

ABSTRACT

Title of Dissertation: On the (Un)intended Consequences of Forgiveness:
Creativity After Conflict

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Within the psychological and organizational sciences, research on forgiveness as an offender-directed motivational response to victimization is flourishing. Scholars have drawn from a wide range of theoretical perspectives to better understand the meaning of forgiveness and the antecedents of victims' forgiving motivations. Underlying this research is a near-unanimous assumption that forgiveness leads to beneficial outcomes, which has paradoxically hampered scholars' understanding of the precise nature of those benefits. The purpose of the current research is to consider a previously unforeseen yet broadly significant potential consequence of forgiveness – creativity. Drawing from evolutionary process models of creative performance (Simonton, 1999; 2003), forgiveness is theorized to impact creativity by broadening the set of ideas, concepts, and knowledge structures utilized during the creative process, referred to collectively as the participant's "domain set". Specifically, forgiveness and creativity are theoretically linked via three distinct mechanisms: mood, motivation, and cognitive resources.

Two pilot studies were conducted to ensure the efficacy of a forgiveness priming procedure and explore a theoretically consistent set of lab-based creative performance measures. Three primary studies were subsequently conducted to fully test the effect of forgiveness on creative performance and the theorized mediating mechanisms. In Study 1, a brainstorming task was utilized to provide initial support for the forgiveness-

creativity link and the role of domain set over simple task persistence. Mood was furthermore measured as a mediating mechanism. Study 2 replicated and extended the Study 1 findings via a different creativity task (creative drawing) and tests of both mood and motivation as potential mediators. In Study 3, further evidence for a forgiveness-creativity effect was sought via a creative problem solving exercise (the Duncker candle task). Mood and motivation were again measured as mediators. In addition, the cognitive resource theory was explored via the addition of a cognitive load manipulation. Results cumulatively supported the cognitive resource perspective. In all three studies, forgiveness predicted creative performance. The forgiveness-creativity link disappeared under cognitive load (Study 3), but was unrelated to victim mood (Studies 1-3) or motivation (Studies 2 and 3). In the discussion section, theoretical and practical implications are reviewed along with limitations and potential future directions.

ON THE (UN)INTENDED CONSEQUENCES OF FORGIVENESS:
CREATIVITY AFTER CONFLICT

by

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CHAPTER 1. INTRODUCTION AND RESEARCH OVERVIEW

Within social and organizational contexts alike, victimization is commonplace. From marital disputes and schoolyard bullying to sexual harassment and abusive supervision, suffering at the hands of others is seemingly endemic to the human experience. Aquino and Thau (2009) identify ten forms of victimization in the workplace alone; social psychologists likewise study a broad array of situations in which individuals aggress against each other and experience victimization in turn (Zechmeister & Romero, 2002). Given the ubiquity of victimization across a range of social and organizational contexts, one key question for scholars is how victims respond to the transgressions they experience. Of particular interest in the current research is the question of how transgressions influence victims' offender-directed motivations as encompassed by the construct of *forgiveness* (McCullough, Worthington, & Rachal, 1997; McCullough, Rachal, Sandage, Worthington, Brown, & Hight, 1998). When victims become motivated to act prosocially toward their offenders they can be described as adopting a forgiving mindset toward them. When victims maintain motivations to act antisocially toward their offenders (e.g. to avoid or take revenge against them) they can be described as adopting an unforgiving mindset toward them (McCullough et al, 1997; 1998).

Testaments to the significance of forgiveness span time and cultures. Greek and Roman philosophers certainly possessed notions of forgiveness. Aristotle discussed forgiveness in *Nicomachean Ethics* and other texts, as did Plato, Socrates, and Epicurus (Griswold, 2007). In the Middle Ages, religious approaches to the topic prevailed (Owen, 1976). The Renaissance in turn witnessed an expanded interest in forgiveness, mirroring the scholarly ethos of the time (Owen, 1976; Shifflett, 2003a). Themes of forgiveness can

be found in Shakespeare's *The Merchant of Venice* (McLean, 1996) and the works of other great Renaissance thinkers including Erasmus (Tentler, 1965) and John Milton (Shifflett, 2003b). In the 18th century, moral philosopher and theologian Joseph Butler is often mentioned as an influential voice in reasoning about forgiveness (Griswold, 2007; Murphy, 2005; Newberry, 2001), although his was certainly not the only perspective of the time (Speight, 2005), and philosophical treatments of forgiveness continued into the 19th century and beyond (e.g. Downie, 1965; Nietzsche, 1887; North, 1987).

In the 21st century, the psychological sciences are experiencing a veritable renaissance of forgiveness scholarship. Scholars have come from social, personality, organizational, clinical, counseling, and developmental perspectives to develop influential theories of forgiveness explore the construct's nomological net. Overwhelmingly, research has focused on the antecedents of forgiveness – individual differences and situational contexts that facilitate victims' forgiveness of their offenders. For instance, scholars have demonstrated that empathy (McCullough et al, 1998), apologies (Fehr & Gelfand, in press; Ohbuchi, Kameda, & Agarie, 1989), perceptions of intent (Struthers, Eaton, Santelli, Uchiyama, & Shirvani, 2008), harm severity (Fincham, Jackson, & Beach, 2005), mood (McCullough, Bono, & Root, 2007), the Big Five (McCullough & Hoyt, 2002), narcissism (Exline, Baumeister, Bushman, Campbell, & Finkel, 2004), and trait anger (Berry, Worthington, Parrott, O'Connor, & Wade, 2001) all play important roles in determining the degree to which victims forgive their offenders (for a meta-analytic review see Fehr, Gelfand, & Nag, in press).

Consistent across these and other studies is an unflagging belief in the power of forgiveness for victims' and society's well-being. Unfortunately, seemingly near-

unanimous agreement among scholars on the importance of forgiveness' effects has hampered research on what, precisely, those effects are. Indeed, research on the consequences of forgiveness is surprisingly limited. The small compendium of scholarship that is available has focused on forgiveness' role in enhancing victim well-being, victim-offender cooperation, and victim prosociality (Karremans & Van Lange, 2008). For example, studies have demonstrated that forgiveness facilitates life satisfaction (Karremans, Van Lange, Ouwerkerk, & Kluwer, 2003), reduces blood pressure (Witvliet, Ludwig, & Vander Laan, 2001), facilitates interpersonal cooperation (Fincham, 2000), and enhances victims' general feelings of relatedness toward other people to pre-conflict levels (Karremans, Van Lange, & Holland, 2005). Taken together, these findings confirm that forgiveness enhances what is commonly perceived to be lost during conflict – well-being, cooperation, and relatedness. Yet conflict can exhibit deleterious effects that extend well beyond feelings of stress and relationship dissolution. Thus, the positive effects of forgiveness may likewise extend well beyond reductions in stress and relationship restoration.

One finding within the applied literature is that conflict inhibits creativity, defined as the production of novel and useful outputs (Hennessey & Amabile, 2010). Multiple studies have demonstrated that conflict compromises creativity in group brainstorming exercises (e.g. Pearsall, Ellis, & Evans, 2008) and individual creative problem solving tasks (Carnevale & Probst, 1998). The purpose of the current research is explore the hypothesis that forgiveness counteracts the negative effects of conflict on creativity, enhancing victims' creative performance to pre-conflict levels. Drawing from the stochastic model of creative achievement (described in detail in Chapter 3; Simonton,

1999; 2003), creativity is traced to two key inputs: domain set (the set of ideas, thoughts, and knowledge structures utilized in the creative process) and persistence (the frequency with which creative achievement is attempted). Forgiveness is in turn linked to domain set via three key mediating mechanisms: mood, motivation, and resource availability.

The overarching implications of the hypothesized forgiveness-creativity link are broad and far-reaching. Given previous research on the generally detrimental effects of conflict on team performance and creativity (De Dreu & Weingart, 2003), forgiveness represents one means toward a post-conflict enhancement of creative potential that is entirely within the hands of the victim. Similarly, the forgiveness-creativity link implies a constructive means through which employees can overcome feelings of victimization from customers, coworkers, and managers alike. Parallel implications can be drawn outside the organizational context for individuals seeking to engage in artistic pursuits. Interpersonal disputes, when resolved through forgiveness, may allow artists to create higher quality paintings, poems, and sculptures.¹

The hypothesis that forgiveness enhances creativity will be tested across three studies. Each study will utilize a priming methodology (Bargh & Chartrand, 2000) to enhance the internal validity of the presented findings, albeit at some expense to external validity. Participants will specifically be primed with forgiveness, unforgiveness, or a control condition. It is expected that forgiveness and control participants will experience parallel levels of creativity, but that unforgiveness participants will experience less

¹ As nearly every extant review of creativity has noted, history is rife with examples of conflict- and revenge-induced creative achievement (e.g. Simonton, 2003). Motivated processing theories of creativity suggest that a conflict-oriented mindset may specifically facilitate creativity on violent or vengeful tasks (De Dreu & Nijstad, 2008). The present research does not debate this point, but rather limits its focus to the arguably more common phenomenon wherein conflict and creativity are decoupled – e.g. a marital dispute that occurs before a brainstorming session at work a few hours later.

creativity than forgiveness or control participants. In Study 1, the forgiveness-creativity link will be tested via the alternative uses task – a popular lab-based brainstorming exercise (Torrance, 1964). Creative performance will be delineated in terms of both domain set and persistence to ensure that forgiveness does not simply encourage task persistence, but rather directly broadens victims’ domain sets (De Dreu & Nijstad, 2008). The mediating role of mood will also be explored via a modified measure of the PANAS scale (Baas, De Dreu, & Nijstad, 2008).

In Study 2, convergent validity for the forgiveness-creativity relationship will be sought via a creative drawing task (Ward, 1994). Mood will again be measured as a potential mediating mechanism, along with measures of task efficacy, task interest, and task choice to explore the mediating role of intrinsic motivation (Ryan & Deci, 2000).

In Study 3, further evidence for the validity of the forgiveness-creativity link will be sought via the utilization of a creative problem solving task (Dunker, 1945). Mood and motivation will again be measured as potential mediating mechanisms. In addition, the role of cognitive resource availability will be tested via the addition of a cognitive load manipulation. Specifically, half of participants will be randomly assigned to rehearse a nine digit number while completing the creative problem solving task. In this design it is theorized that cognitive load will override the impact of forgiveness on creativity by perpetually depleting participants’ cognitive resources.

Results across each of the three studies confirmed the cognitive resource perspective. In Studies 1-3, forgiveness was shown to enhance creative performance to levels that mirrored the performance of the control participants. In Study 1, the effect was specifically shown to be driven by domain set, and not task persistence. In Studies 1-3,

mood was ruled out as a mediating mechanism. Intrinsic task motivation was likewise ruled out in Studies 2 and 3. In Study 3, the effects of forgiveness were shown to disappear under conditions of cognitive load, supporting the theory that cognitive resource availability and the enhancement of depleted resources drives the forgiveness-creativity effect. The three primary studies are preceded by a description of two pilot studies wherein the forgiveness priming procedure and creativity tasks were selected, pre-tested, and refined.

This paper proceeds as follows. First, the construct of forgiveness is introduced. Previous research on the antecedents of forgiveness is reviewed to provide a conceptual foundation for the construct; the considerably narrower compendium of research on the consequences of forgiveness is then discussed in detail to situate the present research within the available literature (Chapter 2). Following the review of forgiveness, research on creativity is explored. Drawing from the stochastic model of creative achievement (Simonton, 1999; 2003) creativity is linked to two distinct inputs – domain set and persistence (Chapter 3). Forgiveness is subsequently argued to broaden participants' domain sets to pre-conflict levels via distinct affective, motivational, and cognitive mechanisms (Chapter 4). Two pilot studies and three primary studies are presented to demonstrate the forgiveness-creativity link and test the competing mediational pathways (Chapters 5-8). In the discussion section implications for research and practice are reviewed (Chapter 9). Emphasis is placed upon the need to develop a broader understanding of the consequences of forgiveness and the need for conflict scholars to emphasize forgiveness and related conflict management strategies in studies of conflict and creative performance. Future directions and limitations are also discussed.

CHAPTER 2. FORGIVENESS THEORY AND RESEARCH

In a Distinguished Scholar essay published in *Personal Relationships*, renowned forgiveness researcher Frank Fincham (2000) drew from the lessons of the porcupine to describe the ubiquity and necessity of forgiveness in social life. As the winter draws near the porcupines, like many other animals, huddle together for warmth. Drawing closer to each other they find themselves repelled by the pricks of their neighbors' quills and quickly disperse. Nonetheless, they come together yet again and thus begin a cyclical process of attraction and repulsion. To Fincham, the pricks experienced by the porcupine parallel humanity's own interpersonal quarrels. In the face of a transgression, it is human nature to recoil and protect oneself from a subsequent offense. Yet, as Michael McCullough documents extensively in a recent book, it is also human nature to forgive – to move past the experienced harm and reinstate a prosocial mindset toward the aggressor (McCullough, 2008). This ability to forgive – to once again approach a transgressor and reinstate interdependence – is inherent not only in humans but also in monkeys, dogs, fish, mice, and countless other social creatures (De Waal & Pokorny, 2005)

Psychological scientists have adopted a variety of conceptualizations of forgiveness, alternatively defining the construct as an emotion (Worthington, 2006; Worthington & Wade, 1999) a decision (DiBlasio, 1998), a behavior (e.g. Gahagan & Tedeschi, 1968; Tedeschi, Hiester, & Gahagan, 1969), or a motivational change (McCullough et al, 1997). In recent years scholars have coalesced around the conceptualization of forgiveness as a primarily motivational phenomenon (McCullough et al, 1997) with affective, cognitive, and behavioral antecedents (Fehr et al, in press) and consequences (Karremans et al, 2003). To quote McCullough, Pargament, and Thoresen

(2000) forgiveness can therefore be defined as an “intraindividual, prosocial change toward a perceived transgressor that is situated within a specific interpersonal context” (p. 9). As victims of transgressions come to forgive, their prosocial motivations toward their offenders increase; when victims’ motivations toward their transgressors remain antisocial, they can be described as unforgiving. Importantly, forgiveness does not imply condoning, pardoning, excusing, forgetting, or denying the harmful actions of an offender (Coyle & Enright, 1997; McCullough et al, 2000; North, 1987). Victims who forgive their offenders remain committed to the idea that the offense occurred and that it was wrong. Forgiveness thus occurs despite these facts and not because of a disassociation from them.

Predicting Forgiveness

Since Piaget’s (1932/1965) *The Moral Judgment of the Child*, forgiveness research has grown to receive attention from clinical (Enright, 2001; Enright & Fitzgibbons, 2000; Freedman, Enright, & Knutson, 2005; Wade & Worthington, 2005; Worthington, Kurusu, Collins, Berry, Ripley, & Baier, 2000), developmental (Allemand, 2008; Girard & Mullet, 1997; Hebl & Enright, 1993; Darby & Schlenker, 1982; Enright et al, 1994), social (Struthers et al, 2008; Takaku, 2001; Karremans & Van Lange, 2008; Fincham et al, 2005), personality (McCullough & Hoyt, 2002; Berry et al, 2001; Exline et al, 2004), and organizational (Aquino, Tripp, & Bies, 2001; Aquino, Tripp, & Bies, 2006) perspectives. Across each of these psychological sub-disciplines, research on the antecedents of forgiveness has received the lion’s share of attention. For example, among the twenty-one papers in the *Journal of Personality and Social Psychology* that examine forgiveness from 1982 to early 2010, all but two focus upon its predictors. Similarly, only

one of the nineteen articles on forgiveness published in *Personality and Social Psychology Bulletin* during the same timeframe focuses on its consequences.

Although the focus of the present research is on the consequences of forgiveness, it is prudent to begin with a discussion of its antecedents for two reasons. First, given the centrality of forgiveness's predictors to the field as a whole, an examination of this compendium of work is vital if one hopes to understand what psychologists currently know about the construct and its conceptualization. Second, given the cross-sectional nature of most forgiveness research, it is reasonable to presume a significant degree of bi-directional causality with respect to many variables modally framed as predictors of forgiveness (e.g. empathy; depression). In a recent meta-analysis, these correlates of forgiveness were delineated across three categories: cognitions, affect, and constraints (Fehr et al, in press). Each of these sets of constructs is reviewed below and summarized in Table 1.

Insert Table 1

Cognitions

The cognitive antecedents of forgiveness can be unified via a sensemaking perspective, wherein victims seek to interpret the transgression event with respect to both the offense itself and the offender (Weick, 1995). Constructs including intent, responsibility, severity and apology can be categorized as cognitive antecedents of forgiveness. Through the sensemaking process, victims ask themselves the question, "What has happened here?" and via this question determine whether or not to forgive. Central to the sensemaking process are attributional cognitions that determine how

victims interpret offenders' roles in the transgressions they experienced. Victims may seek to understand how responsible an offender was for what happened (Aquino et al, 2006) by prescribing blame to either their offenders or external circumstances. Presuming responsibility, victims may likewise seek to interpret an offender's intentions – the degree to which the transgression was goal-directed and purposeful (e.g. Struthers et al, 2008). Apologies may mitigate victims' negative perceptions of their offenders (Fehr & Gelfand, in press) as should victims' understanding of their offenders' perspectives (Exline, Baumeister, Zell, Kraft, & Witvliet, 2008) and perceptions of the severity of harm incurred (Fincham et al, 2005). Several victim dispositions shown to affect forgiveness can likewise be traced to the cognitive perspective. Agreeableness predicts whether victims interpret conflict events as deserving of cooperative and integrative tactics or assertive and disengaging tactics (Graziano, Jensen-Campbell, & Hair, 1996). Trait forgiveness more specifically predicts whether or not victims view the offenses they experience as deserving of a forgiving response (Berry et al, 2001; Brown, 2003). Meta-analytic evidence suggests that dispositional cognitions account for an average of 6% of variance in victim forgiveness while situational cognitions account for 14% of variance in forgiveness. For instance, apologies are correlated with forgiveness $r = .42$ while agreeableness is correlated with forgiveness $r = .22$ (Fehr et al, in press).

Affect

Affective antecedents of forgiveness describe the many emotions and moods that victims experience in the wake of an offense (e.g. McCullough et al, 2007). Whereas the cognitive correlates of forgiveness imply a sensemaking process that is explicitly directed toward the offender and offense, the affective correlates of forgiveness relate more

directly to victims' emotional experiences and moods. Affective theories of forgiveness presume that emotions are closely associated with victims' motivations to forgive. When victims experience negative offender-directed emotions such as anger, a reduced motivation to forgive can be expected. Conversely when victims experience positive offender-directed emotions such as empathy, an enhanced motivation to forgive can be expected (Worthington, 2006). Moods in turn can be expected to impact forgiveness in accordance with mood-as-input theory, such that moods become attributed to salient external sources (Clore, Schwarz, & Conway, 1994; Martin, Ward, Achee, & Wyer, 1993; Schwarz & Clore, 1988). Following an offense, victims can be expected to attribute negative mood states to their offenders and thus be demotivated to forgive. Positive moods conversely imply a less severe impact of the offense on the victim and thus a greater motivation to forgive. As with victim cognitions, victims' affective states can be traced to several dispositions. Within the Big Five taxonomy, research suggests that neuroticism is predictive of the types of affective states that inhibit forgiveness. Neuroticism is defined as the tendency to react stressfully to life events (McCrae & Costa, 1987). When faced with negative environmental stimuli, neurotic individuals experience higher levels of negative affect than their less neurotic peers (Larsen & Ketelaar, 1991), leading to less forgiveness (McCullough & Hoyt, 2002). Research similarly suggests that trait anger (Wilkowski & Robinson, 2007), empathic concern (McCullough et al, 1997), and depression (Orth, Robins, & Roberts, 2008) impact forgiveness via tendencies to experience particular moods and emotions. Meta-analytic evidence suggests that dispositional inclinations toward specific affectivities account for

an average of 3% of variance in forgiveness while situational affect accounts for an average of 12% of variance in forgiveness (Fehr et al, in press).

