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# Adjustment to the dissolution of a romantic relationship: effects of ex-relationship specific thought content valence

Rachel E. Brenner  
*Iowa State University*

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**Adjustment to the dissolution of a romantic relationship: Effects of ex-relationship  
specific thought content valence**

by

**Rachel E. Brenner**

A thesis submitted to the graduate faculty

in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Psychology

Program of Study Committee:

David Vogel, Major Professor

Frederick Lorenz

Stephanie Madon

Iowa State University

Ames, Iowa

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## ABSTRACT

The purpose of this research was to examine the immediate effects of engaging in predominantly positively or predominantly negatively valenced thinking about one's most recent romantic ex-relationship and assess whether these effects are unique from thinking about memories from a non-romantic relationship. The application of self-regulation theory within the context of rumination and romantic relationship breakups suggests that recalling positive memories from a relationship may make it more difficult to move on from the relationship that ended, whereas recalling negative memories may make moving on easier. Participants were instructed to write about a relationship memory, with experimental manipulations of the memory valence (positive vs. negative) and relationship type (ex-relationship vs. friendship). Differences in outcome measures associated with adaptive and adverse breakup adjustment were subsequently examined. It was predicted that negatively valenced writing would yield higher ratings of adaptive adjustment measures and lower scores of adverse adjustment measures among participants in the ex-relationship condition, but yield lower scores of adaptive adjustment and higher scores on adverse adjustment among participants in the friendship condition. Results partially supported the hypotheses; participant ratings of adaptive outcomes were higher in the negative ex-relationship condition relative to the positive ex-relationship condition, and participants in the positive friendship condition higher ratings compared to those in the negative friendship condition. No meaningful differences were found with regard to adverse outcomes.

*Keywords:* romantic relationship breakups, thought content valence, breakups, obsession

## CHAPTER I

## INTRODUCTION

“Where you used to be, there is a hole in the world, which I find myself constantly walking around in the daytime, and falling in at night. I miss you like hell.”

-Edna St. Vincent Millay, Letters (1892-1950)

After the unwelcomed end of a romantic relationship, people are oftentimes inundated with a deep sadness and constant, obsessive yearning for their lost beloved. Unable to eat, sleep, or think about anything else, the dissolution of a romantic relationship is one of the most distressing events an adult can experience (Monroe, Rohde, Seeley, & Lewinsohn, 1999; Sbarra, 2006; Slotter, Gardner, & Finkel, 2010). Most individuals will go through at least one painful romantic breakup in their lifetime (Battaglia, Richard, Datteri, and Lord, 1998) accompanied by potential deleterious responses such as major depression, anxiety, insomnia, mood swings, obsessive thoughts, and greater risk for suicide (see Field, 2011, for a review). Although a burgeoning area of research interest, the extant literature predominantly focuses on describing the negative outcomes associated with romantic breakups or identifying the factors that predispose individuals to develop negative outcomes once a relationship ends (Davis, Shaver, & Vernon, 2003). Yet, surprisingly little is known about what responses are adaptive in recovering from this devastating experience. The current research intends to address this omission by examining potentially differential effects of both positive and negative memories of a romantic relationship on positive and negative adjustment outcomes following a breakup.

### **Breakup Thought Content and Valence**

The end of a romantic relationship typically involves a separation from a loved one. As a result, obsession toward the ex-partner and/or ex-relationship is common, particularly when this

dissolution is undesired (Field, Diego, Pelaez, Deeds, & Delgado, 2009). Intensely craving the affection of our beloved, obsessive behaviors after a breakup are well documented such as sending unwanted gifts, phone calls, text messages, expressions of affection (Dutton & Winstead, 2003), and even stalking (Fremouw, Westrup, & Pennebaker, 1997; Haugaard & Seri, 2003). Whereas some of these behaviors are more extreme, some level of obsessive thinking is typically experienced by almost all individuals experiencing a romantic relationship breakup (Field et al., 2009).

Rumination and mental health researchers explain obsessive focus through the application of self-regulation theory. Self-regulation theory (Carver & Scheier, 1981, 1998; Duval & Wicklund, 1972) discusses a wide range of processes involved in self-regulatory behavior, cognitions, and affect. Within self-regulation theory, self-focused attention is one automatic process used to keep a person on track in pursuit of important goals by informing self-regulatory behavior. When a behavioral standard is salient, a person compares whether their current state meets their current standard, or desired state. If the current state meets or exceeds the standard, a person ceases self-regulation processes and self-focused attention because the goal is met. A discrepancy between the current state and current standard can be accompanied by feelings of distress, which has been viewed as a motivational tool in engaging in discrepancy-reducing behavior (Carver & Scheier, 1981, 1998; Duval & Wicklund, 1972). Indeed, if the current situation does not meet the standard, some theorists (Carver & Scheier, 1998) contend that a person will either intentionally engage their behavior in order to reduce this discrepancy, or cease pursuing their goal if the probability of achieving the current standard is low. Researchers of rumination and mental health have extended this theory, and note that in more personally relevant instances, such as a hurtful breakup, obsessive thinking and the related

distress will continue even when the probability of meeting the goal is low (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008; Pyszczynski & Greenberg, 1987). Applied to breakups, if a person experiences an unwelcomed end to their romantic relationship, obsessive thinking results from the discrepancy between no longer being involved in a romantic relationship with their ex-partner (i.e., their current state) despite their wish to be romantically involved with their ex-partner (i.e., their desired state). Indeed, researchers have demonstrated that greater obsessive thinking is associated with greater distress, confusion, tension, and depression (Collins & Clark, 1989; Davis et al., 2003; Feeney & Noller, 1992), as well as worse emotional adjustment and greater levels of stress (Fagundes, 2012; Saffrey & Ehrenberg, 2007).

Beyond identifying obsessive thinking as a common, unpleasant by-product accompanying the end of a romantic relationship, however, little advancement has been made in the romantic relationship dissolution literature to understand the content of the thoughts themselves. Yet, humans can alter their current psychological state through subjective thought. For example, imagining the presence of an important individual, such as a current or ex-romantic partner, can elicit a similar experience to their actual presence in the immediate moment (Fitzsimons & Bargh, 2003). In a previous fMRI study identifying regions of the brain underlying romantic love (Aron et al., 2005), by imagining their current partner, passionately-in-love participants experienced brain activity in the ventral tegmental area (VTA), similar to receiving their partner's affection in person. The ventral tegmental area (VTA) is the center of the brain's reward system, responsible for the euphoria experienced with romantic love and cocaine, as well as the obsessive behaviors that accompany addiction. These same regions also showed activity in a separate study where participants were injected with cocaine (Breiter et al., 1997).



Another important aspect that shapes our current experience during memory recall is *content valence* (Segerstrom, Stanton, Alden, & Shortridge, 2003). Imagining a positively valenced event typically improves mood, whereas imagining a negatively valenced event worsens it (Mather, 2006). Findings demonstrate positive memory recall as a form of emotional regulation to enhance mood (Joormann & Siemer, 2004), and that those who tend to focus on negative thoughts are more likely to suffer from depression (Josephson, Singer, & Salovey, 1996). Segerstrom and colleagues (2003) extended this understanding to the long-term by examining components of repetitive thought. They identified content valence as a robust dimension of repetitive thought, where positive and negative content valence are associated with a positive and negative influence, respectively, on outcome variables such as affect, physiological health, and psychological functioning. Extending beyond its influence on one's current, subjective state, negative or positive thought content pertaining to a specific object can shape the appraisal or meaning that is attached to it (Seegerstrom et al., 2003). This has been demonstrated in the context of romantic relationships. In one study, participants recalling positive autobiographical memories about their current romantic relationship experienced a subsequent increase in the perceived warmth of their relationship (Alea & Bluck, 2007). Similarly, couples reminiscing about a past experience involving shared laughter reported subsequent increases in their relationship satisfaction (Bazzini, Stack, Martincin, & Davis, 2007). Philippe, Koestner, & Leke (2013) posit that frequent activation of couple-related memories, and thus the emotions associated with them, can guide global attitudes and behavior toward a romantic relationship as a form of appraisal. However, Philippe and colleagues only considered how these effects pertain to current romantic relationships and not previous ones.

Despite the substantial influence of content on mental health and intimate relationships, positive and negative thought content valence—or, more accurately, the existence of positive content valence—after a romantic relationship *ends* has only recently been seriously considered. In fact, response style theorists have tended to suggest that thought content is always negative when an individual is distressed because both negative thought content and rumination, the most studied form of obsessive thinking, have been shown to negatively impact adjustment (Nolen-Hoeksema et al., 2008). As a result, romantic relationship dissolution studies typically operate under the assumption(s) that the content of thoughts and memories after a breakup are negative and/or pertain to the breakup itself (e.g., Boelen & Reijntjes, 2009; Fagundes, 2012; Kross et al., 2011; Lewandowski, 2009), failing to consider the existence of positively valenced relationship-relevant content.

Several studies have provided evidence that valence matters. A recent scale development study demonstrated that an individual's thoughts after a relationship breakup could contain both positive and negative content (Brenner & Vogel, 2015). Results from this study also demonstrated that more frequent positive thoughts about the ex-relationship were associated with worse adjustment outcomes, while more negative thoughts about the ex-relationship was associated with better adjustment outcomes. In an fMRI study of individuals distressed about their breakup, when asked to think about their beloved ex-partner, participants described both unhappy *and* happy memories (Fisher et al., 2010). In line with the subjective power of our memories, particularly with individuals holding great importance to us, results demonstrated activity related to systems of drug addiction, supporting the contention that love is an addiction, and romantic breakups can be a form of drug withdrawal (Fisher, 2004; Fisher et al., 2010). In another fMRI study of romantic relationship breakups, rejected-in-love participants were

specifically asked to focus on a sad thought. In this study participants did *not* show activation in the reward systems brain region (Najib et al., 2004), and instead demonstrated *deactivation* in certain areas activated in the Fisher et al. (2010) study.

Researchers have speculated why there was this difference in parts of the brain activated, because participants in both studies thought about their ex-partner. Although they have not found a conclusive explanation, I posit that this difference lies in the content of their thoughts and, unlike previous studies on content valence, that positive thought content is actually *maladaptive* to breakup recovery. If thinking about an important individual elicits an experience similar to their physical presence, and if breakups really are a form of addiction, then a positively valenced thought or memory could induce the temporary yet powerful feeling of experiencing an ex-partner's affection. This could also explain why participants, who oscillated from happy to unhappy memory recollection in Fisher and colleagues' study, showed signs of drug high as well as craving whereas participants in Najib and colleagues' (2004) study, who thought about their grief, did not show signs of addiction or craving. If an individual experiences "withdrawal" from their ex-partner's love, utilizing positive memories may offer relief but also serve as unintentional reappraisal of the ex-partner.

Although Philippe and colleagues' (2013) postulation about romantic thought content and appraisal pertained only to those currently in a romantic relationship, predicting relationship persistence before termination, relationship memory content may continue to influence people's outcomes after a relationship ends. From the self-regulation theories perspective, reinforcing desire for an ex-partner, and thus sustaining the discrepancy between an individual's current state and desired state, could make it more difficult to move on and accept the breakup. In other words, an individual who thinks about relationship-positive experiences, while feeling better in

the moment due to an immediate reduction in negative feelings, could actually be less willing to accept the breakup and thus have greater difficulty moving on. Conversely, those who think about the negative experiences, while feeling worse in the moment, may actually become more accepting of the breakup.

This possible influence of ex-relationship memory recall on moving on from an ex-relationship differs from the potential influence of other close relationship memory recall, such as a close friendship, on moving on from an ex-relationship. Though potentially intimate and meaningful, memories from a friendship are not about the ex-relationship and, therefore, do not directly address the current state-desired state discrepancy. Furthermore, unlike positive ex-relationship memories, thinking about a positive friendship experience would not be followed by being met with a discrepant reality from the subject of their thoughts. In fact, as social support contributes to adaptive coping in stressful events (Shulman, 1993), thinking about a positive friendship memory may actually relate to positively to adjustment outcomes. As such, one might expect that an individual who thinks about a positive friendship memory during a difficult time, such as after a breakup, would feel better in the moment and also experience better adjustment to their breakup. Similarly, thinking about a negative memory from a friendship would likely make an individual feel worse in the moment and instead be maladaptive toward breakup recovery.

