informant reports by examining possible alterations in participant responses and behaviors as a result of informant reporting.

2. METHOD

Participants

Participants were 145 University of Arizona and community-dwelling young adults ($n = 25$ men) recruited through Mass Survey, online advertisements and campus-wide email. On average, participants were 19.4 years old ($SD = 1.79$ years; range = 18 – 28 years old), reported having been in their relationship for 20.6 months before the breakup ($SD = 13.4$ months; range = 2 – 70 months), and having separated from their former partner an average of 3.4 months before the first study session ($SD = 2.2$ months; range = 2 – 12 months). Eight percent of the sample reported they remain best friends with their former partner, 15% were close friends, 15% were friends, 25% were acquaintances, 1% were enemies and 32% had no relationship at all (the remainder of the sample did not describe their separation status). Sixty-three percent of sample described themselves as White (non-Hispanic), 21% as Hispanic, 3% African American, 2% Native American, 5% Asian American, and 3% Other (the remainder of the sample chose not to provide ethnicity data). Participants reported spending an average of 24% of each day (in the two weeks before study intake) thinking about their ex-partner and the demise of their relationship ($SD = 23\%$; range = 0 – 95%). Fifty percent of the sample ($n = 72$) was randomly selected to participate without an informant, the remaining 50% ($n = 73$) were randomly selected to participate with an informant reporting on their behaviors and feelings. Thirty-nine percent of the sample participated via online-only questionnaires, and 61% completed their initial questionnaire in-person in the laboratory. Data for this study were collected over a period of 27 months between 2010 and 2012, and all aspects of this study were approved by the University of Arizona Human Subjects Protection Program.

The retention rate across the study was as follows: 87% at follow-up one ($n = 126$), 86% at follow-up two ($n = 125$), 70% at follow-up three ($n = 102$) and 75% at the final assessment

($n = 111$; 81% of participants without an informant and 71% of participants completing the study with an informant). For informants, out of the 48 who began the study, 81% completed follow-up one ($n = 39$), 83% completed follow-up two ($n = 40$), and 81% completed the final assessment ($n = 39$). Participants who completed all assessments ($n = 65$) differed from those who did not in that the time since their breakup length was shorter by 2 weeks (2.9 months compared to 3.4 months), the length of their relationship was longer by 1.5 months (21.8 months compared to 20.6 months), 87% of these participants remained single ($n = 57$), 55% indicated their ex-partner had ended the relationship ($n = 39$), and these participants reported thinking about their ex-partner 34% of the day. An equal number of these participants came from each condition; and while the distribution of participant-defined relationships with an ex-partner were similar, none of the participants who completed all assessments indicated they were ‘enemies’ with their former partner. When each of these differences were analyzed, the only statistically significant difference between the two groups of participants was regarding the shorter time since the breakup evident in the ‘completers’ ($t = 2.06, p = .04$).

Study Design

At study entry, the sample was randomly assigned to one of two experimental conditions (see Figure 1), the first condition answered weekly questionnaires about their contact with former partners, the social support efforts of others and their emotional states ($n = 72$), and the second condition provided weekly questionnaires about contact with former partners, the social support efforts of others and emotional states while also having informants report on their own support behaviors and their perceptions of the participant's contact with his/her former partner and emotional states ($n = 73$). Prior to completing the initial questionnaire, participants in the latter condition were asked to identify a potential friend/family member who could accurately

report on their behaviors and emotions relative to the breakup. If their friend/family member agreed to be contacted, participants provided the phone number of their informant at the conclusion of the initial questionnaire and a trained research assistant contacted and conducted verbal consent of the informant. Consenting informants were emailed information regarding access to and how to complete the questionnaire measures; they were asked to complete these questionnaires on a weekly basis on the same day as the participant completes his/her follow up assessment. Informant measures were identical to participant measures, with the exception of altering the questions to reflect informant perceptions of participant behaviors and emotions. Two participants in this condition declined to include an informant and 23 potential informants either declined participation or were unresponsive to contact attempts. Informant data was available for 48, or 66%, participants in this condition.

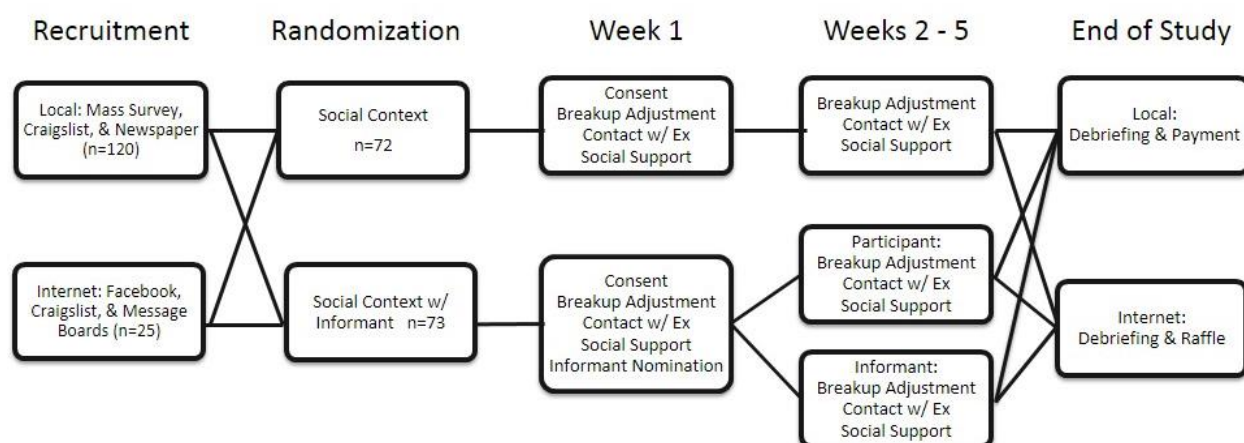


Figure 1. Diagram of study design including recruitment, randomization and assessment.

No demographic information was obtained from informants, and questions instead focused on the nature of the relationship between informants and participants. Informants classified themselves as friends (71%, $n = 34$) or family (21%, $n = 14$); 81% reported daily contact with a participant, 15% 2-3 times per week, 2% once per week and 2% once per month; and the most frequent methods of contact were in-person (60%) and text message (25%),

speaking on the phone (13%) and social networking contact (2%) were also endorsed. Finally, informants were asked to indicate if they felt they could report on a participant across several areas of functioning, 90% indicated they could report on the participants' emotional well-being, 79% on social functioning, 77% health behaviors and 73% occupational functioning.

Local participants met with a research assistant for an in-lab session where they provided informed consent, had their current level of emotional adjustment assessed, and were provided instructions regarding the weekly internet questionnaire. They also completed a cross-sectional assessment of demographic, adult attachment style, interdependence, loneliness, and relationship specific measures at this time. For the internet based sample, interested participants completed a brief eligibility assessment via email or phone, with informed consent occur over the phone for eligible participants. Following consent procedures, internet based participants received an email including login information (unique user ID) and a link to the initial assessment. Similar to local participants, weekly emails with links to the appropriate follow up assessment were sent on the specific assessment day.

All participants completed four assessments after their initial questionnaire that were spaced one-week apart. Follow-up questionnaires were abbreviated questionnaire sets designed to assess weekly contact with ex-partner, social support from friends/family members and emotional adjustment to the breakup. After completing the final assessment a debriefing statement was displayed and the project coordinator provided contact information to answer any questions related to the study the participant/informant might have and arrange for payment.

Measures

Note: All measures are included in the appendix, please refer to specific measures by their designated appendix letters.

Profiles of contact with ex-partners. Contact with former partners was assessed via a detailed set of questions asking participants the number of days in the past week they have engaged in in-person, phone, e-mail, or text message contact, as well as viewed their ex-partner's social networking site; and, the occurrence and frequency of sexually intimate contact (see Table 2). Additional questions probed for the valence (e.g. “When you reflect on all of the contact you had with your ex-partner in the past week, how negative or positive are your emotions in this moment?”), tone (e.g. brief and important/unimportant, casual and relaxed, romantic and positive/negative), content (practical or related to the relationship), and emotional intensity of each specific form of contact (e.g. “When you reflect on all of the contact you had with your ex-partner in the past week, how intense are your emotions in this moment?”). This measure builds upon previously used assessments of contact (see Sbarra & Emery, 2005; refer to Appendix A).

Table 2.
Descriptive Statistics for Weekly Contact with Ex-partner (n = 145)

	Frequency of Contact		
	<i>Mean</i>	<i>Std. Deviation</i>	<i>Range</i>
E-mail	.08	.44	0 – 5
In-Person	1.01	1.86	0 – 7
Phone	.69	1.49	0 – 7
Social Network	1.75	2.19	0 – 7
Sexual Contact	.22	.77	0 – 5
Text	1.76	2.38	0 – 7

Note: When only participants who report having engaged in sexually intimate contact with an ex-partner are examined the mean is 2.21 days ($SD = 1.27$).

Emotional adjustment. Emotional adjustment was assessed with three primary measures that served as the main outcome variables in this study.

The Inventory Of Complicated Grief (ICG; Prigerson et al., 1995: Appendix B) measures ongoing grief symptoms relative to the loss of the relationship. Complicated grief is distinct from bereavement in that it represents a set of symptoms that predicts long-term dysfunction, we removed 4-items from the original 19-item inventory that specifically addressed grief related to death. Question stems for the 15-items were altered to reflect the extent to which thoughts specific to the breakup or the ex-partner occur on a weekly basis on a 5-point likert scale (0 = never to 4 = always), and reliability among the items ranged from .90 - .94 (see Table 4). Items were summed for each measurement occasion.

The Center For Epidemiological Studies (CESD-10; Andresen, Malmgren, Carter & Patrick, 1994; Appendix C) scale is a 10-item measure assessing levels of depressive symptoms on a 4-point likert scale (0 = rarely or none of the time (<1 day) to 3 = most of all of the time (5 – 7 days). Items 5 and 8 were reverse scored (0:3, 1:2, 2:3, 3:0) and all items summed for each measurement occasion, reliability among the items ranged from .73 - .83 (see Table 4).

Broad measure of adult attachment style. Adult attachment style was measured from the Experiences in Close Relationships – Short Form questionnaire (ECR-SF; Wei, Russell, Mallinckrodt & Vogel, 2007; Appendix D), which is an abbreviated version of the Experiences in Close Relationships - Revised scale (ECR-R, Fraley, Waller & Brennan, 2000). The 12-item ECR-SF measures the attachment-related anxiety and avoidance individuals experience in close relationships and will serve as a broad measure of how individuals function across a variety of close-relationships on a 7-point likert scale (1 = strongly disagree to 7 = strongly agree). Items 1,

5, 8 and 9 were reverse scored (1:7, 2:6, 3:5, etc.), and the anxious (comprised of items 2, 4, 6, 8, 10 and 12) and avoidance (comprised of items 1, 3, 5, 7, 9 and 11) dimensions created by taking the mean of these items. People with high scores on attachment anxiety experience heightened distress, and employ hyperactivating emotion regulation strategies to restore a sense of felt-security when separated from an attachment figure; whereas, people with high scores on attachment avoidance suppress their distress and employ deactivating emotion regulation strategies to distance themselves from an attachment figure. This was an individual difference measure included at the beginning of the study, reliability was .74 for the anxious dimension and .73 for the avoidant dimension (see Table 4).

Narrow measure of attachment to ex-partner. Current feelings of attachment for the ex-partner were assessed with a modified WHOTO questionnaire (Hazan & Zeifman, 1994; Appendix E) administered at each assessment. This 16-item measure was altered from a free-response to a forced-choice item and asked to what extent the participant would turn to their ex-partner when experiencing distress on a 7-point likert scale (1 = strong disagree to 7 = strongly agree). This repeated measure allowed us to examine the situations in which the participant seeks proximity to, views as a secure base, and seeks safety in their former partner. Thus people with higher mean scores on the WHOTO will continue to consider their ex-partner as a secure base and will seek out their ex-partner, specifically, when in distress. Items were averaged to create a mean attachment score for each measurement occasion and internal consistency ranged from .94 - .97 (see Table 4).

Loneliness. Loneliness was assessed with the short form of the revised UCLA loneliness scale (RUCLALS-4; Russell, Peplau & Cutrona, 1980; Appendix F), this is a 4-item questionnaire assessed time-varying participant perceptions of social isolation on a 4-point likert

scale (0 = never to 4 = always). These items were summed for each measurement occasion and the reliability ranged from .83 - .89 (see Table 4).

Longing. Longing, or preoccupation, was assessed by a single-item asking the percentage of the day the participant spent thinking about their former partner (see Table 4).

Rumination. The Ruminative Response Scale (RRS, Nolen-Hoeksema & Morrow, 1991; Appendix G) is psychometrically sound a measure of the degree to which ruminates about, and causes of, their sadness. The 22-items were altered to assess behavior since the last assessment and measured on a 4-point likert scale (1 = never to 4 = always). Mean scores were computing by averaging the items at each measurement occasion, reliability ranged from .94 - .98 (see Table 4).

Social support behaviors. Twenty-two items constitute the measure of social support (Appendix H). Behaviors were chosen to reflect both practical (e.g. exercising with a friend or having a meal with a friend) and emotional (e.g. a friend telling you 'it'll all be ok' or comforting you while crying) forms of social support. Special attention was paid to selecting behaviors that were not gender specific, such as those that emphasize talking about or sharing emotional thoughts, which may be more indicative of female social relatedness. Participants indicated if they engaged in these behaviors with a friend/family member in the past week (yes/no) and the frequency of these behaviors in the past week (once, a couple of days, most days, or every day). Additional questions assessed how participants view the supportive efforts of their informant and other friends/family members, and the extent to which the supportive efforts of others were viewed as helpful or harmful. Informants' weekly measure sets differed from the participants in one way: informants were asked if they engaged in the behaviors with the participant (using an identical list of behaviors). To create scales of emotional and practical social support we

performed an exploratory factor analysis on all the items specifying 2-factors, varimax rotation and a .50 cutoff value. Out of 22-items 16-items met criteria and each subscale was comprised of 8-items that were summed for each measurement occasion (please refer to Table 3 for descriptive information about social support items). Reliability for emotional social support (comprised of items 3, 6, 8, 10, 12, 15, 17 and 18) ranged from .71-.88 and practical social support (comprised of items 2, 4, 5, 7, 9, 11, 13 and 16) ranged from .56 - .69 (see Table 4). Mean and standard deviations were similar for both participants with, and without, informants (refer to Table 3) though I conducted tests of statistical significance for EA5 (see Table 24).

Perceived Stress Scale. Participants completed the Perceived Stress Scale (PSS; Cohen, Kamarck & Mermelstein, 1983; Appendix I), a 10-item questionnaire measured on a 5-point likert scale (0 = never to 4 = very often). We altered this repeated measure to reflect how often participants felt this way in the past week. This scale is *not* specific to how one views their control over the breakup experience. Instead, this scale was included to assess individual changes in beliefs about how uncontrollable and overloaded one views their life as during a time of distress, immediately after the breakup, and during a resolved period, having successfully coped with the breakup. Four positive items (4, 5, 7 and 8) were reverse scored (0:4, 1:3, 2:2, etc.) and the 10-items summed for each measurement occasion, reliabilities ranged from .73 - .84 (see Table 4).

Table 3.
Social Support Descriptives by Assessment

	Time 1		Time 2		Time 3		Time 4		Times 5	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Participants w/o Informant										
Practical Support	11.83	1.71	10.94	1.88	10.43	1.76	10.18	1.62	9.97	1.69
Emotional Support	14.21	1.86	12.76	2.72	11.80	2.76	11.37	2.69	10.88	2.71
Helpful/Harmful	5.33	1.53	5.08	1.84	4.99	1.91	4.93	2.00	4.91	2.04
Needed Support	4.80	1.85	4.45	1.88	4.30	2.08	4.24	2.09	4.23	1.99
Participants with Informant										
Practical Support	11.65	1.74	10.95	1.82	10.46	1.62	10.20	1.60	9.88	1.59
Emotional Support	14.08	1.93	12.75	2.82	11.86	2.75	11.60	2.66	10.88	2.62
Helpful/Harmful	5.26	1.49	5.09	1.75	5.00	1.75	4.94	1.84	4.89	1.97
Needed Support	5.02	1.64	4.71	1.73	4.40	1.97	4.37	2.02	4.45	1.94
Informants										
Practical Support			11.55	1.79	10.87	1.72	10.66	1.58	10.56	1.67
Emotional Support			14.06	2.07	12.49	2.40	11.89	2.51	11.49	2.50
Needed Support			3.87	1.80	3.28	1.75	3.50	1.93	3.54	1.60

Note: M = Mean & SD = Standard Deviation.

Table 4.
Descriptive and Reliability Statistics for All Measures (N=145)

					Alpha			
	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>Time 1</i>	<i>Time 2</i>	<i>Time 3</i>	<i>Time 4</i>	<i>Time 5</i>
ICG	34.46	13.24	15 - 74	.90	.92	.94	.92	.92
CESD-10	7.35	5.27	0 – 24	.73	.77	.77	.82	.83
ECR-SF								
Anxious Attachment	3.97	1.27	1 - 7	.74				
Avoidant Attachment	2.82	1.15	1 – 6.33	.73				
WHOTO	3.51	1.58	1 – 7	.94	.96	.96	.96	.97
RUCLAS - 4	8.91	3.31	4 – 16	.83	.86	.89	.88	.88
Longing	21.33	23.56	0 – 100					
RRS	.76	.60	0 – 2.5	.98	.94	.94	.94	.95
Social Support								
Emotional	14.21	1.86	8 – 16	.71	.86	.86	.85	.88
Practical	11.83	1.71	8 – 15	.56	.69	.68	.63	.67
PSS	22.30	7.16	6 - 42	.84	.80	.73	.76	.67

Note: Where applicable, cell is empty for viewing clarity. M = Mean & SD = Standard Deviation.

Statistical Methodology

Preliminary Treatment of the Data. Data was examined for outliers and non-normal distributions of responses using scatterplots and histograms, respectively. There were no subjects identified as outliers, and thus, no subjects whose data was eliminated from the analyses. In the following models, breakup adjustment is represented by participant reports of depressed (CESD-10) and complicated grief (ICG) symptoms. These outcomes were examined for linear, quadratic and cubic effects of time. Only linear effects were significant— both depression and complicated grief evidence a significant linear decrease across the study, and hence, a linear effect of time is included in all analyses. Contact is measured as frequency (i.e. number of days in a week) that the participant had a specific form of contact with an ex-partner. These variables comprise the basis for the proposed associations and represent level-1 variables in multilevel modeling regression terms. That is, level-1 variables are measured at each occasion of assessment and may be different at each time-point in the study, these are also called *time-varying* predictors and outcomes. Level-1 variables can be thought of as representing *within-* person indicators. Conversely, level-2 variables such as moderators (i.e. individual difference variables like gender) are *time-invariant* and remain constant at each time-point in the study. Level-2 variables can be thought of as *between-*persons indicators, in that they reflect differences that vary from person to person but remain constant regardless of when they are measured. The following analyses employ both level-1 (within-person) and level-2 (between-persons) variables and will be noted accordingly.

Multilevel Regression Models (MLM; Singer & Willett, 2003). H1-H4, and H6 were conducted using basic MLM and the analyses proceeded in a step-wise fashion: (1) empty models were tested where covariates were excluded and the association between contact and

adjustment were examined using the following MLM regression equation (all variables measured at level-1):

$$1. \text{ Adjustment}_{tj} = B0_j + B1_j \text{Contact}_{(t-1)j} + \varepsilon_{tj}$$

The parameter of interest is $B1_j$, which tells us the strength and significance of the association between reported emotional adjustment today and having contact the previous week; (2) if a significant association occurred between contact and adjustment, covariates were added the model re-examined. Covariates were selected based on prior studies (see Sbarra & Emery, 2005) and included participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time. Correlations between covariates and outcomes of interest were examined (see Table 5).