Constraints

Constraints represent the final class of forgiveness predictors. Within this grouping are relational and socio-emotional constraints that propel the forgiveness motivation. At the relational level, victims may forgive to persist in relationships that they find enjoyable or useful. The importance of relationship restoration to the victim is best depicted via the concept of embeddedness, which Mitchell, Holtom, Lee, Sablinski, & Erez (2001) liken to “a net or a web in which an individual can become stuck” (p.1104). A victim is embedded or “stuck” in the victim-offender relationship to the degree that a dissolution of the relationship would entail significant personal sacrifice. A spouse, for example, might suffer financial loss or a reduced sense of belonging by dissolving the spousal relationship. As the level of sacrifice implied by unforgiveness increases, victims should become increasingly motivated to forgive. Embeddedness is operationalized via measures of relationship closeness, satisfaction, and commitment (Finkel, Rusbult, Kumashiro, & Peggy, 2002; McCullough et al, 1998). These variables are described as situational because individuals experience offenses from partners to whom they are variously committed (e.g. friends versus strangers) just as they experience offenses with varying levels of severity. Thus, even though constructs such as commitment are fairly stable within dyads, they vary across different dyads within which a victim can experience conflict.

Within the victim socio-moral constraints may also play an important role. Such internalized constraints could stem from victims’ religious systems (measured via

religiosity) or stable motivations to be viewed by others in a positive light (measured via social desirability). First, forgiveness can be expected to relate to religiosity to the degree that religion exerts a social pressure on victims to perform in a socially desirable manner (i.e. forgive) regardless of their offense-specific cognitions or affect (McCullough & Worthington, 1999; Mullet, Barros, Frongia, Usai, Neto, & Shafighi, 2003; Tsang, McCullough, & Hoyt, 2005). Social desirability can more generally be expected to relate to forgiveness to the degree that victims want to be viewed favorably by those around them (Crowne & Marlowe, 1964). Situational constraints account for 8% of variance in forgiveness; dispositional constraints account for 2% (Fehr et al, in press).

The Power of Forgiveness

Although the antecedents of forgiveness have received the lion's share of attention among conflict scholars, a limited literature has likewise explored its consequences (Karremans & Van Lange, 2008). Broadly speaking, these data can be delineated across three levels: intrapersonal, interpersonal, and generalized. The intrapersonal consequences of forgiveness include those criteria that affect how victims feel both emotionally and physiologically. The interpersonal consequences of forgiveness include those criteria that affect how victims act or intend to act toward their offenders. The generalized consequences of forgiveness include those criteria that affect how victims act beyond the conflict context – for instance, their feelings of relatedness to people beyond the transgressor. At each level a varied set of consequences can be expected, comprising a suite of emotions, cognitions, and behavioral inclinations. As the review will document, research on the consequences of forgiveness is closely tied to definitions of the construct itself as a prosocial, benevolent act. Thus, the prevalent theme

in the literature is that forgiveness enhances victims' well-being and benevolent tendencies.

The Intrapersonal Consequences of Forgiveness

Within individuals, forgiveness has been shown to exhibit both psychological and physiological consequences. Karremans et al (2003) employed correlational and experimental designs to explore the impact of forgiveness on victims' psychological well-being. For instance, in one study the authors utilized a modified implicit association test to measure victims' "true forgiveness." The IAT was a cover story after which false feedback was provided. Participants were told that they had either begun to forgive their offenders or not yet begun to forgive their offenders. Across three studies, the authors found that forgiveness leads to greater life satisfaction, greater self-esteem, higher levels of positive affect and lower levels of negative affect. The found effects were especially strong among victims who were previously committed to their offenders. In a longitudinal field study, McCullough et al (2007) found that forgiveness – operationalized via victims' avoidant motivations – likewise predicts rumination, such that victims who experience unforgiving motivations ruminate over transgressions more than their peers. Sheffield (2002) showed that participants who had forgiven displayed fewer clinical symptoms (e.g. depression) than their peers while Little, Simmons, and Nelson (2007) demonstrated a negative link between unforgiveness and self-reported health in a sample of religious clergy. Rhoades et al (2007) found that forgiveness of the 9/11 attackers facilitated positive coping responses to the events, while Lawler-Row and Piferi (2006) found that trait forgiveness is associated with greater subjective well-being, spiritual well being, healthy behaviors, and reduced depression and stress. Kluwer and

Karremans (in press) explored the effects of forgiveness following infidelity, and found similar effects as those presented in Karremans et al (2003).

Witvliet et al (2001) demonstrated intrapersonal physiological consequences of forgiveness as well. Utilizing a within-subjects imagery technique, the authors asked participants to recall a recent transgression in which they were the victim and rehearse either forgiving (developing feelings of empathy; granting forgiveness) or unforgiving (rehearsing the hurt; harboring a grudge) responses to the event. Compared with forgiving imagery, unforgiving imagery led to negatively valenced emotion, greater arousal, greater anger, greater sadness, less control, less empathy, above-baseline corrugators electromyogram readings, above-baseline skin conductance, above-baseline arterial pressure, and above-baseline heart rate. Several additional studies show similar physiological effects. Edmonson (2004) found that participants recalling betrayal events displayed less arterial reactivity and less cortisol reactivity when recalling events they had forgiven. Seybold, Hill, Neumann, and Chi (2001) linked trait forgiveness to health habits including alcohol and cigarette use. Several studies by Lawler-Row and colleagues (Lawler et al, 2003; Lawler-Row, Piferi, Jobe, Edmonson, & Jones, 2005; Lawler-Row, Karremans, Scott, Edlis-Matityahou, & Edwards, 2008) found that forgiveness (both trait and state) is associated with lower systolic blood pressure, slower heart rate, fewer physical symptoms, and less alcohol and medication use. Available data suggest that the physiological consequences of forgiveness may be partially mediated by stress reductions (Lawler et al, 2003) as well as social support and psychological well-being (Lawler-Row & Piferi, 2006).

The Interpersonal Consequences of Forgiveness

Within the victim-offender dyad, forgiveness has been shown to facilitate relationship restoration in terms of actual repair and motivation to repair. Fincham and Beach (2002) found that forgiveness facilitates constructive communication and mitigates aggression among married couples. Fincham, Beach, and Davila (2007) found that forgiveness also facilitates conflict resolution in marriage. McCullough et al (1998) demonstrated a link between forgiveness and victims' self-reported feelings of closeness toward their offenders. Karremans and Van Lange (2004) found that forgiveness motivates accommodation (Rusbult Verette, Whitney, Slovik, & Lipkus, 1991), willingness to sacrifice, and cooperative intentions (measured via a modified dictator game; Van Lange & Kuhlman, 1994) among close relationship partners. Fincham and Beach (2007) found that forgiveness facilitates marital quality among women (but not men) over a twelve month interval. Taken as a whole, these findings confirm a main effect between victims' prosocial motivations toward their offenders and subsequent behavioral prosociality – a finding that is hardly surprising given decades of research on the motivation-behavior link, broadly construed (Shah & Gardner, 2007). One fact these studies do emphasize is that when victims are remorseful or otherwise desire forgiveness, power within the dyad shifts to the victim. It is, in other words, “up to the victim” to shape the future of the dyad, at least in terms of prosocial interaction frequency following the transgression.

The Generalized Consequences of Forgiveness

The final set of findings on the consequences of forgiveness comes from a study by Karremans et al (2005). Drawing from research on interpersonal relationships (e.g.

Reis, Collins, & Berscheid, 2000) and self-construal theory (Markus & Kitayama, 1991), the authors note that episodic relationship behaviors can exert meaningful spillover effects, shifting victims' cognitive frameworks and thus their behavioral tendencies. Put differently, events that make certain behavioral schemas temporarily accessible in memory can, upon repetition, become chronically accessible schemas that influence behavior across situations and time (Gelfand, Major, Raver, Nishii, & O'Brien, 2006). In Study 1 participants were asked to recall a recent conflict event with a close other and subsequently use their "intuition" to translate twenty pronouns in a paragraph of fictitious foreign text. Forgiveness was shown to positively correlate with the number of first person plural pronouns (e.g. we, us, ours) that participants produced, suggesting that forgiveness leads to a general feeling of "we-ness". In Study 2 participants were primed with forgiveness by recalling either a forgiven or unforgiven offense. They were then asked to fill out a brief survey indicating their willingness to volunteer for a charity and given the opportunity to donate some of their earnings to the charity. Forgiveness predicted both willingness to volunteer and donations made. In the final study by Karremans et al (2005) participants were again primed with forgiveness and asked to indicate their general sense of relatedness to other people as measured via a modified version of the Inclusion of Others in the Self Scale (IOS; Aron, Aron, & Smollan, 1992). Results again demonstrated that forgiveness leads to a greater sense of connectedness to others. This is the only known study to date that explores the consequences of forgiveness for behavior that extends beyond the dyadic context. Yet it is an important first step in understanding that forgiveness can shift victims' behavioral patterns in contexts that do not explicitly involve the victim-offender conflict event.

Conclusions on Forgiveness: State of the Science

Forgiveness research can be meaningfully delineated in accordance with its focus on either the predictors or the consequences of forgiveness. Although there is evidence to suggest reciprocal relationships with respect to several constructs (e.g. mood; relationship closeness), the causal directions hypothesized in source studies present important distinctions for theory and method. To date, the overwhelming majority of studies have focused on forgiveness's predictors. A recent meta-analysis delineates 22 of these factors across three categories: cognitions, affect, and constraints (Fehr et al, 2001; see Table 1). Several constructs have been shown to exhibit reverse causality. For instance, forgiveness has been shown to predict victim affective states (Karremans et al, 2003) and relationship quality (Fincham et al, 2002). Additional studies have established further consequences of forgiveness including physiological well-being (Wilvliet et al, 2001) and generalized prosocial behavior (Karremans et al, 2005). Yet whereas the predictors of forgiveness cut across a wide range of cognitive, affective, and socio-moral concepts, the consequences of forgiveness focus exclusively on victim well-being and prosocial behaviors such as cooperation, communication, and volunteerism.

What might a broader consideration of forgiveness's consequences entail? To adequately address this question scholars must consider what, aside from prosociality and well-being, is compromised during conflict. As previously reviewed, past research has implicated reduced creativity as an additionally important, negative consequence of conflict. Thus, the restorative effects of forgiveness might likewise extend to creativity, with implications for individuals and organizations. In the next section (Chapter 3) the history and meaning of creativity is reviewed with an emphasis on the stochastic

perspective (Simonton, 1999; 2003) and the dual input model (De Dreu & Nijstad, 2008; Fehr, 2009). The role of forgiveness in broadening victims' creative domain sets to pre-conflict levels is subsequently discussed in Chapter 4.

CHAPTER 3. CREATIVITY THEORY AND RESEARCH

Creativity is one of the most sought-after and admired human abilities. To create – to develop new and exciting ideas, concepts, or inventions – serves as a goal to individuals, organizations, and cultures around the world. Creativity defines our social and physical environments. Everything from the computers we use and the art we view to the medicines we take and the articles we read stems from the creative efforts of individuals throughout history (Simonton, 2000). Societies in turn exalt their most creative members. From Picasso and Da Vinci to Einstein and Newton, few individuals enjoy as much posterity as history's eminent artists, writers, and scientists (Simonton, 2003). Nations are increasing the resources they devote to developing the next generation of eminent thinkers (Hennessey & Amabile, 2010). The business community likewise continues to emphasize and invest in the creative process. As noted in a recent review (George, 2007), “popular business magazines such as *Business Week*, *Fast Company*, and *Fortune* regularly have features highlighting creativity in organizations, and practitioner-oriented publications such as *Harvard Business Review* frequently publish articles on how and why managers often inadvertently thwart creativity and on ways they can and should seek to promote it” (p. 439).

Creativity is most commonly defined as the production of outputs (e.g. ideas; products) that are both novel and useful within a specific context (Amabile, 1985; Ford, 1996; Runco, 2004). A new computer application, for instance, could be considered creative if it is both (a) novel in relation to other computer applications and (b) useful from the perspective of consumers. Creativity can thus be measured by experts' assessments of individuals' overall creativity (e.g. leader ratings; Fleener & Taylor,

2004) or by the quantification of actual creative output such as performance on creativity tasks within a lab context (e.g. creative drawing or ability to complete the Duncker candle test; Duncker, 1945; Glucksberg & Weisberg, 1966; Maddux & Galinsky, 2009; Ward, 1994) or patent disclosures written by an engineer (Oldham & Cummings, 1996). Within the broader context of innovation, creativity is typically linked to ideation – the set of processes whereby individuals and groups develop the concepts, ideas, and products that are later implemented by organizations. The prototypical ideational process within organizations is the brainstorming session, wherein individuals and groups develop as many novel ideas as possible in an effort to push a given project or company in a new direction (Litchfield, 2008; Sutton & Hargadon, 1996).

Guilford's (1950) presidential address to the American Psychological Association is often mentioned as a watershed moment in creativity research (Simonton, 2000). In this address, Guilford emphasized the importance of scholarly research on creativity and served a call to arms to creativity scholars. Since that date creativity research has flourished within psychology. It is the focus of an entire division of APA (Division 10: Society for the Study of Aesthetics, Creativity, and the Arts) and several journals including *Psychology of Aesthetics, Creativity, and the Arts* and *Creativity Research Journal*, among others. It is the topic of several handbooks (e.g. Kaufman & Sternberg, 2006; Sternberg, 1999) and reviews (Hennessey & Amabile, 2010; Runco, 2004; Shalley, Zhou, & Oldham, 2004; Simonton, 2003) as well. Following this widespread interest in creativity, psychological research to date has documented an impressive array of predictors of creativity across levels of analysis. At the individual level, scholars have documented the impact of many individual differences on creative achievement,

including the Big Five (Feist, 1999; McCrae, 1987), regulatory focus (Friedman & Förster, 2001), need for closure (Chirumbolo, Livi, Mannetti, Pierro, & Kruglanski, 2004), intelligence (Sternberg, 1981), cognitive style (Barron & Harrington, 1981; Woodman, Sawyer, & Griffin, 1993), and direct measures of creative ability (e.g. Gough, 1979). Social and organizational psychologists have furthermore identified multiple situational determinants of individual creative achievement including reward (Eisenberger & Rhoades, 2001), mood (Baas, De Dreu, & Nijstad, 2005), and goals (Shalley, 1991). Cross-level predictors of creative achievement include leadership style (Shin & Zhou, 2003), leader supervision (Oldham & Cummings, 1996), and organizational culture (Amabile, Conti, Coon, Lazenby, & Herron, 1996).

In recent years scholars have begun to devote increasing attention to the creative process toward the goal of answering the question, what is it that people and groups *do* when being creative? The process perspective builds upon outcome-oriented definitions of creativity to consider the precise processes that precede it. Among those theories that have begun to document the creative process, the evolutionary perspective pioneered by Campbell (1960) and refined by Simonton (1999; 2003) has garnered perhaps the most attention. In a recent *Annual Review* article, Hennessey and Amabile (2010) refer to the evolutionary perspective as “One of very few recent attempts to construct a systems theory of creativity” which, while not without its skeptics (Dasgupta, 2004; Sternberg, 1998), has proven deeply influential. In the next section, the nature and origins of the evolutionary perspective on creative achievement are discussed in detail.

Evolution, Stochasticism, and the Creative Process

Few theories in the history of science are as widely revered, applied, and discussed as the theory of evolution. It has been described as the grand unifying theory of biology and one of science's most powerful explanatory frameworks (Dennett, 1995). The central tenants of evolutionary theory are parsimonious. Organisms experience cross-generational genetic variation. Through natural selection and genetic drift these variations, over time, are reflected in populations. Natural selection focuses upon variations that directly aid in organisms' survival; genetic drift focuses upon variations that proliferate in local populations but do not generally enhance or inhibit survival. Since evolutionary theory was first proposed by Charles Darwin and Alfred Wallace in 1858 and refined in Darwin's (1859) *Origin of Species*, the principles of evolution have found their way into any and all fields that seek to understand human behavior. The field of psychology is no different. Evolutionary, socio-biological explanatory frameworks for psychological processes have flourished (Buss, 2004), albeit not without controversy.

In modern parlance biological evolution has been referred to as "primary Darwinism" and is thus differentiated from "secondary Darwinism", which utilizes evolutionary metaphor to describe variation/selection processes that extend beyond the trans-generational development of populations of organisms. Examples of secondary Darwinism can be found in the biological and social sciences alike. In the biological sciences, secondary Darwinism has been used to explain antibody formation (Söderqvist, 1994) and neuronal growth (e.g., Edelman, 1987) within individual organisms. In the social sciences, secondary Darwinism has been applied in such diverse realms as operant conditioning (Skinner, 1938) and cultural evolution (Cavalli-Sforza & Feldman, 1981).

Particularly relevant to the current research is the theory of evolutionary epistemology (Campbell, 1974), a process whereby ideational variations (also referred to as “memes”) are viewed as subject to selection and retention pressures by socio-cultural knowledge systems (Dawkins, 1986; Heath, Bell, & Sternberg, 2001). Theories that predict natural phenomena over time and situations survive and proliferate; theories that are falsified face extinction (Popper, 1959).

Evolutionary epistemology applies secondary Darwinian theory to socio-cultural populations and the survival of fully-formed and explicated memes. A related question, however, is how novel, potentially useful ideas and concepts are initially developed and selected by individuals, groups and organizational systems. In response to this question Campbell (1960) again applied Darwinian metaphor to propose a cognitive variation/selection system within the mind. Since Campbell’s (1960) seminal paper, the evolutionary model of ideation has been significantly expanded and refined by Dean Keith Simonton, a psychologist at the University of California, Davis. In several recent papers, Simonton (2003) uses the term *stochastic creativity* to describe modern instantiations of Campbell’s (1960) ideas – this terminology is used in the present paper as well.²

The term “stochastic” itself means “random”, a modern variant of the Greek word “στόχος”, meaning to aim or guess. The stochastic perspective on creativity argues that the creative process necessitates “the intrusion of a restricted amount of chance,

² The terminological shift from “Darwinian” to “stochastic” is a recent one for Simonton, and one that the author explicitly discusses in his writings. Although Darwinian terminology holds the advantage of connecting theories across scientific disciplines, it has led to continued confusion within the literature on what, precisely, secondary evolution entails. Rather than confuse the matter, Simonton has chosen to remove the Darwinian terminology from his writings and thus associated moral, religious, and scientific controversies.

randomness, or unpredictability’’ (Simonton, 2003, p. 476). Yet it does not, as its etymology would suggest, imply complete randomness. Simonton (2003) draws from an introspective report by French mathematician and physicist Henri Poincaré (1921) to illustrate the *semi*-random nature of stochastic ideation:

“In describing one discovery episode, he [Poincaré] observed, ‘Ideas rose in crowds; I felt them collide until pairs interlocked, so to speak, making a stable combination’ (p. 387). Poincaré (1921) compared these colliding images to ‘the hooked atoms of Epicurus’ that jiggle and bump ‘like the molecules of gas in the kinematic theory of gases’ so that ‘their mutual impacts may produce new combinations’ (p. 393). Although this quote suggests a fairly random combinatorial process, it is not completely so. In particular, Poincaré (1921) claimed that the ideas participating in the chaotic collisions are provided during the preparation period of the creative process: ‘The mobilized atoms are . . . not any atoms whatsoever; they are those from which we might reasonably expect the desired solution. Then the mobilized atoms undergo impacts which make them enter into combinations among themselves or with other atoms at rest which they struck against in their course.’ (p. 389) As a consequence, the only combinations that have a chance of forming are those where at least one of the elements is one of those atoms freely chosen by our will.” (p. 476).