### **Current Study**

While a heartbroken person does not have the drug they crave in the purest form (i.e., love from their ex-partner), they do have a surplus of a “counterfeit” form: their memories. The obsessive nature of positive thoughts, for example, may make it difficult to move on from a beloved ex-partner particularly if the thinking about and, in turn, reappraisal, of the ex-

relationship leads one to hold on to the relationship. In Fisher and colleagues' (2010) study, participants relived happy and sad experiences from the relationship, eliciting the reward, craving, and grief evident in the fMRI; however, when participants in another study were instructed to describe a sad thought, which is potentially more of a process-type thought as opposed to reliving a specific memory, results indicated deactivations in these brain regions (Najib et al., 2004). I contend that these drastically different findings between each study resulted from drastically different thought content in their participants.

Recently, Brenner & Vogel (2015) demonstrated the tendency for individuals to reminisce about positive and negative thoughts involving their ex-relationship, and point to potentially differing outcomes based on the degree to which one thinks about positively and negatively valenced relationship thought content in general. Immediate, state-induced responses, however, have not yet been explored. In the current experimental study, I intended to fill this gap in the literature by examining the immediate influence of positive and negative thought content on mood and recovery from romantic relationship dissolution. Participants were randomly assigned to one of four conditions, writing about either: positively valenced thoughts about an ex-relationship, negatively valenced thoughts about an ex-relationship, positively valenced thoughts about a friendship, or negatively valenced thoughts about a friendship. The friendship condition was included in order to parse out whether observed patterns between positive versus negative valence memory conditions would be due to valence effects in general or due to valence effects in the context of ex-relationship memories specifically. Following this writing task, participants indicated their current affect (Watson, Clark, & Tellegen, 1988), self-concept clarity (Lewandowski & Bizzoco, 2007), and adjustment to the breakup (Saffrey & Ehrenberg, 2007) using self-report measures.

It was hypothesized that participants who wrote about positively valenced thoughts regarding their ex-relationship would experience less rediscovery of self-concept and positive adjustment, and greater loss of self-concept and negative adjust post-writing compared to those who wrote about negatively valenced ex-relationship thought content. Meanwhile, the opposite influence was hypothesized for those who wrote about a friendship; participants who wrote about positively valenced thoughts about a friendship were expected to experience greater rediscovery of self-concept and positive adjustment, and less loss of self-concept and negative adjustment post-writing compared to those who wrote about negatively valenced ex-relationship thought content. Moreover, it was hypothesized that participants who wrote about positively valenced thoughts, regardless of relationship type would experience greater positive affect and less negative affect post-writing compared to those who wrote about negatively valenced ex-relationship thought content. If valence influences breakup-related outcomes in opposite directions, this would be the strongest evidence for the notion of the unique effect of content valence. Namely, that within the context of ex-romantic relationships, positively valenced thoughts are more detrimental and less beneficial for mental health and well-being compared with negatively valenced thoughts.

## CHAPTER 2

## LITERATURE REVIEW

Most adults experience a romantic relationship breakup at least once in their lifetime (Battaglia et al., 1998), and research has demonstrated the potentially devastating impact on one's physical and emotional health (Kloss & Lisman, 2002; Monroe et al., 1999; Sbarra, 2006; Slotter et al., 2010). Research thus far has predominantly sought to identify specific symptoms (i.e., sleep disturbance, depression, anxiety) or characteristics (i.e., attachment style, level of emotional involvement) associated with greater distress. However, almost no attention has focused on understanding individual responses to a breakup and how these responses can mitigate or exacerbate this distress or help us to move on. One response to a negative event that individuals typically engage in is an obsessive focus on aspects related to the negative event. Indeed, a common breakup response is to obsessively think about the ex-relationship, and greater obsession is linked to worse outcomes (Field et al., 2009; Saffrey & Ehrenberg, 2007). Researchers have examined adaptive and maladaptive features of obsessive thinking in general; however, different features of this obsessive focus, such as positive and negative content valence, have not been examined in the context of romantic relationship breakups. The goal of this research is to examine this possibility that different features can lead to different outcomes.

As this is a newer area of research, the hypotheses were formulated through integration of interdisciplinary research on aspects of breakups, love, obsession, and valence of thought. Accordingly, to present the hypotheses and design of the current study in a coherent manner, the chapter first reviews the literature in each of four these domains separately and concludes by connecting them to an unified, overarching idea. Therefore, the first topic I will review involves the deleterious outcomes associated with the end of a romantic relationship. The second area of

the review covers the current theories regarding the experience of falling in love and going through a romantic breakup. Third, I will review the extant literature on obsession and obsessive thoughts about an ex-partner, the latter of which is a common presentation after an unwanted romantic relationship breakup (Langhinrichsen-Rohling, Palarea, Cohen, & Rohling, 2000; Saffrey & Ehrenberg, 2007). Finally, I will discuss the subjective influence of the content valence of one's thoughts and how this may affect recovery from a romantic relationship breakup.

### **Romantic Relationship Outcomes**

The dissolution of a romantic relationship is one of the most distressing events an adult can experience, associated with an array of outcomes related to negative adjustment and poor mental health. People typically experience feelings of hurt, frustration and loneliness, (Choo, Levine, & Hatfield, 1996; Sprecher, 1994), mood swings (Sbarra & Emery, 2005), trouble sleeping, intrusive thoughts (Field et al., 2009), as well as depression and anxiety (Boelen & Reijntjes, 2009). Furthermore, a romantic relationship breakup is predictive of the onset of Major Depressive Disorder (MDD). Monroe et al. (1999) conducted a longitudinal study with two time points, involving 1,470 adolescents with data collected approximately 13.8 months apart. Through interviews and assessment, participants were evaluated for depression and other diagnoses. Participants also filled out a survey assessing demographic variables, life stress measures, and depressive symptoms. Analyses revealed that a recent romantic relationship breakup predicted the first onset of Major Depressive Disorder over and above the presentation of subclinical depression at Time 1, and this finding was consistent across sex.

Although a less studied research area empirically, the detrimental experience of a romantic relationship breakup is widely recognized by the everyday individual. In a large phone



survey of traumatic events, relationship dissolution was one of the most common “worst events” offered (Frazier & Hurliman, 2001). Moreover, in writing studies about traumatic events, many participants choose to write about relationship dissolution or difficulties when given the option (e.g., Park & Blumberg, 2002; Pennebaker & Beall, 1986; Ullrich & Lutgendorf, 2002). In one study, relationship problems/dissolution was the second most-chosen topic, preceded only by death of a loved one, and mentioned by up to 25% of participants (Kloss & Lisman, 2002).

While identifying the negative outcomes associated with romantic breakups has been the focus of much of the extant literature, several studies have also focused on identifying pre-existing risk factors for developing these negative outcomes. For example, several studies have examined the influence of attachment style, and findings indicate that greater attachment anxiety is predictive of post-dissolution distress, depression, and complicated grief (Boelen & Reijntjes, 2009; Davis et al., 2003; Fagundes, 2012; Perrier, Boucher, Etchegary, Sadava, & Molnar, 2010). Moreover, individual reports of higher relationship satisfaction (Sprecher, Felmlee, Metts, Fehr, & Vanni, 1998), commitment (Boelen & Reijntjes, 2009), and self-expansion within the relationship (Lewandowski, Aron, Bassis, & Kunak, 2006) are associated with greater breakup distress. In the Field et al. (2009) study, greater breakup distress was present for participants who did not initiate the breakup, for whom the breakup was sudden and unexpected, who felt rejected, who felt betrayed, and who were in a longer relationship. However, results on the rejecter/rejected status are mixed; while a the majority of studies indicate that the individual who did not end the relationship typically experiences significantly greater distress after a relationship ends (e.g., Boelen & Reintjes, 2009; Collins & Clark, 1989; Perilloux & Buss, 2008), others found that this did not significantly impact on distress (Tashiro & Frazier, 2003) or recovery

(Sbarra, 2006) after relationship ends. Researchers have also identified change to the self-concept as an important, plausible outcome after the end of a romantic relationship (Lewandowski & Bizzoco, 2007). Namely, the end of a romantic relationship can weaken one's self-assurance and understanding of their sense of self, who they are as a person. In a longitudinal study, college freshman who recently experienced a romantic relationship breakup reported less clarity in their self-concept, and this diminished clarity predicted greater emotional distress (Slotter et al., 2010).

Although these factors are predictive of distress after a romantic relationship ends, most are present before or during the relationship breakup. Surprisingly little is known about the variability within responses that an individual can control once the breakup has occurred, nor how these responses may vary in the degree to which they are adaptive and maladaptive in recovering from this devastating experience. The most robust predictor of decreased distress after a breakup appears to be time (e.g., Field et al., 2009, Fisher et al., 2010; Knox, Zusman, Kaluzny, & Cooper, 2000; Le, Dove, Agnew, Korn, & Mutso, 2010; Moller, Fouladi, McCarthy, & Hatch, 2003). To better understand how responses may be adaptive or maladaptive, it is important to know the theoretical underpinnings of how love and romantic relationship dissolution may function, which I present in the subsequent section.

### **Love and Dissolution Theories**

Among the existing literature on romantic relationship breakups, two perspectives have emerged to explain the experience of emotional distress after romantic relationship dissolution. As a romantic relationships breakup typically involves a stark separation from a loved one, the first theory views heartbreak as a form of bereavement (Najib et al., 2004; Field, 2011). Indeed, individuals suffering from a breakup experience symptoms similar to the grieving widow or

widower such as depression, intrusive thoughts, sleep disturbances, and immune dysfunction (Davis et al., 2003; Field et al., 2009; Prigerson & Jacobs, 2001). To examine the bereavement parallel between breakups and bereavement, Field et al. (2009) transformed the widely used Inventory Complicated Grief (ICG; Prigerson et al., 1995) which measures bereavement distress, to create a Breakup Distress Scale (BDS; Field et al., 2009). In a sample of 192 college students, those with higher breakup distress also reported greater levels of depression, anxiety, sleep disturbances, intrusive thoughts, and difficulty controlling their intrusive thoughts. Although other studies have not tested this conceptualization directly, other studies on breakups have operated under this grief framework (e.g., Boelen & Reijntjes, 2009; Fagundes, 2012; Langhinrichsen-Rohling et al., 2000).

The second perspective on romantic breakups is based on theories about love; namely, that romantic love is form of addiction (Fisher, 2004; Fisher et al., 2010; Peele and Brodsky, 1975). This stems from the analogous characteristics found in those in love and those with a drug addiction. When in love, people commonly experience euphoria, increased energy, obsessive thoughts, intense focus on the partner, loss of appetite, and emotional dependence (Griffin-Shelley, 1991; Halpern, 1982; Liebowitz, 1983; Mellody et al., 1992; Peele and Brodsky, 1975; Schaef 1989; Tennov, 1979). Moreover, in fMRI studies of romantic love, areas of the brain associated with cocaine high and craving were also affected by sex, love, and attachment. For example, when passionately-in-love participants were instructed to think of their romantic partner, researchers found the same strong correlates in specific brain activity to those injected with cocaine (Aron et al., 2005; Breiter et. al., 1997). One of these regions, the ventral tegmental area (VTA), is the center of the brain's reward system responsible for the euphoria experienced with romantic love and cocaine, as well as the obsessive behaviors that accompany addiction.

Activation in the VTA for passionately in love individuals has been consistent across cultures, namely, in participants from the United States (Ortigue et al., 2007), the United Kingdom (Bartels & Zeki, 2000), and China (Xu et al., 2011). In a classic study by Olds and Milner (1954), rats with unlimited access to food and a lever that provided electrical stimulation to their VTA pushed the lever repeatedly until collapsing from starvation.

Viewing romantic love as a form of addiction and required love as a drug high, the second theory on romantic breakups postulates that going through an unwanted romantic breakup is a form of drug withdrawal (Fisher et al., 2010). This addresses the symptoms overlapping with bereavement as well as those unaccounted for such as mood swings, obsessive behavior, risk-taking, and loss of self-control (Dutton & Winstead, 2003; Sbarra & Emery, 2005). Fisher and colleagues (2010) conducted an fMRI study of persons who were recently broken up with and still in love with their ex-partner. The results demonstrated activity in the areas of the brain that mediate motivation and reward (i.e., increased activity in the midbrain area of the VTA and striatum), as seen in studies of individuals passionately in love with their partner (e.g., Aron et al., 2005; Bartels & Zeki, 2000; Ortigue, Bianchi-Demicheli, Hamilton, & Grafton, 2007; Xu et al., 2011). Further, rejected-in-love individuals also demonstrated activity in the nucleus accumbens and orbitofrontal/prefrontal cortex, the same regions underlying various drug addictions such as cocaine (Risinger et al., 2005; Volkow et al., 2006). In addition to increased activity in the VTA, an fMRI study of rejected-in-love participants found activity similar to individuals withdrawing from stimulant drugs (Fisher et al., 2010). In other words, while rejected and romantically involved samples showed signs of addiction, the rejected-in-love participants also showed signs of withdrawal. As mentioned earlier, one of the most pervasive characteristics of addiction, obsession, is also one of the areas of focus within the formulation of this study.