For **H1** of interest was the lead-lag associations of contact and adjustment, and analyses included a second equation to determine how adjustment might predict contact behaviors (all variables measured at level-1):

$$2. \text{ Contact}_{tj} = B0_j + B2_j \text{Adjustment}_{(t-1)j} + \varepsilon_{tj}$$

Of interest is $B2_j$, the association of emotional adjustment in the previous week and reported frequency of contact with an ex-partner during the current week. Given the time-lags, concurrent associations were also examined to highlight potential types of contact that might benefit from a narrower lag-window. **H2** examined type of contact, including sexual contact and frequency of sexual contact on adjustment, as well as the moderating effects of time (level-1), new relationship (level-1) and gender (level-2). Analyses followed equation 1. **H3** calls for examining adult attachment style as an individual difference moderator of the association between contact and emotional adjustment. The attachment-related anxiety scale score from the ECR-SF was

entered as a level-2/person-level predictor. If a significant cross-level interaction occurred between contact and attachment-related anxiety, the interaction was probed using simple slopes analysis methods and calculators for multilevel modeling proposed by Preacher, Curran and Bauer (2006). **H3** was analyzed according to the following level-1/level-2 collapsed model:

$$3. \text{ Adjustment}_{ij} = B0_j + B1_j \text{Contact}_{(t-1)j} + B2_j (\text{ECR-SF})_{ij} + B3_j (\text{Contact}_{(t-1)j})(\text{ECR-SF})_{ij} + \mu_{0j} + \mu_{1j} + \varepsilon_{ij}$$

The parameter of interest $B3_j$, represented by the cross-level interaction term, if significant ECR-SF scores moderate the relationship of contact on a previous week and reported emotional adjustment today.

H4 examined current feelings of attachment for an ex-partner as a unique predictor of how individuals adjust following a romantic breakup. WHOTO scores were entered as a level-1 predictor and as a cross-level interaction term with contact according to the following level-1/level-2 collapsed model:

$$4. \text{ Adjustment}_{ij} = B0_j + B1_j \text{Contact}_{(t-1)j} + B2_j \text{ECR-SF}_{ij} + B3_j (\text{Contact}_{(t-1)j})(\text{ECR-SF}_{ij}) + B4_j \text{WHOTO}_{ij} + B5_j (\text{Contact}_{(t-1)j})(\text{WHOTO}_{ij}) + \mu_{0j} + \mu_{1j} + u_{2j} + \varepsilon_{ij}$$

There were two parameters of interest, $B4_j$ represented the unique main effect of feelings of attachment for the ex-partner on emotional adjustment and $B5_j$ represents the interaction term which will answer the question of if the association of contact with former partners and emotional adjustment is moderated by feelings of attachment for the former partner. Significant interaction terms were probed using identical methods as proposed for **H3** (Preacher et al., 2006).

H6 examined feelings of loneliness since the breakup as another possible predictor of distress and moderator of the contact and distress association. Analyses proceeded identically to

H3 with the R-UCLALS (level-1) replacing the ECR-SF and $B3_j$ representing the time-varying interaction term of perceived loneliness and contact. If significant, perceived loneliness was considered a time-varying moderator of the contact and emotional distress association. Of specific interest will be the direction of this association, how do perceptions of loneliness and isolation influence contact and emotional distress.

Basic MLM techniques also were used to examine **EA1** that sought to replicate the Bolger and colleagues (2000) invisible support findings. Drawing from the original study, the following model was proposed:

$$5. \quad \Delta\text{Adjustment}_{t+1} = B0_j + B1_j\text{Adjustment}_{(t)j} + B2_j\text{PR}_{(t)j} + B3_j\text{IR}_{(t)j} + \varepsilon_{tj}^1$$

The outcome in this model is represented by the change in emotional adjustment (i.e. depressive symptoms or complicated grief) between two successive assessments, $B1_j$ represents current emotional adjustment, and the parameter of interest is $B3_j$ the effect of reported informant provided support. The effect of informant provided support is hypothesized to be significant and negative, such that the support provided outside of the participants' awareness (i.e., the variance in adjustment that remains after variance associated with participant reported received support has been accounted for) will be associated with a decrease in depression and complicated grief scores.

Multi-level Structural Equation Modeling (MSEM, Preacher, Zhang & Zyphur, 2010) – Preacher and colleagues (2010) introduced MSEM to address two limitations within traditional multilevel mediation approaches. One of these limitations, and of importance to this study, involves the partitioning of variance when using MLM in mediation analysis such that level-2 (i.e. between-person) variance is conflated with level-1 (i.e. within-person) variance.

¹ Note that some parameters have been omitted such as those including 'stressor phase' (Bolger et al., 2000) because they were not applicable to the current study.

Without partitioning these as separate effects, the slope estimates provided in MLM combine the between and within variance when they are necessarily uncorrelated due to the separate levels on which they are measured. The consequence of this is inflation or bias in the estimated indirect effect and significance tests of the indirect effect. In this study **H5** and **H7** specify lower-level (1-1-1) models but both include level-2 covariates, and **H7** examines a mediated moderation model with a level-2 moderator. As such, using MSEM, as opposed to a MLM approach, generated less biased results. The MSEM model is expressed in terms of measurement and structural models, with the structural models separated into within and between equations. The following models are employed in SEM (Muthén & Muthén, 1998-2011).

6. Level 1 Measurement Model $\mathbf{Y}_{ij} = \mathbf{v}_j + \mathbf{A}_j\boldsymbol{\eta}_{ij} + \mathbf{K}_j\mathbf{X}_{ij} + \boldsymbol{\varepsilon}_{ij}$
7. Level 1 (Within) Structural Model $\boldsymbol{\eta}_{ij} = \boldsymbol{\alpha}_j + \mathbf{B}_j\boldsymbol{\eta}_{ij} + \mathbf{\Gamma}_j\mathbf{X}_{ij} + \boldsymbol{\zeta}_{ij}$
8. Level 2 (Between) Structural Model $\boldsymbol{\eta}_j = \boldsymbol{\mu} + \boldsymbol{\beta}\boldsymbol{\eta}_j + \boldsymbol{\gamma}\mathbf{X}_j + \boldsymbol{\nu}_j$

Of note are the following parameters: \mathbf{Y}_{ij} , the vector of endogenous measured variables; \mathbf{X}_{ij} , the level 1 exogenous measured variables; and \mathbf{X}_j , the level 2 exogenous measured variables. A j subscript denotes that this parameter can vary across participants. A path diagram of a lower-level mediation model in SEM can be exemplified as follows:

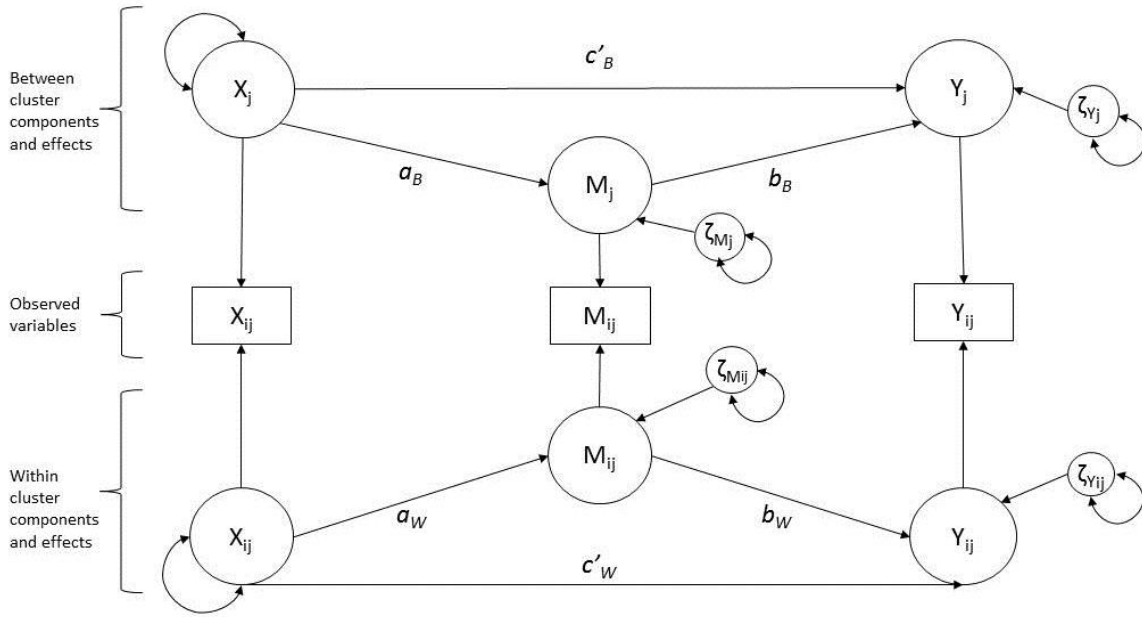


Figure 2. Multilevel SEM path diagram of proposed general lower-level mediation models.

For the proposed analyses, the parameters of interest were a_w , b_w and c'_w because the proposed mediations all occur at the lower-level, or in the within cluster. The significance test of the indirect effect, as well as the significance of each individual parameter is reported. For **H7**, the mediated moderation hypotheses, ' X_{ij} ' represents the interaction term of type of lagged contact and adult attachment anxiety or avoidance.

EA2 calls for lower-level mediation analyses as described in detail for **H5**; but type of support, total, emotional or practical reported by informants, is hypothesized to mediate the association of participant reported supportiveness (lagged 1-week) and how helpful/harmful the participant currently feels the support has been. **EA3** calls for lower-level mediation analyses examining PSS scores as mediators of the association between informant reported support and participant reported emotional adjustment. **EA4** will follow similar analyses to **H7** where ' X_{ij} ' represents the interaction term of type of lagged contact and adult attachment anxiety or avoidance.

Exploratory Analyses Using T-Tests. The final exploratory analysis (**EA5**) centers on examining if participant knowledge of a friend/family member reporting on their behavior alters the participant's responses. This analysis used *t*-tests to compare the mean responses on all predictors and outcomes included in the proposed analyses to identify significant differences between participants in each condition.

Table 5.
Correlations Between Covariates and Adjustment Outcomes (n = 145)

	1	2	3	4	5	6	7	8	9	10	11
1. Age	1.00										
2. Gender	.10 [*]	1.00									
3. Initiator	.10 [*]	.004	1.00								
4. Time Since Breakup	.13 [*]	-.05	.01	1.00							
5. Relationship Length	.20 [*]	.12 ^{**}	-.002	-.03	1.00						
6. Percentage of Day Thinking About Ex	-.06	.20 ^{**}	.07	-.13 ^{**}	.11 [*]	1.00					
7. New Relationship Status	-.10 [*]	.07	-.02	.10 [*]	.12 ^{**}	-.13 ^{**}	1.00				
8. Time - linear	0	0	0	0	0	-.27 ^{**}	.13 [*]	1.00			
9. Condition	.002	.15 ^{**}	-.004	.04	.18 ^{**}	.10 [*]	-.09 [*]	0	1.00		
10. CESD-10	.10 [*]	.02	.07	.06	.08	.21 ^{**}	-.17 ^{**}	-.21 ^{**}	.04	1.00	
11. ICG	.11 [*]	.03	.22 ^{**}	.06	.11 [*]	.46 ^{**}	-.21 ^{**}	-.31 ^{**}	.03	.60 ^{**}	1.00

Note: * $p < .05$, ** $p < .01$. Correlations were examined across all occasions. CESD-10 = The Center for Epidemiological Studies 10-item depression inventory, and ICG = Inventory of Complicated Grief

3. RESULTS

Aim 1: Examine role of specific ex-partner contact on emotional adjustment

Bidirectional Lead-lag Analyses

To assess whether contact with an ex-partner is associated with worse *future* adjustment, or if worse adjustment is associated with greater future ex-partner contact, I examined **H1** using MLM (see Tables 6 & 7); covariates were selected based on prior studies (see Sbarra & Emery, 2005) and included, in all models, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time. All ex-partner contact variables were measured as frequency, or number of days, in the past week that a specific form of contact occurred between the participant and their ex-partner. The more sexual intimacy in a previous week the less depression was reported during the current week ($b = -2.98$, $S.E. = .89$, $p = .001$), but no other lagged contact effects evidenced significant associations with depression or complicated grief. Greater complicated grief during a previous week was associated with less in-person, and marginally associated with less phone, contact in the current week ($b = -.03$, $S.E. = .01$, $p < .01$ and $b = -.01$, $S.E. = .005$, $p < .10$, respectively), no other lagged adjustment effects evidenced significant associations with ex-partner contact.

Due to the limited significant associations with lagged contact, concurrent effects were analyzed to evaluate **H2**, whether all forms of ex-partner contact have the same impact on participant emotional adjustment. The more in-person ex-partner contact reported the greater depression during the same week ($b = .34$, $S.E. = .15$, $p = .02$). Sexual intimacy with an ex had similar associations ($b = 1.97$, $S.E. = .60$, $p = .003$). Greater social network ex-partner contact was associated with higher complicated grief ($b = .96$, $S.E. = .31$, $p = .003$), but text ex-partner contact was associated with less ($b = -.62$, $S.E. = .24$, $p = .01$). Higher depression scores were

marginally associated with greater frequency of sexual intimacy and social network contact ($b = .07$, $S.E. = .04$, $p < .10$ and $b = .03$, $S.E. = .02$, $p < .10$, respectively) during the same week. Finally, greater complicated grief was positively associated with social network ex-partner contact and negatively associated with text ex-partner contact ($b = .03$, $S.E. = .01$, $p < .01$ and $b = -.02$, $S.E. = .01$, $p < .05$, respectively) in the same week.

Given the lagged and concurrent effects of sexual intimacy in the preceding models, I report the lagged *and* concurrent effects from the **H1** model. When examined together, intimate contact last week is associated with less depression this week ($b = -2.98$, $S.E. = .89$, $p = .001$) but sex with an ex-partner during a current week is associated with greater depression ($b = 3.89$, $S.E. = .92$, $p < .001$). Said differently, the net effect of being sexually intimate with an ex-partner is an approximately 1-unit ($\Delta b = .91$) increase in depression for each two week period that a participant reports a one unit increase in how many times they slept with an ex-partner. These results are mixed, and there is no conclusive evidence for the direction of the effects between ex-partner contact and emotional adjustment.² The sex with an ex-partner analyses support the hypothesis that some forms of contact will be associated with poorer adjustment than others. Sex with an ex was the only significant lagged effect to predict future depression, and the net effect of ongoing sexual contact was an increase in the report of depression symptoms.

² Given the numerous analyses for each aim, I acknowledge a possible alpha-error inflation rate association with multiple tests. Please refer to page 105 in the discussion section for an explanation of how I corrected for this and any changes in results given a more conservative cut-off p-value.

Table 6.

AIM 1: Ex-partner Contact Predicts Depression and Complicated Grief (n = 145)

	Depression			Complicated Grief		
Lagged Contact	Est.	SE	p	Est.	S.E.	p
Email	.30	.63	.64	-.33	1.26	.80
In-person	-.11	.15	.45	-.34	.31	.27
Phone	-.17	.20	.38	-.42	.39	.28
Sexual Intimacy	-2.98**	.89	.001**	-.75	1.84	.68
Social Network	-.22	.16	.16	-.04	.31	.91
Text	.18	.14	.19	-.29	.27	.29
Concurrent Contact	Est.	S.E.	p	Est.	S.E.	p
Email	-.05	.43	.91	1.00	.91	.27
In-person	.34*	.15	.02*	.51	.31	.11
Phone	.09	.16	.58	-.13	.33	.70
Sexual Intimacy	1.97**	.60	.003**	-1.05	1.38	.45
Social Network	.21	.14	.15	.96**	.31	.003***
Text	.02	.11	.85	-.62*	.24	.01*

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis, and analyses were conducted with *either* depression or complicated grief as the emotional adjustment outcome. Also note that the lagged contact analyses include current frequency of contact. Finally, all analyses included the following covariates: participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 7.

AIM 1: Depression and Complicated Grief Predicting Ex-partner Contact (n = 145)

	Email		In-person		Phone		Sexual Intimacy		Social Network		Text	
Lagged	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Depression	.001	.01	-.02	.06	.01	.01	.01	.03	.02	.02	-.004	.02
Complicated Grief	.001	.002	-.03***	.01	-.01*	.01	-.03	.02	.003	.01	-.01	.01
Concurrent												
Depression	-.003	.004	.02	.01	-.002	.01	.07*	.04	.03*	.02	-.01	.02
Complicated Grief	.0001	.002	.01	.01	-.01	.01	-.01	.02	.03***	.01	-.02**	.01

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis, and analyses were conducted with the frequency of only *one* specific form of contact as the outcome. Also note that the lagged adjustment analyses include current frequency of contact. Finally, all analyses included the following covariates: participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Aim 2: Examine Moderators and Mediators of Emotional Adjustment Post-dissolution

In Aim 2 I sought to explore whether the ex-partner contact/emotional adjustment are stronger for people reporting specific psychological traits, as well as the pathways can explain the effects of ex-partner contact on emotional adjustment.

Non-attachment Related Moderators

The following models explore relationship and individual differences to gain a better understanding of how different people and different behaviors are associated with adjustment after the breakup. I examined gender, new relationship status and breakup initiator status (i.e., who initiated the breakup) as moderators of the ex-partner contact and emotional adjustment association (see Tables 8 and 9 for two-way interaction analyses). Models include the main effect of the proposed moderator and interactions with ex-partner contact and/or the linear effect of time, as well the covariates gender, who initiated the breakup, and if the participant is involved in a new relationship (where not included as a moderator in analyses), participant age, time since the breakup, relationship length, experimental condition, and the linear effect of time (where not included in an interaction with a proposed moderator).

Table 8.

Two-way Interaction Effects of Non-Attachment Moderators and Ex-partner Contact on Depression (n = 145)

Type of Contact	Gender			New Relationship			Initiator Status		
	Est.	<i>S.E.</i>	<i>p</i>	Est.	<i>S.E.</i>	<i>p</i>	Est.	<i>S.E.</i>	<i>p</i>
Email	DNC	DNC	DNC	2.06	1.61	.20	1.33	1.41	.34
In-Person	-.80	.65	.22	-.02	.45	.97	.16	.29	.59
Phone	-1.20	.59	.20	.76	.67	.25	.17	.31	.58
Sexual Intimacy	N/A	N/A/	N/A	-1.21	.93	.20	-.98	1.06	.36
Social Network	-.09	.40	.83	-.09	.31	.77	.22	.25	.37
Text	.20	.49	.68	-.09	.34	.79	.30	.22	.17
Unfriend	8.32*	4.14	.05*	-.71	1.69	.68	-.18	1.77	.92

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row and moderator column of the above table represents a separate analysis, and analyses were conducted with the frequency of only *one* specific form of contact as the outcome. Each analysis included the following covariates: gender, who initiated the breakup, and if the participant is involved in a new relationship (where not included as moderator in analyses), participant age, time since the breakup, relationship length, experimental condition, and the linear effect of time (where not included in an interaction with a proposed moderator). DNC = model did not converge; and N/A = model is examined in a three-way interaction analysis with the linear effect of time.