Beyond singular case studies and introspective reports, a significant compendium of data has supported the stochastic model (Simonton, 2003), even if in ways that are often indirect and not fully agreed upon (Dasgupta, 2004; Mumford & Antes, 2007). Among those findings that support the stochastic perspective are data on the nonmonotonic production of individual creative works (Simonton, 2007), the benefits of flat associative networks in facilitating novel associations (Feist, 1999), the Poisson distribution of creative success across individuals and within careers (Simonton, 2003), the serendipitous origins of many of society’s most successful memes (Kantorovich & Ne’eman, 1989), and the conspicuously detrimental effects of overspecialization in creative pursuits (Simonton, 1999).

A Dual Input Model of Stochastic Creativity

The stochastic perspective on creativity is theoretically compelling and supported by a reasonable body of empirical findings. However, stochastic perspectives on the creative process have received only limited attention from organizational scholars. A recent review of the organizational literature indicated that of the 50 studies on creativity and innovation published in *Administrative Science Quarterly*, *Academy of Management Journal*, *Academy of Management Review*, and the *Journal of Applied Psychology* from 2000-2010, only a small handful cited Simonton or Campbell or mentioned the terms “stochastic” or “Darwinian” in their text. None could be said to have adopted stochasticism or Darwinism as their overarching theoretical framework.

One potential reason for this disconnect is the tendency for stochastic research to be descriptive, rather than proscriptive, in its analysis of creativity. For instance, Simonton (1998) traces historical trajectories of creative assessments of operas, but offers little by way of prediction. Similarly, Simonton (2007) describes the development of paintings as “nonmonotonic” yet does not offer advice on how to facilitate the creative process. At the same time, organizational scholars have put forth a wealth of predictive data while generally overlooking the processes that mediate the input-output relationship (Hennessey & Amabile, 2010). To both understand the creative process and meaningfully link to key antecedents, integration is needed.

Perhaps the best candidate for integration of the descriptive and proscriptive approaches to creativity is the dual input model (De Dreu et al, 2008; Fehr, 2009). The dual input model of creativity models the creative process as the function of two inputs: domain set and persistence. The former focuses upon the set of ideas, concepts, and

knowledge structures subjected to stochastic recombination; the latter focuses upon the frequency with which stochastic recombination is attempted. Although dual input theories of creativity and the theory of constrained stochasticism have only recently been linked (Fehr, 2009), the integration and refinement of these perspectives allows for a clear and parsimonious understanding of the creative process as typically discussed in the psychological and organizational sciences.

Domain Set

In Simonton's (1999) model of Darwinian creativity an evolutionary process of variation and selection is emphasized. Creators bring a body of knowledge to a creativity task and subject that knowledge to stochastic integration toward the goal of creative outputs (Simonton, 2003). Creativity is thus "guided by the existence of knowledge elements that are available for combination into new variations within the creator's mind, by the extent to which the creator's mind treats those elements as relevant to the problem at hand, and by heuristic processes for combining those elements" (Amabile, Barsade, Mueller, & Staw, 2005, p. 368). This set of knowledge elements – the ideas, concepts, and knowledge structures utilized during the creative process – is referred to here as *domain set*. Related concepts have referred to individuals' creative ability (Ford, 1996), domain breadth (Fehr, 2009), and cognitive flexibility (De Dreu et al, 2008). Domain set entails both what the creator knows what knowledge is deemed relevant for the creative task.

A central tenant of the creativity literature is that individuals tend to approach creative tasks too narrowly. An engineer may focus on improving the efficiency of existing car engines and thus overlook the possibility of new ways to power a car. A

painter may focus on refining pointillism and thus fail to inspire a novel artistic movement. Consider the Duncker candle task, presented in Figure 1a. Participants are presented with this image and told to find a way to affix the candle to the wall so that no wax will drip on the table or floor. They are only allowed to use the items they see in the picture. When approached narrowly, a first solution to the task is to directly tack the candle to the wall. However, this does not solve the problem of wax dripping on the table. The tacks also seem too small to directly affix the candle to the wall. The correct, creative solution to the task requires participants to overcome their functional fixedness. They must recognize that the box can hold not just the tacks but also the candle, and can thus be solved as presented in Figure 1b (Duncker, 1945).

Insert Figures 1a-1b

Given the tendency for individuals to approach creative problems too narrowly, a significant body of literature focuses on individual differences and situational contexts that enhance creative performance by stimulating the accessibility and utilization of a broad array of concepts for cognitive processing (Clore et al, 1994). For example, Isen (1999a, 1999b) proposed that creativity requires (a) an increase in the number of concepts available to an individual for cognitive processing, (b) a defocused attention, leading to a more complex cognitive context, and (c) an increase in the probability that a set diverse cognitive elements will actually be linked.

Numerous contextual phenomena have been theorized to impact creative performance via the broadening of domain set. One of the most commonly studied predictors of a broad domain set is positive mood. Numerous lab studies have specifically

posited that positive mood defocuses attention and broadens the set of concepts made accessible during the creative process (e.g. Isen 1999a; 1999b). These lab findings have been replicated in field settings (Amabile et al, 2005) and confirmed at the population level via meta-analysis (Baas et al 2008). In a recent set of lab studies, Förster, Friedman, and Lieberman (2004) found that promotion-oriented regulatory focus likewise facilitates creativity by enabling creators to make “risky” decisions and look past safer, less creative solutions. Creativity is similarly associated with power – people in powerful positions are less susceptible to prototypes and other information on how tasks were previously accomplished, and thus more likely to utilize a broad set of ideas during ideation (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008). In a study linking creativity to cultural evolution, Griskevicius, Cialdini, and Kenrick (2006) found that romantic motivation, primed via the salience of an attractive potential mate, increases creativity by fostering a desire to think of new and creative ways to appear desirable to the potential mate. In a recent study on the link between creativity and living abroad, Maddux and Galinsky (2009) noted that “living abroad may allow people to approach problems from different perspectives” and thus facilitate creative achievement (p. 1048). Simonton (1975) similarly found that creativity in adulthood is facilitated by exposure to a breadth of novel ideas during development (i.e. childhood). Further expanding upon this notion, Simonton declares that “In creative domains, the negative effects of ‘over-training’ are as conspicuous as the positive effects of ‘cross-training.’ Only the latter encourages creators to look at problems in new and often totally unanticipated ways” (Simonton, 1999, p.363).

Additional evidence that domain set impacts creative performance can be found at the dispositional level. Consider the following abridged list of personality traits reviewed by Feist (1999) as consistently indicative of success in the fine arts: openness to experience, fantasy-orientation, imagination, impulsivity, lack of conscientiousness, affective illness, norm doubting, nonconformity, independence, hostility, and aloofness. If there is any common thread to bind these traits, it is a tendency to look at the world (and the tasks held within) broadly, with relatively little consideration of social expectations or conventions. When individuals look beyond the status quo they are creative; when they settle into accepted practices and paradigms, they are less creative. Openness to experience, a Big Five personality construct, is prototypical of this class of constructs, characterized by a willingness to accept new ideas, a propensity toward fantasy, and flexibility of thought (Digman, 1990; McCrae & Costa, 1987). Whereas open people could be expected to consider a wide range of possibilities when approaching a task, less open people could be expected to act more rigidly.

Recent research continues to support the dispositional perspective on creativity as facilitated by domain set. Carson, Peterson, and Higgins (2003) demonstrated that latent inhibition – an ability to screen out irrelevant information – is negatively correlated with creativity. In a similar set of findings Keri (2009) found that polymorphism of the promoter region of the neuregulin 1 gene is associated with creativity (creative personality; performance on the “just suppose” task; the creative achievement questionnaire).

Persistence

The second prerequisite for creativity within the dual component model is persistence. As in non-creative performance domains, persistence – prototypically measured via time on task or total number of ideas produced in creative exercises (De Dreu et al, 2008) – has been shown to directly and linearly predict creative achievement. Historiometric data indicate that the number of ideas an individual produces (e.g. the number of papers one writes) is the single best predictor of the number of truly creative outputs an individual produces (e.g. the number of highly cited papers one writes; Simonton, 2003). Indeed, a central descriptor of the stochastic model is the *equal-odds* rule, which notes that one's ratio of successes to failures is uncorrelated with the number of ideas produced.

Several empirical studies have demonstrated phenomena that affect persistence, but not domain set, during creative tasks. In a study on mood and creativity, De Dreu et al (2008) found that negative, activating moods cause individuals to persist on creative tasks (to spend more time on insight tasks and come up with more ideas during brainstorming sessions), but not approach them with a broader domain set. Dietrich (2004) identified unique neural pathways in the prefrontal cortex for persistent, but not spontaneous, creative achievement. Rietzschel, De Dreu, and Nijstad (2004) demonstrated that need for structure and fear of invalidity interact to predict perseverance but not flexibility on creative tasks.

Summarizing the Creativity Literature

The history of psychological inquiry into the creative process is broad and far-reaching. Although creativity is typically defined as the production of novel and useful

outputs (Amabile, 1985), scholars have begun to call for models that more precisely document the creative process. Above all others, the stochastic model of creativity has arguably received the greatest theoretical and empirical attention. Drawing from research on secondary Darwinism and evolutionary epistemology, the stochastic model hypothesizes a semi-random combinatorial process wherein ideas and concepts are subjected to novel associations and recombinations. By integrating the stochastic perspective with the nascent “dual input” model of creative achievement, the antecedents of creativity can be parsimoniously delineated as a function of domain set and persistence. In the next section, forgiveness is theoretically linked to creative achievement via domain set. Three distinct meditational mechanisms, including mood, motivation, and cognitive resource availability, are theorized to explain the forgiveness-creativity effect.

CHAPTER 4. LINKING FORGIVENESS AND CREATIVITY: THREE COMPETING FRAMEWORKS

Given the presented review of the creativity literature, any hypothesized association between forgiveness and creativity must be traced to either domain set or persistence. In this paper I focus on domain set and theorize that forgiveness broadens the set of ideas, concepts, perspectives, and knowledge structures made available and accessible during post-conflict creative tasks. To build this theoretical model I begin this section with a review of the spillover approach to forgiveness's effects, which discusses the processes through which forgiveness influences behaviors outside the dyadic conflict context. Then, I present a general summary of the forgiveness-creativity link and a formal hypothesis of the effect. Finally, I present a series of research questions that look at mood, motivation, and resource availability as potential mediators of the impact of forgiveness on creativity.

Mechanisms for Creativity: Importance of a Spillover Approach

Regardless of the precise mechanism theorized to mediate the forgiveness-creativity link, a central assumption of the current paper is that forgiveness can exhibit spillover effects beyond the dyadic context in which forgiveness itself takes place. The spillover model situates the present research criteria among the generalized outcomes of forgiveness. As previously reviewed, research attesting to such outcomes is already available in Karremans et al (2005), wherein the authors demonstrated spillover effects of forgiveness on participants' general feelings of relatedness to others and willingness to volunteer for or donate to a charitable cause.

Existing evidence on the spillover model can be traced to at least two theoretical traditions: the self-construal literature and the interpersonal relationships literature. Self-construal theory maintains two paths through which a given self-construal becomes activated: chronic and temporary. Chronic sources of self-construal activation are dispositional. Women, for instance, are predisposed to act in accordance with the relational self (Cross & Madson, 1997). Temporary sources of self-construal activation are situational. A salient ingroup/outgroup distinction may activate the collective self; a close relationship may activate the relational self. Over time, temporary activations can impact subsequent behavioral patterns and even transform into chronic activations (Deaux & Perkins, 2001). Thus, an evening with one's family could stimulate relational interactions at work the next day. Similarly, a long-term living arrangement with salient in-group members could foster a chronic collectivist orientation (Holmes, 2000; Gelfand et al, 2006). Applied to the concept of forgiveness, a victim who forgives could be expected to subsequently act more prosocially toward others or, in accordance with the three meditational models presented below, display a suite of affectivities, motivations, and cognitions that facilitate creativity.

Beyond the self-construal literature, research on interpersonal relationships more broadly attests to the tendency for behavioral patterns within a single dyad to spillover into subsequent contexts. To quote Reis et al (2000), "relationships past and present... influence the individual's current behavior in other relationships and in many nonrelationship contexts as well" (p. 844). Put differently, human behavior does not exist in a vacuum – it is influenced by relational expectations and trends. To the degree that

relational interactions temporarily or chronically influence victims' worldviews, they can be expected to impact any number of downstream phenomena.

Overview of the Forgiveness-Creativity Hypothesis

Drawing from the spillover model of forgiveness, the central hypothesis of this paper is that forgiveness will lead to psychological states that ultimately enhance victims' creative performance. Within this context forgiveness is conceptualized as a process of overcoming conflict. Thus, its effects on creativity should be evident when contrasted against unforgiveness, but not in comparison to a control condition (Karremans et al, 2005). This perspective implies that while forgiveness is a desirable alternative to unforgiveness, its effects should be indistinguishable from conflict-free contexts.

Looking to the dual process model of creativity, forgiveness must either encourage victims of conflict to persist on creative tasks or to incorporate a broad range of ideas, concepts, and domain structures during creative tasks. Overall, there is little evidence linking forgiveness to perseverance or persistence. Forgiveness can be an effortful, deliberate process requiring persistence (Pronk, Karremans, Overbeek, Vermulst, & Wigboldus, 2010), but it can also occur subconsciously and automatically (Karremans & Aarts, 2007). Furthermore, psychological states that are diametrically opposed to forgiveness – such as revenge – can be pursued with a fervor parallel to forgiveness (McCullough, 2008). On the other hand, several affective, motivational, and cognitive phenomena suggest a link between forgiveness and creative domain set. First, forgiveness has been shown to foster positive mood states – the exact same mood states other researchers have shown to predict creativity (Amabile et al, 2005; Karremans et al, 2003). Second, forgiveness has been shown to foster a sense of self-worth (Luchiens et

al, 2010), implying the development of feelings of generalized self-efficacy and interest in life that could influence creativity motivationally as posited by self-determination theory (Ryan & Deci, 2000) and flow theory (Csikszentmihalyi, 1975). Third, forgiveness may allow victims to overcome cognitive rigidities and resource depletion, previously demonstrated to emerge during conflict episodes and negatively affect creativity (Carnevale & Probst, 1998). This leads to an overall forgiveness-creativity hypothesis, at once supported by affective, motivational, and cognitive evidence:

Hypothesis 1: Forgiveness enhances creative task performance

In the sections below mood, motivation, and cognitive resource availability are discussed in detail and presented as potential explanations of the processes that underlie forgiveness-creativity effect. I begin with mood, which is associated with the most significant body of empirical evidence to support the forgiveness-creativity relationship. I then follow with analyses of motivation and resource availability, respectively.

Model 1: Affect

Perhaps the most readily apparent mechanism that can be theorized to drive the forgiveness-creativity link is affect. More specifically, forgiveness can be theorized to increase victims' positive moods and decrease their negative moods, leading to greater levels of creativity on subsequent tasks. This hypothesis presumes that (a) creativity is predicted by creators' mood states, and (b) forgiveness influences the downstream mood states of conflict victims.

Watson, Clark, and Tellegen (1988) differentiate mood states into two factors: positive and negative. Positive mood is a measure of enthusiasm and alertness. Individuals who experience positive mood feel active and excited, whereas individuals

who lack positive mood feel lethargic. Negative mood, in contrast, is a measure of displeasure. Individuals who experience negative mood feel fearful, nervous, and distressed; individuals who lack negative mood feel calm and tranquil. Beyond valence, moods can also be defined by level of activation (Baas et al, 2008). Activating moods are characterized by high arousal; deactivating moods are conversely characterized by low arousal. Table 2 shows the mood states utilized in the present study, categorized by both valence and activation. For instance, anger is characterized by negative valence and activation. Calmness is characterized by positive valence and deactivation. Thus, I consider both valence and activation in the theoretical development of the forgiveness-mood-creativity path.

Insert Table 2

Creativity and Mood

Many years of research have explored the role of mood states in creativity. Within this literature, careful attention is given to both the axis of mood valence (positive-neutral or negative-neutral) and activation level (activating versus deactivating). The link between creativity and positive affect is most consistent and clear. Findings from multiple studies and quantitative reviews suggest that positive affect stimulates cognitive variations and remote associations, resulting in the utilization of a wider domain set during the creative process. A longitudinal field study by Amabile et al (2005) demonstrated a causal link between positive affect and creativity in the workplace, with the former facilitating the latter. Multiple lab studies by Isen (1999a; 1999b) similarly support the unique importance of positive moods above neutral baselines. Indeed, a meta-

analysis of 63 studies by Baas et al (2008) showed that positive mood facilitates creativity when compared against neutral mood, $r = .15$.

Research on the link between negative mood and creativity is less clear. Mood-as-input theories suggest that negative moods may facilitate creative performance (George & Zhou, 2002), a finding that would seem to be supported by data on the link between creativity and mental illness (Feist, 1999). However, meta-analytic findings from Baas et al (2008) yielded no significant effect of negative versus neutral moods on creative performance across 61 studies ($r = -.03$) and some individual studies suggest that negative moods may inhibit creativity (e.g. Hirt et al, 1997). With respect to activation, research generally suggests that activating moods facilitate creativity while deactivating moods inhibit creativity. Moderately activating mood states are specifically posited to facilitate the cognitive processing of information, leading to greater flexibility and broader domain set (De Dreu et al, 2008). Neurological research has linked activation and arousal to dopamine and noradrenalin, which have a positive effect on working memory capacity (Flaherty, 2005; Usher, Cohen, Servan Schreiber, Rajkowski, & Aston Jones, 1999). Taken together, the data thus suggest that positive and activating moods facilitate creativity while deactivating moods inhibit creativity.

Forgiveness and Mood

Previous correlational research attests to a link between forgiveness and the valence of victims' mood states. A small meta-analysis of four studies by Fehr et al (in press) yielded a link between positive mood and forgiveness that was nonsignificant but in the predicted direction, $r = .13$. Individual studies, such as those by Karremans et al (2003), have suggested that the link between forgiveness and mood may be particularly

strong when situated with mood as the criterion of forgiveness rather than its cause. In other words, while positive mood states may not necessarily facilitate forgiveness, forgiveness may be quite effective at enhancing victims' positive moods after the fact.

The link between forgiveness and negative affect appears stronger, although the causal direction of the association is again uncertain. For instance, Aquino et al (2006) demonstrated a significant cross-sectional association between negative mood states and victims' forgiving motivations in a sample of working adults. Fehr et al (in press) demonstrated a population correlation of $r = -.27$ for forgiveness and negative mood across 12 studies and 1,463 study participants. Supporting the argument that forgiveness causally inhibits negative affectivities, McCullough et al (2007) found that unforgiveness predicts next-day levels of anger. Carlsmith, Wilson, and Gilbert (2008) found that unforgiveness leads to negative affectivities in a laboratory context as well. Taken together, the evidence thus suggests a significant relationship between forgiveness and mood such that forgiveness induces positive mood states and reduces negative mood states. However, no data to date have specifically explored the impact of forgiveness on activating versus deactivating moods.

Linking Forgiveness, Creativity, and Mood

Three potential affective paths may mediate the forgiveness-creativity link. First, since research suggests that positive mood is both facilitated by forgiveness and predictive of creativity, a positive mood mediator can be supposed (e.g. happy, upbeat, calm, serene etc.; See Table 2). Second, although the link between negative mood and creativity is unclear, it is possible to suggest that the types of negative moods instilled by relationship conflict may prove particularly detrimental to creative performance. Thus,

forgiveness may facilitate creativity by reducing victims' negative moods as well (e.g. angry, tense, sad; See Table 2). Finally, in accordance with recent evidence on the particular importance of activating moods on creative performance, the mediating effect of mood could theoretically be limited to positively valenced and activating mood states (e.g. happy, upbeat, and elated; See Table 2). Overall, the following research question can thus be put forth:

Research Question 1: Does mood mediate the impact of forgiveness on creativity?