### Obsession

Obsessive behaviors demonstrate the overwhelming magnitude and power of intrusive, obsessive thoughts that are common after a romantic relationship breakup. Although we may like to believe that mankind possesses a level of control and sophistication beyond the obsessive lever-pushing mice observed by Olds & Milner (1954), we too engage in corresponding behaviors with more intrusive manifestations. Obsessive behaviors after a breakup vary in severity and frequency (Langhinrichsen-Rohling, Palarea, Cohen, & Rohling, 2000), including examples such as sending unwanted gifts, phone calls, text messages, and expressions of affection (Dutton & Winstead, 2003). In a collegiate sample, 89% of respondents indicated that a previous romantic partner engaged in at least one unwanted pursuit behavior after the relationship ended (Langhinrichsen-Rohling et al., 2000). Stalking is a more extreme yet not uncommon pursuit behavior after a breakup. In one study, 55% of female and 25% of male stalking victims indicated that their stalker was an ex-partner from a serious relationship (Fremouw et al., 1997) and 21% in another study stated they had been the targets of intrusive contact after they ended a relationship (Haugaard & Seri, 2004). This obsessive behavior also translates to social networking websites, such as Facebook, where individuals commonly monitor their ex-partner and, on the more extreme end, use Facebook to attempt to reconnect (Chaulk & Jones, 2011; Marshall, 2012). For example, in a survey of 1,022 undergraduate students in Canada, 82% of participants reported viewing pictures that their ex-partner posted and/or pictures of their ex-partner that had been posted by others, 60% read their ex-partner's wall conversations (including posts and replies), and 31% reported using Facebook to "keep tabs" on their ex-partner. With regard to actual contact, 63% reportedly sent their ex-partner messages, 58% posted on their Facebook page, and 7% have actually showed up to events that

their ex-partner indicated via Facebook that they would be attending. Participants also used Facebook to stalk and even communicated with their ex-partner's friends and family (Chaulk & Jones, 2011). Moreover, those who use Facebook to monitor ex-romantic partners are more likely to engage in unwanted physical pursuit behaviors (Lyndon, Bonds-Raacke, & Cratty, 2011).

Obsessive behaviors are external manifestations of a very common internal experience after the end of a romantic relationship: obsessive thought about an ex-relationship (Collins & Clark, 1989; Field et al., 2009). As such, understanding the nature of obsessive thoughts after the end of a romantic relationship has become a more recent area of interest for dissolution researchers hoping to understand the broader population or to address the more extreme cases (Saffrey & Ehrenberg, 2007). In the extant literature, obsessively thinking about a negative event has also been referred to as *ruminatio*n. Specifically, response styles theory (Nolen-Hoeksema, 1991) defines rumination as a maladaptive response to a negative event, comprised of obsessive focus on the symptoms, causes, and consequences of one's distress. The content of ruminative thought is assumed to be predominantly negative (Nolen-Hoeksema et al., 2008). Rumination is one of the most widely studied processes of obsessive, repetitive thinking, and extensive research demonstrates a significant association between rumination and depression (see Aldao, Nolen-Hoeksema, & Schweizer, 2010, for review). Namely, those who ruminate on a regular basis are more likely to be depressed, and the more that currently depressed individuals ruminate about their distress, the more likely they are to stay that way (Mor & Winquist, 2002). Furthermore, rumination is linked to myriad negative outcomes, even after controlling for depression, such as hopelessness, low self-esteem, dysfunctional attitudes, pessimism, reduction in social support, and dependency (Lam, Schuck, Smith, Farmer, & Checkley, 2003; Nolen-

Hoeksma, Parker, & Larson, 1994; Nolen-Hoeksma, Larson, & Grayson, 1999; Roberts, Gilboa, & Gotlib, 1998). Self-regulation theories (Carver & Scheier, 1998; Duval & Wicklund, 1972; Martin & Tesser, 1996; Pyszczynski & Greenberg, 1987) contend that rumination results from perceived discrepancies between one's current state and their desired state. Moreover, researchers contend that this obsessive focus can be adaptive when it leads to problem solving or letting go of impossible goals, yet maladaptive when the individual engages in neither of these and remains in a state of obsessively focusing on their discrepancies.

Since the introduction of response styles theory, researchers have identified another obsessive thought process of *reflection*, or curious and intellectual examination of the self and events, as a construct distinct from rumination (Trapnell & Campbell, 1999). Although rumination and reflection are both associated with greater distress in the short-term, longitudinal analyses indicate that reflection may improve well-being over time (Seegerstrom et al., 2003). In other words, obsessively thinking about the cause and state of one's despair is generally maladaptive in the short- and long-term, whereas obsessive reflection, though painful in the immediate setting, may be beneficial for recovery from a hurtful experience in the long-term.

Although obsessive thinking is common after the end of a romantic relationship, only a few studies have examined the relationship between this obsessive thinking and breakup-relevant outcomes. Even with different measures of obsessively thinking about an ex-relationship (e.g., relationship preoccupation, intrusive thoughts, rumination), findings are consistent: greater time spent thinking about an ex-partner relates to higher levels of distress, worse adjustment, more confusion, tension, and depression (Collins & Clark, 1989; Fagundes, 2012; Feeney & Noller, 1992; Saffrey & Ehrenberg, 2007). In the nascent studies examining ex-relationship obsession Collins and Clark (1989) and Davis et al. (2003) found that those who did not end the

relationship experienced higher levels of intrusive thoughts and preoccupied thinking about their ex-partner. In another study of 231 college students, relationship preoccupation partially mediated the relationship between attachment styles and breakup adjustment (Saffrey & Ehrenberg). Finally, Fagundes (2012) found an association between relationship reflection and negative emotional adjustment. In sum, the more that an individual is generally thinking about their ex-partner, the worse off they appear to be in recovering from their breakup. While general amount of time spent thinking about an ex-partner has been linked to pertinent adjustment outcomes, the content of those thought may provide a more nuanced effect. Next, I will talk about different characteristics of thought content and their subjective influences in the short and long term.

### **Thought Content Valence**

Our thoughts and memories hold a powerful, multifaceted influence on people's current psychological state, where people are able to experience an envisioned incident as if it were occurring in the present moment (Rasmussen & Bernsten, 2013; Tulving, 2002). Different characteristics influence the subjective strength of people's thoughts. For example, the more important an individual is to a person, the more that person will experience their imagined presence as occurring in the present moment (Fitzsimons & Bargh, 2003). Master et al. (2009) tested this notion in the context of romantic relationships. Twenty-five women in long-term heterosexual relationships participated in a study where pain was induced equally in seven study conditions. The pain was induced while, depending on the current condition, the participant either (a) held the hand of the partner, (b) held the hand of a male stranger, (c) held an object, (d) viewed the partner's photograph on a computer screen, (e) viewed photographs of a male stranger (f) viewed photographs of an object (a chair), or (g) viewed a fixation crosshair (no



manipulation). Results support the notion that the imagined presence of an important individual elicits an experience similar to their actual presence. Namely, participants experienced significant attenuation of physically induced pain when viewing a picture of their romantic partner equal to the pain reduced while holding their partner's hand, with the partner-photograph conditions receiving marginally lower ratings. Moreover, results also underscored the power of a loved one's support. Participants reported lower pain ratings when holding their partner's hand than when holding an object or holding a stranger's hand. Similarly, viewing a picture of their partner led to lower pain ratings than when viewing a photograph of an object or viewing photographs of a stranger. The same effects were not present when these conditions were employed with a complete stranger or an object.

This impact can be observed in thoughts and memories taking place at different points in time (Berntsen & Bohn, 2010; D'Argembeau & Van der Linden, 2004; Rasmussen & Bernsten, 2013). While Master et al.'s (2009) study examined present thinking about an ex-partner, a powerful memory can project itself onto the present (Tulving, 2002; Wheeler, Stuss, & Tulving, 1997). For example, Kross et al. (2011) conducted study to compare imagined social pain from the past with physical pain in the present. Forty participants who recently experienced an unwanted romantic relationship end engaged in tasks of social rejection and tasks of physical pain. Specifically, to manipulate social rejections, participants either "relived" an unwanted romantic relationship breakup by viewing a photograph of their ex-partner while thinking about their rejection experience, or viewed a photograph of their friend of the same sex as their ex-partner and thought about a positive experience they shared with that friend. Physical pain was manipulated by participants receiving a painful or non-painful thermal stimulation on their left forearm. Participants reported greater distress when reliving their breakup experience compared

to a positive experience with a friend, as well as when receiving the painful versus non-painful thermal stimulation. Moreover, the effect sizes for the social and physical pain conditions imply that the subjective experiences were equally intense. Furthermore, when thinking about the breakup, brain imagining demonstrated greater activity in the same regions activated during first-hand experience of both social exclusion and physical pain (Eisenberger, 2012).

Although these studies highlighted different aspects of thoughts that can impact our current state, they also underscore a shared feature that can significantly influence our current state: content valence. Indeed, content valence is an integral determinant of the mood elicited by our thoughts. Moreover, content valence surrounding an attitude-object can also influence our perceptions of the attitude object in the immediate moment. For example, in one study (Alea & Bluck, 2007), 179 adults in long-term relationships were asked to recall two positive autobiographical memories from their romantic relationship. Without their partner being present, simply recalling these two memories led to an increase in reported positive affect and perceived warmth in their romantic relationship.

The aforementioned studies underscore the state-based influence of our thoughts. Segerstrom and colleagues (2003) extended this understanding to our general state by examining components of repetitive thought in the long-term. They identified content valence as a robust dimension of repetitive thought, distinct from the process component captured by rumination and reflection. That is, rumination and reflection denote the purpose of repetitive thinking (e.g., to gain understanding, to solve problems), while content valence pertains to the thoughts within a ruminative or reflective process. Positive and negative content valence of repetitive thoughts is associated with a corresponding influence on outcome variables such as affect, physiological health, and psychological functioning (Kubzansky et al. 1997; Roach, Salt, & Segerstrom, 2010;

Segerstrom et al., 2003). That is, positive content valence promotes positive affect, and improved physiological health and psychological function while negative content valence worsens them. While there appears to be a personality-linked component to the degree that people think about positively and negatively valenced thoughts, there is also evidence for variability in this domain. Namely, individuals can substantially shift the amount of positively and negatively valenced thought that they engage in, and this may be more likely to happen when facing stressful situations (Roach et al., 2010).

To understand the impact of these emotion-laden memories over time, one line of research examined the purpose of episodic memories and how these memories influenced thoughts, feelings, and behavior on a day-to-day basis (Bluck, 2003; Pillemer, 2001; Robinson, 1986). Researchers identified three functions: social, self, and directive function (Bluck, Alea, Habermas, & Rubin, 2005). The social function refers to the ways in which people engage their memories in conversation with others. The self-function refers to the way that people use their memories to form a coherent sense of self over time. The directive function. The directive function, which denotes how memories influence thoughts, feelings, and behavior (Pillemer, 1998, 2003), is the most prominent of the three functions and most directly related to decision-making and romantic relationships (Philippe et al., 2013). The directive function can occur automatically without the individual's awareness of its influence (Kuwabara & Pillemer, 2010; Philippe, Koestner, Beaulieu-Pelletier, Lecours, & Lokes, 2012, Study 1), and emotional re-experiencing can be an important component to this function (Alea & Bluck, 2007). For example, when deciding whether or not to eat at a particular restaurant, a person may remember a positive experience that occurred at the restuarant there in the past, and thus be more likely to decide to eat there.

Repetitive negative or positive thought content pertaining to a specific event can shape the appraisal or meaning we attach to it (Segerstrom et al., 2003). Philippe and colleagues (2013, Study 4) examined the directive function of memories over time in a one-year longitudinal study of 196 undergraduate and graduate students in a romantic relationship. A cross-lag panel analysis demonstrated that the content of couple-related memories influence relationship outcomes over time. The researchers found that the type of memory content at Time 1 predicted relationship perseverance or dissolution at Time 2. Moreover, they found a reciprocal relationship where higher relationship quality predicted more satisfying memory recall. In other words, relational outcomes predict the couple memories recalled, while couple memories recalled also influence relational outcomes (Philippe et al., 2013). While other researchers examining the directive function with romantic relationship outcomes in the immediate moment (Alea & Bluck, 2007; Bazzini et al., 2007), this study introduced the importance of this this over time. Moreover, Philippe and colleagues (2013) conclude that frequent activation of couple-related memories can influence how one perceives their current romantic relationship relationship over time. Though they did not consider this in the scope of previous romantic relationships, I posit that this applies to our view of romantic relationships in the past as well, with important implications for how we respond to breakups.