Table 9

Two-way Interaction Effects of Non-Attachment Moderators and Ex-partner Contact on Complicated Grief (n = 145)

Type of Contact	Gender			New Relationship			Initiator Status		
	Est.	S.E.	p	Est.	S.E.	p	Est.	S.E.	p
Email	DNC	DNC	DNC	-.66	3.41	.85	1.89	2.97	.53
In-Person	-2.28*	1.34	.09*	2.23**	.87	.01**	.02	.62	.97
Phone	-.50	1.22	.69	3.19**	1.40	.02**	-.55	.65	.40
Sexual Intimacy	-10.82**	4.28	.01**	3.64	3.52	.30	-2.90	2.31	.22
Social Network	.21	.83	.80	-.39	.64	.53	.82	.51	.11
Text	1.07	1.03	.30	.43	.72	.55	-.23	.46	.62

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row and moderator column of the above table represents a separate analysis, and analyses were conducted with the frequency of only *one* specific form of contact as the outcome. Each analysis included the following covariates: gender, who initiated the breakup, and if the participant is involved in a new relationship (where not included as moderator in analyses), participant age, time since the breakup, relationship length, experimental condition, and the linear effect of time (where not included in an interaction with a proposed moderator). DNC = model did not converge; and N/A = model is examined in a three-way interaction analysis with the linear effect of time

Gender. Gender was examined as a level-2 main-effect and as a moderator in a three-way cross-level interaction to examine if men and women respond differently to the various types of contact across the study. At the level of a statistical trend, gender moderates the new relationship and time interaction on complicated grief ($b = 3.88$, $S.E. = 2.14$, $p = .07$, see Table 10), such that men who are in a new relationship at the beginning of the study evidence significantly less complicated grief at the end of the study, but women do not (men: $z = -4.52$, $p < .001$; women: $z = .05$, $p = .59$, see Figure 3).

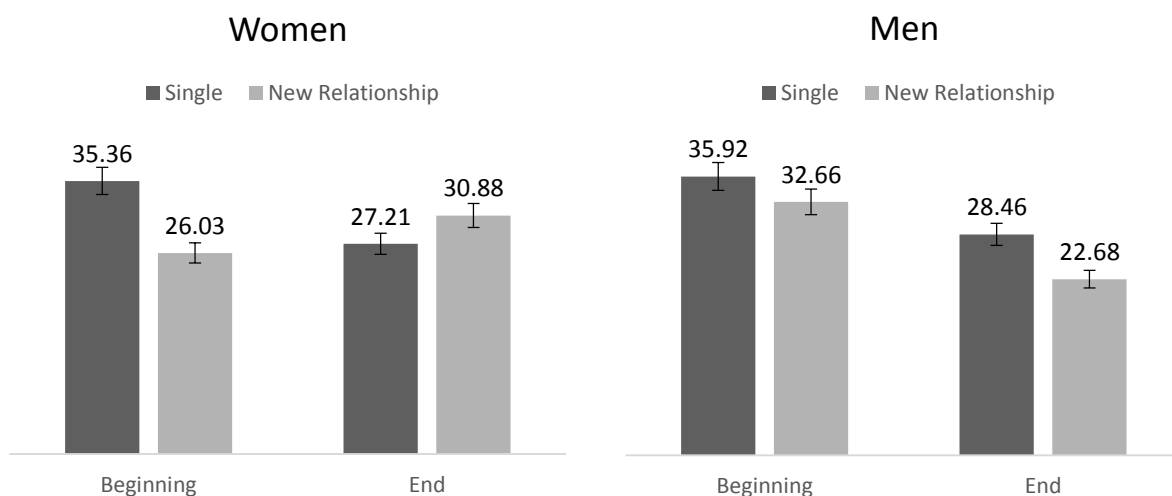


Figure 3. Three-way interaction of gender, new relationship status and time on complicated grief.
Note: error bars indicate standard errors of the mean.

Gender also impacts the consequences associated with engaging in sexually intimate ex-partner contact, evidenced by a significant three-way cross-level interaction of gender, frequency of sexual contact in a week, and the linear effect of time ($b = 4.11$, $S.E. = 2.08$, $p = .05$, see Table 10). Women who reported a greater amount of sex with an ex-partner showed no changes in complicated grief across the study ($z = .74$, $p = .46$) but all other participants (women who deny sex with an ex, as well as all male participants) evidence significantly decreasing slopes in complicated grief across the study (women no/sex: $z = -2.43$, $p = .003$; men no/sex: $z = -7.23$, $p < .001$; men sex w/ ex: $z = -2.61$, $p = .01$).

Social Network. One finding specific to social network ex-partner contact suggests that being ‘unfriended’ by an ex-partner can be beneficial. A two-way interaction of ‘unfriend’ status and the linear effect of time ($b = -2.02$, $S.E. = .92$, $p = .03$) showed that participants who report being ‘unfriended’ by their ex-partner entered the study with significantly higher depression ($z = 3.11$, $p = .002$) but ended the study with similar depression scores to participants who remained online ‘friends’ with their former partners ($z = .78$, $p = .44$); ‘unfriended’ participants evidence a faster decrease in their reported depression across the study period (unfriended: $z = 2.78$, $p = .006$; still friends: $z = -1.19$, $p = .24$).

Gender and Social Network. Finally, different online behaviors (such as reading wall posts or viewing ex-partner’s ‘friending’ behaviors) were examined as specific forms of social network contact. At the level of a trend, gender moderated the effects of viewing pictures of an ex-partner and the linear effect of time on depression ($b = .50$, $p = .06$ refer to Table 10). Men have a significant decreasing slope in depression across the study regardless of online picture viewing (low picture: $z = -3.80$, $p = .04$, high picture: $z = -5.52$, $p = .03$), though men with greater picture viewing experienced faster decreases in depression. Women do not evidence changes in depression as a function of ex-partner online picture viewing. A two-way interaction of gender, and ‘unfriending’ status on depression suggests that for men, the act of being ‘unfriended’ is associated with better emotional adjustment ($b = 8.32$, $S.E. 4.14$, $p = .05$, refer to Table 8). At the level of a statistical trend, men but not women show decreases in depression if they have been ‘unfriended’ ($z = 1.72$, $p = .08$).

Together, these findings suggest that active and passive coping strategies may be associated with better emotional health post-breakup depending on gender. Beginning a new relationship or viewing an ex-partner’s pictures online may be male attempts at active coping,

whereas being ‘unfriended’ by an ex-partner occurs outside of men’s control but is still associated with better emotional adjustment. For women, results suggest that refraining from post-breakup sex may be the most beneficial way to positively impact emotional adjustment.

Table 10
Three-way Interactions Involving Gender as a Moderator

Model	Depression			Complicated Grief		
	Est.	S.E.	p	Est.	S.E.	p
Time				-1.69***	.61	.006***
Gender				-.56	2.57	.83
New Relationship				2.81	7.64	.71
Time * Gender				-.17	.67	.80
Time * New Relationship				-4.51**	2.05	.03**
Gender * New Relationship				-6.08	7.84	.44
Gender * New Relationship * Time				3.88*	2.14	.07*
Time				-1.82***	.34	<.001***
Gender				.83	2.52	.74
Sexual Intimacy				16.40***	5.42	.003***
Time * Gender				-.19	.34	.57
Time * Sexual Intimacy				-3.91**	1.92	.04**
Gender * Sexual Intimacy				-19.10***	5.78	.001***
Gender * Sexual Intimacy * Time				4.11*	2.08	.05*
Time	-.91**	.44	.04**			
Gender	-1.82	1.31	.17			
Picture Viewing	1.56***	.41	<.001***			
Time * Gender	.54	.47	.25			
Time * Picture Viewing	-.62**	.26	.02**			
Gender * Picture Viewing	-1.20***	.44	.007***			
Gender * Picture Viewing * Time	.50*	.27	.06*			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row section and column section represents a separate analysis. All contact variables measure frequency of contact in a week. Each analysis included the following covariates: if the participant is involved in a new relationship (where not included as moderator in analyses), participant age, time since the breakup, relationship length, experimental condition, and who initiated the breakup.

Broad and Narrow Adult Attachment Moderators

Broad measure. H3 examined traditional measures of adult attachment style as a potential moderator. These analyses include main effects of attachment anxiety/avoidance, and interactions between attachment anxiety/avoidance and contact/post-dissolution context variables, as well as the covariates participant age, who initiated the breakup, time since the breakup, relationship length, and experimental condition. The linear effect of time, if the participant is involved in a new relationship, and gender also were only included as covariates if not a part of the proposed moderation model. For each analysis, refer to Table 10 for the specific main effects and interactions included in each model.

Attachment style and new relationships. At the level of a statistical trend, attachment anxiety moderates the interaction of new relationship status and time on depression ($b = -.38$, $S.E. = .21$, $p = .07$, refer to Table 11). New relationships are associated with decreasing depression across the study for high attachment anxiety individuals, but not low attachment anxiety individuals (high anxiety: $z = -5.00$, $p < .001$; low anxiety: $z = -1.14$, $p = .25$; slope difference test: $t = -3.08$, $p = .003$, see Figure 4). This same association direction of effect is observed for attachment avoidance when predicting complicated grief ($b = -.99$, $S.E. = .50$, $p = .05$). High avoidance individuals who are in new relationships evidence the faster decreases in complicated grief across the study, relative to low avoidance individuals (high avoidance: $z = -4.50$, $p < .001$; low avoidance: $z = -1.53$, $p = .12$; slope difference test: $t = -2.38$, $p = .02$, see Figure 5).

Attachment style and in-person ex-partner contact. Both attachment anxiety ($b = -1.26$, $S.E. = .57$, $p = .03$, refer to Table 11) and avoidance ($b = -1.61$, $S.E. = .74$, $p = .03$) moderate the interaction of in-person contact frequency in a given week and gender on depression. High

attachment anxiety moderates the gender and in-person contact with an ex-partner interaction on depression (women: $z = -1.98, p = .05$; men: $z = 1.74, p = .08$) such that high anxiety women, but not men, evidence significant decreases in their reported depression with greater in-person ex-partner contact (slope difference test: $t = -2.40, p = .02$ see Figure 6). Similarly high attachment avoidance women, but not men experience faster decreases in depression with greater in-person ex-partner contact (women: $z = -2.35, p = .02$; men: $z = -.11, p = .91$; slope difference test: $t = -2.44, p = .02$ see Figure 7). These results appear surprising in that high avoidance but not high anxiety women evidence increased distress when seeing an ex-partner.

Attachment style and sex with an ex-partner. Both attachment anxiety ($b = -4.92, S.E. = 2.10, p = .02$, refer to Table 11) and avoidance ($b = -5.16, S.E. = 2.56, p = .05$, refer to Table 11) moderate the interaction of gender and sexual contact with an ex-partner on depression. At the level of a trend, high attachment anxiety women, but not men experience decreases in depression when having a sex with an ex-partner (women: $z = -7.86, p = .07$; men: $z = .69, p = .49$; slope difference test: $t = -2.30, p = .02$, refer to Figure 8). Both low anxiety men and women experience greater depression when they sleep with an ex-partner (women: $z = 1.83, p = .07$; men: $z = 2.83, p = .005$). Similar to attachment anxiety, high attachment avoidance women also show significant decreases at the trend level in depression if they have sex with their ex-partners (women: $z = 1.81, p = .07$, refer to Figure 9), no other participants evidenced significant changes in depression when engaging in sex with an ex.

Taken together, these results indicate a consistent moderating effect of both attachment anxiety and avoidance on contact/relationship variables and emotional adjustment as proposed in **H3**. Specifically, forming a new relationship, having greater in-person ex-partner contact, or engaging in sex with an ex-partner is beneficial for high attachment anxiety/avoidance people.

These people show better emotional adjustment relative to other participants, and even a faster decrease in depression and complicated grief.

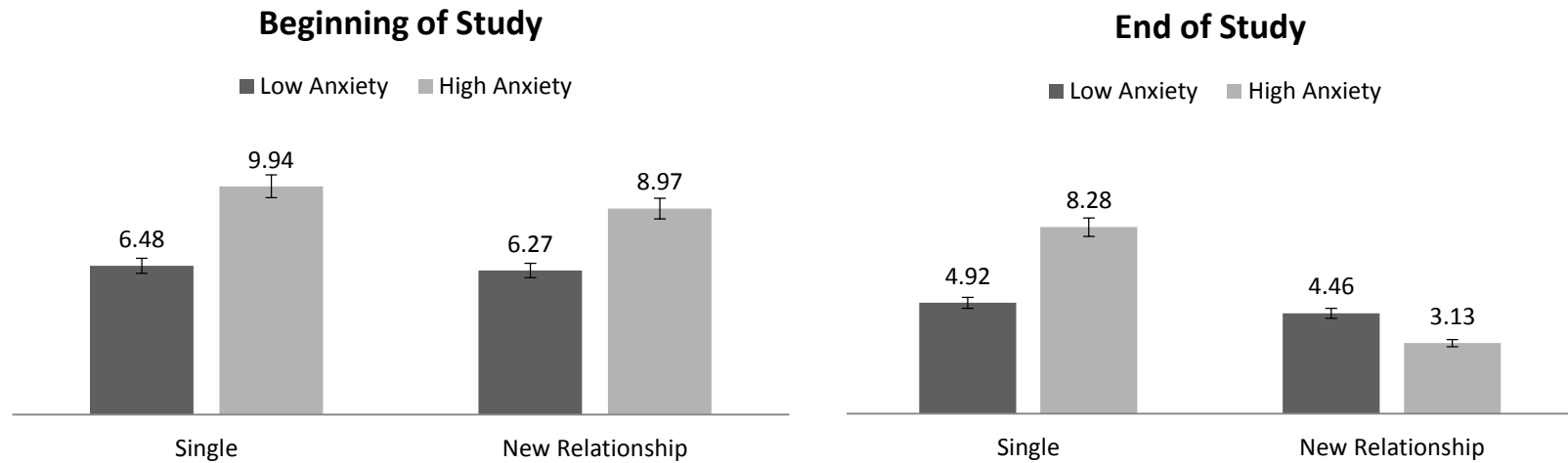


Figure 4. Attachment anxiety, new relationship and linear time interaction on depression.
Note: Error bars indicate standard errors of the mean.

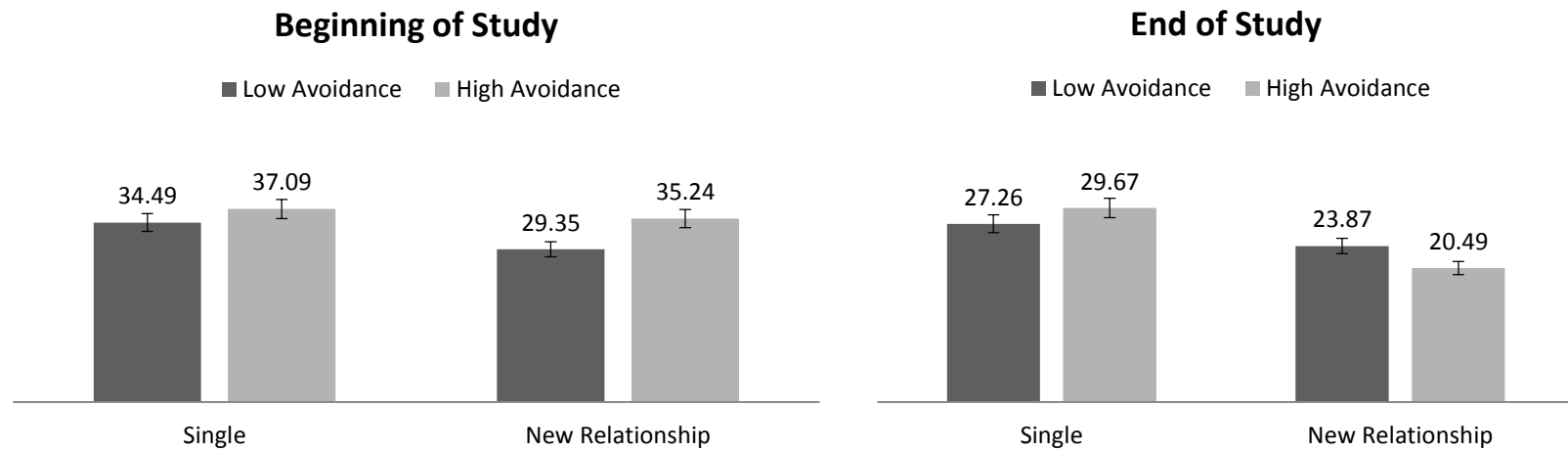


Figure 5. Attachment avoidance, new relationship and linear time interaction on complicated grief.
Note: Error bars indicate standard errors of the mean.

Table 11
Attachment Anxiety and Avoidance Moderation Models ($n = 145$)

Model Tested	Depression						Complicated Grief		
	Attachment Anxiety			Attachment Avoidance			Attachment Avoidance		
	Est.	S.E.	<i>p</i>	Est.	S.E.	<i>p</i>	Est.	S.E.	<i>p</i>
Time	-.40***	.12	.001***				-1.83***	.27	<.001***
Attachment	1.35***	.32	<.001***				1.13	.80	.16
New Relationship	-.59	.85	.49				-3.48*	1.88	.06*
Time * Attachment	-.01	.09	.91				-.02	.22	.92
Time * New Relationship	-.55*	.25	.05*				-.70	.60	.24
New Relationship * Attachment	-.30	.60	.63				1.43	1.46	.33
Attachment * New Relationship * Time	-.38**	.21	.07*				-.99*	.50	.05*
In-Person Contact	1.12*	.63	.07*	1.50**	.66	.03**			
Attachment	1.05	.79	.18	.33	.89	.72			
Gender	-.82	.96	.39	-.55	.99	.58			
In-Person Contact * Attachment	1.31**	.56	.02**	1.31*	.72	.07*			
In-Person Contact * Gender	-.82	.64	.20	-1.18*	.68	.08*			
Attachment * Gender	.02	.84	.98	.21	.95	.83			
Attachment * In-Person Contact * Gender	-1.26**	.57	.03**	-1.61**	.74	.03**			
Sex w/ Ex	4.10*	2.07	.05*	4.53*	2.53	.08*			
Attachment	.72	.82	.38	.03	.96	.97			
Gender	-.67	1.00	.51	-.51	1.06	.63			
Sex w/ Ex * Attachment	4.24**	2.00	.04**	4.72*	2.43	.06*			
Sex w/ Ex * Gender	-2.44	2.18	.26	-3.62	2.67	.18			
Attachment* Gender	.44	.88	.62	.54	1.02	.59			
Attachment * Sex w/ Ex * Gender	-4.92***	2.10	.02***	-5.16*	2.56	.05*			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row section and column section represents a separate analysis. All contact variables measure frequency of contact in a week. Each analysis included the following covariates: gender and if the participant is involved in a new relationship (where not included as moderator in analyses), participant age, time since the breakup, relationship length, experimental condition, and who initiated the breakup.