Model 2: Intrinsic Motivation

Beyond affect, a second mechanism through which forgiveness might impact creativity is intrinsic motivation. According to this theory, forgiveness (a) aligns' victims' feelings of self-efficacy with the creative task, and (b) enhances victims' feelings of task interest and choice, by definition leading to a more intrinsically rewarding experience with the creative task and, consequently, the consideration of broad domain sets.

Intrinsic Motivation and Creativity

Few notions are as central to the creativity literature as the idea that creativity is facilitated by intrinsic motivation. Broadly defined, intrinsic motivation refers to the desire to engage in a task for its own sake – for the enjoyment or fulfillment that the task provides (Amabile, 1979). Theorists suggest that intrinsic motivation is central to creativity because it leads the creator to engage in the playful consideration of a broad range of possibilities during the creative process (Hennessey & Amabile, 2010). Conversely, extrinsic motives can lead to overjustification – a loss in the belief that a task

is inherently enjoyable, which in turn leads to a narrow focus on external evaluations and expectation (Amabile, Hennessey, & Grossman, 1986).

Two theories of creativity to stem from the intrinsic motivation concept are self-determination theory and flow theory. Self-determination theory focuses on the idea that intrinsic motivation is best defined by tasks that individuals find enjoyable and feel that they have a choice in performing (Deci & Ryan, 2000). Flow theory focuses on the link between challenging work and skill, arguing that intrinsic motivation is best described through work that challenges yet falls within the boundaries of creators' abilities (Csikszentmihalyi, 1975). In this context, self-efficacy plays a vital role (Tierney & Farmer, 2002). Thus, three factors that may enhance intrinsic motives – and thus creative achievement – are task efficacy, task interest, and task choice.

Forgiveness and Flow

How might forgiveness impact creators' intrinsic motives? Research from the social, clinical, and counseling literatures first converges around a conceptualization of forgiveness as an empowering act that provides victims with feelings of self-confidence, self-efficacy and control over the victim-offender relationship (Worthington, 2006). Within this context, forgiveness is conceptualized as an effortful process that requires self-regulation and control – anecdotal descriptions of the forgiveness process speak of “finding the strength to forgive” and of forgiveness being an “attribute of the strong” (Pronk et al, 2010). Equity models of forgiveness further suggest that forgiveness, once offered, shifts the balance of power within the victim-offender dyad toward the victim, wherein he or she offers forgiveness as a “gift” to the offender, leading the offender to subsequently act more complaint toward the victim (Kelln & Ellard, 1999). Thus

forgiveness may lead to feelings of self-efficacy by both providing the victim with power over the offender and demonstrating the victim's "strength" in finding the will to forgive.

Defined as a belief in one's ability to complete a particular task or action, self-efficacy enjoys an illustrious tradition within the social and organizational sciences (Bandura, 1997; Locke & Latham, 1990). It is one of the most central constructs within the literature on individual motivation, and has been linked to a wide range of performance outcomes (Bandura & Locke, 2003).

Consistent with the spillover approach to forgiveness (Karremans et al, 2005), these feelings of efficacy could be theorized to influence other behavioral realms as well. In other words, forgiveness might exert an upward influence on generalized feelings of self-efficacy and, subsequently, on feelings of efficacy regarding specific creative tasks. Indeed, one oft-cited goal of forgiveness interventions is to reduce generalized feelings of depression and low self-esteem so as to facilitate broadly adaptive downstream behaviors (Worthington, 2006).

As previously discussed, self-efficacy is predictive of intrinsic motivation in accordance with flow theory (Csikszentmihalyi, 1975). When individuals feel that creative tasks challenge – but do not overwhelm – their abilities, they become "lost" in the task and experience a state of flow that is highly conducive to creative performance. Therefore, the following research question can be offered:

Research Question 2a: Does task efficacy mediate the impact of forgiveness on creativity?

Forgiveness and Self-Determination

Beyond experiences of flow, forgiveness may also impact creativity in accordance with self-determination theory. According to self-determination theory, people experience intrinsic motivation when conducting tasks that (a) they feel are their choice to conduct, and (b) they find to be interesting (Deci & Ryan, 2000). Thus, when employees conduct tasks out of coercion or despite disinterest, they are unlikely to be intrinsically motivated and produce creative outputs.

How might forgiveness enhance feelings of choice and interest on subsequent creative tasks? Just as previous research suggests that forgiveness facilitates feelings of generalized efficacy, forgiveness has also been shown to facilitate feelings of generalized interest in life – again via reductions in depression and enhanced self-esteem (Worthington, 2006). Luchies, Finkel, McNulty, & Kumashiro (2010) further clarified the conditions under which forgiveness empowers victims, demonstrating that forgiveness empowers victims and enhances feelings of self-esteem when the offender seems deserving of forgiveness as indicated by offender agreeableness or apology offers. In their meta-analysis Fehr et al (in press) confirmed a correlation of $r = -.27$ between forgiveness and depression, supporting the idea that forgiveness and depression are meaningfully and negatively linked.

Again drawing from the spillover model of forgiveness, feelings of life interest that stem from forgiveness can be expected to influence victims' perceptions of downstream creative tasks. Just as they are likely to approach these tasks with greater efficacy after forgiveness, so too can it be hypothesized that they will approach these

tasks with greater interest and perceptions of choice, leading to the following research question:

Research Question 2b: Do task interest and task choice mediate the impact of forgiveness on creativity?

Model 3: Cognitive Resources

The final theoretical mechanism between forgiveness and creativity employs a cognitive, resource-based approach. This hypothesis supposes that forgiveness enhances victims' cognitive resources lost or depleted during conflict, allowing them to be utilized during subsequent creativity tasks.

Creativity and Cognitive Resources

Research on the impact of cognitive resources on human behavior, primarily through manipulations of cognitive load and self-regulatory resource depletion, is extensive. The term "cognitive resources" itself refers to the capacity of working memory at any given time to engage in effortful, conscious, controlled mental processes. This is in contrast to automatic mental processes that occur outside of mental awareness and are effortless (Bargh, 1994). Any given task can be viewed as a controlled, effortful process that requires cognitive resources if performance is inhibited under cognitive load (e.g. rehearsal of a ten digit number); automatic mental processes are conversely unaffected by cognitive load. Examples of phenomena demonstrated to require effortful mental processing via cognitive load manipulations include self-presentation (Pontari & Schlenker, 2000), food intake inhibition (Ward & Mann, 2000), and stereotype-consistent information processing (Sherman, Lee, Bessenoff, & Frost, 1998).

In a related literature, research has also indicated that effortful mental processes can be thwarted by self-regulatory depletion. A prototypical paradigm in this realm involves completing a written task wherein participants must cross out the letter “e” every time it appears on a page of text. They then must unlearn that task and, in a subsequent task, cross out the letter “e” except when immediately followed by another vowel or when appearing in a word with a vowel two letters before the “e” (Muraven, Tice, & Baumeister, 1998). Thus, whereas the cognitive load paradigm focuses on taking away participants’ cognitive resources *during* task completion, the resource depletion paradigm focuses on taking away participants’ cognitive resources *before* task completion. Temporal dynamics aside, the theories and mechanisms underlying these two theoretical perspectives are quite parallel. For instance, participants should tend to rely on stereotypic information when under cognitive load or resource depletion. Similarly, participants should be expected to engage in less food intake inhibition when under cognitive load or resource depletion. In cognitive load paradigms, resources are enhanced through removal of the load task (e.g. no longer needing to recall a 9-digit number). In resource depletion paradigms, resources are enhanced through the passage of time or “energizing” interventions such as glucose intake.

Among those phenomena demonstrated to require cognitive resources (and thus shown to suffer under conditions of cognitive load and resource depletion) is creativity. In a series of studies, Baumeister, Schmeichel, DeWall, and Vohs (2007) most notably demonstrated that musical improvisations were less creative when musicians were required to count backwards from 917 by sixes (Study 2), that drawings were less creative when participants had to count instances of a lyric in a song (Study 3), and that

creativity on the alternative uses task was lower after participants completed a regulatory depletion task (Study 4). Thus, while creativity has been traced to unconscious processes both theoretically and empirically (e.g. Dennett, 2003; Russ, 1993; Wegner, 2002), it appears that conscious processes play an important role as well. In other words, an ability to consciously process information is central to one's ability to adapt the types of flexible, broad mindsets that allow individuals to think creatively.

Conflict and Cognitive Resources: The Threat-Rigidity Effect

To understand the impact of forgiveness on cognitive resource availability during creativity tasks it is necessary to explore what is already known about conflict and resource availability within the creative context. Theory and data in this realm purport a threat-rigidity model (Staw, Sandelands, & Dutton, 1981). According to this model, conflict narrows the attention of individuals engaged in creativity tasks, inhibiting their creative performance. Prototypical operationalizations of conflict in these studies include task framing (e.g. framing an impending negotiation exercise as either a conflict task or a cooperation task) and social value orientations (individual differences in responses to decomposed prisoners' dilemma games). According to Carnevale and Probst (1998), conflict entrenches the perception that one is right while others are wrong, leading to a rigid thinking style characterized by a failure to consider diverging perspectives on subsequent tasks. For example, Carnevale and Probst (1998) demonstrated that expectations for conflict (both situational and dispositional) and actual conflict experiences lead to decreased performance on the Dunker Candle Task (Dunker, 1945; See Figures 1a-1b) and reduced category inclusivity in Rosch's (1975) object categorization task.

Forgiveness and Cognitive Resources

While informative, traditional tests of conflict and creativity suffer from two limitations. First, they assume that conflict only impacts creativity when closely linked to creativity tasks themselves. Second, they fail to examine how conflict management processes such as forgiveness relate to creative processes. The spillover model of creativity and forgiveness addresses both of these limitations. First, it incorporates the explicit expectation that conflict events are frequently decoupled, both temporally and in terms of their content, from creative attempts in organizational and other contexts.

Consider the following examples:

1. A father of three and manager at a local engineering firm has a fight with his oldest son about using the family car. The father leaves the house for a 9am brainstorming session. However, he has trouble performing in the session – he is still suffering from the deleterious effects of the morning’s argument.
2. A retail service employee is cut off by another car on the way to work. She vows revenge and speeds up to respond in kind. She ruminates over the event for several hours. While setting up a display for a new digital camera she overlooks what would have been a creative design solution, setting the display in the travel section of the store to encourage suggestive selling.
3. Two childhood friends, inseparable for twenty years, experience a falling out. The broken relationship deeply upsets both friends, who feel victimized by the other. Months of distraction and negative emotion ensue. One friend in particular has constant trouble completing his projects at a local graphic design firm. He is ultimately let go for “underperformance” and “an uninspired aesthetic.”

The second, perhaps even more important advantage of the forgiveness spillover model of conflict and creativity is the emphasis on conflict management tactics as effective interventions in the conflict-performance relationship. No longer subject to the deleterious effects of the conflicts they experience, what truly matters is how victims respond to and manage the conflict events they experience. If they are able to forgive their offenders and move past the conflict, they can be expected to experience positive

outcomes. If they are unable to forgive their offenders, they may nonetheless experience a host of negative outcomes.

Indirect data support the idea that forgiveness enhances the cognitive resources lost during conflict. Forgiveness is characterized by empathy (McCullough et al, 1997) perspective taking (Exline et al, 2008), and the belief that the offender is a good person (Karremans & Aarts, 2007), implying an ability to consider one's offender and thus overcome cognitive rigidity. It is similarly facilitated by cognitive dissonance. When victims are presented with the concept that although they are good people they too could have committed a similar offense under the right circumstances, they are increasingly likely to forgive (Takaku, 2001; 2006). Lastly, forgiveness is also associated with decreased rumination – a reduced focus on the conflict event – emphasizing the conceptualization of forgiveness as “moving past” the conflict event (Fehr et al, in press).

Taken together, the cognitive resource model of creativity and forgiveness therefore suggests that (a) creativity requires conscious processing and cognitive resources, (b) conflict depletes mental resources and produces cognitive rigidities among victims, and (c) forgiveness enhances victims' cognitive resources to pre-conflict levels, eliminating the rigidities originally produced by the conflict frame. Thus, a final mechanism for the forgiveness-creativity link can be suggested:

Research Question 3: Does cognitive resource enhancement mediate the impact of forgiveness on creativity?

In summation, the three presented research questions posit three distinct mechanisms through which forgiveness might enhance victims' post-conflict creative performance. First, mood was reviewed as the most likely explanation for the

hypothesized forgiveness-creativity effect, given a significant compendium of available data on both forgiveness's casual effects on mood and mood's causal effects on creativity. Second, two additionally plausible, albeit less empirically supported, mechanisms were also examined: motivation and cognitive resource enhancement. The former mechanism posited that forgiveness might enhance victims' feelings of task efficacy, choice and interest. The latter mechanism posited that forgiveness might enhance victims' cognitive resources.

Across three studies these mechanisms are tested in rough accordance with the empirical support that can be attributed to them. Thus, mood is tested first and across all three studies. Motivation is tested in Studies 2 and 3; the cognitive resource mechanism is in turn tested in Study 3. Before proceeding to these studies, the next chapter presents two pilot studies that establish the efficacy of the priming procedure and a set of lab-based creativity tests.

CHAPTER 5. PILOT RESEARCH

In Chapter 4, evidence was presented to suggest that forgiveness should facilitate creative performance. Furthermore, three potential mediating mechanisms were reviewed: mood, motivation, and cognition. In Chapter 6, data from three primary studies are presented to explore the hypothesized main effect of forgiveness on creativity and the competing mediating mechanisms. In this chapter data are presented from two pilot studies that establish an efficacious priming procedure and an initial set of creativity tasks.

Priming Forgiveness

The purpose of the priming methodology is to explore the differential effects of forgiveness versus unforgiveness on creativity. In priming research, participants are presented with a stimulus (e.g. an American flag) to assess how individuals' mental representations of those stimuli impact subsequent information processing and behavior. The assumption is that the mental representations that become accessible via priming activate an associated network of concepts through which later environmental data are interpreted (Bargh & Chartrand, 2000). For instance, an American flag might be expected to prime a bicultural participant's individualist values, in turn causing her to feel less connected to others in a group setting (e.g. Oyserman & Lee, 2008). Priming procedures can enhance the accessibility of relatively simple schemas, but they can also enhance the accessibility of complex psychological phenomena including power (Galinsky et al, 2008), cultural values (Oyserman & Lee, 2008), and forgiveness (Karremans et al, 2003; 2005).

Within the forgiveness context, priming presents important advantages over other methodologies that could be utilized. Principle among these advantages is the level of control that the priming methodology affords. Actual offenses instigated in the lab, for instance, may be viewed as differentially severe by participants. Correlational studies of forgiveness and creativity likewise present important confounding issues and may reduce the internal validity of the data. Previous research supports the notion that participants can readily recall events they have or have not forgiven in the past (Zechmeister & Romero, 2002). One advantage of the recall priming procedure in forgiveness research is that it closely mirrors the processes through which forgiveness and unforgiveness might be activated in real-world settings. The prime brings the conflict event into central focus, as it might similarly be brought to focus during a conversation with an offender or under conditions of minimal temporal separation from the event.

In the pilot and primary studies, the specific recall prime utilized was adapted from Karremans et al (2005). In this context, participants were asked to recall and write about a time they experienced a severe transgression at the hand of a close other that they forgave (forgiveness condition). In a control condition, participants were asked to recall a recent everyday interaction they had with another person. The final condition – the unforgiveness condition – differed across the pilot and primary studies. In the pilot studies, participants were asked to recall a time they took revenge against another person. This operationalization of forgiveness was chosen on the basis of predominating theory and measurement in the forgiveness literature, which conceptualizes unforgiveness primarily as revenge (e.g. McCullough et al, 1997; 1998). However, for reasons that will be discussed later in this chapter, an operationalization of unforgiveness as simply “not

forgiving” an offender was ultimately adopted for the primary studies. The three primes used in the primary studies, along with the revenge prime, are presented in full in Table 3.

Insert Table 3

Creativity as Breaking From Established Heuristics

As previously reviewed, creativity can be operationalized in a number of ways, including but not limited to manager ratings of employees (Zhou, 2003), archived data on creative products (e.g. patent applications), and performance on laboratory tasks (De Dreu et al, 2008; Maddux & Galinsky, 2009). In this project I focus on laboratory measures of creativity, with the goal of selecting and utilizing several different laboratory measures to establish convergent validity for the effects of forgiveness. Such an approach is prototypical in the creativity literature and enhances the confidence with which found effects can be considered robust. Each laboratory measure of creativity entails certain advantages and disadvantages. Some tasks, such as the alien drawing task (Ward, 1994) include objective criteria for creativity (e.g. sensory atypicalities) but lack face validity when implications for organizations are discussed. Other tasks such as the alternative uses task (Torrance, 1962) more closely resemble creative processes that occur within organizational contexts.

For the reasons outlined above, Pilot Study 1 utilized an alternative uses task while Pilot Study 2 utilized a creative drawing task. These two tasks were also utilized in the first two primary studies. In Primary Study 3, further objectivity was added to the

criterion space through the utilization of a creative problem solving exercise with a single clear solution – the Dunker Candle Task (1945).

Inter-rater reliability was established for both the alternative uses and creative drawing tasks in similar ways. Three coders – the author and two research assistants – independently coded all participant data. The research assistants were trained by the author with a set of approximately 50 practice responses to both tasks. Discrepancies were resolved as they arose to ensure that the raters assessed responses similarly. Raters' responses were averaged across the three coders for all outcomes of interest. Reliability ratings always exceeded .80 for all pilot and primary data; specific reliability scores are reported for all outcome variables in the primary studies.

Pilot Study 1

One hundred thirty-two undergraduate students participated in the first pilot study in exchange for course credit or \$5. Participants completed the forgiveness prime as outlined in Table 3. Then, participants were asked to “think up as many creative uses for a tin can as possible” in five minutes (Torrance, 1962). The study was thus established as a three condition experimental design, with the independent variable manipulated between participants. Participants' responses to the creativity task were coded for novelty – a sign that a broad domain set is utilized during the creative process – and fluency – a sign of persistence. Thus, the task assesses not just the total number of ideas put forth but also their quality.

Manipulation Check. Participants responded to a single item to assess differences in forgiveness across the forgiveness and revenge conditions, “I have forgiven my offender” (1 = *Strongly Disagree*, 5 = *Strongly Agree*). The item indicated no

significant differences in forgiveness across the forgiveness and revenge conditions, $p > .05$.

Novelty. Participants' responses were first coded for novelty. With each response, two independent coders rated the degree to which the use of the can was "creative and novel." A one-way ANOVA confirmed a significant effect of experimental condition on novelty, [$f(2,132) = 5.85, p = .004, \eta^2 = .083$]. Post-hoc t-tests indicated that participants in the forgiveness condition [$M = 1.96, SD = .42$] generated ideas that were significantly more creative than participants in the revenge condition [$M = 1.74, SD = .46$]. As expected, the forgiveness and control conditions did not differ, supporting the conceptualization of forgiveness as a restorative process.

Fluency. Fluency was assessed as the number of individual uses developed for the can. A one-way ANOVA indicated that the effect of experimental condition on fluency was non-significant across conditions, [$f(1, 132) = .56, p = .575$]. Thus, while participants in the forgiveness condition provided more novel uses for the tin can than participants in the revenge and control conditions, they did not provide more uses overall.

Pilot Study 2

Ninety-six undergraduate students at a large Mid-Atlantic University participated in the second pilot study in exchange for course credit. Forgiveness was primed via the recall manipulation previously explained (Karremans et al, 2005). As the measure of creativity, participants were asked to draw an alien creature. The procedure was adapted from Ward (1994). Participants were asked to imagine travelling to another galaxy and visiting a planet there. Then, they were asked to imagine an encounter with an alien on

that planet, and to draw the alien they encountered. As in Pilot Study 1, a three condition experimental design was therefore established.