In essence, Philippe et al. (2013) implied that by recalling emotion-laden memories, people could unintentionally reappraise a romantic relationship over time. Although valence has been omitted from previous research with breakups, positive or negative valence repeatedly applied to a previous romantic relationship could significantly differ the course of recovery. From a self-regulation theorist perspective, as obsessive thinking and distress result from the discrepancy between one's current state and their desired state, negatively reappraising the ex-

relationship to seem less appealing would be adaptive; desiring the partner less would more closely match the current state of not being with the ex-partner. In other words, if a person alters their view of their goal to undesirable, the discrepancy would be diminished, along with the amount of obsessive thinking and presenting distress. However, maintaining or increasing the perceived desirability toward an unattainable state will only persevere and/or exacerbate this distress. In terms of a previous romantic relationship, if an individual reappraises their ex-relationship as less and less desirable, then their current state (i.e., not in the relationship) will match their desired state, and they will move toward acceptance. Conversely, if an individual continues to evaluate their ex-relationship in a positive light, they will only struggle to accept the breakup, maintaining the distress and obsession accompanying this dissonance. Furthermore, recalling low-closure memories elicits more intense emotion than high-closure memories, and thinking about a low-closure memory incites an urge to repeat a task in order to achieve a thwarted goal (Beike & Wirth-Beaumont, 2005; Beike, Adams, & Wirth-Beaumont, 2007). Thus, if the person does not have closure on their relationship and thus being in their ex-relationship is their “goal”, then recalling memories, particularly those that reinforce the goal itself, will perpetuate that desire.

Beyond studies examining the magnitude of relationship preoccupation, little effort has been made to delineate style or content of the thoughts themselves. That is, researchers have hardly examined if there are differential outcomes related to the way that we think about an ex-relationship after a breakup. While Saffrey and Ehrenberg (2007) examined relationship preoccupation, they also examined participants’ general tendencies (i.e., not in the context of their romantic breakup) to ruminate and reflect after experiencing a negative event. Results indicated that brooding (rumination) was uniquely linked to worse adjustment and reflection was

uniquely linked to better adjustment. As mentioned earlier, Fagundes (2012) did examine reflection in the context of romantic relationships, and results demonstrated that reflection was *not* adaptive in the short-term; however, the study did not include the other subscale measure for rumination, which is typically measured concurrently. Either way, these studies shed light on the potential for characteristics of obsessive thought beyond the sheer magnitude to influence adjustment outcomes. Content valence of these ex-relationship thoughts has also been overlooked.

One study (Lewandowski, 2009) did assess valence as a manipulation of adjustment among individuals who experienced a romantic relationship breakup in the past six months. After filling out a pre-test survey that measured positive and negative emotions experienced since the breakup, participants (n=87) wrote for 20 minutes about either positive or negative thoughts about the aftermath of their breakup once per day for three days. Interestingly, findings were mixed. Consistent with the current discussion, participants in the positive condition reported experiencing more positive emotion since the breakup compared to those in the negative condition. Yet no differences in negative emotion were reported between conditions. The researchers then examined these effects controlling for initiator status. Once controlled for, there was no difference in positive emotion between conditions unless the breakup was mutual. Those in the neutral and negative conditions only increased in positive emotion if the participant initiated the breakup. However, there were several limitations that preclude its application to the current study. For example, participants returned for a post-test survey and debriefing two days after they completed the third writing activity. Therefore, any immediate effects may have been overcome by any differently valenced thoughts that the individual may have been engaging in independently since the final writing activity. Furthermore, the study mainly looked at positive

and negative valence surrounding the breakup as opposed to the relationship itself. The instructions changed each day, but the instructed valence was consistent. After writing about the relationship that ended (Day 1), participants in the non-neutral conditions were instructed to “let go and write about your deepest thoughts and (positive/ negative) feelings about aftermath of the breakup” either “a few days after it happened” (Day 2; Lewandowski, 2009, p.25) or “a few weeks after it happened” (Day 3; Lewandowski, 2009, p.25). An additional potential problem here is that, in thinking about the aftermath of the breakup, people may have generated thoughts outside of the relationship. For example, a person may highlight the support they received from friends. Although they may feel closer to their friends, this may or may not make an individual feel better about the relationship ending itself.

In other words, while this study is the first to include thought content valence in a romantic relationship study, the methodology differentiates the study from the one that is currently being proposed. The participants did not respond to the outcome measures immediately after the intervention was completed. The valence was mainly applied to the breakup and not the relationship itself. Moreover, the content did not necessarily involve the actual romantic relationship that ended. Although the aforementioned reasons limit the conclusions that can be drawn from these findings, the different results when controlling for initiator status does underscore the role it can play in studies of this nature. This study contributes to the literature on relationship thoughts and breakups by considering features of thoughts independent from the presence of obsessive thoughts in one’s life after a breakup (i.e., positive and negative valence), and demonstrating the potential influence of initiator status in the breakup. However, their methods approach the notion of valence in a less related fashion to the study being proposed.

Several recent studies have provided evidence that valence matters. A recent scale development study demonstrated that an individual's thoughts after a relationship breakup could contain both positive and negative content. Brenner and Vogel (2015) developed the Positive and Negative Ex-Relationship Thought (PANERT) scale to measure positively and negatively valenced ex-relationship thoughts. The positively and negatively valenced items loaded as two distinct factors coinciding with positively valenced and negatively valenced thought content. Both constructs were uniquely associated with greater negative emotional adjustment, breakup distress, and loss of self-concept. Further, they were associated with other constructs in opposite directions. More frequent positive thoughts regarding the ex-partner and/or ex-relationship was uniquely associated greater levels of depression, lower rediscovery of self-concept, and lower positive adjustment. Conversely, negative thoughts about the ex-partner uniquely predicted greater rediscovery of self-concept, more positive adjustment, and had no statistically significant association with depression. In other words, both positive valence account for unique variance in outcomes pertinent to romantic relationship breakups and also demonstrate unique patterns in the way that they relate to these outcomes.

This notion of two distinct types of thought content is also supported by research with rejected-in-love individuals who were asked to think about their beloved ex-partner with no specific instruction on thought content valence (Fisher et al., 2010). Fisher et al.'s (2010) report of what participants thought about during the fMRI scan portrayed the fluctuation in content valence within participants thinking about their ex-partner:

“During the prescanning interview, the interviewer (HEF) and participant discussed events that the participant might think about while looking at each photograph...the participants started with their feelings of disappointment and their list of injustices...[but] expressed both negative and positive feelings...In the postscanning interview, individuals showed mixed expressions of romantic love, agitation, anger, and despair. Most recounted *both* happy and unhappy memories.” (p. 53, Fisher et al., 2010)



Interestingly, these differing thought contents may have led to different activations of the brain. Fischer et al. (2010) conducted fMRI scans of these individuals while they were thinking about their ex (i.e., both happy and unhappy memories). In other words, the rejected-in-love participants showed signs of both experiencing drug highs and withdrawal. However, as noted above, in this study participants were given no instructions as what aspects of the relationship to think about and identified both positive and negative aspects to remember. In another fMRI study of romantic relationship breakups (Najib et al., 2004), rejected-in-love participants were specifically instructed to describe a “sad thought about their lover on which they had been ruminating” (p. 2246). In this study participants did *not* show activation in the reward systems brain region, and even showed deactivation in certain areas activated in the Fisher et al. (2010) study. Although researchers have speculated why this discrepancy occurred, they have not found a conclusive explanation. I posit that this difference lies in the content of their thoughts and, unlike previous studies on content valence, that positive thought content is actually *maladaptive* to breakup recovery. If thinking about an important individual elicits an experience similar to their physical presence, and if breakups really are a form of addiction, then a positively valenced thought or memory could induce the temporary yet powerful feeling of experiencing an ex-partner’s affection. This could also explain why participants, who oscillated from happy to unhappy memory recollection in Fisher and colleagues’ study, showed signs of drug high as well as craving whereas participants in Najib and colleagues’ (2004) study, who thought about their grief, did not show signs of addiction or craving. If an individual experiences “withdrawal” from their ex-partner’s love, utilizing positive memories may offer relief but also serve as unintentional reappraisal of the ex-partner.

### The Current Study

Although previous research demonstrated that people obsessively think about aspects of their ex-relationship after a breakup, researchers have rarely considered the features of these thoughts—what they think about their ex-relationship, how they think about their ex-relationship—as an area that may lead to varied paces of recovery from a romantic breakup. Consider thought content valence, for example. If two individuals, both terribly and equally devastated over their romantic relationship breakup, obsessively think about their ex-relationship but one predominately thinks about what they love and miss from their ex-relationship and the other thinks about all of the aggravating aspects of the relationship, would they recover at the same rate? That question cannot be answered because, prior to this study, it has not yet been asked. By considering potential differences in outcomes related to how individuals think about an ex-relationship, this line of research could inform the development of interventions aimed at helping individuals experiencing a distressing romantic breakup. Thus, the goal of this study is to examine how the valence of memories specific to an ex-relationship may differentially impact immediate ratings of affect and outcomes related to moving on.

The current experimental study featured a 2 (Valence: Positive versus Negative) x 2 (Relationship type: Ex-relationship versus Friendship) between-subjects design. Participants engaged in a writing activity where, depending on the condition, they were instructed to write about either positive or negative memories about their most recent ex-relationship or a current friendship. Participants then responded to measures related to affect, self-concept, and breakup adjustment. The friendship condition was included in order to parse out whether any observed patterns would be due to valence effects in general or due to valence effects within the specific context of ex-relationship memories.

Reminding oneself of the positive aspects of a relationship may make it more difficult to move on from the relationship, whereas reminding oneself of the negative aspects of a relationship may be reassuring toward the fact that the relationship is over. However, the influence of valence with friendship-related thoughts may actually have the opposite impact on breakup-related outcomes expected with those about ex-relationship. Supportive friendships can positively influence mental health and self-esteem (Keefe & Berndt, 2006), and social support is important in coping with difficult life events (Shin & Ryan, 2012) including romantic relationship breakups (Locker, McIntosh, Hackney, Wilson & Wiegand, 2010). As our thoughts can impact our current moment experience, positively valenced memories of a friendship could reinforce this social support and make one feel less alone. Conversely, thinking about negative memories from a friendship may lead one to feel more isolated. Therefore, a person who thinks about positively valenced friendship memories would likely experience this as beneficial compared to someone who thinks about negatively valenced friendship memories.

As discussed previously, valence of thought is generally linked to congruent affect. Therefore, one would expect that affect-congruence is present across relationship types. However, an exception to this may be present for ex-relationships as the relationship is over and thus positive memories could lead one to stay attached to something they cannot have resulting in a decreased ability to move on and increased distress. If valenced thoughts about an ex-relationship do influence breakup-related outcomes in opposite directions as expected, this would provide clear evidence that within the context of romantic relationships that have ended, positive valenced thoughts are more detrimental and less beneficial to mental health and well-being than negatively valenced thoughts.

## **Research Hypotheses**

### **Hypothesis 1: Adaptive Outcomes**

A two-way interaction of valence (positive versus negative) and relationship type (ex-relationship versus friendship) was predicted with regard to outcomes related to moving on. Specifically, among participants who wrote about an ex-relationship, negatively valenced writing was predicted yield higher ratings rediscovery of self-concept and positive adjustment among participants in the ex-relationship condition, but yield lower scores on these variables among participants in the friendship condition.

### **Hypothesis 2: Adverse Outcomes**

A two-way interaction of valence (positive versus negative) and relationship type (ex-relationship versus friendship) was predicted with regard to adverse outcomes. Negatively valenced writing was predicted yield higher ratings loss of self-concept and negative adjustment among participants in the ex-relationship condition, but yield lower scores on these variables among participants in the friendship condition.

### **Hypothesis 3: Affect Congruence**

A main effect was predicted with respect to affect such that participants in the negatively valenced writing conditions were expected to report greater negative affect and lower positive affect.