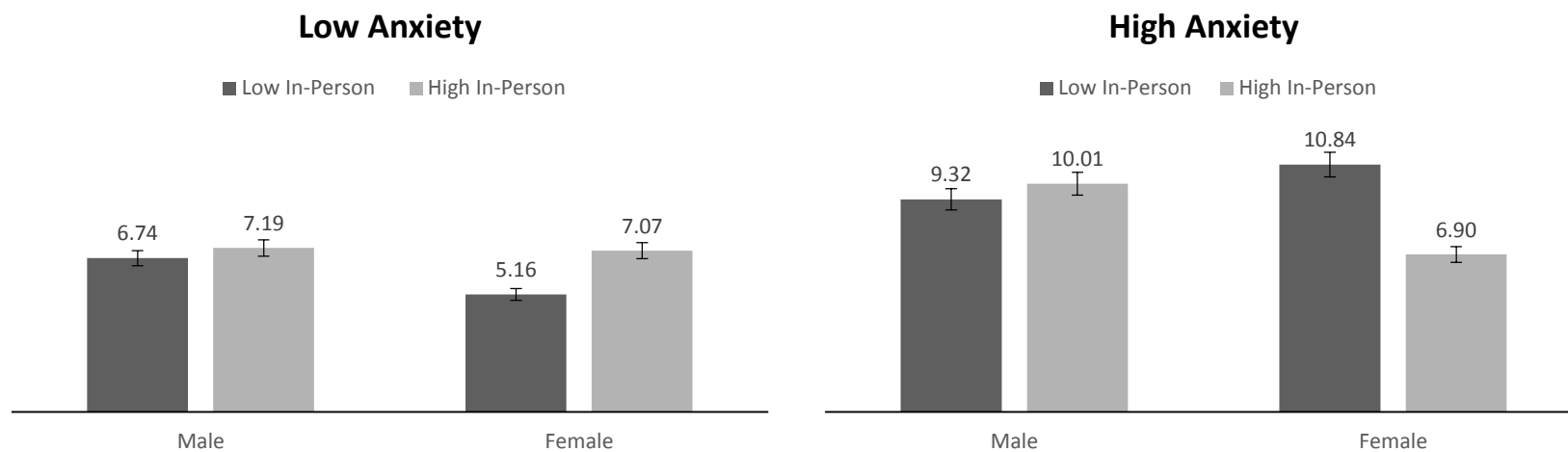


Figure 6. Gender, attachment anxiety and in-person contact on depression
 Note: Error bars indicate standard errors of the mean.

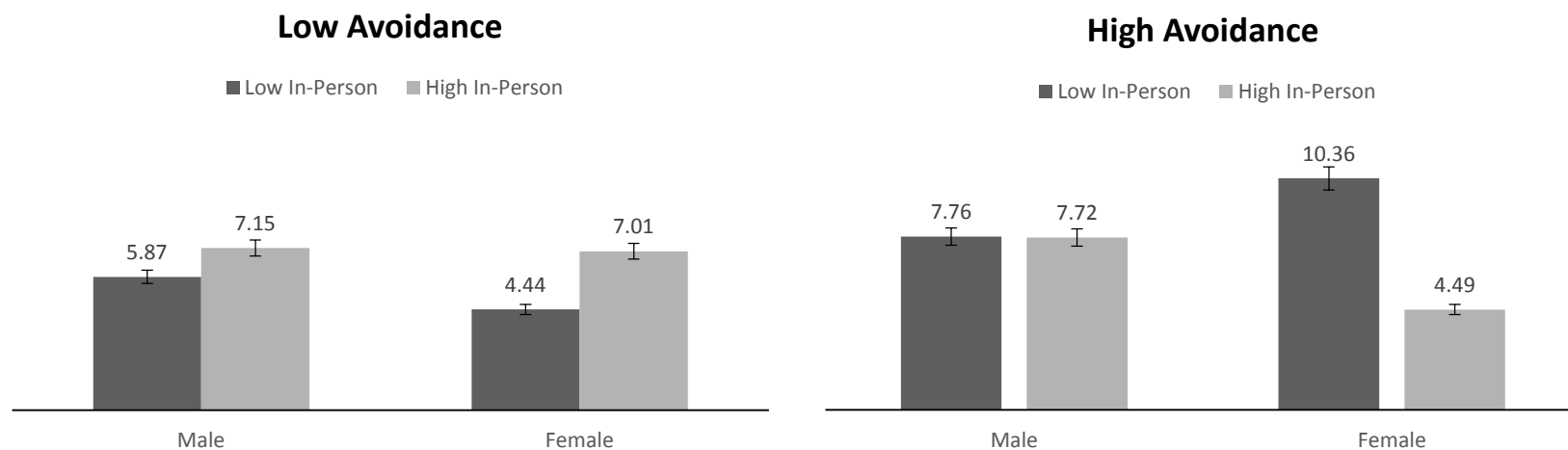


Figure 7. Gender, attachment avoidance and in-person contact on depression.
 Note: Error bars indicate standard errors of the mean.

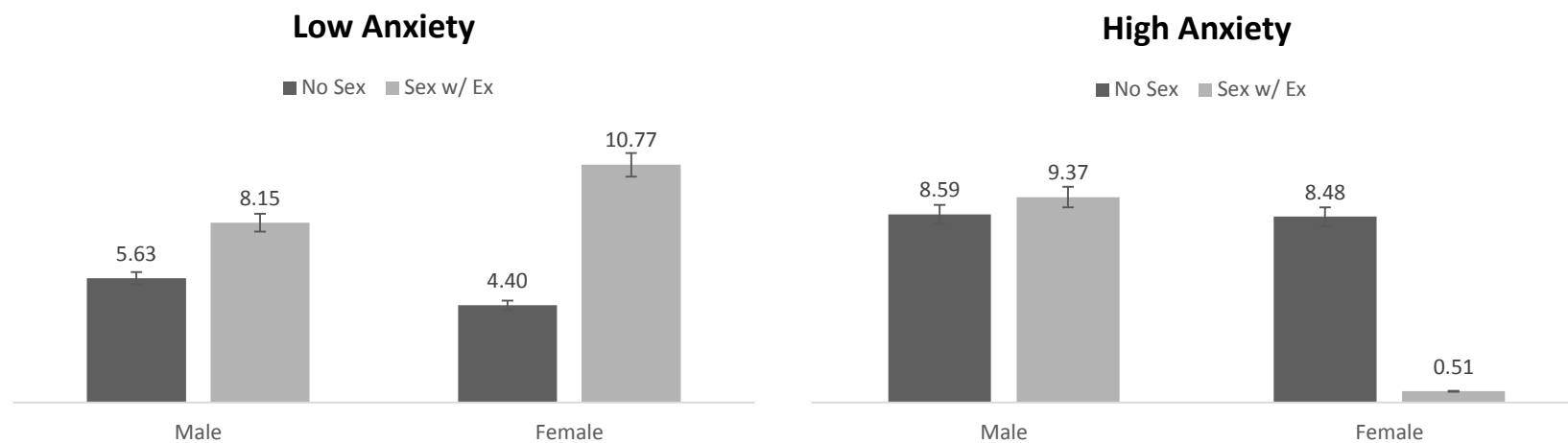


Figure 8. Gender, attachment anxiety and sex with an ex-partner on depression.
Note: Error bars indicate standard errors of the mean.

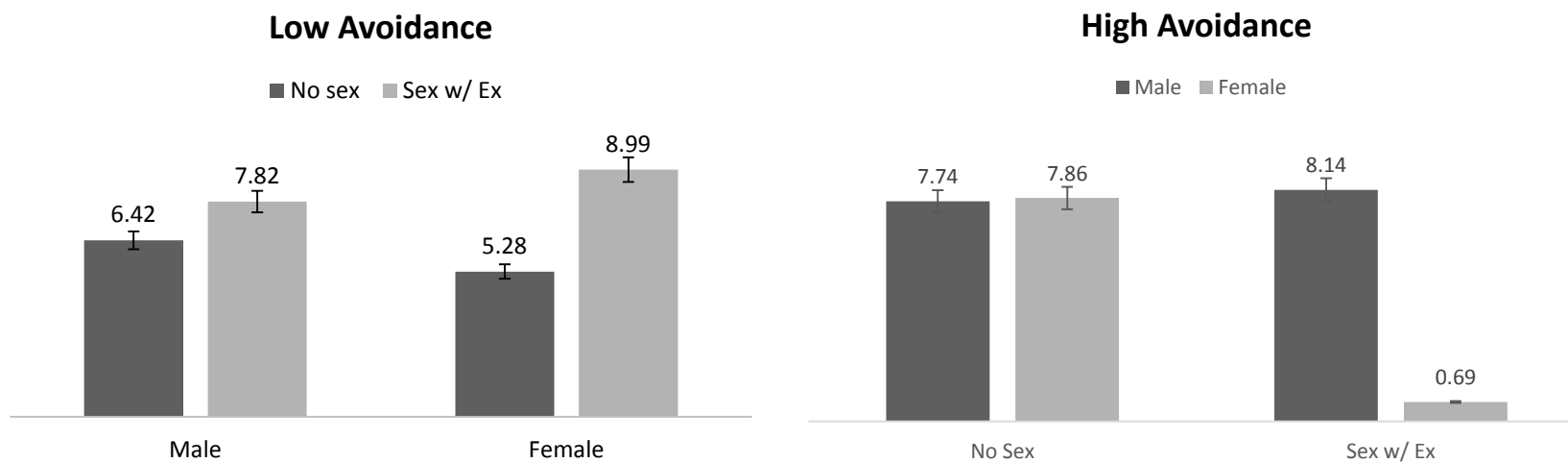


Figure 9. Gender, attachment avoidance and sex with an ex-partner on depression.
Note: Error bars indicate standard errors of the mean.

Narrow Measure: H4 asked if attachment anxiety to a specific ex-partner would provide more sensitive information about contact responses during uncoupling and adjustment. For main effects, WHOTO mean scores were entered into models with attachment anxiety, measured by the ECR-SF. Interaction effects included three-way interactions of WHOTO, specific contact/relationship variables of interest, and the linear effect of time. Covariates included participant age, if the participant is involved in a new relationship, gender, time since the breakup, relationship length, and experimental condition.

The inclusion of ex-partner specific attachment anxiety did not yield model convergence when analyses from **H3** were reanalyzed. As such, findings focus on one model of interest that was not attached to a specific hypothesis. After accounting for the broad measure of attachment anxiety, ex-partner specific attachment moderated the initiator status, who the participant attributes the end of the relationship to, and time interaction on depression ($b = -.68$, $S.E. = .30$, $p = .03$, refer to Table 12). For people who reported they had initiated the breakup, low levels of ex-partner attachment were associated with significant decreases in depression across the study ($z = -3.25$, $p = .001$) but this change was not evident in high ex-partner attachment participants ($z = .91$, $p = .36$ see Figure 10). Participants who reported their ex-partner had initiated the breakup, evidenced an opposite association such that high ex-partner attachment, but not low ($z = .71$, $p = .48$), participants experienced significant decreases in depression ($z = -2.84$, $p = .005$ see Figure 10). These decreasing slopes were also significantly different from each other: One will be the best adjusted following a breakup if there was low attachment to an ex-partner and if the breakup occurred by choice ($t = 2.10$, $p = .04$). Previous studies (e.g. Sbarra & Emery, 2005; Sbarra, 2006) have not shown effects of initiator status on adjustment outcomes. While this result neither confirms nor rejects H4, it does suggest that the information provided by examining ex-

partner specific attachment may measure different aspects of attachment relative to broad measures.

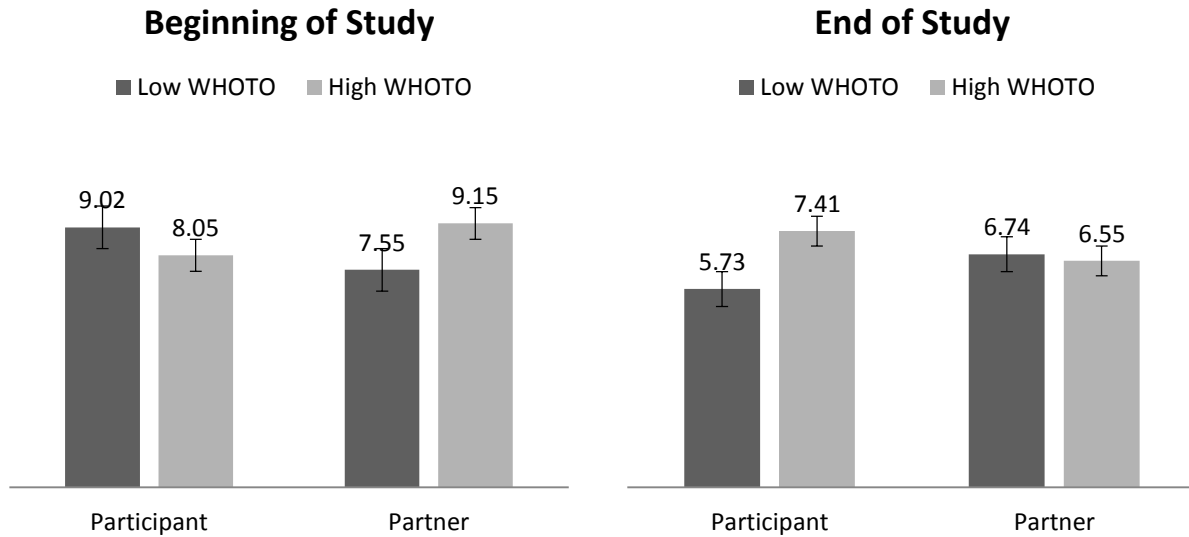


Figure 10. Ex-partner specific attachment, initiator status and the linear effect of time on depression.

Note: Error bars indicate standard errors of the mean.

Table 12

Model of WHOTO Moderating Initiator Status and Time Interaction on Depression After Controlling for Attachment Anxiety (n = 145)

Model Tested	Depression		
	Est.	S.E.	p
Attachment Anxiety	1.10 ^{***}	.27	<.001 ^{***}
Time	-.56	.37	.13
WHOTO	-2.15 [*]	1.13	.06 [*]
Initiator Status	-.18	.79	.82
Time * WHOTO	1.08 ^{**}	.51	.03 ^{**}
Time * Initiator Status	.06	.22	.78
WHOTO * Initiator Status	1.67 ^{**}	.67	.01 ^{**}
WHOTO * Initiator Status * Time	-.68 ^{**}	.30	.03 ^{**}

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. The following covariates were included: attachment anxiety, participant age, gender, time since the breakup, relationship length, experimental condition, and if the participant is involved in a new relationship.

Mediators of the Contact and Adjustment Association. In **H5**, lower-level mediation was proposed as the mechanism through which contact with an ex-partner might negatively impact emotional adjustment. Analyses focused on significance tests of the overall within person indirect effect for each proposed mediation, and if significant, the individual path estimates and associated significances. Longing and rumination were analyzed separately, and together as multiple mediators, of the ex-partner contact and emotional adjustment association. (Note that these analyses do include effects not supported in **H1/H2**, please refer to page 107 of the discussion for a description of why this was not necessary in the following analyses.)

Longing. Longing lagged 1-week was a significant mediator of in-person contact lagged 1-week and depression association ($a_w b_w = .03, p < .10$ refer to Table 13 for path coefficients). The more in-person contact a participant has with their ex-partner the more they long for their ex-partner, and this association predicts greater future depression. Similar lower-level mediation associations occurred for social network³ and text ex-partner contact ($a_w b_w = .02, p < .05$, for each, refer to Table 13 for path coefficients). For all these associations, the direct path (c'_w) was insignificant after accounting for the significant indirect effect. Mediation analyses generally assume some mechanistic effects due to the temporal nature of proposed associations, but in these analyses the proposed contact and mediator variables were measured at the same time point. To more stringently test for specificity of a mechanistic pathway, a series of analyses followed each significant within participant indirect effect. Shown in the bottom-half of Table 13, the time-lagged association for the three variables in the original analyses was re-specified and tested for each possible mediation relationship. If a significant mediation pathway occurred with a re-specified model, then confidence regarding a mechanistic relationship is decreased.

³ Indirect effect remains significant with inclusion of in-person contact as a within control covariate (Indirect Effect = .11, S.E. = .05, $p = .02$)

Both in-person and text ex-partner contact mediation pathways held-up under this more stringent analysis. Social network contact however, produced several significant indirect effects suggesting that for the associations among social network contact, longing and depression, the direction of effects are unclear.

The next set of analyses focused on the same mediational pathway but in relation to a breakup specific outcome, complicated grief regarding the breakup. The same significant indirect effects were present, for in-person ($a_w b_w = .43, p < .10$ refer to Table 14 for path coefficients), social network⁴ ($a_w b_w = .48, p < .01$) and text ($a_w b_w = .38, p < .05$), as well as phone ($a_w b_w = .80, p < .05$) ex-partner contact and complicated grief mediated by longing. Text ex-partner contact and complicated grief was the only association to stand following the more stringent analyses ($a_w b_w$'s = 0 - .28, p 's > .05, see Table 15).

Rumination. Identical analyses to those above examined rumination as a mediator of the contact and emotional adjustment outcomes. Similar to longing, rumination was a significant mediator of the in-person ($a_w b_w = .12, p < .10$, refer to Table 16 for path coefficients), social network⁵ ($a_w b_w = .27, p < .01$) and text ($a_w b_w = .08, p < .10$) ex-partner contact and depression association. The indirect effect explaining the in-person contact to rumination to depression pathway was the only finding to remain significant following the additional analyses ($a_w b_w$'s = -.01 - .05, p 's > .10 see bottom of Table 16).

As with the ex-partner contact and complicated grief mediated by longing analyses, rumination mediated the in-person ($a_w b_w = .39, p < .05$, refer to Table 17 for path coefficients),

⁴ Indirect effect remains significant with inclusion of in-person contact as a within control covariate (Indirect effect = .05, S.E. = .23, $p = .02$)

⁵ Indirect effect remains significant with inclusion of in-person contact as a within control covariate (Indirect effect = .27, S.E. = .06, $p < .001$)

phone ($a_w b_w = .36, p < .10$), social network⁶ ($a_w b_w = .16, p < .05$) and text ($a_w b_w = .29, p < .05$) ex-partner contact association with complicated grief. Held up to the same scrutiny, none of these effects persisted following the more stringent tests (refer to Table 18). It is worth noting, however, that when ex-partner contact and rumination were reversed in order (i.e. lagged rumination became the predictor and type of ex-partner contact became the mediator) the models were not significant, suggesting that the association of ex-partner contact and rumination is not bidirectional.

Multiple Mediators. Longing and rumination were included in the same model to examine the possibility that in parallel both might mediate the ex-partner contact and emotional adjustment association (please refer to Table 19). For depression, several models (email, phone and sexual intimacy) did not converge, those models that did (in-person, social network and text) were not significant. For complicated grief, only the sexual intimacy model did not converge, but all convergent models also were not significant. The lack of significant findings in this multiple mediator analysis may suggest that longing and rumination may be associated with similar mechanisms to produce alterations in adjustment.

⁶ Indirect effect remains significant with inclusion of in-person contact as a within control covariate (Indirect effect = .09, S.E. = .03, $p = .01$)

Table 13.