Participants responded to a single item to assess differences in forgiveness across the forgiveness and revenge conditions, “I have forgiven my offender” (1 = *Strongly Disagree*, 5 = *Strongly Agree*). The item indicated no significant differences in forgiveness across the forgiveness and revenge conditions, $p > .05$.

To assess the impact of forgiveness versus revenge on the overall creativity of participants’ alien drawings, creativity was submitted to a one-way ANOVA. Results confirmed a significant main effect of experimental condition, [$f(2, 94) = 3.49, p = .025, \eta^2 = .075$]. Post-hoc t-tests indicated that participants in the forgiveness condition [$M = 3.14, SD = 1.20$] drew more creative aliens than participants in the revenge condition [$M = 2.35, SD = 1.09$]. As expected, the forgiveness and control conditions did not differ.

A one-way ANOVA was likewise conducted to estimate the impact of experimental condition on the similarity of participants’ drawings to Earth creatures. Results again confirmed a main effect for the forgiveness prime, [$f(2,94) = 3.86, p = .025, \eta^2 = .076$]. Post-hoc t-tests indicated that participants who recalled forgiveness [$M = 3.05, SD = 1.08$] drew aliens that were less similar to Earth creatures than participants in the revenge condition [$M = 3.74, SD = .92$]. The forgiveness and control conditions again did not differ.

The final dependent variable of interest was sensory atypicalities. A one-way ANOVA showed that the experimental condition significantly impacted the number of atypicalities drawn, [$f(2, 94) = 3.49, p = .032, \eta^2 = .072$]. Participants in the forgiveness condition [$M = 1.23, SD = 1.29$] drew nearly twice as many atypicalities than participants

in the revenge condition [$M = .64$, $SD = .70$]. No differences between the forgiveness and control conditions were found. Overall, the results support the hypothesis that forgiveness, compared to revenge, facilitates creativity. Participants in the forgiveness condition exhibited greater overall creativity, drew aliens that were less similar to Earth creatures, and drew aliens with a greater number of sensory atypicalities than participants in the revenge condition.

Discussion of Pilot Studies

Two pilot studies were conducted to confirm the appropriateness of the Karremans et al (2005) priming procedure and two initial dependent variables that require broad domain set for successful completion. The priming studies were generally successful, although two key changes differentiate the pilot studies from the three primary studies to be discussed in the next chapter.

One important difference between the pilot studies and the primary studies is the operationalization of unforgiveness in the recall prime. In pilot studies 1 and 2, unforgiveness was operationalized as revenge. The use of revenge as a construct inversely related to forgiveness is grounded in theory and measurement within the forgiveness literature, which modally assesses forgiveness via victims' motivations to avoid and/or take revenge against their offenders (McCullough et al, 1998). However, manipulation checks revealed a nonsignificant difference across conditions in forgiveness. Review of participants' recall narratives suggested a tendency for participants in the revenge condition to recall events they later forgave. Furthermore, the revenge incidents tended to be less significant events in participants' lives than the

forgiveness incidents. Therefore, in the primary studies participants were asked to recall events they had not forgiven rather than events after which they had enacted revenge.

A second important difference between the pilot studies and the three primary studies is the assessment of the three meditational frameworks for the forgiveness-creativity link. Mood is assessed as a mediator via an adapted version of the PANAS scale (Baas et al, 2008) in Studies 1-3. Motivation is assessed as a mediator via measures of task efficacy, task interest, and perceived task choice (Studies 2 and 3). Cognitive resource enhancement as a mediator is assessed via a cognitive load manipulation (Study 3).

CHAPTER 6. STUDY 1: FORGIVENESS AND CREATIVE BRAINSTORMING

The purpose of Study 1 was to provide initial evidence that forgiveness broadens the domain sets individuals use during creative task performance, resulting in performance levels that resemble those of control participants. Toward these ends, the alternative uses task (Torrance, 1962) – a type of brainstorming exercise – was utilized. Brainstorming is a common and useful organizational process with far-ranging consequences. It can improve company profits, help businesses manage client perceptions of their innovation practices, and facilitate organizational memory (Sutton & Hargadon, 1996). Of course the single most important consequence and goal of brainstorming is the development of new and useful ideas (Litchfield, 2008), whether manifested as an individual or group activity. Countless studies have utilized brainstorming to study creativity among individuals and groups (Choi & Thompson, 2005; De Dreu et al, 2008; Pearsall et al, 2008). The alternative uses task specifically requires participants to consider creative uses for a common everyday object and has likewise been used across a range of contexts (e.g., Csikszentmihalyi, 1975; Eisenberger & Armeli, 1997; Guilford, 1967; Silvia & Phillips, 2004; Szymanski & Harkins, 1992; Torrance, 1962; De Vet & De Dreu, 2007).

A unique advantage of the brainstorming paradigm is the ability for researchers to delineate participants' creative performance in terms of both persistence and domain set. First, persistence is indicated by idea fluency – the total number of ideas an individual or group produces during brainstorming. Second, domain set is indicated by idea novelty – the average creativity of participants' ideas as determined by consensual assessment. The two measures need not be correlated. An individual could come up with two highly novel

ideas or ten rather mundane ideas. Several studies have examined novelty and fluency scores to explore the processes underlying the impact of individual differences (Rietzschel et al, 2007), mood (De Dreu et al, 2008), and task instructions (De Vet & De Dreu, 2007) on creative performance.

In this study participants were specifically asked to come up with creative uses for a tin can. The tin can is a common variant of the alternative uses task. Others include the utilization of a brick, a knife, and a book. The task requires creativity because participants must break from established heuristics and consider what, aside from its prototypical uses (e.g. to hold food) a tin can might be used for (Torrance, 1962).

Methods

Participants and Design

83 undergraduate students at a large Midatlantic University participated in the study in exchange for course credit. The mean age of participants was 20.30; ages ranged from 18 to 40. 58% of participants were female and 42% were male. 87.7% of participants listed English as their first language. 65.4% of participants were Caucasian, 13.6% were African American, 9.9% were Asian American. The remaining 11.1% listed other ethnicities. Participants were randomly assigned to one of three experimental conditions – the forgiveness prime, the unforgiveness prime, or a control prime.

Materials and Procedure

Participants completed the study in a laboratory setting. Participants were seated in individual rooms or around a table in small groups of 2-3 people. The informed consent form indicated that the individuals would be participating in a series of problem solving tasks. Neither creativity nor forgiveness were explicitly mentioned on the

informed consent form. After completing the form, participants handed the informed consent form to the experimenter. Informed consent forms were kept separately from participants' data to ensure anonymity. All participants received course credit in exchange for completing the experiment.

The study began after participants handed their informed consent forms to the experimenter. The experimenter told each participant that they would be “completing a few different tasks” for the experiment, and that each task would vary somewhat from the next. Again, neither forgiveness nor creativity were explicitly mentioned. At this point, participants were informed that some of the tasks would be timed. The experimenters carried small, nondescript timers with them. The timed nature of the tasks was not overemphasized, so as to avoid feelings of time pressure that might have unduly influenced creative performance (Chirumbolo et al, 2004). That said, all participants were given the same amount of time for each task, and so perceived time pressure could be expected to average out across participants.

The first task was the forgiveness prime. Participants were randomly assigned to one of the three experimental conditions. In the forgiveness condition, participants were asked to recall a recent conflict that they had forgiven. In the unforgiveness condition, participants were asked to recall a recent conflict that they had not yet forgiven. In the control condition, participants were asked to recall a recent everyday interaction. Each set of instructions then asked the participant to write down their recollections of the event. In the forgiveness and unforgiveness conditions it was specified that participants should recall a severe event. The purpose of this restriction was to ensure that participants recalled meaningful rather than trivial events. Participants were given eight minutes to

finish the task. To ensure a consistent level of rumination over the recalled events, participants were furthermore instructed to remain seated with the stimulus materials for the entirety of the eight minutes.

Immediately after completing the forgiveness prime, participants were asked to complete the “tin can” task – a variation on Torrence’s (1945) alternative uses task wherein participants are asked to think of multiple uses for a common object (e.g. a brick or paperclip). In this study, participants were specifically instructed to “List as many creative uses for a tin can as you can think of.” Five minutes were allotted for the task. After completing the alternative uses task participants were asked to report their current mood states and fill out several demographic items.

Mood measures: Positive, negative, and activating. Six items adapted from Baas et al (2008) assessed victims’ positive mood states: calm, serene, relaxed, happy, upbeat, and elated ($\alpha=.63$). Nine items adapted from Baas et al (2008) assessed victims’ negative mood states: sad, discouraged, disappointed, uneasy, tense, fear, disgust, angry and frustrated ($\alpha=.78$). A third scale assessed only those positive mood states that were also activating (happy, upbeat, and elated; $\alpha=.63$). In lieu of theory on forgiveness’s effects depending upon the activation level of negative mood states, no distinctions were made. However, exploratory analyses yielded no unique findings from such differentiations in Studies 1, 2, or 3. For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Forgiveness, harm severity, and closeness. A single item, “I have forgiven my offender”, served as a manipulation check. Individual items also assessed the severity of harm incurred (I would describe the consequences of what happened to me as severe) and

current closeness to the offender (I currently share a close relationship with the person who offended me). For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Results

Descriptive Statistics and Manipulation Checks

Means, standard deviations, and bivariate correlations for all study variables are presented in Table 4. Independent samples t-tests were conducted to (a) ensure that participants in the forgiveness condition reported greater levels of forgiveness than participants in the unforgiveness condition, and (b) assess group differences in harm severity, post-offense relationship closeness, and revenge. Participants in the forgiveness condition indicated forgiving their offenders [$M = 3.96$, $SD = 1.02$] to a greater degree than participants in the unforgiveness condition [$M = 2.69$, $SD = 1.09$, $t(51) = -4.39$, $p < .001$]. There were no significant differences between groups regarding the severity of the events recalled [$t(51) = .10$, $p = .920$] or the amount of revenge taken [$t(51) = -1.33$, $p = .189$]. Participants in the forgiveness condition did, however, report currently sharing a closer relationship with their offenders [$M = 3.48$, $SD = 1.37$] than participants in the unforgiveness condition [$M = 1.92$, $SD = 1.26$; $t(51) = -4.30$, $p < .001$]. Since the control condition simply asked participants to recall a recent everyday interaction, none of the manipulation check variables were assessed for this group.

To allay concerns over potentially confounding demographic issues, participants' age, gender, ethnicity, and first language were assessed in relation to both the experimental condition and the two creativity DVs. Demographics were uncorrelated with the experimental condition. Age was associated with creative fluency [$r(81) = .35$, p

= .001], indicating that older participants generally offered more uses for the tin can. No other demographic differences with respect to creative fluency or novelty were found.

Insert Table 4

Tin Can Coding Procedure

Three independent coders, blind to the experimental conditions, rated participants' responses for both fluency and novelty. Fluency was objectively defined as the number of ideas put forth by each participant. Novelty was defined as the average level of creativity reflected by participants' responses. The two measures are quite distinct. For instance, one participant might record ten commonplace ideas (to hold coins, to use as a cup, to store food, etc.) while another participant might record two highly creative ideas (as a steamroller for a toy construction vehicle; as a planetarium, inverted with holes poked out and a light underneath).

As in past laboratory-based creativity tasks, consensual assessment was utilized for the coding procedure (Amabile, 1996). Before coding the study data, the coders reviewed pilot data to establish the fluency count procedure and review discrepancies in perceptions of participants' response novelty. In the final data set, 100% agreement was found for participants' fluency scores, as could be expected given the highly objective nature of the coded criterion. A reliability of .98 was recorded for participant novelty ratings, and so the three coders' novelty ratings were averaged to create an overall novelty score. Examples of items deemed uncreative, moderately creative, and highly creative by the coders are provided in Table 5.

Insert Table 5

Main Effects Analyses

Forgiveness and idea novelty. An overall ANOVA indicated a significant main effect for condition on participants' creative novelty, [$f(2,80) = 3.35, p = .040, \eta^2 = .079$]. Post-hoc independent samples t-tests indicated that participants in the unforgiveness condition [$M = 1.82, SD = .40$] provided uses that were significantly less creative than participants in the forgiveness condition [$M = 2.16, SD = .53; t(52) = -2.65, p = .011$] and marginally less creative than participants in the control condition [$M = 2.03, SD = .52; t(52) = -1.68, p = .099$]. The forgiveness and control conditions did not differ [$t(52) = -.89, p = .378$], consistent with the hypothesis.

Forgiveness and idea fluency. A second overall ANOVA was conducted to assess the impact of experimental condition on idea fluency. The effect was not significant, [$f(2,80) = .723, p = .489$]. The results indicate that forgiveness leads to greater idea novelty, but not greater idea fluency.

Mood As a Mediating Mechanism

Research question 1 indicated that mood might mediate the forgiveness-creativity relationship. There was a significant difference between conditions for positive mood, [$f(2,80) = 3.88, p = .025$]. Participants in the forgiveness condition [$M = 2.67, SD = .60$] were in a significantly *less* positive mood than participants in the unforgiveness condition [$M = 3.19, SD = .85; t(52) = 2.59, p = .012$] and the control condition [$M = 3.13, SD = 2.94; t(52) = 2.45, p = .018$]. However, positive mood was uncorrelated with creative fluency [$r(81) = .10, p = .358$] or creative novelty [$r(81) = -.04, p = .706$]. Therefore, the

test for mediation was not conducted. No other associations were found between mood and the experimental condition or outcome variables.

Study 1 Discussion

The results from Study 1 provide initial evidence for the forgiveness-creativity link, supporting Hypothesis 1. As theorized, forgiveness facilitated creative task performance. The effects were limited to domain set as hypothesized. Participants displayed enhanced idea novelty (average idea creativity), but did not display enhanced idea fluency (number of ideas put forth). Mood did not mediate the effects of forgiveness on creativity. Thus, initial evidence suggests a negative response to Research question 1. In Study 2 I provide convergent validation of the forgiveness-creativity effect with a different creativity task. I test both mood and motivation as potential mediating mechanisms.

CHAPTER 7. STUDY 2: FORGIVENESS AND CREATIVE DRAWING

Study 2 served as a conceptual replication and extension of Study 1. As a measure of creativity, participants were given a creative drawing task adapted from Ward (1994). Participants were specifically given the following instructions: “Imagine going to another galaxy in the universe and visiting a planet very different from earth. On your trip, you discover a creature that is local to this planet. In the space below, draw the creature that you encounter.” The task is derived from previous research on exemplar generation. It is structured to measure creativity by requiring participants to intentionally deviate from known exemplars (e.g. humans; animals) and develop an entirely novel life form. The drawings are typically rated for overall creativity and deviation from known exemplars – for example, deviation from the types of sensory arrangements typically found in humans and other mammals (Maddux & Galinsky, 2009).

Ward (1994) established the flexibility and utility of the alien drawing task. It is susceptible to situational primes (e.g. the specific instructions provided; Ward, 1994) and able to be reliably coded by independent raters (Kozbelt & Durmysheva, 2007). Previous research has utilized the task as a criterion across a broad range of studies, including assessments of creativity and power (Galinsky et al, 2008), creativity and international experience (Maddux & Galinsky, 2009), and creativity and personality (Rietzschel, De Dreu, & Nijstad, 2007).

Methods

Participants and Design

Fifty-two undergraduate students at a large Mid-Atlantic University participated in the study in exchange for course credit. 72.5% percent of participants were female, and

27.5% were male. 78.4% of participants indicated that English was their first language. 63.3% of participants were Caucasian, 20.4% Asian or Asian American, and 8.2% African or African American. The average age of participants was 19.55. Participants were randomly assigned to one of three experimental conditions: forgiveness, unforgiveness, or control.

Materials and Procedure

Participants were first presented with the forgiveness prime, identical to the Study 1 procedure. Following Karremans et al (2005), participants were asked to recall a serious transgression from a close other that they have forgiven (forgiveness condition), a serious transgression from a close other that they have not forgiven (unforgiveness condition), or a recent everyday interaction (control condition). They were subsequently given eight minutes to write about the recalled event.

After administration of the forgiveness prime, participants were given the alien drawing task as already described (Ward, 1994). Participants were given five minutes to complete the drawing task. As with the prime, participants were instructed to remain seated with the stimulus materials for the entirety of the five minutes. Upon completion of the creativity exercise participants filled out measures of the key mediating mechanisms along with several control variables. Measures included mood, task interest, perceived task choice, and task efficacy among others discussed in the measures section. Participants then completed several unrelated tasks and were debriefed. No students indicated suspicion regarding the key hypothesis.

Mood measures: Positive, negative, and activating. Mood was again assessed with a modified version of the PANAS (Baas et al, 2008) and delineated across three

subscales. The first two scales assessed positive and negative mood states; the final scale examined positive moods that were also activating. For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Motivation measures: Task choice, task interest, and task efficacy. Seven items assessed perceived task choice. A sample item is “I believe I had some choice about doing the task” ($\alpha=.88$). Seven items assessed task interest. An example item is “I thought the task was quite enjoyable” ($\alpha=.93$). Six items measured participants’ feelings of task efficacy, e.g. “I am satisfied with my performance on the task” ($\alpha=.90$). The items were developed by Ryan, Koestner, and Deci (1991). For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Forgiveness, harm severity, and closeness. A single item, “I have forgiven my offender”, served as a manipulation check. Individual items also assessed the severity of harm incurred (I would describe the consequences of what happened to me as severe) and current closeness to the offender (I currently share a close relationship with the person who offended me). For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Results

Descriptive Statistics and Manipulation Checks

Means, standard deviations, and bivariate correlations for all study variables are presented in Table 6. ANOVAs and chi-square tests were conducted to ensure that the experimental conditions did not differ according to gender, age, or language ability. No differences across groups were found. Furthermore, the correlation table indicated no significant associations between the demographic variables and participant creativity.

A manipulation check confirmed that participants in the forgiveness condition indicated more forgiveness of their offenders [$M = 4.44$, $SD = .71$] than participants in the unforgiveness condition [$M = 2.33$, $SD = 1.14$; $t(34) = 8.02$, $p < .001$]. No differences in revenge were found between the two conditions [$t(33) = -.05$, $p = .96$], highlighting the distinctiveness of forgiveness from revenge. No differences in the severity of the recalled offenses were reported [$t(33) = -.05$, $p = .962$]. As might be expected, participants did report a greater level of current closeness to offenders they had forgiven [$M = 4.00$, $SD = 1.46$] than to offenders they had not forgiven [$M = 2.22$, $SD = 1.52$; $t(34) = .463$, $p = .001$]. None of the manipulation checks were measured among control participants, since the control task did not involve the recollection of conflict.

Insert Table 6

Alien Coding Procedure

Three independent raters, blind to the experimental conditions, coded participants' alien drawings. In accordance with Ward's (1994) recommended procedures and recent parallel methodologies (Maddux & Galinsky, 2009), the drawings were coded along three dimensions: sensory features, similarity to earth creatures, and overall creativity. Before coding the study data, the coders reviewed a set of pilot drawings to develop baseline assessments of creativity and discuss significant discrepancies in creativity perceptions.

To assess the aliens' sensory features, coders were asked to provide yes/no responses to five different questions: (a) is the alien missing any major sensory organ (eyes, nose, or mouth)? (b) does the alien have an unusual number of sensory organs (e.g.

three eyes or two mouths)? (c) does the alien have an unusual configuration of sensory organs (e.g. mouth above the eyes)? (d) does one of this alien's sensory organs have an unusual or exaggerated ability (e.g. eyes as laser beams)? and (e) Does one of this alien's sensory organs serve an unusual purpose (e.g. ears for protection)? Coders' responses to these questions were summed for an overall "sensory features rating" for each coder. Reliability of the three coders' summed ratings was sufficient, $\alpha=.88$ and so the three coders' ratings were averaged to create an overall sensory feature score for each participant, with higher numbers indicating a greater number of sensory atypicalities.