## CHAPTER 3

## METHODS

**Power Analysis**

No previous study has examined how writing about differential thought content valence about an ex-relationship may influence relationship adjustment for individuals who have experienced a romantic relationship breakup. A power analysis was conducted for small, medium, and large effect sizes. Assuming a small effect (.2 to .3) and a power of .8, this study would require a sample of 90 to 199 participants. Assuming a medium effect (.5) size and a power of .8, this study would require a sample of 34 participants. Assuming a large effect size (.8), this study would require a sample size of 15 participants (Faul, Erdfelder, Land, & Buchner, 2007). To be more conservative, the goal for this study was to recruit at least 200 participants.

**Participants**

Undergraduate students from Iowa State University were recruited through an online research sign-up system (SONA) administered by the Department of Psychology. The research pool were students currently enrolled in introductory psychology and communication studies courses who can sign up for studies as one option of gaining credit toward their course research requirement. Those who have had a romantic relationship end in the past twelve months were eligible to participate. Following the results of a power analysis, the aim was to recruit at least 200 participants for this study. A small effect size (.2) was used in the power analysis as a conservative estimate because no study has examined how writing about differential thought content valence about an ex-relationship may influence relationship adjustment for individuals who have experienced a romantic relationship breakup.

A total of 242 undergraduate students participated in the study. Participants who did not write about the correct experience throughout the entire writing exercise according to our manipulation check were removed from further analyses ( $n = 17$ ). Therefore, 225 participants were included in the final analyses ( $M_{\text{Age}} = 19.0$ ;  $SD = 1.7$ ). Most of the participants were female (66.4%), European American (82.6%; Asian American [7.6%], African American [3.6%], Multiracial American [2.7%], Latino/Latina American [2.7%], and American Indian/Alaskan Native [0.4%]), heterosexual (95.1%; bisexual [2.7%], gay [0.9%], questioning [0.4%], pansexual [0.4%]) and currently single (68.9%). The average length of time since their most recent breakup was 6.0 months ( $SD = 3.9$ ).

### Study Design

Participants ( $N = 225$ ) were randomly assigned to a 2 (Relationship: ex-relationship vs. friendship) x 2 (Valence: positive vs. negative) between subjects experimental design. All participants engaged in a writing activity where they described a memory from a relationship. Participants in the ex-partner condition ( $n = 122$ ) described a memory involving an ex-romantic partner. Participants in the friendship conditions ( $n = 103$ ) described a memory involving a friend. Participants in the positive valence condition ( $n = 110$ ) were instructed to write about a positive memory whereas participants in the negative valence conditions ( $n = 115$ ) were instructed to write about a negative memory.

### Measures

Participants responded to background questions about their ex-relationship as well as measures of current affect (Watson, Clark, & Tellegen, 1988), self-concept clarity (Lewandowski & Bizzoco, 2007), and adjustment to the breakup (Saffrey & Ehrenberg, 2007)

using self-report measures. Information on each of these measures is provided below, and all experimental measures are included in *Appendix A*.

### **Self-Concept**

The rediscovery of self scale (ROSS) and the Loss of Self Scale (LOSS; Lewandowski & Bizzoco, 2007) were used to measure positive and negative self-concept adjustment after a romantic relationship breakup. The Rediscovery of Self Scale (ROSS; Lewandowski & Bizzoco, 2007) is a 6-item scale that measures the degree to which participants felt they had become reacquainted with aspects of the self since their romantic breakup. Participants rate how well each item describes them since their romantic relationship ended using a 7-point Likert scale ranging from 1 (*not at all*) to 7 (*a great deal*) with higher scores indicating greater rediscovery of self. A sample item is “I have reclaimed lost parts of myself that I could not express while with my partner.” The ROSS has been positively associated with greater acceptance, positive emotions, and inversely associated with denial (Lewandowski & Bizzoco, 2007). It has also been associated with greater negatively valenced thoughts about an ex-relationship and lower positively valenced thoughts about an ex-relationship (Brenner & Vogel, 2015). Internal consistency has been demonstrated in previous studies, ranging from .88 (Brenner & Vogel, 2015) to .91 (Lewandowski & Bizzoco, 2007). In the current study, the ROSS yielded an internal consistency of .90.

The LOSS is a 6-item scale that measures the extent to which one has experienced self-concept loss after the end of a romantic relationship. Participants use 7-point Likert scale ranging from 1 (not at all) to 7 (a great deal) to rate how well each item describes them since their breakup, with higher scores indicating a greater loss of self-concept. A sample item is “I do not know who I am.” The LOSS has been positively associated positive ex-relationship

thoughts, negative ex-relationship thoughts (Brenner & Vogel, 2015), negative emotions, denial, and mental disengagement (Lewandowski & Bizzoco, 2007). Internal consistency has been demonstrated in previous studies, ranging from .90, (Lewandowski & Bizzoco, 2007) to .94 (Brenner & Vogel, 2015). In the current study, the LOSS yielded an internal consistency of .87.

### **Positive and Negative Relationship Adjustment**

The relationship adjustment measure (Saffrey & Ehrenberg, 2007) was used to assess post-dissolution adjustment. The 18-item measure consists of positive adjustment and negative adjustment subscales. Participants rate the extent to which they experience specific emotions when currently thinking about their lost partner and relationship on a 7-point Likert scale from 1 (*not at all*) to 7 (*very much*). Examples of items assessing positive adjustment include “happy,” “satisfied,” and “relieved.” Examples of negative adjustment include “hurt,” “disappointed,” and “lonely.” The scale was adapted from an earlier study (Sprecher, 1994) wherein the directions were altered to inquire about the participants’ current feelings when thinking about the breakup, as opposed to how they felt initially after the breakup. Further, the original version of this measure, Sprecher (1994) used nine items to capture negative adjustment and five items to capture positive adjustment after a breakup. Saffrey and Ehrenberg (2007) included four more positive adjustment items, which they took from Sanna & Turley-Ames’ (2000) study of counterfactual thinking (i.e., “if only” mental simulations of alternative outcomes). Responses for each subscale are averaged to calculate their respective scores, with higher scores indicating greater positive adjustment or greater negative adjustment congruent with the respective dimension of adjustment. Construct validity has been provided for both subscales. The positive adjustment subscale has been associated with less relationship preoccupation, greater levels of reflection, and greater levels of general positive adjustment (Saffrey & Ehrenberg, 2007). The



negative adjustment subscale has been associated with greater relationship preoccupation, lower levels of reflection, lower levels of general positive adjustment (Saffrey & Ehrenberg, 2007), greater positive ex-relationship thoughts and negative ex-relationship thoughts (Brenner & Vogel, 2015). Both the positive adjustment and negative adjustment subscales have demonstrated good internal consistency, with Cronbach's alphas of .93 and .88, respectively (Saffrey & Ehrenberg, 2007). In a recent study of undergraduate students, the positive adjustment subscale demonstrated an internal consistency of .85 and the negative adjustment subscale demonstrated an internal consistency of .88 (Brenner & Vogel, 2015). The current study demonstrated internal consistencies of .93 and .89 for positive adjustment and negative adjustment, respectively.

### **Affect**

The positive and negative affect scale (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess state affect of participants immediately after writing about their ex-relationship. The 20-item scale consists of both positive affect (PANAS PA) items, such as "excited" and "strong" and negative affect (PANAS NA) items such as "distressed," "upset," and "guilty" (Watson et al., 1988, p. 1070). Higher scores indicate more affect on that dimension of current affect. Previous studies demonstrated the validity of the PANAS through its associations to state and other measures of positive and negative mood (Watson et al., 1998). Cronbach's alpha scores in undergraduate samples for positive mood have ranged from .86 to .90, and for negative mood have ranged from .84 to .87 (Watson et al., 1988). In a recent study of undergraduate students at a Midwestern university, the Cronbach's alpha score for positive mood was .86, and for negative mood was .78 (Lannin, Guyll, Vogel, & Madon, 2013). Internal reliabilities for the PANAS PA and PANAS NA in the current study were .88 and .85, respectively.

### **Background Questions About The Breakup**

Participants responded to two background questions about the relationship breakup: “how long ago did the relationship end?” and “who ended the relationship? (*1 = me to 7 = my partner*)”.

### **Experimental Manipulation of Valence and Relationship Type**

Participants were randomly assigned to one of four ten-minute writing exercises designed to elicit either reminiscing about positively or negatively valenced memories from either their ex-relationship or from a friendship. Instructions for each writing condition (see *Appendix C*) were adapted from Lepore and Greenberg (2002). In the *positive ex-relationship* condition, participants were instructed to recall and write about a positive memory from and/or positive aspects of their most recent romantic relationship. In the *negative ex-relationship* condition, participants were instructed to recall and write about a negative memory from and/or negative aspects of their most recent romantic relationship. In the *positive friendship* condition, participants were instructed to recall and write about a positive memory from and/or positive aspects of a friendship that is important to them. In the *negative friendship* condition, participants were instructed to recall and write about a negative memory from and/or negative aspects of a friendship that is important to them.

### **Manipulation Check**

Written responses were first examined to confirm that participants followed directions for the respective manipulated condition. An undergraduate research assistant who was blind to the assigned conditions read each response and rated which condition they thought the participant was assigned to see whether this matched their actual assigned condition. The research assistant also examined whether the participant followed the directions for his or her entire response.

Participants who did not write about the correct experience through the entire writing exercise were removed from further analyses.

### **Procedure**

IRB approval was obtained prior to the commencement of this study (*see Appendix B*). Participants signed up for the study online through SONA on a first-come, first-serve basis. The study posting on SONA indicated that the study examined the thought content for those who have experienced a recent romantic relationship breakup. Upon arriving to the laboratory, participants read and signed an informed consent document that communicated the procedures in place to maintain anonymity of participant responses. Subsequently, participants responded to background questions about the relationship breakup.

Participants were randomly assigned to one of the four ten-minute writing exercises (i.e., *positive ex-relationship, negative ex-relationship, positive friendship, or negative friendship*). After this experimental manipulation of thought content valence and relationship type, participants completed the PANAS to measure positive and negative affect, the LOSS to measure perceived loss of self-concept since the breakup, the ROSS to measure rediscovery of self-concept since the breakup, the relationship adjustment measure to measure positive and negative adjustment to the breakup, and demographic items (e.g., age, gender). At the conclusion of the study, participants were debriefed, asked to maintain confidentiality regarding the nature of the study, and dismissed.

## CHAPTER 4

## RESULTS

**Manipulation Check**

Seventeen participants did not write about the correct experience through the entire writing exercise and were removed from further analyses. A total of 225 participants were included in the final analyses.

**Primary Analyses**

To examine the proposed hypotheses, which involve differential effects of valence within different relationship types on adaptive outcomes, adverse outcomes, and affect, a series of MANCOVA and ANCOVA analyses were conducted using the same model with all dependent variables. Namely, independent variables were valence (positive versus negative) and relationship type (ex-relationship versus friendship), and their interaction term. Covariates were initiator status and time since the relationship ended. I also examined the inclusion of possible interaction terms—specifically, interactions between the covariates and each condition—to determine if they should be included in the final model. Results did not suggest that the inclusion of any additional significant interaction terms added significantly to the model ( $p > .05$ ). As such, the original model was used for subsequent analyses. A series of linear regression analyses were also conducted to examine for issues with collinearity and for cases of influential data points. Results did not demonstrate any issues with collinearity or influential data points. Descriptive information for each condition and dependent variable are provided in Table 1.

Table 1

*Descriptive Statistics of All Outcome Measures by Experimental Manipulation of Valence and Relationship Type*

	<i>n</i>	Time	ROSS	Positive Adjustment	LOSS	Negative Adjustment	Positive Affect	Negative Affect
<b>Positive Ex-Relationship</b>	57	3.12 (1.81)	3.61 (1.56)	3.70 (1.46)	1.94 (1.21)	3.22 (1.29)	2.61 (0.82)	1.69 (0.61)
<b>Negative Ex-Relationship</b>	53	3.30 (2.00)	4.43 (1.51)	4.12 (1.44)	2.02 (1.24)	3.31 (1.40)	3.16 (0.63)	1.43 (0.43)
<b>Positive Friendship</b>	65	3.55 (1.83)	4.41 (1.50)	3.76 (1.63)	2.03 (1.15)	3.44 (1.43)	2.64 (0.93)	1.92 (0.72)
<b>Negative Friendship</b>	50	3.26 (1.76)	3.75 (1.74)	3.49 (1.59)	2.30 (1.45)	3.51 (1.51)	2.64 (0.78)	1.86 (0.70)

*Note:* Means are presented with standard deviations in parentheses.