H5 - Lower-level Mediation Analyses of Longing Mediating the Contact – Depression Association (n = 145)

Lagged Contact	Indirect Effects				Path Coefficients for Within Effects		
	Indirect Between	S.E.	Indirect Within	S.E.	a_w	b_w	c'_w
Email	.35	.21	.12	.17			
In-person	.13	.10	.03*	.01	.80**	.03***	.13
Phone	.37	.18	.00	.001			
Sexual Intimacy	.002	.03	-.14	-.57			
Social Network	.10	.09	.02**	.01	.66***	.04***	-.01
Text	.22*	.13	.02**	.01	.60**	.04***	.03

Contact	Lagged X	Lagged M	Current Y	Indirect Effects		Path Coefficients		
				Est.	S.E.	a_w	b_w	c'_w
In-person	Longing	In-person	Depression	0	0			
	In-person	Depression	Longing	.04	.05			
	Depression	Longing	In-person	0	.001			
Social Network	Longing	Social Network	Depression	.002**	.001	.01***	.29***	-.002
	Social Network	Depression	Longing	.41**	.19	.56***	.70***	2.27***
	Depression	Longing	Social Network	.01	.01			
Text	Longing	Text	Depression	.002	.002			
	Text	Depression	Longing	.04	.04			
	Depression	Longing	Text	.01	.01			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and longing effects concurrent with depression, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 14

H5 - Lower-level Mediation Analyses of Longing Mediating the Contact – Complicated Grief Association (n = 145)

Lagged Contact	Indirect Effects				Path Coefficients for Within Effects		
	Indirect Between	S.E.	Indirect Within	S.E.	a_w	b_w	c'_w
Email	2.48***	.81	.54	.77			
In-person	.77	.48	.43*	.24	2.78**	.15***	.24
Phone	1.21***	.63	.80**	.21	4.66***	.17***	.02
Sexual Intimacy	-.02	.28	.49	.63			
Social Network	.40*	.21	.48***	.16	3.12***	.16***	.11
Text	.56**	.24	.38**	.18	2.26**	.17***	.13

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and longing effects concurrent with complicated grief, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 15

H5 – Follow-up Analyses of Significant Indirect Effects Where Longing Mediates the Contact – Complicated Grief Association (n = 145)

Contact	Lagged X	Lagged M	Current Y	Indirect Effects		Path Coefficients		
				Est.	S.E.	a_w	b_w	c'_w
In-person								
	Longing	In-person	Complicated Grief	.01	.01			
	In-person	Complicated Grief	Longing	.70**	.33	1.47**	.48***	-.47
	Complicated Grief	Longing	In-person	.01	.004			
Phone								
	Longing	Phone	Complicated Grief	.004	.01			
	Phone	Complicated Grief	Longing	.82***	.29	1.54***	.53***	.41
	Complicated Grief	Longing	Phone	.01*	.003	1.07***	.004*	-.01
Social Network								
	Longing	Social Network	Complicated Grief	.02***	.01	.02***	1.00***	.07**
	Social Network	Complicated Grief	Longing	1.10***	.29	2.15***	.51***	1.26*
	Complicated Grief	Longing	Social Network	0	.004			
Text								
	Longing	Text	Complicated Grief	0	.004			
	Text	Complicated Grief	Longing	.28	.18			
	Complicated Grief	Longing	Text	.01	.01			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the effects of the predictor and mediator concurrent with the outcome, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 16

H5 – Lower-level Mediation Analyses of the Contact – Depression Association Mediated by Rumination (n = 145)

Lagged Contact	Indirect Effects				Path Coefficients for Within Effects		
	Indirect Between	S.E.	Indirect Within	S.E.	a_w	b_w	c'_w
Email	.19	.90	.47	.38			
In-person	-.40**	.16	.12*	.06	.06**	2.06***	-.19
Phone	.03	.35	.11	.07			
Sexual Intimacy	-.06	1.96	.11	.53			
Social Network	.10	.03	.27***	.06	.11***	2.51***	-.24**
Text	-.21	.15	.08*	.04	.03**	2.50***	.10

Contact	Lagged X	Lagged M	Current Y	Indirect Effects		Path Coefficients		
				Est.	S.E.	a_w	b_w	c'_w
In-person								
	Rumination	In-person	Depression	.05	.07			
	In-person	Depression	Rumination	.01	.01			
	Depression	Rumination	In-person	-.01	.01			
Social Network								
	Rumination	Social Network	Depression	.10	.11			
	Social Network	Depression	Rumination	.02**	.01	.57***	.04***	.01
	Depression	Rumination	Social Network	.02**	.01	.08***	.26**	.01
Text								
	Rumination	Text	Depression	.04	.04			
	Text	Depression	Rumination	.01**	.01	.28**	.05***	.01
	Depression	Rumination	Text	-.001	.02			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and longing effects concurrent with complicated grief, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 17

H5 - Lower-level Mediation Analyses of the Contact – Complicated Grief Association Mediated by Rumination (n = 145)

Lagged Contact	Indirect Effects				Path Coefficients for Within Effects		
	Indirect Between	S.E.	Indirect Within	S.E.	a_w	b_w	c'_w
Email	-.81	.51	1.61	1.19			
In-person	-.50**	.21	.39**	.19	.06**	6.98***	.17
Phone	-.04	.39	.36*	.20	.05*	8.04***	.28
Sexual Intimacy	-.11	1.25	.59	.79			
Social Network	.11	.18	.16**	.05	.02***	7.49***	-.04
Text	-.25	.20	.29**	.13	.04**	8.10***	.20

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and rumination effects concurrent with complicated grief, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 18

H5 – Follow-up Analyses of Significant Indirect Effects Where Rumination Mediates the Contact – Complicated Grief Association (n = 145)

				Est.	S.E.	a_w	b_w	c'_w
In-person								
	Rumination	In-person	Complicated Grief	.21	.21			
	In-person	Complicated Grief	Rumination	.02**	.01	1.47**	.02***	-.01
	Complicated Grief	Rumination	In-person	.002	.01			
Phone								
	Rumination	Phone	Complicated Grief	.14	.10			
	Phone	Complicated Grief	Rumination	.03***	.01	1.58***	.02***	.01
	Complicated Grief	Rumination	Phone	.002	.01			
Social Network								
	Rumination	Social Network	Complicated Grief	.78***	.26	.98***	.79***	.62
	Social Network	Complicated Grief	Rumination	.03***	.01	2.14***	.02***	-.01
	Complicated Grief	Rumination	Social Network	.001	.01			
Text								
	Rumination	Text	Complicated Grief	.05	.07			
	Text	Complicated Grief	Rumination	.01*	.01	.53*	.02***	.01
	Complicated Grief	Rumination	Text	-.003	.01			

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and longing effects concurrent with complicated grief, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Table 19

H5 - Multiple Mediators Lower-level Analyses –Rumination and Longing Mediate the Contact-Emotional Adjustment Association (n = 145)

Depression

Lagged Contact	Indirect Within				Path Coefficients				
	<i>Longing</i>		<i>Rumination</i>		<i>Longing</i>		<i>Rumination</i>		
	Longing	S.E.	Rumination	S.E.	a_w	b_w	a_w	b_w	c'_w
Email									
In-person	-.04	.04	-.01	.04					
Phone									
Sexual Intimacy									
Social Network	.00	.01	-.02	.03					
Text	-.01	.03	-.003	.01					

Complicated Grief

Lagged Contact	Indirect Within				Path Coefficients				
	<i>Longing</i>		<i>Rumination</i>		<i>Longing</i>		<i>Rumination</i>		
	Longing	S.E.	Rumination	S.E.	a_w	b_w	a_w	b_w	c'_w
Email	.35	.65	.02	.13					
In-person	.11	.10	-.06	.10					
Phone	.19	.17	-.02	.05					
Sexual Intimacy									
Social Network	.02	.09	-.05	.30					
Text	-.09	.06	-.12	.10					

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and mediator effects concurrent with the emotional adjustment outcome, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Perceptions of Loneliness as a Time-varying Moderator. In **H6** perceptions of loneliness at each assessment occasion were predicted to intensify the experience of ex-partner contact and emotional adjustment because of the loss of companionship the relationship provided. The association of the three-way interaction between text ex-partner contact, perceptions of loneliness and linear time on complicated grief was the only significant MLM model ($b = .23$, $S.E. = .09$, $p = .02$). Probing this three-way interaction, however, suggested that the main effect of loneliness was driving this interaction and no evidence was found for a moderating effect of loneliness on the interaction of text ex-partner contact and linear time.

Mediated Moderation: The Mediating Effects of Longing and Rumination are Moderated by Adult Attachment Style. These analyses extend the findings of **H5** and suggest that path a_w , or the association of ex-partner contact and the mediator, will be moderated by participants attachment style. Attachment anxiety and avoidance were analyzed separately, but **H7** hypothesized that attachment anxiety, not avoidance, would moderate path a_w . These models included lower-level mediation effects that remained significant following the more stringent analyses. For longing, attachment avoidance moderated the association of text ex-partner contact and longing (Depression - $a_w b_w = .02$, $p < .05$; complicated grief $a_w b_w = .07$, $p < .05$ refer to Table 20 for path coefficients). Attachment anxiety moderated the effect of in-person ex-partner contact on rumination when depression was the outcome ($a_w b_w = .02$, $p < .05$, refer to Table 20 for path coefficients). Little and colleagues (2007) suggest that probing of these interactions is unnecessary because this significant a_w path exists across all levels of the moderator. This approach however is imprecise and to validate this finding of mediated moderation I probed the interactions of attachment avoidance and lagged text ex-partner contact, and attachment anxiety

and in-person ex-partner contact on longing and rumination, respectively, using MLM models.⁷ When analyzed as a separate effect, independent of path b_w and out of the context of being part of the within person indirect effect, the two-way interaction of attachment avoidance and text ex-partner contact was not significant ($b = .01$, $S.E. = .02$, $p = .43$). At the trend level, the two-way interaction of attachment anxiety and in-person ex-partner contact was significant ($b = .02$, $S.E. = .01$, $p = .07$), and probing of this interaction showed that greater in-person contact with an ex-partner was associated with greater rumination only for those participants who reported higher attachment anxiety ($z = 2.18$, $p = .03$). These findings suggest that responses to ex-partner contact are not ‘one size fits all.’ By examining an association of interest from **H3** (that is, attachment anxiety moderating the in-person ex-partner contact and depression association) for the mechanism that might explain this association, these results suggest that a specific aspect of depression, rumination, may account for worse adjustment post-contact. Taken together, these results provide evidence in support of the hypothesis that inclusion of attachment anxiety as a moderator may tell us more about how certain adjustment processes will unfold, and for whom they demonstrate the greatest negative effects.

⁷ Participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time were also included as covariates.

Table 20

H7: Contact-Emotional Adjustment Associations Mediated by Longing/Rumination and Moderated by Adult Attachment Style (Mediated Moderation of Significant H5 Effects; n = 145)

Longing and Depression

	Attachment Anxiety					Attachment Avoidance				
	<i>Indirect Effect</i>		<i>Path Coefficients</i>			<i>Indirect Effect</i>		<i>Path Coefficients</i>		
	Est.	S.E.	a_w	b_w	c'_w	Est.	S.E.	a_w	b_w	c'_w
Lagged Contact										
In-person	.007	.01	.30	.02**	-.27*	.01	.01	.38	.02**	.11
Text	.01	.01	.24	.04***	.13*	.02**	.01	.41**	.04***	-.04
<i>Longing and Complicated Grief</i>										
Text	.05	.04	.27	.17***	.11	.07**	.03	.42**	.17***	-.12
<i>Rumination and Depression</i>										
In-person	.02**	.01	.01**	2.06***	-.24*	.02	.02	.01	2.05***	.17

Note: * $p < .10$ ** $p < .05$ *** $p < .01$ Estimates are unstandardized. Each row of the above table represents a separate analysis. Finally, all analyses included the following covariates: the ex-partner contact and mediator effects concurrent with the emotional adjustment outcome, participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Aim 3: Explore Social Support in the Context of Recovering from a Romantic Breakup

Explore Invisible Support Model using Participant and Informant Reports of Social Support. Using Bolger, Zuckerman and Kessler's (2000) invisible support model, **EA1** applied a MLM regression based analysis to see if participant emotional adjustment would be uniquely predicted by informant reported support. Total social support, emotional social support and practical support were tested in separate models. In this sample, no evidence was found for invisible support. Participant reports of total and emotional social support received in a previous week were associated with both depression and complicated grief (please refer to Table 21), but informant reports were not associated with significant additional variance.

Table 21

EA1 – Invisible Social Support Models of Participant Adjustment (n = 48)

	Participant	S.E.	p	Informant	S.E.	p
<i>Depression</i>						
Total Support	-.33**	.14	.02**	.02	.08	.85
Emotional Support	-.45**	.18	.02**	.08	.15	.58
Practical Support	-.29	.27	.30	-.06	.10	.55
<i>Complicated Grief</i>						
Total Support	-.64*	.37	.09*	-.04	.21	.84
Emotional Support	-1.04**	.45	.02**	.27	.36	.45
Practical Support	.04	.68	.95	-.15	.24	.54

Note: *p < .05, **p < .01. Estimates are unstandardized. Each row of the above table represents a separate analysis. Each analysis included the following covariates: participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Explore Mediation of Participant Reports of Social Support and Evaluations of Helpfulness by Informant Reported Social Support. These analyses (EA2) used the MSEM models proposed in H5, and offer a novel way to explore invisible support outside of the Bolger et al. (2000) models. Following from the original MLM models used in **EA1**, I proposed that the amount of participant received support and how a participant evaluated the effects of support provided by an informant would be mediated by the amount of support offered by the informant. As opposed to **EA1** that focused on an unrelated emotional adjustment outcome, I was curious to see if a directly related outcome might highlight the different variance associated with received and offered support. Total social support, emotional social support and practical support were tested in separate models. There was no support for informant reports of social support efforts mediating these associations (please refer to Table 22).

Table 22

EA2 - Participant Reported Support and Helpful/Harmful Mediated by Informant Reported Support (n = 48)

Lagged	Indirect Within	S.E.	p	Indirect Between	S.E.	p
Total	.01	.01	.36	.01	.06	.86
Practical	.001	.02	.96	.06	.11	.58
Emotional	-.003	.01	.72	.01	.04	.71

Note: *p < .05, **p < .01. Estimates are unstandardized. Each row of the above table represents a separate analysis. Each analysis included the following covariates participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Explore Participant's Appraisal of Perceived Stress as a Mediator of Informant Provided Support and Emotional Adjustment. These analyses focused on a specific mechanism through which informant reports of provided support efforts might influence adjustment. Participant perception of perceived stress was proposed to mediate this association

for support and both depression and complicated grief. None of the proposed lower-level mediations were significant (refer to Table 23), and thus no inferences are possible regarding coping appraisals as mediators.

Table 23

EA3 - Participant Coping Abilities Mediates the Informant Support and Emotional Adjustment Association (n = 48)

	Indirect Within	S.E.	p	Indirect Between	S.E.	p
<i>Depression</i>						
Total	.02	.04	.56	-.03	.03	.32
Practical	-.03	.07	.66	-.01	.02	.59
Emotional	.08	.08	.31	-.02	.04	.60
<i>Complicated Grief</i>						
Total	.04	.07	.57	.06	.07	.45
Practical	-.04	.08	.64	.02	.04	.71
Emotional	.09	.09	.35	.02	.07	.74

Note: * $p < .05$, ** $p < .01$. Estimates are unstandardized. Each row of the above table represents a separate analysis. Each analysis included the following covariates: participant age, gender, who initiated the breakup, time since the breakup, relationship length, if the participant is involved in a new relationship, experimental condition, and the linear effect of time.

Explore adult attachment style as a moderator of association proposed in EA1, EA2 and EA3. None of the analyses in Aim 3 produced significant associations on interest, negating the possibility of examining adult attachment style as a moderator (**EA4**).

Aim 4: Methodology Exploration

Explore Impact of Informant Reports by Examining Possible Alterations in Participant Responses and Behaviors as a Result of Informant Reporting. EA5 asks if participant knowledge of a friend/family member reporting on their behaviors, thoughts and feelings alters participant responses. Table 24 shows t-test for all outcomes of interest used in the previous analyses and condition. People in the two conditions did not differ in either outcome of interest in this study, they did not report significantly different depression or complicated grief. Differences in response rates existed for sexually intimate ($t = 2.06, p = .05$) ex-partner contact suggesting that participants may have reported lower frequency due to knowledge that a friend/family member might be also reporting on these behaviors. There also exists a 7% difference between participants in the informant condition starting the study and remaining single ($t = 2.18, p = .03$). Participants with an informant also reported significantly more practical ($t = -1.78, p = .08$), emotional ($t = -2.15, p = .03$) and total ($t = -2.26, p = .03$) social support received from a close friend/family member. Two questions asked both participants and informants the how much the question/questionnaires and breakup were discussed during the study period to parcel out how aware a participant might be about the behaviors friends/family members were reporting on.⁸ Participants endorse discussing the questions/questionnaires included in the study significantly more than informants ($t = -2.16, p = .04$), but this difference is not evident when discussing the breakup in general ($t = -.03, p = .76$). These findings suggest that participants may have exhibited a heightened awareness of their informant participating in the study.

⁸ These analyses include only 30 pairs of participant and informant matched responses, this is due to both participant and informant attrition because these questions were asked at the final study assessment.

Table 24

EA5 T-tests Examining Participant Knowledge of Friend/Family Reports on Response Differences (n = 145)

	<i>Cond. 1 Mean /Frequency</i>	<i>Cond. 1 SD</i>	<i>Cond. 2 Mean /Frequency</i>	<i>Cond. 2 SD</i>	<i>t-value</i>	<i>p-value</i>
New Relationship Status	22%		15%		2.18**	.03**
Sexual Intimacy Frequency	2.24	1.12	1.56	.74	2.06*	.05*
Total Social Support Received	22.76	3.18	23.89	2.75	-2.26**	.03**
Emotional Support Received	12.11	2.11	12.83	1.86	-2.15**	.03**
Practical Support Received	10.65	1.43	11.06	1.31	-1.78*	.08*

Note: * $p < .10$ ** $p < .05$ *** $p < .01$. Each row of the above table represents a separate analysis. Condition 1: participants who entered the study without an informant; and Condition 2: participants who entered the study with a friend/family member reporting on participants' behaviors, emotional adjustment and social support offered to participants.

4. DISCUSSION

My dissertation study examined the association between contact with a former romantic partner and emotional adjustment following a non-marital romantic breakup. The research addressed two specific aims that were designed to: (1) Understand how specific forms of ex-partner contact are associated with variability in emotional adjustment over time; and, (2) Examine the moderators and mediators of these associations. The study also explored (Aim 3) associations between the social support efforts of close friends/family and participants' emotional adjustment with a specific focus on evaluating the correlates of target participants' received support with respect to informants' reports of support provided. A final (Aim 4) methodological aim explored whether having a friend/family member report on participants' responses to the separation might alter the target participants' self-reports of adjustment over time. I addressed each aim using a repeated measures study design, including informant reports to explore social support associations (Aim 3) and random assignment of participants to participate with/without an informant to explore the methodological questions of interest (Aim 4).

Summary of Results

This study included numerous statistical analyses, and although the work was guided by a clear set of aims and followed a logical analytic sequence of increasing complexity, the numerous combination of predictor and outcome variables renders the study largely exploratory. Therefore, on whole, I summarize and discuss the main study findings with a broader understanding these results should be considered generative and drive future research hypotheses rather than a definitive set of conclusive findings. In this section of the Discussion, I briefly

summarize what I see as the main findings from the study. This review will set the stage for locating the main findings within the existing literature.

What is the direction of the ex-partner contact and distress association? (Aim 1)

Greater sexual intimacy one week before was associated with *less* depression in a current week (after accounting for concurrent sexual intimacy, relationship specific covariates, between person covariates and the linear effect of time). Greater complicated grief one week before was associated with less in-person ex-partner contact in a current week, and marginally associated with less phone contact in a current week (after accounting for current complicated grief, relationship specific covariates, between person covariates and the linear effect of time). From this data I cannot conclude that contact with an ex-partner leads to poorer adjustment or if poor adjustment is associated with greater future contact. What is more, there were very few significant associations, lagged or concurrent, from the contact-adjustment analyses (refer to Tables 6 and 7). Thus, the results are inconclusive regarding the directionality of the contact-adjustment association.