Aliens' similarities to earth creatures were assessed with three Likert items measured along a five point scale ($1 = not\ at\ all\ similar; 5 = very\ similar$). Items were worded as follows: "How similar is this alien to Earth creatures?", "To what extent did participants seem to take known Earth creatures into account when making this drawing?", and "To what extent did participants seem to take general Earth animals into account when making this drawing?" Reliabilities among the three items for individual raters were high (alphas between .93 and .99). Averaged ratings among the three coders were likewise reliable ($\alpha=.83$). The three coders' ratings were therefore averaged to create an overall similarity rating for each coded alien.

The final item asked the raters to answer the question, "Overall, how creative is this drawing of an alien?" ($1 = not\ at\ all\ creative; 5 = very\ creative$). Ratings between coders were sufficiently reliable ($\alpha=.85$) and were consequently averaged to create an overall creativity score for each alien. Examples of aliens deemed uncreative and highly creative are provided in Figure 2.

Insert Figure 2

Main Effects Analyses

Forgiveness and sensory atypicalities. A one-way ANOVA was conducted to examine the effect of the forgiveness prime on the sensory atypicalities drawn by participants. The overall ANOVA was significant [$f(2,50) = 4.12, p = .022, \eta^2 = .17$]. Post-hoc t-tests assessed differences between the three conditions. As hypothesized, participants in the unforgiveness condition [$M = .39, SD = .64$] drew significantly fewer sensory atypicalities than participants in the forgiveness condition [$M = 1.11, SD = .82; t(33) = -2.87, p = .007$] or the control condition [$M = .94; SD = .83; t(31) = -2.13, p = .041$]. No differences were found between the forgiveness and control conditions [$t(32) = .98, p = .545$], consistent with the hypotheses.

Forgiveness and dissimilarity to Earth creatures. Next, the impact of the forgiveness condition on the similarity of participants' aliens to earth creatures was assessed. A one-way ANOVA was again conducted for this purpose. The overall ANOVA was again significant, [$f(2,50) = 4.43, p = .017, \eta^2 = .16$]. Post-hoc t-tests assessed differences between the three conditions. Participants in the unforgiveness condition [$M = 3.93, SD = 1.16$] drew aliens that were significantly more similar to Earth creatures than participants in the forgiveness condition [$M = 3.06, SD = .50; t(33) = 2.91, p = .006$] or the control condition [$M = 3.12, SD = .1.09; t(31) = 2.07, p = .047$]. No differences in similarity were observed between the forgiveness and control conditions [$t(32) = -.20, p = .845$], as expected given the conceptualization of forgiveness as a restorative process.

Forgiveness and overall creativity. A final one-way ANOVA was conducted to assess the impact of forgiveness on overall alien creativity. The overall ANOVA was significant, [$f(2,50) = 4.77, p = .013, \eta^2 = .17$]. Post-hoc t-tests assessed differences between the three conditions. Participants in the unforgiveness condition [$M = 2.14, SD = 1.20$] drew aliens rated as less creative than those produced by participants in the forgiveness [$M = 3.07, SD = .53; t(33) = 3.02, p = .005$] and control [$M = 3.06, SD = 1.21; t(31) = 2.21, p = .035$] conditions. No differences in creativity were observed between the forgiveness and control conditions [$t(32) = -.04, p = .971$] as expected.

Insert Figures 3a-3c

Mediation Analyses: Mood, Motivation, or Neither?

In addition to providing initial evidence for the link between forgiveness and creativity, Study 2 afforded the opportunity to test the mediational frameworks of affect and motivation. The first mediational framework suggested that forgiveness would impact creativity via hedonic tone – specifically, an induction of positive mood, a reduction in negative mood, or more narrowly an induction of positive, activating, and promotion-focused moods. Following the methods of Baron and Kenny (1986) and more recent methodological work (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002) mediation requires that the mediator relate to both the independent and dependent variables. The first mood mediator requires that positive moods correlate positively with both the forgiveness prime and creativity. The second mood mediator requires that negative moods correlate negatively with both forgiveness and creativity. The final mood mediator requires that positive, activating moods correlate positively with both

forgiveness and creativity. However, none of these requirements were met in Study 2. The results thus converge with Study 1 and suggest that mood does not mediate the forgiveness-creativity link.

Research questions 2a and 2b posited three motivational mechanisms to mediate the forgiveness-creativity link including task efficacy, interest, and choice. Again, the test for mediation includes as a prerequisite links between these mechanisms and both forgiveness and creativity. The data indicated that forgiveness significantly predicted task interest. However, none of the mechanisms were significantly related to creative performance, and so the motivational perspective was not supported.

Study 2 Discussion

Results from Study 2 replicate and extend the Study 1 findings. Hypothesis 1 was once again supported. Participants primed with forgiveness via a recall task drew aliens that were less similar to Earth creatures and generally more creative than participants primed with unforgiveness. In addition, participants primed with forgiveness drew more than twice as many sensory atypicalities (e.g. three eyes; mouths positioned above the nose) as participants primed with unforgiveness. Post-hoc mean comparisons suggest that forgiveness produces pre-conflict levels of creative performance. The mood perspective was once again not supported. Positive mood, negative mood, and positive activating mood did not mediate the forgiveness-creativity link. The motivation perspective likewise was not supported. Task efficacy, task interest, and task choice did not mediate the effects of forgiveness on creativity.

CHAPTER 8. STUDY 3: FORGIVENESS AND CREATIVE PROBLEM SOLVING UNDER COGNITIVE LOAD

The primary purpose of Study 3 was to further explore the theory that forgiveness facilitates creativity via the enhancement of victims' depleted cognitive resources. A secondary purpose was to explore the effects of forgiveness on a third measure of creativity – the Duncker candle task. Mood and motivation were again measured as potential mediating mechanisms.

The Duncker candle task is a commonly used and validated measure of creative problem solving. Participants are shown a candle, a box of tacks, and a book of matches and asked to affix the candle to a bulletin board wall so that no wax drips on the table. The proper solution requires participants to use the box holding the tacks as a candleholder (Dunker, 1945). Participants must therefore overcome functional fixedness to solve the problem. Other solutions – such as directly tacking the candle to the wall or tacking the matchbook to hold the candle to the wall – are suboptimal solutions to the problem. Solutions are coded dichotomously as either correct or incorrect (e.g. Maddux & Galinsky, 2009).

To manipulate cognitive load, participants were given a nine digit number (854917632) and instructed to spend 30 seconds committing the number to memory. They were subsequently given 5 minutes to complete the Duncker candle task and asked to write down the number after the five minutes had passed. Participants were considered to have attended to the manipulation if they correctly recalled at least four of the numbers.

Methods

Participants and Design

A total of 100 undergraduate students at a large Midatlantic University participated in the study in exchange for course credit. Nine students were excluded from the study for indicating that they had previously seen the candle task (N=5), failing the cognitive load manipulation (N=2), or failing to follow the instructions (N=2). The remaining sample consisted of 91 participants. 58.2% of participants were women, 39.6% were men, and 2.2% did not report their gender. 62.6% were Caucasian, 14.3% were African American, 9.9% were Asian American, 6.6% were Hispanic, 4.4% reported other ethnicities and 2.2% did not report their ethnicity. The average age of participants was 19.54, and the majority (89%) reported that English was their first language.

Materials and Procedure

As in Studies 1 and 2, participants completed this study in individual rooms or small groups. Participants were given eight minutes to complete the forgiveness prime. Participants were also randomly assigned to either a cognitive load condition or no cognitive load. In the cognitive load condition, participants were given 30 seconds to remember a nine digit number. Participants were then given 5 minutes to complete the Duncker candle task. Participants subsequently completed measures of mood, motivation, and control variables.

Mood. Participants completed the same mood scale as in Studies 1 and 2. For positive affect, $\alpha=.83$. For negative affect, $\alpha=.83$. For positive, activating moods, $\alpha=.79$. For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Motivation. Motivation measures were identical to those from Study 2. For task interest, $\alpha = .94$ For task choice, $\alpha = .77$ For task efficacy, $\alpha = .84$. For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Forgiveness, harm severity, and closeness. A single item, “I have forgiven my offender”, was used as a manipulation check. Identical items from Studies 1 and 2 also assessed the severity of harm incurred (I would describe the consequences of what happened to me as severe) and current relationship closeness with the offender (I currently share a close relationship with the person who offended me). For all items, 1 = *Strongly Disagree*; 5 = *Strongly Agree*.

Results

Descriptive Statistics and Manipulation Checks

Means, standard deviations, and bivariate correlations for all study variables are presented in Table 7. The manipulation check confirmed a main effect of forgiveness. Participants in the forgiveness condition indicated greater forgiveness of their offenders [$M = 4.47$, $SD = .82$] than participants in the unforgiveness condition [$M = 2.10$, $SD = 1.09$; $t(58) = -9.49$, $p < .001$]. Participants in the forgiveness condition also reported greater closeness to their offenders [$M = 4.10$, $SD = 1.40$] than participants in the unforgiveness condition [$M = 2.43$, $SD = 1.41$; $t(58) = -4.60$, $p < .001$] and reported offenses significantly less severe [$M = 2.40$, $SD = 1.28$] than participants in the unforgiveness condition [$M = 3.10$, $SD = .92$, $t(58) = 2.44$, $p = .018$]. Control participants did not respond to the manipulation check items. Across conditions, 29.7% of participants correctly solved the candle task, indicated by participants who attached the

tack box to the wall and used it as a candleholder (Duncker, 1945; Maddux & Galinsky, 2009).

Logistic regression analyses indicated no impact of age on performance on the Duncker candle task. A chi square analysis indicated that men were more likely to solve the task than women, [$\chi^2(1) = 5.69, p = .017$]. There were no demographic differences across the experimental conditions.

Insert Table 7

Main Effects and Interaction Analyses

Results were computed with hierarchical logistic regression and post-hoc chi square analyses. The main effect for the control dummy variable was significant [Wald = 7.17, $p = .007$]. The main effect for the forgiveness dummy variable was nonsignificant, [Wald = 1.14, $p = .286$]. The main effect of cognitive load was significant [Wald = 7.40, $p = .007$]. These data indicate that cognitive load inhibits creative performance across forgiveness conditions while the control prime facilitates creative performance across cognitive load conditions. Of particular interest to the cognitive resource theory of forgiveness, however, are the interaction effects.

Significant interaction effects were found for both the forgiveness [Wald = 4.04, $p = .045$] and control [Wald = 3.97, $p = .046$] dummy codes. The nature of these interactions is elucidated in Figure 4. Among participants who did not experience cognitive load, results replicated the findings from Studies 1 and 2. The overall model was significant [$\chi^2(2) = 11.75, p = .003$]. Participants in the unforgiveness condition were less likely to solve the task correctly than participants in the forgiveness [$\chi^2(1) =$

4.39, $p = .036$] and control [$\chi^2 (1) = 10.80, p = .001$] conditions. There was no significant difference between the forgiveness and control conditions [$\chi^2 (1) = 1.83, p = .176$], as hypothesized. Among participants who experienced cognitive load, there were conversely no differences across groups [$\chi^2 (2) = 2.15, p = .341$], consistent with the resource depletion hypothesis.

Insert Figure 4

Mood and Motivation As Mediating Mechanisms

In this study, mood was again ruled out as a mediating mechanism. The interaction between forgiveness and cognitive load failed to predict victims' positive mood states, negative mood states, or positive activating mood states ($ps > .05$). Furthermore, there was no association between victims' mood states and performance on the candle task.

As in Study 2, measures of task interest, perceived task choice, and self-efficacy failed to mediate the effects of forgiveness on creativity. Task interest was related to performance on the candle task, [Wald = 4.063, $p = .044$]. However, the interaction between forgiveness and cognitive load did not predict any of the motivation variables.

Study 3 Discussion

The results from Study 3 confirm and extend the findings from Studies 1 and 2. First, the impact of forgiveness on creativity was extended to a third creative context – creative problem solving. This represents an important extension of the previous findings in demonstrating that forgiveness facilitates a highly objective creative problem solving

task with a single, clear solution. Mood and motivation were again shown not to mediate the found effects.

The most significant advantage of Study 3, however, was to demonstrate support for the cognitive resource model of forgiveness and creativity. Whereas the results from Studies 1 and 2 were essentially replicated under conditions of no cognitive load, the effects disappeared when cognitive load was introduced. The results suggest that forgiveness impacts creativity through online, conscious processes. Consistent with threat-rigidity models of conflict and creativity, unforgiveness narrows participants' perspectives. Forgiveness in turn reduces these effects.

CHAPTER SIX: DISCUSSION

Archbishop Desmond Tutu once wrote that “without forgiveness, there is no future” (Tutu, 2000). Anecdotal evidence certainly suggests that forgiveness is a powerful social force. History is replete with examples of individuals seeking forgiveness as a means to resolve conflict and move forward, from former child soldiers in Uganda and relatives of the 9/11 victims to consumers of defective cars and employees with unfriendly bosses. Yet empirical research has not kept pace with society’s emphasis on the concept. Given the fervor with which forgiveness is sought, it is important to understand what the precise consequences of forgiveness and unforgiveness are likely to be. Previous research had confirmed many of society’s intuitive notions on the restorative effects of forgiveness. Forgiveness has been shown to foster positive affect and enhance victim self-esteem (Karremans et al, 2003), to reduce victims’ blood pressure and stress levels (Witvliet et al, 2001), and to restore cooperation and communication in marriage (Fincham et al, 2002). It has even been shown to produce prosocial spillover effects, leading victims to feel more related to other people in general and volunteer more often for charitable causes (Karremans et al, 2005).

What else does forgiveness do? The antecedents of forgiveness are broad and varied. As a psychological construct, forgiveness is impacted by a wide range of cognitions, affectivities, and constraints (Fehr et al, in press). Multiple theoretical perspectives underlie these effects, from sensemaking (Weick, 1995) and attributional theories (Weiner, 1995) to mood-as-input (Clore et al, 1994; Martin et al, 1993; Schwarz & Clore, 1988) and embeddedness (Mitchell et al, 2001). It has been demonstrated that forgiveness is at once an effortful process requiring self-regulation and executive control

(Pronk et al, 2010) and an automatic process that can occur subconsciously (Karremans & Aarts, 2007). Yet the consequences of forgiveness remain surprisingly narrow. Is it possible for a phenomenon with such a complex array of antecedents to yield such a limited set of consequences?

The purpose of the current research was to look beyond the intuitive, assumed, and intended consequences of forgiveness to consider its unintuitive, unassumed, and unintended consequences. Toward these ends, forgiveness was theorized to impact victims' creative performance, such that victims who forgive exhibit pre-conflict levels of creativity. First and foremost, this hypothesis presumes that forgiveness can exhibit spillover effects beyond the victim-offender dyad. Previous research has attested to this fact, demonstrating that people who forgive display congruent, prosocial behaviors during subsequent tasks (Karremans et al, 2005). To explore the precise means through which forgiveness impacts creative performance, it was next important to explore the processes that underlie creative achievement. Drawing from the stochastic perspective on creative achievement (Simonton, 1999; 2003), the creative process was traced to two key inputs: domain set and persistence (De Dreu et al, 2008; Fehr, 2009).

The forgiveness-creativity link was proposed to impact creativity through three potential mechanisms. First, forgiveness might impact creativity through victims' affective experiences – specifically, an induction of positive mood, a reduction of negative mood, or an induction of positive moods that are also activating. Second, forgiveness might impact creativity through victims' motivational experiences. As an empowering, transformational experience, forgiveness could be theorized to impact victims' feelings of self-efficacy, choice, and interest with respect to a downstream

creative task. Finally, forgiveness might impact creativity via the cognitive resources that it affords. Whereas unforgiveness depletes victims' cognitive resources under threat-rigidity models of conflict, forgiveness may instead enhance victims' resources.

These research questions were tested across three studies. In Study 1, participants were primed with forgiveness and asked to complete a version of the alternative uses task (Torrence, 1964) by recording creative uses for a tin can. Creative performance was differentiated in accordance with the dual input model, including both creative fluency (a sign of persistence) and creative novelty (a sign of domain set). Mood was assessed via an adapted version of the PANAS. In Study 2, participants were primed with forgiveness and instructed to complete a creative drawing task. Mood was again assessed via an adapted version of the PANAS (Baas et al, 2008); motivation was measured via task self-efficacy, task interest and perceived task choice. In Study 3, the link between forgiveness and creative performance was demonstrated via a creative problem solving task. Both mood and motivation were measured as in Study 1. Furthermore, half of participants were presented with a cognitive load task to assess the theory that forgiveness enhances victims' depleted cognitive resources.

Results conformed to the cognitive resource perspective. Studies 1-3 all confirmed a main effect of forgiveness on creativity, supporting hypothesis 1. Consistent with the presented theory, Study 1 further demonstrated that the effect was due to domain set and not simple task persistence. Studies 1-3 yielded no evidence for mood as a mediating mechanism; Studies 2 and 3 similarly ruled out motivation as a mediator. In Study 3, the effect of forgiveness on creative performance was eliminated under cognitive load, with participants in the forgiveness and control conditions exhibiting

levels of creativity that resembled participants in the unforgiveness condition. Thus, Study 3 suggested that conflict depletes victims' cognitive resources, and that forgiveness enhances those resources to pre-conflict levels.

In the sections below, implications for three areas of research are discussed: conflict, forgiveness, and creativity. This is followed by a final consideration of the practical implications of the presented studies, a review of the studies' limitations, and directions for future research.

Theoretical Implications

Conflict

Research on conflict and creativity has traditionally focused on contexts in which creativity itself takes place. The prototypical study measures or manipulates conflict within teams that attempt to solve creative brainstorming exercises. Studies within these contexts generally show that conflict inhibits team creativity, although curvilinear effects (Baer & Oldham, 2006) and task moderators (De Dreu & Nijstad, 2008) have also been demonstrated. However, the literature is limited in its assumption that conflict only affects creativity when it occurs within the creative context itself. This assumption contradicts the inherently temporal nature of interpersonal interactions, both within and beyond the organization. Every day, individuals experience conflicts large and small that impact their moods, motivations, cognitions, and behaviors. The present research utilized a spillover model of conflict and creativity to explore how victims' post-offense, offender-directed motivations influence their creativity on subsequent, unrelated tasks. It isn't necessary to look very far for examples of such a scenario. An employee might have a fight with her children before heading to a morning meeting; a manager might bear

derision from an angry customer before a strategy session; two coworkers might fight over who should make the coffee before brainstorming new product ideas.

After conflict, it is not unusual for one or more people to feel victimized – to feel that they have experienced an unsolicited offense at the hands of a friend, family member, stranger, or coworker (Aquino & Thau, 2009). Given feelings of victimization, victims are left with several response choices. They can choose to take revenge against the offender, to simply avoid him or her, or to forgive and even reconcile. In recognizing these multiple response choices I draw attention to the role of conflict management techniques in the link between conflict and downstream creative performance.

The importance of integrating conflict management research with scholarship on creativity and conflict itself cannot be overstated. Conflict events are not experienced uniformly across victims and time. Rather, some may respond benevolently and with a shrug; others may ruminate over the event and experience anger (McCullough et al, 2008). Differences in response patterns can be traced to any number of dispositional (agreeableness; neuroticism; depression; empathic concern) or situational (perceived intent; perspective taking; relationship closeness) antecedents (Fehr et al, in press). These response patterns should in turn moderate the effect of conflict and victimization on any hypothesized downstream phenomenon, of which creativity is only one exemplar.