### **Hypothesis 1: Adaptive Outcomes**

An interaction between valence and relationship type was hypothesized. Specifically, it was predicted that those in the ex-relationship condition would indicate lower ratings of rediscovery of self-concept and positive adjustment if they wrote about positively valenced memories, whereas those in the friendship condition would indicate lower ratings if they wrote about negatively valenced memories. First, a MANCOVA was conducted with rediscovery of self-concept and positive adjustment as the dependent variables. No main effects were found for valence,  $F(2, 219) = 1.437, p = .240, \eta^2 = .001$ , or relationship type,  $F(2, 219) = 0.145, p = .865, \eta^2 = .01$ . However, consistent with hypotheses, a significant interaction effect between valence and relationship conditions was present,  $F(1, 219) = 4.96, p < .05, \eta^2 = .02$ .

To further examine the impact of relationship of valence and relationship type on each of the outcomes, separate ANCOVA analyses were conducted for each dependent variable (see Table 2 and Table 3). As demonstrated in Table 2, there were no main effects for rediscovery of self-concept for valence,  $F(1, 219) = 0.297, p = .586, \eta^2 = .001$  or relationship type,  $F(1, 219) =$

0.097,  $p = .756$ ,  $\eta^2 = .000$ . As demonstrated in Table 3, there were also no main effects for valence,  $F(1, 219) = 1.525$ ,  $p = .596$ ,  $\eta^2 = .007$ , or relationship type,  $F(1, 219) = 0.218$ ,  $p = .596$ ,  $\eta^2 = .001$ , on positive adjustment.

Table 2

*ANCOVA of Model Predicting ROSS*

Source	df	SS	MS	F
Initiator	1	16.23	16.23	6.79*
Length	1	6.48	6.48	2.71
Valence	1	0.71	0.71	0.30
Relationship	1	0.23	0.23	0.10
Valence * Relationship	1	15.52	15.52	15.52***
Corrected Model	5	54.64	10.93	
Error	219	523.86	2.39	4.57**
Corrected Total	224	578.50		

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

Table 3

*ANCOVA of Model Predicting Positive Adjustment*

Source	df	SS	MS	F
Initiator	1	72.26	72.26	35.92***
Length	1	6.51	6.51	3.23
Valence	1	3.10	3.10	1.19
Relationship	1	0.57	0.57	0.26
Valence * Relationship	1	10.00	10.00	5.0*
Corrected Model	5	90.75	18.15	
Error	219	441.84	2.02	9.00***
Corrected Total	224	532.59		

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

Confirming the hypothesis, ANCOVA analyses did indicate significant interaction effects in predicting rediscovery of self-concept,  $F(1, 219) = 15.52$ ,  $p < .001$ ,  $\eta^2 = .07$ , and positive adjustment,  $F(1, 219) = 4.96$ ,  $p < .05$ ,  $\eta^2 = .02$  such that there were differences between positive and negative valence for each relationship type, but in opposite directions (see Table 4). That is, within the ex-relationship conditions, those who wrote about negative memories reported greater

rediscovery of self ( $M_{adj} = 4.49$ ) than those who wrote about positive memories ( $M_{adj} = 3.55$ ). Conversely, within the friendship conditions, rediscovery of self-concept ratings were lower for those who wrote about negative memories ( $M_{adj} = 3.72$ ) than those who wrote about positive memories ( $M_{adj} = 4.44$ ). Partial eta-squared ( $\eta^2$ ), used as a measurement of effect size, examines the ratio of variance in the dependent variable accounted for by the selected independent variable when controlling for other variables. The partial eta-squared of the interaction term in predicting rediscovery of self indicated a medium to large effect size ( $\eta^2 = .07$ ; Cohen, 1988).

Pairwise comparisons revealed that participants in the negative ex-relationship condition indicated significantly higher rediscovery of self-ratings compared to those in the positive ex-relationship condition ( $\Delta M_{adj} = 0.94, p < .01, 95\% \text{ CI } [.38, 1.50]$ ) and negative friendship condition ( $\Delta M_{adj} = 0.76, p < .05, 95\% \text{ CI } [0.18, 1.34]$ ). There were also higher ratings of rediscovery of self in the positive friendship condition compared with the negative friendship condition ( $\Delta M_{adj} = 0.71, p < .05, 95\% \text{ CI } [0.11, 1.32]$ ) and the positive ex-relationship condition ( $\Delta M_{adj} = 0.89, p < .01, 95\% \text{ CI } [-1.48, -.31]$ ).

Positive adjustment was also larger for the negative ex-relationship condition ( $M_{adj} = 3.78$ ) than the positive ex-relationship condition ( $M_{adj} = 3.59$ ), whereas within the friendship conditions, ratings of positive adjustment were highest for the positive valence condition ( $M_{adj} = 4.12$ ) and lowest for negative valence condition ( $M_{adj} = 3.46$ ). The effect size of this interaction ( $\eta^2 = .02$ ) indicates that this is a small yet meaningful interaction. Pairwise comparisons revealed that participants in the positive friendship condition indicated significantly higher positive adjustment than those in the negative friendship condition ( $\Delta M_{adj} = 0.66, p < .05, 95\% \text{ CI } [0.1, 1.22]$ ) and marginally significantly higher ratings than participants in the positive romantic condition ( $\Delta M_{adj} = 0.53, p = .053, 95\% \text{ CI } [-0.01, 1.07]$ ). Overall, the results of the ANCOVA

tests supported the hypothesis of an interaction between valence and relationship type such that positive valence was more adaptive in the friendship condition only.

Table 4

*Adjusted Means and Simple Main Effects for ROSS and Positive Adjustment*

Rediscovery of Self				
Relationship	Valence		<i>M (SE)</i>	$\Delta M (SE)$
	Positive	Negative		
Ex-Relationship	3.55 (.21)	4.49 (.19)	4.02 (.14)	<b>-0.94 (.29)**</b>
Friendship	4.44 (.21)	3.27 (.22)	4.08 (.15)	<b>0.71 (.31)*</b>
<i>M (SE)</i>	3.99 (.15)	4.11 (.15)	4.05 (.10)	<b>-0.11 (.21)</b>
$\Delta M (SE)$	<b>-0.89 (.30)</b>	<b>0.76 (.29)*</b>	<b>-0.07 (.21)</b>	

Positive Adjustment				
Relationship	Valence		<i>M (SE)</i>	$\Delta M (SE)$
	Positive	Negative		
Ex-Relationship	3.59 (.19)	3.78 (.18)	3.69 (.13)	<b>-0.19 (.26)</b>
Friendship	4.12 (.20)	3.46 (.20)	3.79 (.14)	<b>0.67 (.28)*</b>
<i>M (SE)</i>	3.86 (.14)	3.62 (.14)	3.74 (.01)	<b>0.24 (.19)</b>
$\Delta M (SE)$	<b>-0.53 (.27)</b>	<b>0.33 (.27)</b>	<b>-.10 (.19)</b>	

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

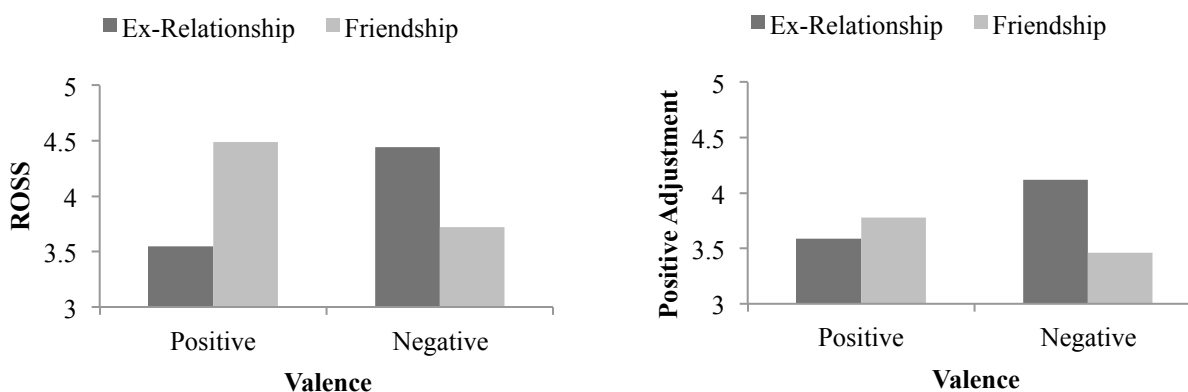


Figure 1 and Figure 2. Estimated marginal mean rediscovery of self and positive adjustment, respectively, by experimental manipulation of valence and relationship type.



## Hypothesis 2: Adverse Outcomes

It was hypothesized that self-ratings of loss of self-concept and negative adjustment would be highest for those who wrote about positive ex-relationship memories and negative friendship memories and lowest for those who wrote about negative ex-relationship memories and positive friendship memories. A MANCOVA was performed to examine this hypothesized interaction effect. No main effects were found for valence  $F(2, 219) = .407, p = .666, \eta^2 = .00$  or relationship type,  $F(2, 219) = 0.757, p = .470, \eta^2 = .01$ . Results did not indicate a significant interaction effect between valence and relationship type  $F(1, 219) = 1.11, p = .332, \eta^2 = .01$ . To examine each dependent variable separately, two-way ANCOVAs were performed separately for both loss of self-concept (see Table 5) and for negative adjustment (see Table 6). As demonstrated in Table 5 and Table 6, analyses did not indicate a significant interaction effect for loss self-concept,  $F(1, 219) = 2.15, p = .144, \eta^2 = .01$ , or negative adjustment  $F(1, 219) = 0.97, p = .326, \eta^2 = .00$ , respectively. Overall, the results did not support this hypothesis that self-ratings of loss of self-concept and negative adjustment would be highest for those who wrote about negative friendship memories and lowest for those who wrote about negative ex-relationship memories. Estimated marginal means, main effects, and simple main effects are reported in Table 7. Figure 4 and Figure 5 offer visual representations of the estimated marginal means.

Table 5.

*ANCOVA of Model Predicting LOSS*

Source	df	SS	MS	F
Initiator	1	8.78	8.78	6.26*
Length	1	33.91	33.91	24.17***
Valence	1	0.57	0.57	.29
Relationship	1	2.08	2.08	1.48
Valence * Relationship	1	3.02	3.02	2.15
Corrected Model	5	47.20	9.44	
Error	219	175.58	2.39	6.73***
Corrected Total	224	354.48		

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

Table 6

*ANCOVA of Model Predicting Negative Adjustment*

Source	df	SS	MS	F
Initiator	1	33.13	33.13	7.18***
Length	1	24.00	24.00	19.09***
Valence	1	1.34	1.34	0.67
Relationship	1	1.11	1.11	0.66
Valence * Relationship	1	1.68	1.68	0.97
Corrected Model	5	62.28	12.46	
Error	219	380.10	1.74	7.18***
Corrected Total	224	442.37		

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

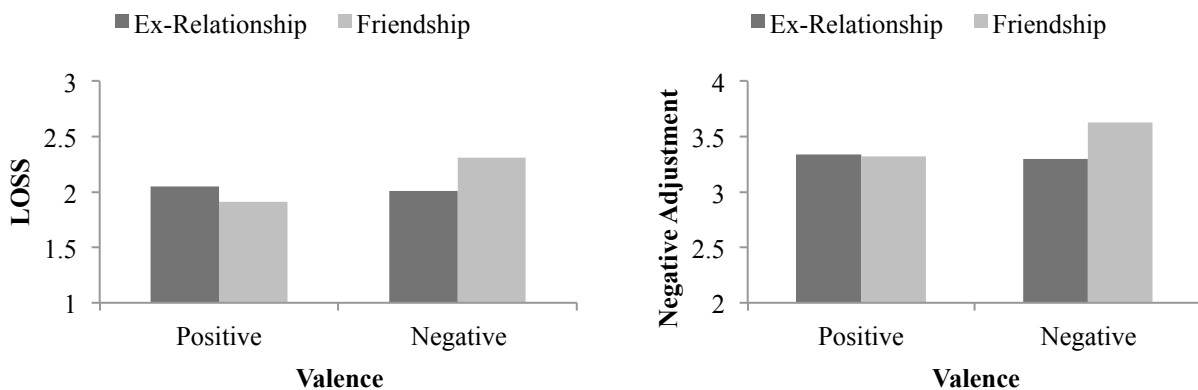


Figure 3 and Figure 4. Estimated marginal mean loss of self and negative adjustment, respectively, by experimental manipulation of valence and relationship type.