Are all forms of ex-partner contact equivalent in their association with emotional adjustment?⁹ (Aim 1) In-person and, in a separate analysis, sexually intimate ex-partner contact was associated with greater depression during the same week. Social network contact was associated with greater complicated grief, but text contact was associated with less in the same week. Reversing the direction of the effects, depression was marginally associated with greater frequency of sexual intimacy and social network contact during the same week. Complicated grief was associated with more social network contact and less text contact in the same week. For those who endorsed having contact with an ex-partner most commonly reported types of

⁹ Note that these results are from contact and emotional adjustment variables measured concurrently due to the lack of significant findings in the previous analysis.

contact were sexually intimate, text, social network and in-person contact. In general, forms of contact that involve seeing an ex-partner are associated with consistently poorer emotional adjustment.

Sex with an ex-partner. Initially, I focused exclusively on lagged effects in **H1** and concurrent effects in **H2**. Given the significant lagged and concurrent effects for sex with an ex-partner and emotional adjustment in these separate analyses, I examined the full lagged model (i.e. lagged and concurrent effects together in the same model) to understand the net effect of ongoing sexual intimacy post-breakup with an ex-partner. Sexually intimate ex-partner contact one week before is associated with less depression this week, but sexually intimate contact during the same week is associated with more depression. Though the lagged analysis suggests participants may experience some decreases in depression from being intimate with an ex, continuing sexual contact in a current week is associated with greater depression resulting in a net overall increase in depression across the two-weeks (assuming that the time-varying variable, sex with an ex, remains relatively stable from week to week). Extending this finding across the five-week study, this would mean that a participant who engaged in sexually intimate behavior with their ex-partner would experience a 2-unit increase in depression. Given that the mean depression reported by participants at study entry was 7.35, this 2-unit increase across the study period would indicate that an average participant would be considered to have symptoms indicative of a major depressive episode at the end of the study.¹⁰

What factors moderate the effect of ex-partner contact and emotional adjustment? (Aim 2)

Moderators not associated with a specific hypothesis. In addition to adult attachment style, I examined several potential moderators of interest to understand how other between-

¹⁰ Though the CESD-10 is not generally used to diagnose individuals with Major Depressive Disorder, validity analyses suggest that using a cut-point of ≥ 8 is associated with false positives ($k = .75$), whereas a cut-point of ≥ 10 is associated with false negatives ($k = .97$; Andresen et al., 1994).

person differences might affect the association of ex-partner contact and emotional adjustment. One finding specific to social network contact suggests that being ‘unfriended’ by an ex-partner can be beneficial but that effect is dependent on when you are ‘unfriended.’ Participants who entered the study ‘unfriended’ by their ex-partner had greater depression than those who were remained Facebook friends with their ex-partner, but this effect did not occur if a participant ended the study ‘unfriended.’ Said differently, the more removed in time a person is from their breakup experience, the weaker the associations between ‘unfriended’ and emotional adjustment.

Gender. Gender was added as a level-2 moderator to examine if men and women respond differently to the various types of contact across the study (refer to Table 10). Accounting for all main effects and two-way interactions, men who are in a new relationship at the beginning of the study ended the study with less complicated grief, but women do not. Further, women who report engaging in sex with an ex-partner do *not* change in complicated grief across the study whereas all other participants (women who report below average frequency of sex with an ex, as well as all male participants) have significantly less complicated grief at the end of the study. Further, women who have less than the average frequency of sex with an ex experienced faster decreases in complicated grief relative to all male participants, and, men having below average frequency of sex with an ex decrease in complicated grief more quickly relative to men who are engaging in above average frequency of sex with an ex-partner. Finally, gender interacted with the amount of viewing pictures of an ex-partner and the time period of the study to predict depression: men improve regardless of picture viewing across the study but women do not. These findings suggest that the course of adjustment may be generally more positive for men, as they evidence improved adjustment (i.e., decreases in self-reported distress) even if they engage in behaviors that are associated with distress among women.

Adult Attachment.

Broad adult attachment style. Attachment anxiety and avoidance moderated the association of new relationship status and time on emotional adjustment (refer to Table 11). New relationships are associated with decreasing depression across the study for people with high attachment anxiety, and faster decreases in complicated grief for people with high attachment avoidance. Both attachment anxiety and avoidance also moderate the effect of ex-partner in-person contact and gender on depression. Women with high attachment anxiety or avoidance, but not men, evidence less depression with greater in-person ex-partner contact. Taken together, these findings suggest that transferring attachment to a new partner mitigates poor emotional adjustment for people with very strong attachment anxiety or avoidance, and that in-person interactions with a former partner are associated with better adjustment for more insecure people. Although it sounds trite, for people high in either attachment anxiety or avoidance, the best summary of these findings might be encapsulated by the lyrics of the 1970s folk song: *if you can't be with the one you love, love the one you're with.*

Attachment to an ex-partner. After accounting for adult attachment anxiety, ongoing attachment to an ex-partner moderated the effect of initiator status and time on depression. People who reported ending the relationship had less depression if they also reported low levels of ex-partner attachment (refer to Table 12). People who reported their ex-partner had ended the relationship had more depression at the end of the study if they were highly attachment to their ex-partner. The inclusion of ex-partner specific attachment highlights that being the 'leaver' or the 'left' is only associated with worse adjustment if a person was highly attached to their ex-partner.

Loneliness. Loneliness was not a time-varying moderator of the contact-adjustment association.

What factors can explain the association between ex-partner contact and emotional adjustment? This summary of findings focuses on **Aim 2** and reviews the 1-1-1 mediational analyses.

Longing. In-person and texting individually, were associated with greater preoccupation or longing with an ex-partner, which, in turn, explained the overall direct effect from these two contact variables to higher depression. Texting contact is also associated with greater complicated grief, and this association also is explained by longing as well (refer to Tables 13 and 15).

Rumination. Greater in-person ex-partner contact was associated with greater rumination regarding an ex-partner and the dissolved romantic relationship, which, in turn, explained the direct effect from in-person ex-partner contact and higher depression (refer to Table 16).

When both longing and rumination are included in a multiple mediator analysis neither is significant.

Does adult attachment style also moderate the associations mediated by longing and rumination? (Aim 2), Attachment anxiety and avoidance moderate different ex-partner contact and mediation pathways, and the direction of effects supported my main hypothesis. Attachment anxiety moderated the association of in-person ex-partner contact and rumination, whereas attachment avoidance moderated the association of text ex-partner contact and longing. Probing of each of these pathways showed that moderation only truly existed for attachment anxiety and in-person contact: greater rumination occurs only for people with high attachment anxiety who were having above average in-person contact with an ex-partner (refer to Table 20).

Does social support from close others operate to improve adjustment outside the participant's awareness? Can the effects of invisible support be examined through mediation processes? (Aim 3) Data from this sample cannot answer these questions; none of the exploratory social support analyses were significant.

Does participant knowledge of close others reporting on their behaviors alter participant reports of their behaviors? (Aim 4) Participants randomly assigned to be in conditions where a friend/family member also reported on their behaviors and emotions relative to their breakup did evidence some significant differences relative to those who participated in the study alone. Participants with informants reported significantly less in-person, social network and sexually intimate contact with ex-partners, as well as greater ex-partner picture viewing and significantly less participants in this condition were involved in new romantic relationships. These participants also reported significantly more received support from their informants, relative to participants asked to report on the supportive acts from a specific friend/family member not included in the study (refer to Table 24). Note, people who participated with an informant did not show significant differences in either measure of emotional adjustment. Overall, these findings suggest there is reason to believe these participants altered some aspects of their behaviors or reports of their behaviors when they were aware that another person would be asked about how they were coping with the breakup.

Implications

“They say that breaking up is hard to do” goes the song by Neil Sedaka, but the results from this study suggest that a simplistic, “one size fits all” conclusion about the emotional correlates of a non-marital separation do not comport with existing data. In this section, I discuss how the observed findings fit within the existing literature with a particular emphasis on the variables and processes that are associated with variability in young adults’ responses to a breakup.

The impact of ongoing contact with an ex-partner. A romantic relationship breakup is not always a definitive event, but rather a process that unfolds over time. Ex-partners may remain in contact for a variety of reasons, and research prior to this study focused on the social necessity of maintaining friendships post-dissolution (Schneider & Kenny, 2000). The scope of the current study was to measure the consequences of said contact, as follow-up to the original finding that having contact with an ex-partner (dichotomously assessed) was associated with slower decreases in feelings of love and sadness (Sbarra, 2006; Sbarra & Emery, 2005).

Sex with ex-partners. Although the direction of the effect is not conclusive, there is consistent evidence to suggest that maintaining sexual intimacy with an ex-partner actually hampers emotional adjustment. In the romantic breakup literature only one recent study examines the individual and relationship characteristics associated with sexual contact with ex-partners and this paper relies exclusively on cross-sectional data (Halpern-Meeking, Manning, Giordano and Longmore, 2012). In the Halpern-Meeking et al. (2012) study, one-fourth of the total sample reported having engaged in sex with an ex-partner with an equivalent number of men and women endorsing; significant predictors of sex were the length of the relationship with the ex-partner, and increasing age. These results say very little about the correlates or

consequences of sexually intimate contact. The only other study to investigate sex with ex-partners looked at divorced adults, and suggested that if a person has low acceptance of the marriage ending (i.e., high longing for reunion measured by the Acceptance of Marital Termination (AMT); Kitson, 1982), then sex with an ex-spouse can be associated with improved adjustment, whereas *not* sleeping with your ex-spouse was associated with worse adjustment among these high longing people (Mason, Sbarra, Bryan & Lee, 2012). These findings were couched within attachment theory and the authors argued that sexual contact may fulfill attachment needs in a way that non-sexual contact cannot; thus, sexual contact is not uniformly negative, but instead depends in part on whether a person is moving on with their life following divorce.

The aforementioned studies were cross-sectional in nature, which prevents modeling of the longer consequences associated with sex with an ex-partner. In the current sample, using lagged and concurrent reports of sexual intimacy with an ex-partner, I found an association that suggests that having sex with an ex one week earlier is associated with decreased depression but that engaging in sex within the same week is associated with greater depression. The overall net effect of sexual contact with an ex-partner during two-weeks of the current study was a 1-unit increase in depression. A similar effect (using complicated grief as the emotional adjustment outcome) was moderated by gender, such that women who were not sleeping with an ex-partner and all male participants exhibited significantly decreasing complicated grief across the study, whereas women who were having sex with an ex-partner showed no changes in complicated grief. When attachment anxiety was added to the analyses (and the linear effect of time removed), high anxiety women who were having sex with their ex-partner had less depression, whereas low anxiety women who were having sex with an ex-partner exhibited more depression.

This effect is essentially a conceptual replication of the Mason et al. (2012) finding noted above. In addition, low anxiety men also exhibited greater depression when having sex with an ex-partner, but for high anxiety men, having sex with an ex had no effects on depression. Analyses with attachment avoidance also evidenced the effect of decreased depression for high attachment avoidant women who were engaging in sex with their ex-partner, but no alterations in depression for other participants.

A complex picture emerges when these findings are examined together. Similar to Mason and colleagues' findings (2012), having sex with an ex is not uniformly associated with poorer adjustment, these findings highlight that women experience poorer emotional adjustment, but only if they also have low attachment anxiety. To a lesser extent this effect also operates in low anxiety men.

One way to interpret these findings is to focus on the potential benefit associated with having sex with an ex. Shaver and Mikulincer (2002) suggest that when faced with emotional upheavals, anxiously and avoidant attached people will display distinct emotion regulation strategies—hyperactivation and deactivation, respectively. Hyperactivating strategies attempt to establish security by proximity-seeking of the attachment figure, whereas deactivating strategies attempt to distance the individual from any attachment-related thoughts or actions. The only study to date to explore the empirical question of whether a person's attachment style alters adjustment demonstrated that people high in attachment anxiety are more likely to seek contact with their former partner, ostensibly as a hyperactivating strategy (Sbarra & Emery; 2005). The same study, however, found no support for attachment style serving as a moderator of contact and emotional adjustment. For people with high attachment anxiety sexual contact may occur to avoid disapproval from a romantic partner, or to cope with feeling unloved or abandoned (Davis,

Shaver & Vernon, 2004; Birnbaum, Mikulincer, Reis, Gillath & Ornaz, 2006; Schachner & Shaver, 2004), whereas people with high attachment avoidance may approach sex with selfish motivations and in a self-serving manner to maintain emotional distance (Davis et al., 2004; Del Guidice, 2009). Taken together with previous findings (Mason et al., 2012) I suggest attachment anxiety and avoidance may be associated with different motivations for sexual behavior, and that both may be associated with positive outcomes.

It is worth noting these sex with ex-partner effects were most salient for women. Research into gender and attachment focuses on the greater preponderance of men with dismissing (i.e., avoidant) attachment style and women with more ambivalent (i.e., anxious) attachment (Bartholomew & Horowitz, 1991; Bem, 1993; Kirkpatrick, 1998; Scharfe & Bartholomew, 1994). A cross-cultural multi-site (56 nations) study, however, found that although men do report being more dismissing in romantic relationships than women, the differences are small in magnitude and appear to be mainly associated with Western culture (Schmitt et al., 2003). The gender imbalance in this study limits conclusions about differences in attachment style by gender.

In-person contact. In-person contact with an ex-partner was hypothesized to be more impactful than other forms of contact. Findings from this study showed greater depression associated with high levels of in-person contact. Further, both attachment anxiety and avoidance moderated the ex-partner in-person contact and gender effect on depression. Highly anxious and avoidant women, but not men, evidenced less depression across the study with greater in-person ex-partner contact. Similar to the sex with an ex-partner findings described above, the motivations for seeking ex-partner in-person contact may vary across the dimensions of attachment insecurity, but the end result is improved emotional adjustment. Consistent with these

results, other research finds that people high in attachment anxiety express a desire to rekindle the relationship and greater distress about the breakup than securely attached people (Madey & Jilek, 2012). That is, women employ these attachment-based emotional regulation strategies in a functional attempt to decrease their distress.

This last point is worth further discussion. The current study provides evidence that emotion regulation strategies employed by high anxious and avoidant women are associated with less distress when specific relational behaviors occur. The social lens or framework of this study provides an excellent context for revealing new information about how these processes operate. For women with high attachment anxiety seeking contact with an ex-partner may lead to decreases in depression because it plays a direct role in meeting their unmet attachment needs. For women with high avoidance, seeing an ex-partner may provide emotional distance and an avoidance of the negative emotional experience associated with missing an ex-partner. These points are conjecture, but would be worth pursuing in future research.

Electronic forms of contact. This study is the first attempt to examine the correlates of online social network contact with an ex-partner and emotional recovery from a breakup. I find clear evidence that greater social network contact is associated with significantly worse emotional adjustment. For example, there is a time-dependent effect of being ‘unfriended’ by an ex-partner, such that being ‘unfriended’ prior to entry into the study is associated with greater depression. Length since the breakup was a covariate in all analyses, so even looking across the five weeks of the study we can see an effect of less depression for those participants who reported having been unfriended during the course of the study. Being ‘unfriended’ soon after a breakup may be felt as a severe form of rejection by an ex-partner. Gender moderated the effect of unfriending on depression such that women, but not men, who report being unfriended prior to

the study experienced greater depression. I also found that gender altered the impact of viewing pictures of an ex-partner online on emotional adjustment. Men reported improved adjustment over time regardless of how much picture viewing they engaged in, but women did not (I found a small effect for men but not women decreasing in depression with ex-partner picture viewing). Finally, social network ex-partner contact and poorer emotional adjustment was mediated by both longing and rumination.¹¹ Although these effects did not hold after more stringent tests of mediation, it is worth noting that there are significant positive associations linking social network contact with greater longing, rumination, depression and complicated grief.

Social network ex-partner contact was the most passive form of contact examined in this study, yet in our hyper-connected world where people have immediate access to each other via the internet, this type of contact may be a highly relevant behavior. Though still an emerging area of research, ‘unfriending’ by online friends is associated with greater rumination and negative emotion, especially if a person is unfriended by a close partner (Bevan, Pfyl & Barclay, 2012). This finding makes sense given that unfriending someone on Facebook (either a casual acquaintance or former flame) violates the norms of social networking (McLaughlin & Vitak, 2012). Today, displaying a romantic relationship online, through a relationship status on Facebook or tagging a partner in posts has become an integral part of self-expansion behaviors normally attributed with romantic relationship development (Carpenter & Spottswood, 2013). A term for being linked “in a relationship” online has emerged, with many people not considering a relationship legitimate unless it is ‘Facebook official’ (Fox & Warber, 2013); thus, changing a relationship status from “in a relationship” to “single” is one of the first ways to indicate to others that a romantic relationship has ended. Thus, the information that is communicated about

¹¹ Note that all analyses included in-person ex-partner contact to correct for offline interactions so findings are more reliability attributable to online specific contact.

one's romantic life online, and the meaning associated with such information, cannot be minimized in the context of young adults' romantic relationships.

Specific to online ex-partner related contact, 'Facebook stalking' has also emerged in the cyberpsychology literature. People use Facebook as a way to 'covertly' provoke ex-partners, and although viewing pictures of an ex-partner on Facebook is not inherently harmful, doing so may also unintentionally evoke negative emotional states in the viewer (Lyndon, Bonds-Raacke & Cratty, 2011). More severe cyberstalking behaviors, such as public harassment via posting on an ex-partner's Facebook wall, are associated with stalking behaviors offline as well. This suggests that online social networking behaviors may be proxies for real-world behaviors. Surveillance of ex-partners via social networking sites such as Facebook is common and one-half to two-thirds of people report making contact with ex-partners via Facebook after a separation (Chaulk & Jones, 2011; Lyndon et al., 2011). In a recent study, after accounting for relationship specific covariates, personality variables, general Facebook usage and offline ex-partner contact, remaining friends with an ex on Facebook was associated with less negative feelings and longing for an ex-partner, but also with lower personal growth (Marshall, 2012). The greater surveillance, or time spent on Facebook for the purpose of viewing information about an ex-partner, was associated with worse current distress, more negative feelings and more longing for an ex-partner (Marshall, 2012). Couched within this literature, the exploratory results of social network contact and poorer emotional adjustment in the current study suggest a person's online communication relative to an ex-partner is highly relevant to the study of relationship dissolution.

Contact with an ex-partner leads to worse adjustment by increasing longing for an ex-partner and rumination about the former relationship.

Mechanisms. This study is the first to examine the mechanisms (i.e., mediators) that explain why contact with an ex-partner is associated with poorer emotional adjustment. I found increased longing for an ex-partner mediated the greater in-person and texting contact and worse *future* emotional adjustment association. Rumination about the relationship also mediated the in-person ex-partner contact and future depression association.

Appraisals of a stressful event impact emotional coping (Folkman, Lazarus, Gruen & DeLongis, 1986; Lazarus & Folkman, 1984) and specific to the non-marital breakup literature, people who appraise a breakup as a desirable report less negative emotion (McCarthy, Lambert & Brack, 1997). Findings support the idea that contact may alter how a person evaluates their breakup, and that this evaluation, in turn, affects the individual's emotional response. Even with online forms of contact, more exposure to information about an ex-partner is associated with greater longing, negative feelings and worse distress (Marshall, 2012).