Forgiveness

As previously reviewed, research on the consequences of forgiveness is narrow. Scholars have primarily focused on the implications of forgiveness for victim well-being and prosocial behavior. The present research represents one of the first sets of studies to look at the consequences of forgiveness more broadly. Affective, motivational, and

cognitive mechanisms were reviewed to tie forgiveness to creative performance – the data supported the cognitive perspective. Thus, it is important for future research to further emphasize the cognitive consequences of forgiveness. In addition to providing victims of conflict with cognitive resources for creativity tasks, forgiveness may provide victims with cognitive resources to solve complex spatial tasks or overcome stereotypes (Blessum et al, 1998; Sherman et al, 1998). Indeed, one clear potential advantage of forgiveness is enhanced performance on *noncreative*, yet still cognitively demanding, tasks. These might include complex arithmetic, verbal reasoning, team coordination, or a host of other task behaviors. To the extent that creative tasks require greater cognitive resources than noncreative tasks the link between forgiveness and noncreative performance might be attenuated. However, given the relative prevalence of noncreative tasks in the workplace, an understanding of how they are influenced by forgiveness processes is vital.

Creativity

Looking to the creativity literature, several points can be emphasized. First, creativity is not solely influenced by events that occur within the creativity context itself. Rather, a spillover model of forgiveness and creativity demonstrates that victims' responses to specific events (conflict or otherwise) can influence subsequent creative performance. Looking beyond conflict research, any number of contextual phenomena can thus be theorized to affect creative performance, even if not directly linked to the task itself. This hypothesis starkly diverges from most cross-level models of creative performance, which almost exclusively focus on how a creative task is framed or presented. Consider the following selection of situational and cross-level predictors of

creative achievement in organizational settings: supervisor monitoring (George & Zhou, 2001), time pressure (Chirumbolo et al, 2004), reward (Eisenberger & Rhoades, 2001), expected evaluation (Shalley, 1995), task rotation (Madjar & Oldham, 2006), membership change (Choi & Thompson, 2005), and feedback (Zhou, 2003). Each of these factors is closely related to the creativity task – feedback on the creativity task (Zhou, 2003), time pressure to complete the creativity task (Chirumbolo et al, 2004), rewards for completing the creativity task (Eisenberger & Rhoades, 2001) and so on. But creativity is not only affected by task-specific constraints and expectations. It is also affected by a wide range of contexts that *precede* the creative task. Forgiveness and revenge were shown to impact creativity in the current study, but many other tasks – for example, resource depletion tasks – could be theorized to exhibit parallel effects.

A second and equally important point for creativity research is that conscious processes are as important as unconscious processes. The stochastic model of creativity supposes stochastic processes at both levels, with unconscious combinatorial processes leading to the surfacing of a broad set of conscious ideations and ideational subcomponents, which in turn are ultimately refined, explicated, and subjected to secondary Darwinism as memes (Dawkins, 1975). Traditionally, creativity has been treated as a largely subconscious process, subject to the whims of muses and unforeseen insight. Indeed, the subconscious model seems most closely aligned with stochasticism. Yet conscious processing is needed to sift through the foaming sea of subconscious ideation and separate the wheat from the shaft. One key cognitive process might be inhibition. Decades of creativity research indicate that one of the foremost challenges of

creativity is to suppress dominant response patterns, and this very inhibitory process has been shown to correlate with forgiveness as well (Carson et al, 2003; Pronk et al, 2009).

Practical Implications

Everyday, organizations seek to manage interpersonal conflict and foster creativity. Even the most routine organizations can benefit from creativity. Assembly line workers are renowned for their ability to develop creative solutions to efficiency dilemmas, exponentially affecting their safety and productivity. Similarly, even the most peaceful and cooperative organizations can be expected to suffer from interpersonal conflict – especially when spillover models take non-work conflict into account. Given the inevitability of both conflict and creativity, it is not surprising to find many articles on how to manage these two intersecting phenomena. Boundary conditions aside, the majority of the literature focuses on how to reduce conflict and thus facilitate effective ideational processes and implementation procedures. This literature overwhelmingly adopts a prevention approach, proposing mechanisms to stop conflict before it starts. The prevention approach enjoys an extensive lineage with the psychological and organizational sciences, from the Robbers Cave experiments of the early 1950s onward.

A more complete approach to conflict management should focus less on preventing conflict and more on how it is managed – how interpersonal transgressions are dealt with after they occur. Within the conflict literature, mediation research is one of the clearest examples of this line of work, yet it too focuses on “making things right” and closing the injustice gap. What if nothing can be done? What if a coworker utters a racial slur or breaches another worker’s trust? Offers of compensation and expressions of empathy can only begin to heal the conflict. The victim must also be motivated to act

prosocially toward the offender – the victim must forgive. Forgiveness holds obvious benefits for interpersonal cooperation and mood (Fincham, 2000; Karremans et al, 2003), which themselves could be expected to affect downstream performance. But as the current research has shown, forgiveness can also impact performance in ways that move beyond offender-victim dynamics and mood states. It can free up key cognitive resources that allow victims to excel in complex creative tasks.

Limitations

The three studies presented here represent the first to examine how forgiveness impacts downstream creative performance. This is an important extension of the literature on the consequences of forgiveness. Whereas previous research has demonstrated that forgiveness restores victims' well-being and cooperative patterns of behavior, the current studies extend these findings to demonstrate that forgiveness can also facilitate effortful information processing. Given the likelihood of many bidirectional linkages in the forgiveness literature, a key strength of the presented studies is their internal validity. Through priming, it can be said with relative certainty that forgiveness relates to creativity in the hypothesized causal direction. This does not rule out the possibility of reverse causality, but such reverse causality would not be to the exclusion of the presented effects.

All research designs contain inherent flaws, and the priming methodologies used herein do not obviate this fact. Two limitations of the presented studies are of particular note, and both are in reference to external validity. First, all three presented studies utilized student samples from the United States. Thus, the generalizability of the findings to adult and Nonwestern populations is unclear. As scholars have long noted, adult

populations are less susceptible to situational influence than student populations. Thus, they may be less affected by the situational primes presently utilized (Sears, 1986). Furthermore, recalled instances of forgiveness and unforgiveness may vary dramatically across populations. The passage of time may afford adults the opportunity to recall particularly strong situations. Conversely, in accordance with socioemotional selectivity theory, victim reactions to offenses may become less severe in adulthood and old age.

A second limitation of the present set of studies is the validity of the creativity tasks. The alien drawing task arguably bears little resemblance to the sorts of complex ideational processes valued in brainstorming sessions and other organizational contexts. The alternative uses task is a closer approximation of organizational creativity, although it lacks the motivational contexts and inherent ambiguities of organizational creativity. Previous research has stressed the need for more externally valid measures of creative performance, such as the production of renowned inventions or artistic works (Simonton, 2003). Relatedly, the current set of studies was limited in examining only the ideational phase of organizational innovation (i.e. creativity). The effects of conflict and forgiveness on idea implementation remain unknown.

Even within the realm of lab-based creativity measures, it is important to consider how each task systematically differs from the next. One clear difference across measures is the operationalization of creativity as a product of divergent versus convergent thinking. Divergent tasks, such as the brainstorming and drawing exercises, do not have a single “correct” solution. Convergent tasks, such as the candle task, instead require participants to converge upon a single correct solution (Fleenor & Taylor, 2004). While the effects of these different types of creativity tasks are often identical when looking at a

given antecedent (e.g. international experience; Maddux & Galinsky, 2009) they can also diverge (e.g. counterfactuals; Kray, Galinsky, & Wong, 2006). The current research appears to fall within the former category, with forgiveness influencing both convergent and divergent tasks. Nonetheless, additional research is needed to explore precisely why this is the case.

A final issue relates to the question of how the priming conditions differed from each other aside from the degree to which the conflict events were forgiven. Previous research indicates that forgiven versus unforgiven offenses, when recalled, differ in a number of ways (Zechmeister & Romero, 2002). Thus, the presented findings may not be directly due to forgiveness. Rather, they may be due to a more proximal mediating process. For instance, if participants in the forgiveness condition recalled events from further in their past than participants in the unforgiveness condition, construal level theory suggests that they might have been more creative because they were cognizing at a more abstract level (Förster, Friedman, & Liberman, 2004). Additional confounding factors, such as victim-offender relationship dynamics, could likewise be theorized to mediate the effect of the prime on creativity. Such factors must be controlled for in future research to enhance the validity of the findings.

Future Directions

Based upon the aforementioned limitations and additional theoretical considerations, several important directions for future research can be inferred. First, it would be advantageous to conduct field studies with adult populations that enhance the external validity of the forgiveness-creativity relationship. Within such a context, creativity could be measured via objective production criteria (e.g. patent applications) or

manager ratings. Also in reference to sampling issues, future research should explore the cross-cultural generalizability of the presented findings. Given previous research on cultural differences in how conflict is perceived (e.g. Gelfand, Nishii, Holcombe, Dyer, Ohbuchi, & Fukuno, 2001), the psychological experience of forgiveness may likewise vary greatly, resulting in different behavioral consequences. Unfortunately, there is a dearth of data to date on cross-cultural issues in forgiveness (Sandage & Williamson, 2005).

Methodologically, future field studies should explore the temporal dynamics of forgiveness and creativity via longitudinal, multi-wave designs. The present research utilized a cross-sectional priming methodology, yet the underlying theory could be seen as fundamentally temporal – conflict reduces cognitive resources which are in turn restored over time via forgiveness, resulting in a contaminant restoration of creative potential. However, the nature of the temporal unfolding of creativity via forgiveness remains to be seen. Previous research generally supports a linear model of forgiveness, such that forgiving motivations increase over time with transient fluctuations (McCullough et al, 2007). Future research must extend the temporal approach by exploring how the effects of forgiveness on downstream phenomena unfold. For instance, does forgiveness impact creativity across multiple days or only a few hours? Is the strength of the effect linear over time or nonlinear? An additional advantage of the temporal approach would be enhanced confidence in the theorized mediational pathways and a more stringent test of those paths not supported in the present research. Mood, for instance, might be shown to explain some variance in creative performance when measured both before and after within-person shifts in forgiveness.

Complexity could also be added to the forgiveness-creativity hypothesis by exploring moderators of the effect. One key moderator within organizational contexts is the salience of the conflict event. Presumably, conflict events will only affect downstream creative tasks when made salient to the degree that they are cognitively taxing to ruminate upon. Thus, specific triggers that remind victims of the conflict – for example, the physical presence of the offender – would likely lead to both chronic and temporary accessibility of the target event. Several broad hypotheses could stem from this observation. For instance, conflict events that occur in the workplace should generally be more salient, and therefore more distracting to employees, than conflict events that occur in the home. Another contextual moderator may be the relationship between victim and offender. For instance, since followers tend to think of their leaders more often than leaders think of specific followers, conflict with a subordinate may prove less distracting than conflict with a supervisor (Aquino et al, 2001; 2006).

As a final note of consideration, future research should more closely consider the role of cognitive resource depletion in organizational creativity. Generally speaking, research on creativity and conflict tends to focus on coordination loss. The resource hypothesis may lend additional credence to “garbage can” models of slack resources and their role in the creative process (Cohen, March, & Olsen, 1972). A key first step toward full understanding of the dynamics of forgiveness, creativity and resource depletion is to explore the dual input model of creative performance in depth. Unlike the Study 1 brainstorming exercise, the Study 3 candle task did not allow for a delineation of creative performance according to domain set versus persistence or other factors. Future research should examine forgiveness and creativity within the context of dynamic organizational

creativity tasks, such as group brainstorming exercises and subsequent implementation procedures, so that cognitive resources can be more explicitly linked to domain breadth.

Conclusion

Forgiveness is a powerful social force. Testaments to its importance span millennia (Griswold, 2007). Today, forgiveness is used throughout the world to help individuals and groups alike reconcile their differences (McCullough et al, 1997; Tutu, 2000). Nonetheless, psychologists have displayed only a limited consideration of its consequences. By strictly focusing on the prosocial consequences of forgiveness, scholars risk an incomplete and thus inaccurate understanding of how and when forgiveness impacts interpersonal and organizational dynamics. By linking forgiveness to creativity, the current research may potentially add an important dimension to forgiveness scholarship and expand our understanding of conflict dynamics during group creativity tasks. Forgiveness after task conflict, for instance, might help groups leverage the perceived benefits of minority dissent (e.g. De Dreu & West, 2001) without suffering the perils of emotional conflict and group faultlines (e.g. Pearsall et al, 2008). Looking strictly within the forgiveness literature, a demonstration of its benefits for creativity stands to make an important contribution to the very definition of the construct, allowing scholars to move beyond a solely prosocial conceptualization of what it means to forgive.

Table 1. A tripartite model of forgiveness (Reprinted from Fehr, Gelfand, & Nag, in press)

Factor	Overarching Question	Psychological Mechanisms	Illustrative Inputs	Situational Correlates	Dispositional Correlates
Cognitions	What happened?	Sensemaking about offender and offense	<ul style="list-style-type: none"> • My offender intentionally harmed me • My offender hurt me severely • I can't understand my offender's point of view 	<i>H1a.</i> Intent (-) <i>H1b.</i> Responsibility (-) <i>H1c.</i> Apology (+) <i>H1d.</i> Harm severity (-) <i>H1e.</i> Rumination (-)	<i>H2a.</i> Agreeableness (+) <i>H2b.</i> Perspective taking (+) <i>H2c.</i> Trait forgiveness (+)
Affect	How do I feel?	Emotions and Mood-as-input	<ul style="list-style-type: none"> • I am upset • I am relaxed • I feel empathy toward my offender 	<i>H3a.</i> Positive mood (+) <i>H3b.</i> Negative mood (-) <i>H3c.</i> State empathy (+) <i>H3d.</i> State anger (-)	<i>H4a.</i> Neuroticism (-) <i>H4b.</i> Trait anger (-) <i>H4c.</i> Empathic concern (+) <i>H4d.</i> Self-esteem (+) <i>H4e.</i> Depression (-)
Constraints	What if I don't forgive?	Embeddedness / Internalized socio-moral expectations	<ul style="list-style-type: none"> • If I don't forgive, we can't continue our relationship • If I don't forgive, I'll fail to live up to social and moral standards 	<i>H5a.</i> Relationship closeness (+) <i>H5b.</i> Relationship satisfaction (+) <i>H5c.</i> Relationship commitment (+)	<i>H6a.</i> Religiosity (+) <i>H6b.</i> Social desirability (+)

Table 2. Mood scale according to item categories adapted from Baas et al (2008)

Positive hedonic tone		Negative hedonic tone	
Deactivating	Activating	Deactivating	Activating
Calm	Happy	Sad	Uneasy
Serene	Upbeat	Discouraged	Angry
Relaxed	Elated	Disappointed	Tense
			Frustrated
			Fear
			Disgust

Table 3. Experimental conditions: Forgiveness, control, unforgiveness, and revenge

<p>Forgiveness Prime</p>	<p><i>Instructions:</i> Every now and then, most or all of us have had a conflict with somebody we are close to. The conflict can be relatively mild (a conflict that you forget about easily), but the conflict can also be severe (a conflict that you are unlikely to forget). Now – think about a severe conflict that you have had with someone close to you that you have forgiven. How did you show forgiveness? What did you say? What did you do? How did it make you feel to forgive him/her? Please take a few moments to describe the experience and your forgiveness in as much detail as possible.</p>
<p>Control Prime</p>	<p><i>Instructions:</i> People experience many everyday social interactions. They greet their friends and family, engage in social activities together, etc. For the most part, these interactions are common, everyday occurrences. Now – think about a recent, everyday social interaction you have recently had with someone close to you. What did you say? What did you do? Please take a few moments to describe the experience and what happened in as much detail as possible.</p>
<p>Unforgiveness Prime</p>	<p><i>Instructions:</i> Every now and then, most or all of us have had a conflict with somebody we are close to. The conflict can be relatively mild (a conflict that you forget about easily), but the conflict can also be severe (a conflict that you are unlikely to forget). Now – think about a severe conflict that you have had with someone close to you for which you have not been able to forgive the other person. What happened? What did you say? What did you do? Why haven't you forgiven the other person? How did it make you feel to not be able to forgive him/her? Please take a few moments to describe the experience and your unforgiveness in as much detail as possible.</p>
<p>Revenge Prime</p>	<p><i>Instructions:</i> Every now and then, most or all of us have had a conflict with somebody we are close to. The conflict can be relatively mild (a conflict that you forget about easily), but the conflict can also be severe (a conflict that you are unlikely to forget). Now – think about a severe conflict that you have had with someone close to you for which you took revenge against the other person. What happened? What did you say? What did you do? How did you enact revenge? How did it make you feel to take revenge against him/her? Please take a few moments to describe the experience and your revenge in as much detail as possible.</p>

Table 4. Study 1 means, standard deviations, and correlations

	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>
1. Positive Mood	2.99	.78	(.82)											
2. Negative Mood	1.77	.74	-.50**	(.90)										
3. Positive Act. Mood	2.78	.94	.86**	-.26*	(.83)									
4. Harm Severity	2.83	1.12	-.04	.09	.00	--								
5. Post-Offense Closeness	2.72	1.52	-.24	.22	-.15	-.18	--							
6. Forgiveness	3.34	1.22	-.03	-.01	-.02	-.10	.58**	--						
7. Revenge	1.57	.77	-.27	.14	-.13	.11	.09	.02	--					
8. Age	20.30	1.58	.09	-.20	.02	.03	-.16	.05	.16	--				
9. Gender	1.58	.50	-.14	.21	-.11	.08	.26	.04	.10	-.28*	--			
10. First Language	1.12	.33	-.13	.05	-.11	.00	.03	.29*	-.26	.03	.24*	--		
11. Creative Fluency	11.20	4.78	.10	-.03	.08	.14	.10	.09	.13	.35**	-.13	-.03	--	
12. Creative Novelty	2.00	.50	-.04	-.01	-.01	.05	.12	.22	-.16	-.13	-.15	.16	.09	---

N = 81; N=53 for severity, closeness, forgiveness, and revenge items (control conditions did not receive these items)

1 = unforgiveness; 2 = control; 3 = forgiveness

1 = Male; 2 = Female

Table 5. Uncreative, moderately creative, and highly creative responses to the alternative uses task

Uncreative uses for a tin can	Moderately creative uses for a tin can	Highly creative uses for a tin can
Hold food	Rolling pin	Hair curlers for really big hair
Drink from	Cut off end - make a bracelet	Electrical conductor
Hold pens	Cookie cutter	Poke holes, put light underneath – planetarium
Kick	Stool	Replacement doorknob
Tie to a car (just married)	Door holder	Roll down hill to make ice cream
Hold paperclips	Robot arms	Flatten – use to jimmy a door
Eat from	Seat	Arrange vertically make a chimney

Table 6. Study 2 means, standard deviations, and correlations

	<i>M</i>	<i>SD</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
1. Pos. Mood	3.20	.58	(.63)									
2. Neg. Mood	1.38	.42	-.40**	(.78)								
3. Pos. Act. Mood	2.93	.78	.83**	-.30*	(.63)							
4. Task Eff.	3.32	.80	.43**	-.27	.41**	(.90)						
5. Task Choice	3.41	.91	.42**	-.37**	.43**	.24	(.88)					
6. Task Interest	3.56	.79	.26	-.17	.30*	.53**	.26	(.93)				
7. Harm Severity	2.67	1.19	.08	-.10	.06	.00	-.22	-.12	--			
8. Post-Offense Closeness	3.09	1.74	-.17	.15	-.06	.02	-.03	.22	-.16	--		
9. Forgiveness	3.37	1.44	-.15	.18	-.04	.06	.06	.31	-.04	.69**	--	
10. Revenge	1.66	1.08	.11	.20	.20	.06	.33	-.05	-.41*		-.07	--
11. Age	19.56	1.76	.19	-.10	.06	.15	.05	.04	.33	-.29	-.17	-.20
12. Gender	1.73	.45	.01	.06	.15	-.01	-.05	.03	.01	-.11	.00	-.10
13. First Language	1.22	.42	.13	.10	-.05	-.08	-.03	.02	.20	-.24	-.33*	-.21
14. Sensory Atypicalities	.82	.81	-.03	-.04	-.05	.01	.09	.14	.25	.20	.27	.03
15. Similarity to E. Creatures	3.37	1.01	-.02	.16	.04	-.23	-.10	-.21	-.12	-.28	-.42*	.22
16. Overall Creativity	2.76	1.09	.06	-.18	.01	.25	.07	.21	.13	.28	.41*	-.21

Table 6. Study 2 means, standard deviations, and correlations, continued

	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>
1. Pos. Mood						
2. Neg. Mood						
3. Pos. Act. Mood						
4. Task Eff.						
5. Task Choice						
6. Task Interest						
7. Harm Severity						
8. Post-Offense Closeness						
9. Forgiveness						
10. Revenge						
11. Age	--					
12. Gender	-.24	--				
13. First Language	.27	.11	--			
14. Sensory Atypicalities	.26	-.23	.04	(.88)		
15. Similarity to E. Creatures	-.17	.09	.05	-.54**	(.83)	
16. Overall Creativity	.18	-.07	-.03	.56**	-.99**	(.85)

Table 7. Study 3 means, standard deviations, and correlations

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11
1. Cognitive Load	.50	.50	--										
2. Pos. Mood	3.13	.78	-.09	(.83)									
3. Neg. Mood	1.32	.39	.14	-.32**	(.83)								
4. Pos. Act. Mood	2.81	.92	-.08	.92**	-.27*	(.79)							
5. Task Eff.	3.70	.61	.00	.23*	-.08	.15	(.84)						
6. Task Choice	3.40	.72	.14	.07	-.02	.07	.13	(.77)					
7. Task Interest	3.34	.87	.07	.23*	-.13	.29**	.20	.21*	(.94)				
8. Harm Severity	2.75	1.16	-.09	0.24	.23	-.23	-.06	-.16	.03	--			
9. Post-Offense Closeness	3.27	1.62	-.03	.07	-.13	.04	.15	-.06	.14	-.03	--		
10. Forgiveness	3.28	1.53	.07	.17	-.23	.16	.24	-.04	.14	-.25	.71**	--	
11. Revenge	1.57	.96	.09	-.10	.16	-.11	-.11	.01	-.13	-.07	-.07	-.11	--
12. Age	19.54	2.02	.14	.14	-.01	.20	-.07	.07	.25*	-.23	-.17	-.02	-.10
13. Gender	1.60	.49	-.08	-.16	.08	-.13	-.28**	-.09	-.16	-.01	.12	.02	-.21
14. First Language	1.09	.28	.00	-.03	.14	-.05	-.01	-.11	.14	-.15	.01	.11	.18
15. Candle task response	.30	.46	.27**	.14	-.07	.19	.19	.08	.22*	-.03	.04	.14	.11

Table 7. Study 3 means, standard deviations, and correlations, con.