Table 7.

*Estimated Marginal Means, Main Effects and Simple Main Effects for LOSS and Negative Adjustment*

Loss of Self				
	Valence			
Relationship	Positive	Negative	<i>M (SE)</i>	$\Delta M (SE)$
Ex-Relationship	2.05 (.16)	1.91 (.15)	1.98 (.11)	<b>0.13 (.22)</b>
Friendship	2.01 (.216)	2.31 (.17)	2.17 (.12)	<b>-0.34 (.23)</b>
<i>M (SE)</i>	2.03 (.11)	2.13 (.11)	2.08 (.08)	<b>-0.10 (.16)</b>
$\Delta M (SE)$	<b>0.43 (.23)</b>	<b>-0.43 (.23)</b>	<b>-0.19 (.16)</b>	
Negative Adjustment				
	Valence			
Relationship	Positive	Negative	<i>M (SE)</i>	$\Delta M (SE)$
Ex-Relationship	3.34 (.18)	3.32 (.17)	3.33 (.12)	<b>0.02 (.24)</b>
Friendship	3.30 (.18)	3.63 (.29)	3.47 (.13)	<b>-0.32 (.26)</b>
<i>M (SE)</i>	3.32 (.13)	3.48 (.12)	3.40 (.01)	<b>-0.16 (.18)</b>
$\Delta M (SE)$	<b>0.04 (.25)</b>	<b>-0.32 (.25)</b>	<b>-0.14 (.18)</b>	

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

### Hypothesis 3: Affect Congruence

A main-effect of affect congruence was hypothesized such that those who wrote about negatively valenced memories would indicate higher ratings of negative affect and lower ratings of positive affect. Supporting the hypothesis, ANCOVA results (see Table 8 and Table 9) demonstrated a main effect of valence  $F(1, 219) = 4.66, p < .05, \eta^2 = .02$ ; those in the positively valence conditions ( $M_{adj} = 2.88$ ) reported higher ratings of positive affect than those in the negative valence conditions ( $M_{adj} = 2.64$ ). Results also indicated a main effect of relationship type,  $F(1, 219) = 6.42, p < .05, \eta^2 = .03$ , where those who wrote about a friendship ( $M_{adj} = 2.90$ ) reported higher ratings of positive affect compared with those who wrote about an ex-relationship ( $M_{adj} = 2.62$ ).

Table 8

*ANCOVA of Model Predicting Positive Affect*

Source	df	SS	MS	F
Initiator	1	0.04	0.04	0.07
Length	1	0.44	0.44	0.67
Valence	1	3.48	3.48	4.66*
Relationship	1	4.29	4.29	6.42*
Valence * Relationship	1	3.58	3.58	5.64*
Corrected Model	5	11.73	2.35	
Error	219	143.29	0.65	3.59**
Corrected Total	224	155.02		

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

Table 9

*Estimated Marginal Means, Main Effects and Simple Main Effects for Positive Affect*

Positive Affect				
Relationship	Valence		<i>M (SE)</i>	$\Delta M (SE)$
	Positive	Negative		
<u>Ex-Relationship</u>	2.62 (.11)	2.63 (.10)	2.62 (.07)	<b>-0.01 (.15)</b>
<u>Friendship</u>	3.16 (.11)	2.65 (.11)	2.90 (.08)	<b>0.51 (.16)**</b>
<i>M (SE)</i>	2.89 (.08)	2.64 (.08)	2.76 (.05)	<b>0.25 (.11)*</b>
$\Delta M (SE)$	<b>-0.53 (.16)**</b>	<b>-0.02 (.15)</b>	<b>-0.28 (.11)*</b>	

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

ANCOVA results also supported the main effects for negative affect, wherein those in the negative valence conditions reported higher ratings of negative affect,  $F(1, 219) = 12.91, p < .01, \eta^2 = .06$  (see Table 8 and Table 9). The main effect of relationship type,  $F(1, 219) = 3.50, p = .063$ , and the interaction term,  $F(1, 219) = 3.07, p = .081, \eta^2 = .01$ , were not significant. As the interaction term was significant for positive affect, pairwise comparisons were examined for simple main effects (see Table 10). Results indicated significantly higher ratings of negative affect from those in the negative friendship condition compared to those in the positive friendship condition ( $\Delta M_{adj} = 0.44, p < .01, 95\% \text{ CI } [0.20, .68]$ ). In addition, those in the positive

ex-relationship condition indicated higher negative affect ratings than those in positive friendship condition ( $\Delta M_{adj} = 0.30, p < .05$  95% CI [.07, .53]).

Table 9

*ANCOVA of Model Predicting Negative Affect*

Source	df	SS	MS	F
Initiator	1	0.39	0.39	1.04
Length	1	5.00	5.00	13.32***
Valence	1	4.85	4.85	12.16**
Relationship	1	1.32	1.32	3.43
Valence * Relationship	1	1.53	1.53	3.07
Corrected Model	5	13.38	2.68	
Error	219	82.27	0.38	7.12**
Corrected Total	224	95.64		

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

Table 10

*Estimated Marginal Means, Main Effects and Simple Main Effects for Negative Affect*

Negative Affect				
Valence				
Relationship	Positive	Negative	<i>M (SE)</i>	$\Delta M (SE)$
Ex-Relationship	1.73 (.08)	1.88 (.08)	1.80 (.06)	<b>-0.15 (.11)</b>
Friendship	1.43 (.08)	1.87 (.09)	1.65 (.06)	<b>-0.44 (.12)***</b>
<i>M (SE)</i>	1.58 (.06)	1.88 (.06)	1.73 (.04)	<b>-0.30 (.08)***</b>
$\Delta M (SE)$	<b>0.30 (.12)*</b>	<b>0.01 (.12)</b>	<b>0.15 (.08)</b>	

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

Interestingly, an interaction effect was also found,  $F(1, 219) = 5.46, p < .05, \eta^2 = .02$ , where those in the positive friendship condition reported higher positive affect ratings ( $M_{adj} = 3.16$ ) than those in the other conditions, namely, negative friendship ( $M_{adj} = 2.65$ ), positive ex-relationship ( $M_{adj} = 2.62$ ), and negative ex-relationship ( $M_{adj} = 2.63$ ). Pairwise comparisons to examine the simple main effects indicated that writing about positively valenced friendship memories elicited greater positive affect than writing about negatively valenced friendship

memories, ( $\Delta M_{adj} = 0.51, p < .01, 95\% \text{ CI } [.19, .82]$ ) and positively valenced ex-relationship memories ( $\Delta M_{adj} = 0.53, p < .01, 95\% \text{ CI } [0.23, .84]$ ). This indicates that the positive impact of valence on affect typically seen with positively valenced thinking, including here with those writing about a friendship, did not occur with those writing about positively valenced memories specific to a previous romantic relationship. Estimated marginal means, main effects, and simple main effects are reported in Table 8. Figure 6 offers a visual representation of the estimated marginal means for positive affect.

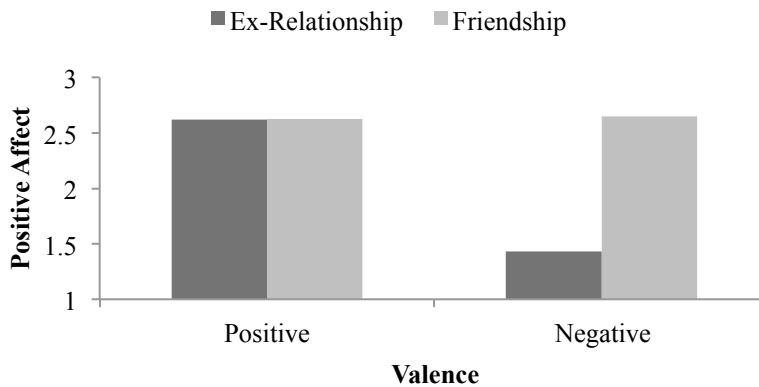


Figure 6. Estimated marginal mean positive affect by experimental manipulation of valence and relationship type.

## CHAPTER 5

## DISCUSSION

The current study examined the immediate effects of engaging in predominantly positively or predominantly negatively valenced thinking about one's most recent romantic ex-relationship and whether these effects are unique from thinking about memories from a non-romantic relationship. Overall, findings supported the notion that recalling positive memories from a relationship may make it more difficult to move on from the relationship that ended, whereas recalling negative memories may make moving on easier. As expected, participant ratings of rediscovery of self-concept and greater positive adjustment were higher in the negative ex-relationship condition relative to the positive ex-relationship condition. Conversely, participants in the positive friendship condition reported greater rediscovery of self-concept and positive adjustment compared to those in the negative friendship condition. Participants in both negatively valenced conditions indicated higher ratings of negative affect. Thus, although individuals may feel more negative affect after recalling negative memories, there still seems to be some adaptive aspect to this form of recall. This contrast illustrates the unique impact of ex-relationship memories, which are also what people tend to frequently think about when a relationship ends (Field et al., 2009). That is, the fact that negatively valenced memories were more advantageous relative to positively valenced memories only within the ex-relationship conditions suggests that this finding is a result of the valence within the specific context of ex-relationship memories and not simply the result of the negative valence itself.

Interestingly, while content valence of ex-relationship thoughts may differentially impact the way in which one adapts to a relationship breakup, findings in the current study did not suggest any meaningful differences in how they may differentially influence adverse outcomes.

No significant interaction or main effects were found in predicting loss of self-concept and negative adjustment. Although results from these constructs did not follow the hypothesized predictions, these findings actually make sense when examining Brenner and Vogel's (2015) PANERT development study more precisely. When they assessed positive content valence and negative content valence as separate constructs, they were differentially linked to outcomes related to moving on in the same pattern found in the current study. That is, negatively valenced thoughts were positively linked to outcomes related to moving on, and positively valenced thoughts were inversely linked to these adaptive outcomes. Moreover, both positively valenced and negatively valenced thoughts from an ex-relationship were positively linked to more distressing outcomes.

Results in the current study mirror those found by Brenner and Vogel (2015) and speak to an interesting pattern: thinking about an ex-relationship may exacerbate negative outcomes from a breakup regardless of content valence, whereas thinking about negative qualities may also increase positive outcomes related to moving forward. An individual may feel worse when thinking about an ex-partner regardless of the valenced thought. As feelings of moving forward are newer and feelings of loss are more familiar, it may take more powerful interventions to mitigate these effects further. It's possible that these unpleasant feelings remind an individual of how they felt after the breakup.

These above differences in valence and outcomes were found despite the suggestion from researchers that the way in which valence can influence attitudes is through the affect that the valenced thought elicits, and this affect ends to be congruent with the valence of the thought (Segerstrom et al., 2003). In the current study, this congruence was found for both positive and negative affect, where those in positive conditions reported higher positive affect and those in the



negative condition reported greater negative affect. However, there was also an unexpected interaction between relationship type and valence in predicting positive affect. It was expected that individuals in the positive valence conditions would report higher ratings of positive affect due to the tendency for affect to be congruent with content valence; yet, those in the friendship condition reported greater positive affect than those in all other conditions, including positive ex-relationship, who indicated statistically equivalent ratings with each other. In other words, the affect congruence with positive valence was only present in those who wrote about a friendship. Those who wrote about positively or negatively ex-relationship thoughts experienced the same level of positive affect as those who wrote about negatively valenced thoughts about a friendship.

There are several possible explanations for this finding. First, consider the results for negative affect. The predicted main effect for content valence was demonstrated, where negative content valence participants reported more negative affect. Although not significant, there was a marginal main effect of relationship type, where those in the ex-relationship condition reported greater negative affect. Given this potential difference by relationship type, thinking about an ex-relationship is difficult in and of itself; therefore, the unpleasantness of recalling a memory from a previous romantic relationship may dampen the positive impact of positive content valence recall.

Another possibility is that the affect immediately following the writing activity does not match the affect during exact moments of recall. This may be particularly salient for those in the positive ex-relationship condition, because they are recalling memories from a time where their relationship status is different from the present. Considering how a person may positively appraise a relationship if they experience positive affect when recalling a related memory,

positively valenced thinking could reframe the ex-relationship in a positive light and reinforcing desire for an ex-partner. Remembering self-regulation theory, the discrepancy between an individual's current state and desired state can elicit distress and negative affect. Thinking about relationship-positive experiences might feel good in the moment; however, this positive emotion may evaporate upon reconnecting with this discrepancy, or the reality that the relationship no longer exists. Finally, individuals may be reluctant to admit to experiencing this congruent affect due to the social pressure to move forward from an ended relationship (Sas & Whittaker, 2013).