The mediation via rumination effect in this study is consistent with several lines of existing research. First, rumination is positively correlated with depression symptoms (Collins and Clark, 1989), as well as associated with onset of major depression (Hammen, 2005; Kendler, Hettema, Butera, Gardner, & Prescott, 2003). Second, maladaptive rumination is associated with more negative adjustment following a breakup (Saffrey & Ehrenberg, 2007). Third, evidence from a longitudinal study focused on changes in depression within a person, found rumination mediated reported stressful life events (e.g. divorce) and increases in depression one-year later (Michl, McLaughlin, Shepherd, & Nolen-Hoeksema, 2013). Finally, in a laboratory analog

study, rumination mediated participants' ability to maintain positive feelings for a relationship or ex-partner following relationship threat inductions (Jostmann, Kerremans & Kinkenauer, 2011).

I conceptualized rumination as distinct from longing in that it generally manifests in negative thoughts about or brooding over relationship regrets (Nolen-Hoeksema, 1998; Saffrey and Ehrenberg, 2007). In the context of romantic relationships, interpersonal social rejection can set off a cascade of responses associated with a person's thoughts, emotions and neurobiology. Slavich and colleagues (2010) propose that because of these responses, social rejection places someone at a heightened risk for depression. Social rejection elicits activation in areas of the brain associated emotional awareness and regulation (Ochsner & Gross, 2005; Somerville, Heatherton, & Kelley, 2006), as well as physical pain (Kross, Berman, Mischel, Smith & Wager, 2011). Given these collective findings, social interactions may activate ruminative thoughts that explain greater depression, and this perspective is consistent with the findings from the current study.

Moderators. Attachment style was already discussed relative to sexual and in-person contact, so this section focuses on findings related to the narrow measure of attachment included in this study as well as the mediated moderation effects.

Examining the effects of ex-partner specific attachment (as measured by the WHOTO), after accounting for a participant's trait attachment anxiety, resulted in an interesting effect that may explain why initiator status (whether you ended the relationship or were dumped) is rarely associated with significant effects in the romantic breakup literature. The primary result here is that being dumped is not uniformly associated with poorer adjustment; rather, attachment to an ex-partner moderates this effect, and I see that it is only for people who remain highly attached to their ex-partner that being left by them is associated with a concomitant negative emotional

outcome. The association of higher distress and having an ex-partner end the relationship is inconsistent in the literature. Initiators of divorce evidence better adjustment but the differences appear to diminish with greater time post-divorce (Pettit & Bloom, 1984; Wang & Amato, 2004). In the non-marital romantic breakup literature, non-initiators typically report more distress and view the breakup as more stressful (Hill, Rubin & Peplau, 1976; Sprecher, 1994; Sprecher, Felmlee, Metts, Fehr, & Vanni, 1998). Though other research either does not replicate this finding or suggests that it is moderated by gender and only holds for men (Helgeson, 1994; Sbarra, 2006). These findings are best grounded in Rusbult's (1980) investment model of commitment—people who end relationships in which their ex-partners were a deep source of emotional support fare worse. This finding makes intuitive sense, of course, but it is important to recall that is only when we assess the degree of the attachment a person has to an ex-partner that the emotional significance of how the relationship ended is realized.

Beyond the ex-partner specific WHOTO index, the broad measures of attachment anxiety and avoidance were included in the mediated moderation hypotheses. Most central among my findings in this area was that attachment anxiety evidenced a significant moderation effect of the in-person contact and rumination pathway (the $X \rightarrow M$ step in the full mediational model). Only people high in attachment anxiety exhibited greater increases in rumination associated with in-person contact. Said differently, the mediation of the in-person ex-partner contact and depression association via rumination occurred only in people with high attachment anxiety who also reported engaging in above average in-person contact with their ex-partner. Attachment anxiety and rumination are both linked to adjustment in the literature, with rumination even mediating the association of attachment anxiety and adjustment post-breakup (Saffrey & Ehrenberg, 2007). These findings are cross-sectional, however, with participants on average being 5 months out

from their relationship ending and relationships lasting on average for 14 months. We build on this finding in the current study, which used lagged-effects and tested the lower-level mediation models stringently to verify that the effects found were directional in nature. Participants in this study were on average 3 months out from their breakup and the relationships they engaged in were on average over 21 months. Accordingly, the current findings delineate in a more sensitive manner the associations among attachment anxiety, rumination and adjustment in the aftermath of a relationship breakup.

Informant reports alter participants' self-reports of behavior. An exploratory aim of this study, I found evidence for significant underreporting of contact with ex-partner behaviors in participant's completing the study with an informant (refer to Table 16). Informant reports are widely used in the person perception and personality literature as a way to collect multi-method data (Carlson, Vazire & Oltmanns, 2013; Kandler, 2012; Vazire, 2006; Vazire & Mehl, 2008). Informant reports improve the validity of personality assessments and typically show modest correlations across informants and with target participants' reports (Oltmanns & Turkheimer, 2009; Vazire, 2006). Although informant reports and self-reports share overlap in variance, they also demonstrate predictive validity, suggesting that the type of report might be associated with different types of information (i.e. interpersonal and intrapersonal; Carlson et al., 2013; Connolly, Kavanagh & Viswesvaran, 2007). These findings say little, however, about *how* an informant reporting on a participant's behavior might alter either the participant's actual behavior or what they report themselves; and, to the best of my knowledge, this is the first study to suggest that they do.

Research on social desirability may be helpful in understanding why informant reports might be associated with participants altering, or underreporting, behaviors. Social desirability

consists of two components, impression management (IM) and self-deceptive enhancement (SDE; Paulhus, 1984, Paulhus, 1991). The former is a deliberate and other-directed tendency to over report desirable behaviors and underreport undesirable behaviors (Tedeschi & Norman, 1985), whereas the latter is an unintentional tendency to give overly positive reports about one's own behavior. Both of these efforts cast a respondent in a positive light, and regarding specific types of behaviors may make the person's actions more socially acceptable. For the purposes of the current study, a focus on IM is more applicable. The current data do not permit analysis of IM as a factor in the mean differences found between participant responses in the two conditions, but future research may want to address this.

It is also worth noting that participants in the condition with informants reported significantly more received social support than participants without informants. Correlations between informant and participant reports of offered and received support were .48 for practical and .41 for emotional support, again consistent with prior research (Oltmanns & Turkheimer, 2009). The mean differences between the two conditions is small, but nevertheless potentially meaningful. Just as participants may want to cast themselves in a positive light, they may endeavor to do the same when reporting their informants' efforts. Again, the current data do not permit analysis of this idea, but may suggest that IM spans beyond participants' reports of their own behaviors.

No evidence for invisible support effects. Although most of this discussion is organized around significant findings of interest, there is one null finding I wish to discuss in a bit of detail. In particular, I find no evidence for the so-called *invisible support* effect, whereby participants benefit most from support that is outside of their awareness (operationalized as the literal difference between stated support received and informants' reports of support behaviors

provided). Instead, the significant negative effects of participant received emotional support (total support effects were driven by emotional social support) and emotional adjustment suggest that the greater social support participants were aware of, the better their emotional adjustment. These findings are contrary to Bolger and colleagues (2000), but may reflect a benefit from support that characterizes positive feelings about relationships with others and not regarding the breakup (see Gable, Reis & Downey, 2003)

Relative to the proposed mediation effects, it is highly likely that given the small sample size of paired participant and informant reports there was insufficient power to detect these contextual effects (Kenny et al., 1998). Had data collection proceeded as planned, with 100 pairs of participant and informant reports effects may have emerged and future research should include this as a consideration.

Relative to the MLM regression analyses using the original invisible support model provided by Bolger and colleagues (2000), there are important differences in how models were specified in the current study. First, the original study had a specified ‘stressor’ phase associated with taking a state bar exam. The main effect and the period by recipient/provider interaction effects were all included in the models, but no such period existed in the current study. Specifically, the entire study period was considered to be a stressor period due to the romantic breakup. As with other studies that have attempted to replicate Bolger et al. (2000) findings, the lack of a stressor period within the study time-frame may have removed an essential context in which invisible support has impact (see Gable et al., 2003). Future analysis may want to examine periods of greater ex-partner contact as a stressor and include main and interaction effects in analyses. Second, social support was coded as a dichotomous event in the original study, a recipient either received support or they didn’t, and a provider either gave support or they didn’t.

This assessment of support is insensitive compared to the number of questions asked, and the attempts I made to distinguish emotional and practical support. Beyond these efforts, employing a quasi-signal detection analysis may be a more accurate way of conceptualizing offered and received support (e.g. Gable et al., 2003). Finally, and most importantly, because the models of invisible support I hypothesized were based off of the earlier research in this area (Bolger et al., 2000; Shrout et al., 2006), I did not include aspects associated with characteristics of both support providers and recipients. More recent work in this area (see Gleason, Iida, Shrout & Bolger, 2008; Iida, Seidman, Shrout, Fujita & Bolger, 2008) suggests that doing so would highlight the individual heterogeneity seen in these dyadic processes, and be more sensitive to the contextual factors that impact the effect of receiving and providing support (e.g. mood states or motivation for providing support).

Limitations and Future Directions

Findings from the current study should be interpreted in light of several limitations. Foremost, the sheer amount of data collected (relative to the specific hypotheses proposed) and analyses conducted poses notable concerns for type-1 errors (see Simmons, Nelson & Simonsohn, 2011). According to the suggested requirements in Simmons et al. (2011) to limit false-positive findings, in the current study: data collection terminated when 150 participants had enrolled in the study as proposed, each condition included an equivalent number of participants, I extensively examined differences across conditions relative to relationship and response differences, and I used all data after I examined for outliers and non-normal distributions. These additional steps adhere to four of the six suggested requirements (see Appendix J). Accordingly, all analyses proceeded in a stepwise fashion. First, the hypothesized predictors and distal outcomes of interest were tested in an empty model (i.e., one that did not include any covariates).

Second, if significant parameters were identified, relationship and individual difference covariates were added to the model as competing predictors, and the analysis was re-run to determine if the focal effect of interest was maintained.

Given the number of individual analyses, it makes sense to consider the significant findings in light of some type of correction for multiple tests. One possible protection against Type 1 (false positive) errors is the Bonferroni alpha-adjusted p-value that adjusts the maximal p-value cutoff by dividing .05 by all the analyses employed in a given study. This approach is considered the most conservative and is associated with Type 2 errors (Leon, 2004). A less stringent approach is to adjust alpha for each hypothesis. The standard cut-off value of $p < .05$ would be divided by the total number of analyses per hypothesis, and only results meeting that p-value cut-off would be considered valid. Based on this correction, the current study's 'significant' findings would change (refer to Table 25). Given the specific adjusted p-values for each hypothesis, a number of reported results become non-significant. The adult attachment style, ex-partner specific attachment, and non-attachment moderators (**H3** and **H4**) would all be invalid, as well as the mediated moderation association found in **H7**. Enforcing the multiple test correction, however, also reinforces the associations of ex-partner contact and emotional adjustment, as well as the mechanisms that explain these associations (**H1**, **H2** and **H5**). Due to the exploratory nature of this study, I include this correction to address the possibility of spurious findings, but hesitate in discounting these 'insignificant' effects because I believe they still inform the growing body of work in this research area.

Table 25

Retained Findings After Modified Bonferroni Correction for Multiple Tests

Hypothesis	Adjust p-value	Retained Effect
H1	<.004	Lagged sex with an ex-partner predicts future depression
		Lagged complicated grief predicts future frequency of in-person ex-partner contact
H2	<.004	Sex with an ex-partner predicts concurrent depression
		Social network contact predicts concurrent complicated grief
		Complicated grief predicts concurrent frequency of social network contact
H3	<.001	None
H4	<.002	None
H5	<.001	Longing mediates the social network contact and complicated grief association
		Rumination mediates the social network contact and depression association
H7	<.006	None
EA5	<.001	None

Another limitation arises from how several variables were included in the proposed analyses. First, I assessed ex-partner contact by questions regarding frequency, valence, tone, content, and emotional intensity of each specific form of contact. The analyses presented focused solely on frequency of each form of contact as a predictor. I took this approach for several reasons. First, the only other research into ex-partner contact measured contact dichotomously (Sbarra, 2006, Sbarra & Emery, 2005) and I chose to focus on frequency of contact in a given week as an incremental increase in sensitivity. Second, by selecting for specific profiles of contact for inclusion as the predictor (e.g. in-person, positive, casual in a group setting, and very emotionally intense) I would greatly decrease the power associated with each of my analyses. Third, inclusion of all these parameters of contact increases the complexity of already complex analyses and may have led to less interpretable findings; and finally, due to the lack of literature

in this area I saw the current study as an important foundational study upon which other studies might be built and thus, emphasized a thorough investigation of the simple models I proposed.

Another limitation worth noting is that the variable included as a measure of longing may not be an accurate reflection of the process of longing for an ex-partner. I used the ‘percentage of the day a participant spent thinking about an ex-partner’ item to reflect the feelings of love and sadness following separation from an ex-partner, but this question may actually better reflect preoccupation with an ex-partner or terminated relationship. For instance, a person could fantasizing that harm befalls their ex-partner, or thinking about how much they hate him/her. While these would both be associated with a percentage of the day spent thinking about an ex, these thoughts are not necessarily related to feelings of love or sadness. As such, ‘longing’ as defined by the item I included in analyses might instead reflect preoccupation that is different from rumination and future research should include the AMT (Kitson, 1982) as a more accurate reflection of longing.

A third limitation in the study is that there were few lagged effects identified in **H1**, and this means that when lower-level mediation analyses were conducted for **H5** the majority of the analyses did not have a significant direct effect between ex-partner contact and emotional adjustment. In the classic regression-based mediation analysis, the causal predictor must be significantly associated with the distal outcome in order for a direct effect to exist (Baron & Kenny, 1986; Judd & Kenny, 1981). However, current consensus is that this is not a required step in mediation, and that the direct effect is implied is significant associations are found between the predictor and the mediator, and the mediator and the outcome (Kenny, 2008; Kenny, Kashy & Bolger, 1998; Bauer, Preacher & Gil, 2006). Additionally, if the mediator completely explains the association of the predictor and the outcome, then this means the direct effect is

equal to the indirect effect, which causes power associated with testing the direct path to be too low to detect statistical significance (Jose, 2013). As such, I do not see the lack of significant direct effects between lagged ex-partner contact and emotional adjustment as a severe limitation in this study.

A greater challenge to the mediation findings (**H5**) is that they do not rely on three separate time points associated with the predictors, mediators and outcomes as suggested by Maxwell and Cole (2007) in their recommendations for cross-lagged mediation analysis. The necessary components of an analysis to infer causal effects is a hotly debated topic within mediation research, and bias estimating effects is shown when using both cross-sectional and longitudinal data in regression-based and structural equation models (Cole & Maxwell, 2011; Reichardt, 2011). Still, using multiple waves of data in mediation analysis is considered the gold standard. Due to the one-week lag between assessments in the current study, lagged effects spanning 3-weeks were not found, and so the mediation models used lagged ex-partner contact and longing/rumination variables to predict current adjustment. To guard against type-1 errors I employed several strategies. First, for any significant indirect within person mediation effect, I tested three alternative mediation models to examine reverse causal effects (see Iacobucci, Saldanha & Deng, 2007 and Fiske, Gilbert & Lindzey, 2010). The first model specified that lagged longing/rumination was the predictor and lagged ex-partner contact the mediator; the second model specified that emotional adjustment was the lagged mediator and longing/rumination the current outcome, and the final model specified that lagged emotional adjustment was associated with lagged longing/rumination acting as the mediator, which in turn was associated with the current week's ex-partner contact. Lower-level mediations were only considered valid if indirect *within-person* effects were not-significant for all three iterations

(refer to page 41 of the Method for an explanation of the logic behind this interpretation and the discussion points on the next page).

Second, in the mediated moderation analyses associated with **H7**, I examined the moderating effects of attachment anxiety and avoidance only using the lower-level mediation models that had passed the stringent reverse mediation tests. Finally, to further ensure the validity of my findings, I probed the two-way interactions of attachment anxiety and in-person contact, and attachment avoidance and text contact, on rumination and longing, respectively. In doing so, I discovered that true mediated moderation only existed for the high attachment anxiety participants who reported greater in-person ex-partner contact and greater rumination. This last analysis goes one step beyond what is recommended for mediated moderation analyses (see Little et al.; 2007).

Using MSEM analysis to examine the lower-level mediation analyses was another strategy employed to ensure the validity of my findings. Multivariate structural equation modeling is relatively new in the quantitative psychology literature (Preacher, Zhang & Zyphur, 2011; Preacher, Zyphur & Zhang, 2010; Zhang, Zyphur & Preacher, 2009). This method builds on suggestions for handling multilevel data in mediation analyses (e.g. Bauer et al., 2006; Kenny, Korchmoros & Bolger, 2003) by partitioning level-2 (i.e. between-person) variance separate from level-1 (i.e. within-person) variance. By combining the between and within variance, the slope estimates provided in MLM are inflated and bias both the estimated indirect effect and significance tests of the indirect effect. Future research with proposed multilevel mediation models should use MSEM and correct for this potential bias.

Finally, findings from this study must be considered in light of the exclusive use of self-report data, the heavily female sample, the small number of informants consenting to

participation and time-interval between assessments. Though informant reports were included to mitigate some of the potential bias associated with self-report data, these reports in and of themselves were also self-report in nature. A multi-method approach, such as the addition of naturalistic sampling methods like the electronically activated recorder (EAR; Mehl & Robbins, 2012) would strengthen findings. The sample was also predominantly female, and this has potential implications for any analysis involving gender, replication of these results in a gender-balanced sample would increase confidence in generalizability of findings. Though half of the sample was randomly assigned to participate in the study with an informant, one-third of nominated informants declined participation and a further 19% declined to complete all the informant assessments. With such a limited participant-informant matched sample analyses suffered from a lack of sufficient power (see discussion implications specific to this point above). Finally, the sample interval may simply have been too long to capture behaviors and their intraindividual consequences accurately. Originally I proposed a one-day study resolution window, but participant burden made this resolution unfeasible. As such, I would suggest that a smaller window of three or four days might represent an ideal resolution in which to more sensitively capture these processes without over burdening participants.

Conclusion

In this study, associations among specific forms of ex-partner contact and emotional adjustment following a romantic breakup highlighted the importance of exploring moderators and mediators of this association. Attachment anxiety and avoidance moderate the ex-partner contact and distress associations in ways consistent with hyperactivating and deactivating strategies used to regulate felt-security. This study is also the first to hypothesize and find evidence for the mechanisms that impede better emotional adjustment. This study also quantified

how sex with an ex-partner may temporarily fulfill attachment needs, but also may be associated with long-term poorer emotional adjustment.

APPENDIX A. Profiles of Contact with Ex-Partners

1. In the last week, on how many days did you interact with your ex-partner **in person** (provide your best estimate of the number of *separate days, not the number of times on a given day*)?

0 1 2 3 4 5 6 7

Please rate how often each of the following occurred during your **in-person** contact with your ex-partner:

2. We discussed practical issues (e.g., When he/she would return my belongings to me)

1 2 3 4 5 6 7

None of the time

All of the time

3. We discussed how each person is coping with the breakup

1 2 3 4 5 6 7

None of the time

All of the time

4. We discussed past relationship events

1 2 3 4 5 6 7

None of the time

All of the time

5. We discussed conflicts occurring since our relationship ended

1 2 3 4 5 6 7

None of the time

All of the time

6. We discussed rekindling our relationship

1 2 3 4 5 6 7

None of the time

All of the time

7. We did not discuss issues related to our relationship

1 2 3 4 5 6 7

None of the time

All of the time

8. We engaged in sexual activity (define this using the scale devised below)

1 2 3 4 5 6 7

None of the time

All of the time

Please rate to what extent your **in-person** contact with your ex-partner had the following tones:

9. Brief and unimportant

1 2 3 4 5 6 7

None of the time

All of the time

10. Brief and important

1 2 3 4 5 6 7

None of the time

All of the time

11. Casual and relaxed

1 2 3 4 5 6 7

None of the time

All of the time

12. Romantic and positive

1 2 3 4 5 6 7

None of the time

All of the time

13. Romantic and negative

1 2 3 4 5 6 7

None of the time

All of the time

14. When you reflect on all of the **in-person contact** you had with your ex-partner in the past week, how intense are your emotions in this moment:

1 2 3 4 5 6 7

Not intense at all

Extremely intense

15. When you reflect on all of the **in-person contact** you had with your ex-partner in the past week, how negative or positive are your emotions in this moment:

1 2 3 4 5 6 7

Very negative

Neutral

Very positive

16. In the last week, on how many days did you **speak with your ex-partner on the phone** (provide your best estimate of the number of *separate days*, *not the number of times on a given day*)?

0 1 2 3 4 5 6 7

Please rate how often each of the following occurred when you **spoke on the phone** with your ex-partner:

17. We discussed practical issues (e.g., When he/she would return my belongings to me)

1 2 3 4 5 6 7

None of the time

All of the time

18. We discussed how each person is coping with the breakup

1 2 3 4 5 6 7

None of the time							All of the time
19. We discussed past relationship events							
1	2	3	4	5	6	7	
None of the time							All of the time
20. We discussed conflicts occurring since our relationship ended							
1	2	3	4	5	6	7	
None of the time							All of the time
21. We discussed rekindling our relationship							
1	2	3	4	5	6	7	
None of the time							All of the time
22. We did not discuss issues related to our relationship							
1	2	3	4	5	6	7	
None of the time							All of the time
Please rate to what extent the following tones were present when you spoke on the phone with your ex-partner:							
23. Brief and unimportant							
1	2	3	4	5	6	7	
None of the time							All of the time
24. Brief and important							
1	2	3	4	5	6	7	
None of the time							All of the time
25. Casual and relaxed							
1	2	3	4	5	6	7	
None of the time							All of the time
26. Romantic and positive							
1	2	3	4	5	6	7	
None of the time							All of the time

27. Romantic and negative

1 2 3 4 5 6 7

None of the time

All of the time

28. Sexually intimate

1 2 3 4 5 6 7

None of the time

All of the time

29. When you reflect on all of the **phone contact** you had with your ex-partner in the past week, how intense are your emotions in this moment:

1 2 3 4 5 6 7

Not intense at all

Extremely intense

30. When you reflect on all of the **phone contact** you had with your ex-partner in the past week, how negative or positive are your emotions in this moment:

1 2 3 4 5 6 7

Very negative

Neutral

Very positive

31. In the last week, on how many days did you **text message** with your ex-partner (provide your best estimate of the number of *separate days, not the number of times on a given day*)?

0 1 2 3 4 5 6 7

Please rate how often each of the following occurred when you **text messaged** your ex-partner:

32. We discussed practical issues (e.g., When he/she would return my belongings to me)

1 2 3 4 5 6 7

None of the time

All of the time

33. We discussed how each person is coping with the breakup

1 2 3 4 5 6 7

None of the time

All of the time

34. We discussed past relationship events

1 2 3 4 5 6 7

None of the time

All of the time

35. We discussed conflicts occurring since our relationship ended

1 2 3 4 5 6 7

None of the time

All of the time

36. We discussed rekindling our relationship

1 2 3 4 5 6 7

None of the time

All of the time

37. We did not discuss issues related to our relationship

1 2 3 4 5 6 7

None of the time

All of the time

Please rate to what extent the following tones were present when you **text messaged** your ex-partner:

38. Brief and unimportant

1 2 3 4 5 6 7

None of the time

All of the time

39. Brief and important

1 2 3 4 5 6 7

None of the time

All of the time

40. Casual and relaxed

1 2 3 4 5 6 7

None of the time

All of the time

41. Romantic and positive

1 2 3 4 5 6 7

None of the time

All of the time

42. Romantic and negative

1 2 3 4 5 6 7

None of the time

All of the time

43. Sexually intimate

1 2 3 4 5 6 7

None of the time

All of the time

44. When you reflect on all of the **text messages** you exchanged with your ex-partner in the past week, how intense are your emotions in this moment:

1 2 3 4 5 6 7

Not intense at all

Extremely intense

45. When you reflect on all of the **text messages** you exchanged with your ex-partner in the past week, how negative or positive are your emotions in this moment:

1	2	3	4	5	6	7
Very negative			Neutral		Very positive	

46. In the last week, on how many days did you **exchange emails** with your ex-partner (provide your best estimate of the number of *separate days*, *not the number of times on a given day*)?

0	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

Please rate how often each of the following occurred when you **exchanged emails** with your ex-partner:

47. We discussed practical issues (e.g., When he/she would return my belongings to me)

1	2	3	4	5	6	7
None of the time			All of the time			

48. We discussed how each person is coping with the breakup

1	2	3	4	5	6	7
None of the time			All of the time			

49. We discussed past relationship events

1	2	3	4	5	6	7
None of the time			All of the time			

50. We discussed conflicts occurring since our relationship ended

1	2	3	4	5	6	7
None of the time			All of the time			

51. We discussed rekindling our relationship

1	2	3	4	5	6	7
None of the time			All of the time			

52. We did not discuss issues related to our relationship

1	2	3	4	5	6	7
None of the time			All of the time			

Please rate to what extent the following tones were present when you **exchanged emails** with your ex-partner:

53. Brief and unimportant

1 2 3 4 5 6 7

None of the time

All of the time

54. Brief and important

1 2 3 4 5 6 7

None of the time

All of the time

55. Casual and relaxed

1 2 3 4 5 6 7

None of the time

All of the time

56. Romantic and positive

1 2 3 4 5 6 7

None of the time

All of the time

57. Romantic and negative

1 2 3 4 5 6 7

None of the time

All of the time

58. Sexually intimate

1 2 3 4 5 6 7

None of the time

All of the time

59. When you reflect on all of the **email messages** you exchanged with your ex-partner in the past week, how intense are your emotions in this moment:

1 2 3 4 5 6 7

Not intense at all

Extremely intense

60. When you reflect on all of the **email messages** you exchanged with your ex-partner in the past week, how negative or positive are your emotions in this moment:

1 2 3 4 5 6 7

Very negative

Neutral

Very positive

61. In the last week, on how many days did you view your ex-partner's **social networking site** (includes Facebook, Myspace, Skype, Twitter, etc.)?

0 1 2 3 4 5 6 7

Please rate how frequently you engaged in the following activities while viewing your ex-partner's **social networking site**:

62. Checking on how my ex-partner was coping with the breakup

1 2 3 4 5 6 7

None of the time

All of the time

63. Checking on how my ex-partner was spending their time

1 2 3 4 5 6 7

None of the time

All of the time

64. Check to see if my ex-partner has started dating other people

1 2 3 4 5 6 7

None of the time

All of the time

65. Checking to see if other people were commenting on our breakup

1 2 3 4 5 6 7

None of the time

All of the time

66. Viewing friends my ex-partner recently added

1 2 3 4 5 6 7

None of the time

All of the time

67. Viewing pictures my ex-partner recently uploaded or was tagged in

1 2 3 4 5 6 7

None of the time

All of the time

68. Posting comments to his/her page that were not about our breakup _____

1 2 3 4 5 6 7

None of the time

All of the time

69. Please reflect on all of times you viewed your ex-partner's **social networking site** in the past week, how intense are your emotions:

1 2 3 4 5 6 7

Not intense at all

Extremely intense

70. When you reflect on all of times you viewed your ex-partner's **social networking site** in the past week, how negative or positive are your emotions:

1	2	3	4	5	6	7
Very negative			Neutral		Very positive	

71. In the last week, have you and your ex-partner engaged in sexual relations (defined as physically intimate contact from kissing to intercourse)?

(1) Yes – If yes, how many separate days in the past week did you have sexual contact? () separate days

(2) No

APPENDIX B. Inventory of Complicated Grief (ICG)

Please fill in the circle next to the answer that best describes how YOU feel right now:

		Never	Rarely	Sometimes	Often	Always
1	I think about my ex-partner so much that it is hard for me to do the things I need to do .	1	2	3	4	5
2	Memories of my ex-partner upset me . . .	1	2	3	4	5
3	I feel I cannot accept the relationship ending	1	2	3	4	5
4	I feel myself longing for my ex-partner . . .	1	2	3	4	5
5	I feel drawn to the places and things associated with my ex-partner . . .	1	2	3	4	5
6	I can't help feeling angry about the relationship ending . . .	1	2	3	4	5
7	I feel disbelief over what happened . .	1	2	3	4	5
8	I feel stunned or dazed over what happened	1	2	3	4	5
9	Ever since the relationship ended it is hard for me to trust people . . .	1	2	3	4	5
10	Ever since the relationship ended I have lost the ability to care about other people, or I feel distant from the people I care about . . .	1	2	3	4	5
11	I often go out of my way to avoid reminders of my ex-partner . . .	1	2	3	4	5
12	I feel that life is empty without my ex-partner . . .	1	2	3	4	5
13	I feel bitter over the relationship ending . . .	1	2	3	4	5
14	I feel envious of other who are in relationships . . .	1	2	3	4	5
15	I feel lonely a great deal of the time since the relationship ended . . .	1	2	3	4	5

APPENDIX C. The Center for Epidemiological Studies Depression Scale (CESD-10)

How often have you felt this way during the last week?

		Rarely of None of the time (< 1 day)	Some of the Time (1-2 days)	Occasionally or a Moderate Amount of Time (3-4 days)	Most or All of the Time (5-7 days)
1	I was bothered by things that don't usually bother me	1	2	3	4
2	I had trouble keeping my mind on what I was doing	1	2	3	4
3	I felt depressed	1	2	3	4
4	I felt everything I did was an effort	1	2	3	4
5	I felt hopeful about the future	1	2	3	4
6	I felt fearful	1	2	3	4
7	My sleep was restless	1	2	3	4
8	I was happy	1	2	3	4
9	I was lonely	1	2	3	4
10	I could not 'get going'	1	2	3	4

APPENDIX D. Experiences in Close Relationships – Short Form

Instructions: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

1. It helps to turn to my romantic partner in times of need.
2. I need a lot of reassurance that I am loved by my partner.
3. I want to get close to my partner, but I keep pulling back.
4. I find that my partner(s) don't want to get as close as I would like.
5. I turn to my partner for many things, including comfort and reassurance.
6. My desire to be very close sometimes scares people away.
7. I try to avoid getting too close to my partner.
8. I do not often worry about being abandoned.
9. I usually discuss my problems and concerns with my partner.
10. I get frustrated if romantic partners are not available when I need them.
11. I am nervous when partners get too close to me.
12. I worry that romantic partners won't care about me as much as I care about them.

APPENDIX E. WHO-TO (modified)

Instructions: Please take a moment to reflect on your current relationship with your ex-partner.

- 1.** My ex-partner is someone I see or talk to on a daily basis.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 2.** My ex-partner is the person I want to talk to when I'm worried about something.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 3.** I miss my ex-partner when he/she is away.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 4.** My ex-partner is likely to do just about anything for me.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 5.** I immediately think of contacting my ex-partner when something bad happens?

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 6.** My ex-partner always wants the best for me.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 7.** If there was an emergency, I would want my ex-partner to be contacted.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 8.** My ex-partner almost always know my whereabouts.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 9.** My ex-partner is the person I would most like to be comforted by when I am upset.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

- 10.** If my ex-partner was absent I would feel like something was not quite right.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

11. I know my ex-partner will always be there for me.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

12. I would contact my ex-partner just to reassure them that I was o.k.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

13. I am likely to tell my ex-partner when something good happens to me.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

14. My ex-partner can almost always lift my spirits.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

15. I can hardly imagine my life without my ex-partner.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

16. I regularly say, “I love you” to my ex-partner.

Strongly Disagree 1 – 2 – 3 – 4 – 5 – 6 – 7 Strongly Agree

APPENDIX F. UCLA Loneliness Scale (RUCLALS-4)

Instructions: The following statements describe how people feel. For each statement, please indicate how often you feel the way described by writing the number in the space provided that corresponds to the way you feel. For example, if the question is, “How often do you feel happy?” and you feel that is “Rarely” the case, then you would put a 2 next to the item.

<u>NEVER</u>	<u>RARELY</u>	<u>SOMETIMES</u>	<u>ALWAYS</u>
1	2	3	4

1. ____ How often do you feel alone?
2. ____ How often do you feel that you lack companionship?
3. ____ How often do you feel left out?
4. ____ How often do you feel isolated from others?

APPENDIX G. Ruminative Response Scale (RRS)

People think and do many different things when they feel depressed. Please read each of the items below and indicate whether you almost never, sometimes, often, or almost always think or do each one when you feel down, sad, or depressed. Please indicate what you generally do, not what you think you should do.

1 - almost never **2** - sometimes **3** - often **4** - almost always

1. think about how alone you feel
2. think "I won't be able to do my job if I don't snap out of this"
3. think about your feelings of fatigue and achiness
4. think about how hard it is to concentrate
5. think "What am I doing to deserve this?"
6. think about how passive and unmotivated you feel.
7. analyze recent events to try to understand why you are depressed
8. think about how you don't seem to feel anything anymore
9. think "Why can't I get going?"
10. think "Why do I always react this way?"
11. go away by yourself and think about why you feel this way
12. write down what you are thinking about and analyze it
13. think about a recent situation, wishing it had gone better
14. think "I won't be able to concentrate if I keep feeling this way."
15. think "Why do I have problems other people don't have?"
16. think "Why can't I handle things better?"
17. think about how sad you feel.
18. think about all your shortcomings, failings, faults, mistakes
19. think about how you don't feel up to doing anything
20. analyze your personality to try to understand why you are depressed
21. go someplace alone to think about your feelings
22. think about how angry you are with yourself

APPENDIX H. Social Support Behaviors (Practical and Emotional Scale Items)

Contact with Friends and Family

When people experience difficult events, they often turn to others for support. Sometimes, other people even offer support (or “advice”) when we don’t necessarily want or need it. In the following series of questions, we are interested in the amount and types of interactions you have had with the person you nominated as an “informant” to help us understand how you’re coping with this breakup. There are no right or wrong answers to the questions below. In general, we’re trying to understand how much social contact you have with your friend or family member and how much support he/she offers you.

Social support comes in many forms, from practical (people providing us help by running errands or taking on responsibilities for us) to emotional (listening, offering advice, or helping you to see alternatives).

- 1) Thinking about **both** forms of social support, how supportive has X been with respect to your separation experience in the **last week**?

	1	2	3	4	5	6	7	
	Not at all		Somewhat supportive					Always

For the following questions, please consider specific ways in which you or X may have acted in the *last week*. **Some of the questions refer to your recent breakup, some do not; if the questions does not refer to your breakup, please assume it is about social contact in general.**

Please indicate if X engaged in these behaviors. (* = Practical Support; ** = Emotional Support)

- 2) X suggested potential new dating partners *
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 3) X offered you some kind of support to help you cope with the end of your relationship.**
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday

- 4) You exercised with X (including anything from simply going for a walk together to vigorous exercise) *
 - (1) Yes
 - (2) No
- a) If yes, how often in the last week?
 - (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 5) X assisted you in either returning your ex-partner's belongings, or getting your belongings back. *
 - (1) Yes
 - (2) No
- a) If yes, how often in the last week?
 - (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 6) X offered you emotional support (listening, offering advice, or helping you to see alternatives). **
 - (1) Yes
 - (2) No
- a) If yes, how often in the last week?
 - (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 7) X and I had drinks together (at home or any other outside-of-home setting) *
 - (1) Yes
 - (2) No
- a) If yes, how often in the last week?
 - (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 8) X told you "everything would be OK" **
 - (1) Yes
 - (2) No
- a) If yes, how often in the last week?
 - (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday

- 9) X and I exchanged text messages *
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 10) X listened when you wanted to talk about the breakup **
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 11) X helped with your errands or chores *
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 12) X told you that you were “better off” without your ex-partner. **
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 13) X and I shared a meal together *
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday

- 14) X spoke about your ex-partner's negative qualities, or why you two were not good together.
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 15) X offered reasons why the breakup is a good thing **
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 16) X and I went to coffee to talk: *
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 17) X told you that you will not have difficulty finding another partner. **
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday
- 18) X comforted you if you cried **
- (1) Yes
 - (2) No
- a) If yes, how often in the last week?
- (1) On one occasion (as far as I can remember)
 - (2) A couple of days (2-3 days)
 - (3) Most days (4-6 days)
 - (4) Everyday or nearly everyday

19) X and I spoke on the phone

(1) Yes

(2) No

a) If yes, how often in the last week?

(1) On one occasion (as far as I can remember)

(2) A couple of days (2-3 days)

(3) Most days (4-6 days)

(4) Everyday or nearly everyday

20) X and I exchanged email messages

(1) Yes

(2) No

a) If yes, how often in the last week?

(1) On one occasion (as far as I can remember)

(2) A couple of days (2-3 days)

(3) Most days (4-6 days)

(4) Everyday or nearly everyday

21) Please reflect on all the times X offered support to you in the last week, to what extent was this support helpful or harmful (by harmful, we mean efforts intended to help that actually made you feel worse)?

	1	2	3	4	5	6	7	
Very harmful				Neutral				Very helpful

22) Please reflect on all the times X offered you support in the last week, to what extent do you feel you needed it?

	1	2	3	4	5	6	7	
Not at all			About half the time					Very much

23) We often receive support from many people in our social networks. Excluding the support provided by the "informant" you nominated, how much do you feel you have people in your life who will comfort you when you are upset?

	1	2	3	4	5	6	7	
Not at all			About half the time					Always

24) Excluding the support provided by the person you nominated, how much do you feel you have people in your life who will assist you in doing specific things (like moving, or taking care of your home when you are away) when you need help?

	1	2	3	4	5	6	7	
Not at all			About half the time					Always

APPENDIX I. Perceived Stress Scale (PSS)

The questions in this scale ask you about your feelings and thoughts during the **last month**. In each case, please indicate with a check how often you felt or thought a certain way.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

3. In the last month, how often have you felt nervous and "stressed"?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

5. In the last month, how often have you felt that things were going your way?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

7. In the last month, how often have you been able to control irritations in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

8. In the last month, how often have you felt that you were on top of things?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

9. In the last month, how often have you been angered because of things that were outside of your control?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

APPENDIX J. Simple Solution to the Problem of False-Positive Publications
(Simmons, Nelson & Simonsohn, 2011)

1. Requirements for authors
 - a. Authors must decide the rule for terminating data collection before data collection begins and report this rule in the article.
 - b. Authors must collect at least 20 observations per cell or else provide a compelling cost-of-data-collection justification.
 - c. Authors must list all variables collected in a study.
 - d. Authors must report all experimental conditions, including failed manipulations.
 - e. If observations are eliminated, authors must also report what the statistical results are if those observations are included.
 - f. If an analysis includes a covariate, authors must report the statistical results of the analysis without the covariate.
2. Guidelines for reviewers
 - a. Reviewers should ensure that authors follow the requirements.
 - b. Reviewers should be more tolerant of imperfections in results.
 - c. Reviewers should require authors to demonstrate that their results do not hinge on arbitrary analytic decisions.
 - d. If justifications of data collection or analysis are not compelling, reviewers should require the authors to conduct an exact replication.

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