### **Limitations and Future Directions**

As mentioned above, having participants respond to a self-report measure of affect immediately following the writing activity might not capture the exact affect experienced as the activity takes place. Future research could address this concern through the use of physiological measurement. Studies using event-related brain potentials (ERPs) indicate distinct neural correlates related to positive and negative affect during affective picture processing. For instance, the early posterior negativity (EPN) and a later posterior slow wave appear to reflect the processing of negative valence, while the P3 appeared to reflect the processing positivity valence (Bailey, West, & Mullaney, 2012). Additionally, these effects were modulated by how individuals were oriented to the pictures. Individuals responding to a self-report measure of affect might experience a shift in affect immediately after recall, or may be reluctant to indicate positive affect due to the social pressure. ERPs could provide an honest assessment of how an individual responds to these affect-laden memories during recall.

The confound of timing (i.e., past or present) in the relationship conditions is also an important limitation to address. The inclusion of the friendship condition helped distinguish that the results for the ex-relationship conditions were specific to the nature of valence in the context

of ex-relationship-memories specifically as opposed to valence within interpersonal memories more generally. In addition, because social support is an adaptive coping mechanism, friendship memories may help represent the common experience of seeking social support after a breakup. However, participants in the ex-relationship condition wrote about a relationship that was in the past and romantic, and participants in the friendship condition wrote about a relationship that was current and platonic. Results were interpreted as an interaction of valence and relationship type; however, it is possible that these findings relate to an interaction of valence and time (i.e., past or present relationship). If the latter is true, it would not negate the findings of the current study; rather, it would suggest that the results from the current study could generalize to moving on from other relationships that have ended, such as a friendship fallout or certain forms of grief. Future studies could compare the influence of positive valence and negative valence across different relationship types that have ended and as well as current.

All outcome measures in this study were self-report scale measures. Examining Figure 3 and Figure 4, the negative outcomes demonstrate a visual pattern in line with the hypotheses, yet the effect size is too small to be significant. This lack of significance may reflect a truly insignificant effect, or it may relate to the use of scale measures as outcome variables. Although scale measurement offers several advantages, the effect of the manipulation may fade over time as participants respond to multiple scale items within each measure. One alternative method to capture the immediate impact of ex-relationship memory valence is the use of behavioral outcome measures. For example, after the writing activity, participants could be offered free enrollment in an online dating website. A behavioral measure of this sort implemented directly following the intervention would best capture the immediate effect of the manipulation. Findings also could be more directly generalized to real world behavior.

In addition, a longitudinal study where participants engage in the writing activity on multiple occasions could examine how valenced memory recall may play out over time. This would also support the usefulness of scale measurement as outcomes because we would be interested in both the immediate effects of the writing activity as well as the broader change caused by the outcomes over time. Moreover, researchers could assess how immediate effects seen after initial interventions may interact with self-report responses in the longer term.

There are also limitations regarding the sample. Participants were students from Iowa State University who experienced a breakup within the past year. Collecting data from these students and controlling for time since the breakup allowed for more efficient participant recruitment. Even though this research produced several meaningful and significant findings, it is possible that the impact of content valence is even more powerful than indicated by these results. Future researchers could limit the sample to those who experienced a very recent breakup, such as within the previous month. This could capture responses while in a more distressed state. In addition, since this is a college student sample, it is possible that participants were writing about their first major breakup. Collecting information about the number of breakups experienced by the participants could lend information regarding whether how people respond to a breakup changes with more experience. The majority of participants identified as European American. Cross-cultural differences in responding to a breakup would be important to examine. Values vary between cultures and also contribute to cognitions (Cross, Morris & Gore, 2002). Future researchers could conduct this study with diverse samples and also examine for values or themes that may vary between participants from diverse cultural backgrounds.

## Conclusion

Findings from the current study suggest that there are different immediate state-induced effects as a result of engaging in predominantly positively valenced or predominantly negatively valenced thinking about one's most recent romantic ex-relationship. Specifically, results lend support to an emerging idea that positively valenced reflection on a romantic relationship that ended may be harmful, whereas negatively valenced reflection may actually have beneficial features. Previous research has examined this concept using associations of pertinent breakup outcomes with a scale measure of the degree to which individuals think about positive and negative aspects from their ex-relationship in general (Brenner & Vogel, 2015). The current experiment built upon this line of research by examining the immediate state-induced effects of differentially valenced thoughts about an ex-relationship and establishing a causal link with these observed effects. Results indicate that the differential impact of content valence was specific to outcomes related to moving on from the relationship as opposed to focusing on the unpleasant consequences of the breakup. The current study also extends our understanding of this pattern by differentiating the impact of content valence of ex-relationship thoughts from thoughts about a non-romantic relationship. Results indicate that impact of content valence is unique in this context from other interpersonal types of memory. The directions in which valence of ex-relationship thoughts related to these outcomes were the opposite from how valence impacted these outcomes when thinking about a friend.

Thinking about a romantic relationship after it ends is a common and distressing response to a breakup. The current study examined thought content valence, which can impact the appraisal or meaning we attach to the subject of our thoughts (Seegerstrom et al., 2003) including our romantic relationships (Alea & Bluck, 2007; Bazzini et al., 2007). Even though thinking

about an ex-relationship in a negatively valenced way may feel hurtful in the moment, results indicated that this negatively valenced way may actually decrease the appeal of that ex-relationship and, in turn, encourage positive feelings toward no longer being with the ex-partner and help individuals to move on. Continued examination of the unique impact of content valence in this context could play a meaningful role in the advancement of coping responses specific to the common, yet painful, experience of a romantic relationship breakup.

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## APPENDIX A

## EXPERIMENTAL MEASURES

**Rediscovery of Self Scale (ROSS)**

DIRECTIONS: Please rate the degree to which the following phrases are true of you since your relationship breakup. Responses range from 1 (not at all) to 7 (a great deal).

	Not at all	Rarely	Infrequently	Somewhat	Moderately	A fair bit	A great deal
1. I have done the things I once enjoyed that I could not do while I was in my relationship.	1	2	3	4	5	6	7
2. I have regained my identity.	1	2	3	4	5	6	7
3. I have reclaimed lost parts of myself that I could not express while with my partner.	1	2	3	4	5	6	7
4. I have focused more on my needs that were neglected while with my partner.	1	2	3	4	5	6	7
5. I have become reacquainted with the person I was before the relationship.	1	2	3	4	5	6	7
6. I have rediscovered who I am.	1	2	3	4	5	6	7

To score: Average items—1 through 6.

### Loss of Self Scale (LOSS)

DIRECTIONS: Please rate the degree to which the following phrases are true of you since your relationship breakup. Responses range from 1 (not at all) to 7 (a great deal).

	Not at all	Rarely	Infrequently	Somewhat	Moderately	A fair bit	A great deal
1. I do not know who I am.	1	2	3	4	5	6	7
2. I have lost my sense of self.	1	2	3	4	5	6	7
3. I feel as though I am missing a part of me.	1	2	3	4	5	6	7
4. I feel as though many of my good qualities have been lost.	1	2	3	4	5	6	7
5. I do not feel like myself anymore.	1	2	3	4	5	6	7
6. I feel incomplete	1	2	3	4	5	6	7

To score: Average items—1 through 6.

### Relationship Adjustment Measure

DIRECTIONS: Think about your emotional reactions to your relationship breakup-up and indicate the extent to which you currently experience the following emotions when you think about the lost relationship.

	Not at all	Rarely	Infrequently	Somewhat	Moderately	A fair bit	Very much
1. Depressed	1	2	3	4	5	6	7
2. Content	1	2	3	4	5	6	7
3. Delighted	1	2	3	4	5	6	7
4. Annoyed	1	2	3	4	5	6	7
5. Happy	1	2	3	4	5	6	7
6. Relieved	1	2	3	4	5	6	7
7. Miserable	1	2	3	4	5	6	7
8. Pleased	1	2	3	4	5	6	7
9. Disappointed	1	2	3	4	5	6	7
10. Sad	1	2	3	4	5	6	7
11. Glad	1	2	3	4	5	6	7
12. Frustrated	1	2	3	4	5	6	7
13. Hurt	1	2	3	4	5	6	7
14. Satisfied	1	2	3	4	5	6	7
15. Guilty	1	2	3	4	5	6	7
16. Lonely	1	2	3	4	5	6	7

To score Positive Adjustment: Average 7 items—2, 3, 5, 6, 8, 11, 14,

To score Negative Adjustment: Average 9 items—1, 4, 7, 9, 10, 12, 13, 15, 16

### Positive and Negative Affect Scale (PANAS)

DIRECTIONS: This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer in the space next to that word. Indicate the extent to which you feel each emotion right now.

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

To score Positive Affect: Sum 10 items—1, 3, 5, 9, 10, 12, 14, 17, 19

To score Negative Affect: Sum 10 items—2, 4, 6, 7, 8, 11, 13, 15, 18, 20

**Breakup Questions**

**How long ago did the relationship end (in months)? \_\_\_\_\_**

**Who ended the relationship?**

Me	Mostly Me	Somewhat me	Mutual	Somewhat Partner	Mostly Partner	My Partner
1	2	3	4	5	6	7



APPENDIX B  
IRB APPROVAL

**IOWA STATE UNIVERSITY**  
OF SCIENCE AND TECHNOLOGY

Institutional Review Board  
Office for Responsible Research  
Vice President for Research  
1138 Pearson Hall  
Ames, Iowa 50011-2207  
515 294-4566  
FAX 515 294-4267

**Date:** 9/26/2013

**To:** Rachel Brenner  
W112 Lagomarcino

**CC:** Dr. David Vogel  
W112 Lagomarcino Hall

**From:** Office for Responsible Research

**Title:** Relationship Memory

**IRB ID:** 13-358

**Approval Date:** 9/26/2013

**Date for Continuing Review:** 9/16/2015

**Submission Type:** New

**Review Type:** Full Committee

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- **Retain signed informed consent documents for 3 years after the close of the study**, when documented consent is required.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- **Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.
- **Stop all research activity if IRB approval lapses**, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. **Approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **IRB approval in no way implies or guarantees that permission from these other entities will be granted.**

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

## APPENDIX C

## WRITING INSTRUCTIONS

**Condition 1 (Positive Ex-Relationship)**

Directions: We would like you to think about your last serious relationship. This should be a relationship that lasted for some time or in which you were seriously emotionally involved before the breakup. Do not refer to a relationship that broke up after just a few dates.

For the next 10 minutes, please write about a positive memory (e.g., happy, romantic) you had with your ex-partner when you were together. Describe this memory in as much detail as possible – what occurred, what you and your partner did, how you felt - really let go and explore your very deepest emotions and thoughts during the time that this memory took place. Do not worry about grammar and spelling. If you are done before the ten minutes is up, continue to describe other memories of this nature.

**Condition 2 (Negative Ex-Relationship)**

Directions: We would like you to think about your last serious relationship. This should be a relationship that lasted for some time or in which you were seriously emotionally involved before the breakup. Do not refer to a relationship that broke up after just a few dates.

For the next 10 minutes, please write about a negative memory (e.g., unhappy, hurtful, sad, angry) you have with your ex-partner when you were together. Describe this memory in as much detail as possible – what occurred, what you and your partner did, how you felt - really let go and explore your very deepest emotions and thoughts during the time that this memory took place. Do not worry about grammar and spelling. If you are done before the ten minutes is up, continue to describe other memories of this nature.

**Condition 3 (Positive Friendship)**

Directions: We would like you to think about a friendship that is important to you. This friendship should be a relationship that is meaningful and/or has lasted for some time.

For the next 10 minutes, please write about a positive memory (e.g., pleasant, happy) you had with your friend. Describe this memory in as much detail as possible – what occurred, what you and your friend did, how you felt - really let go and explore your very deepest emotions and thoughts during the time that this memory took place. Do not worry about grammar and spelling. If you are done before the ten minutes is up, continue to describe other memories of this nature.

**Condition 4 (Negative Friendship)**

Directions: We would like you to think about a friendship that is important to you. This friendship should be a relationship that is meaningful and/or has lasted for some time.

For the next 10 minutes, please write about a negative (e.g., unhappy, hurtful, sad, angry) memory you had with your friend. Describe this memory in as much detail as possible – what occurred, what you and your friend did, how you felt - really let go and explore your very deepest emotions and thoughts during the time that this memory took place. Do not worry about grammar and spelling. If you are done before the ten minutes is up, continue to describe other memories of this nature.