	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
1. Cognitive Load				
2. Pos. Mood				
3. Neg. Mood				
4. Pos. Act. Mood				
5. Task Eff.				
6. Task Choice				
7. Task Interest				
8. Harm Severity				
9. Post-Offense Closeness				
10. Forgiveness				
11. Revenge				
12. Age	--			
13. Gender	-.16	--		
14. First Language	.35**	.10	--	
15. Candle task response	.22*	-.25*	.13	--

Figures 1a and 1b. The Duncker Candle Task as presented to participants and its correct solution

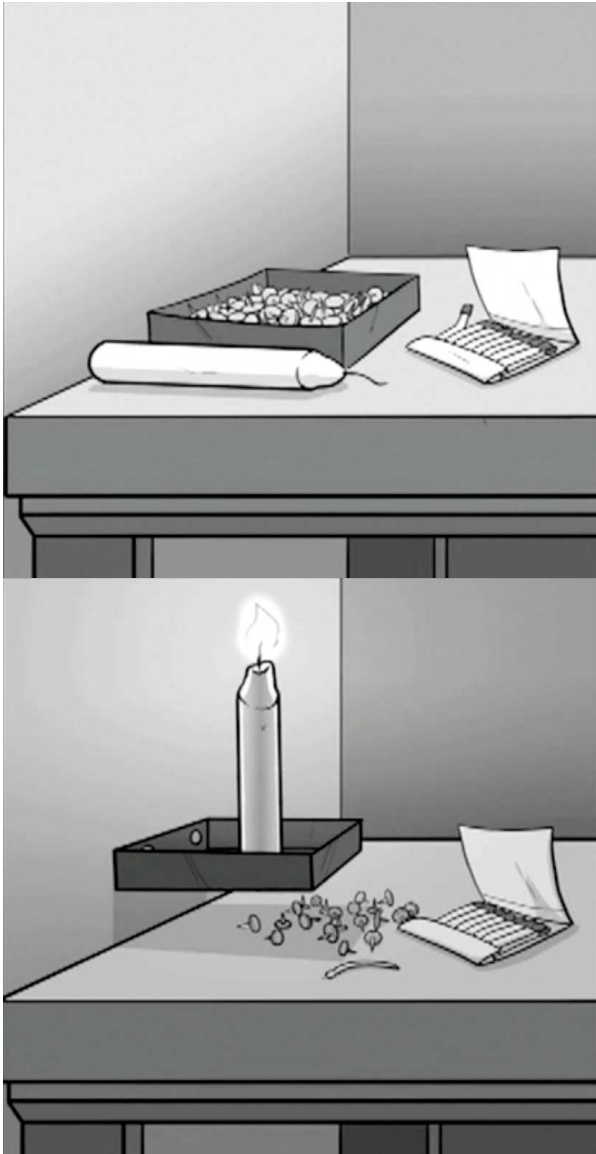
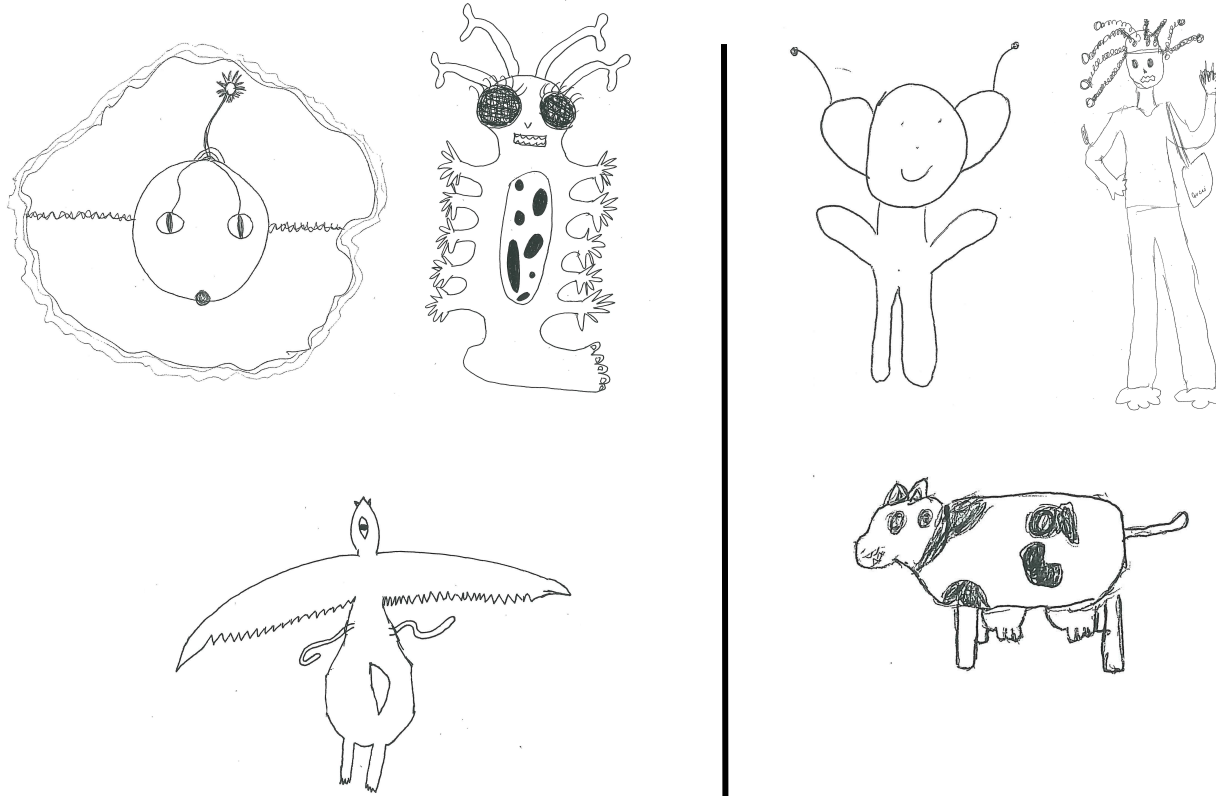


Figure 2. Aliens deemed highly creative (left panel) and uncreative (right panel)



Figures 3a/b/c. Overall creativity, similarity to Earth creatures, and sensory atypicalities in Study 2 drawings

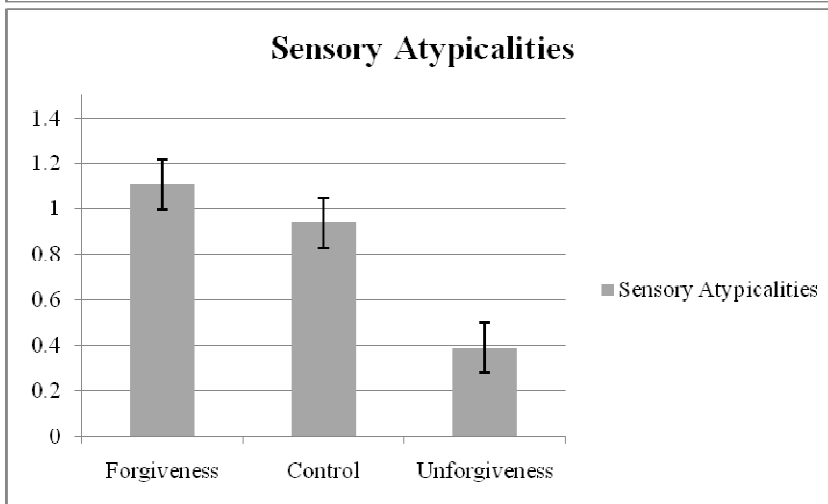
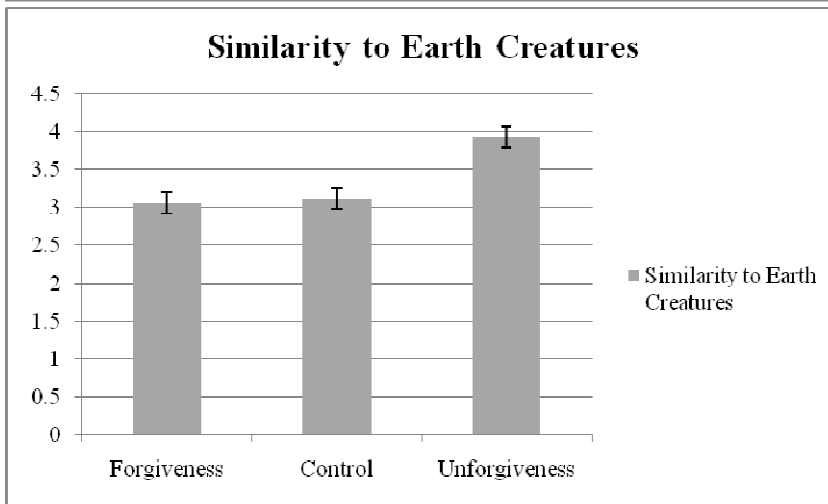
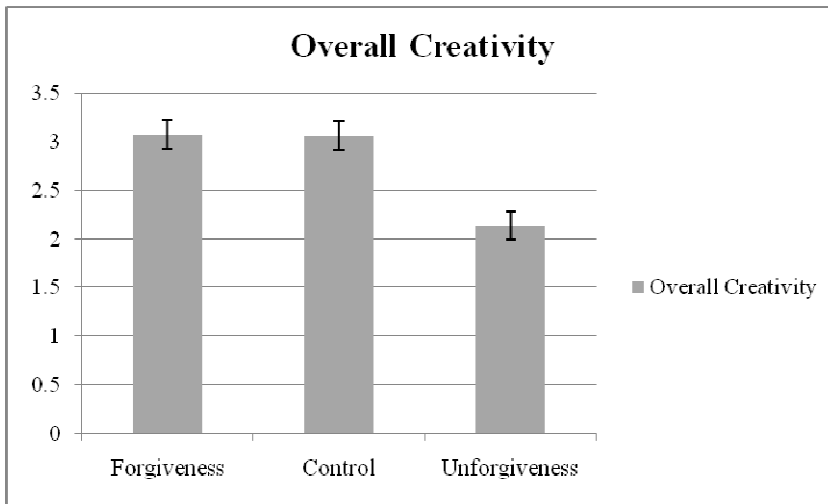
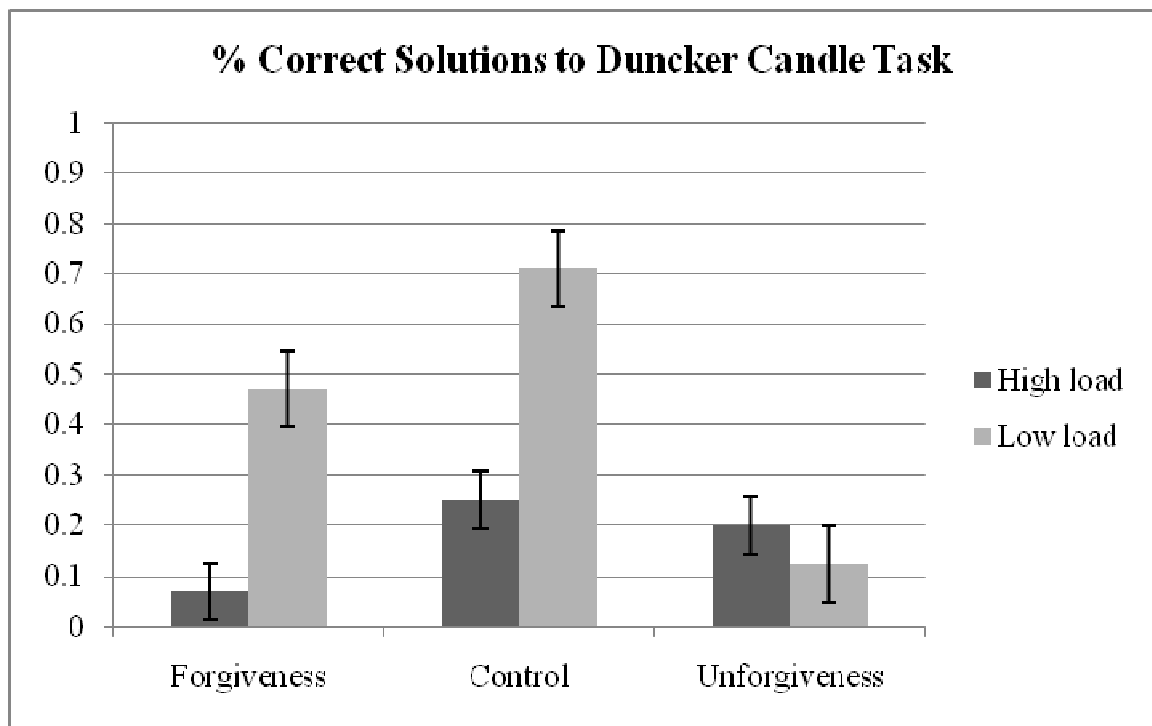


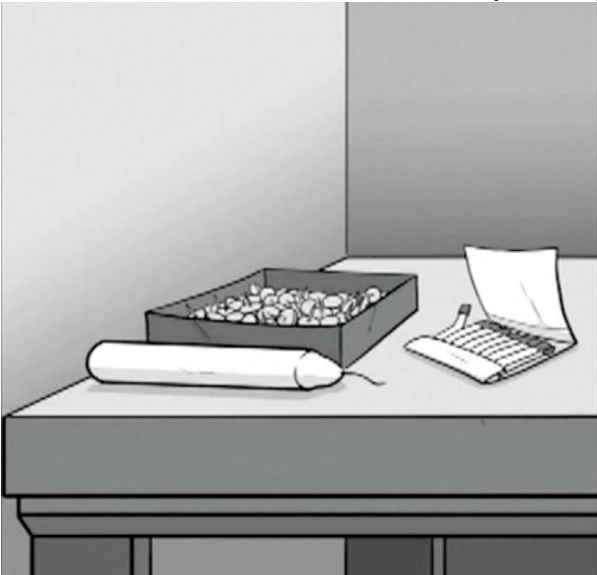
Figure 4. Performance on Duncker Candle Task under cognitive load and forgiveness conditions in Study 3



APPENDIX A: FORGIVENESS PRIMING PROCEDURES

<p>Forgiveness Prime</p>	<p><i>Instructions:</i> Every now and then, most or all of us have had a conflict with somebody we are close to. The conflict can be relatively mild (a conflict that you forget about easily), but the conflict can also be severe (a conflict that you are unlikely to forget). Now – think about a severe conflict that you have had with someone close to you that you have forgiven. How did you show forgiveness? What did you say? What did you do? How did it make you feel to forgive him/her? Please take a few moments to describe the experience and your forgiveness in as much detail as possible.</p>
<p>Unforgiveness Prime</p>	<p><i>Instructions:</i> Every now and then, most or all of us have had a conflict with somebody we are close to. The conflict can be relatively mild (a conflict that you forget about easily), but the conflict can also be severe (a conflict that you are unlikely to forget). Now – think about a severe conflict that you have had with someone close to you for which you have not been able to forgive the other person. What happened? What did you say? What did you do? Why haven't you forgiven the other person? How did it make you feel to not be able to forgive him/her? Please take a few moments to describe the experience and your unforgiveness in as much detail as possible.</p>
<p>Control Prime</p>	<p><i>Instructions:</i> People experience many everyday social interactions. They greet their friends and family, engage in social activities together, etc. For the most part, these interactions are common, everyday occurrences. Now – think about a recent, everyday social interaction you have recently had with someone close to you. What did you say? What did you do? Please take a few moments to describe the experience and what happened in as much detail as possible.</p>

APPENDIX B: CREATIVITY MEASURES

<p>Alien Task</p>	<p><i>Instructions:</i> Imagine going to another galaxy in the universe and visiting a planet very different from earth. On your trip, you discover a creature that is local to this planet. In the space below, draw the creature that you encounter.</p>
<p>Tin Can Task</p>	<p><i>Instructions:</i> In the space below, please list as many unusual, creative uses for a tin can as you can think of</p>
<p>Duncker Candle Task</p>	<p><i>Instructions:</i> In the image below, you will see several objects resting on a table next to a bulletin board wall. Using only the materials you see on the table, figure out a way to attach the candle to the wall so that the candle will burn properly, but no wax will drip on the table or floor when the candle is lit. Please use the lines below to write your response.</p>  <p>The illustration shows a rectangular table with a dark top and a lighter base. On the table, there is a cylindrical candle with a wick, a rectangular box filled with small, round tacks, and a stapler with a sheet of paper inserted. The background is a plain wall.</p>

APPENDIX C: SCALES FOR MEDIATION TESTS, MANIPULATION CHECKS
AND DEMOGRAPHICS

MOOD ITEMS

Instructions: This scale consists of a number of words that describe different feelings and emotions. Read each item and indicate to what extent you feel this way right now, that is, at the present moment.

	1 Very Slightly or Not At All	2 A Little	3 Moderately	4 Quite a Bit	5 Extremely
Calm				1	2 3 4 5
Happy				1	2 3 4 5
Sad				1	2 3 4 5
Uneasy				1	2 3 4 5
Angry				1	2 3 4 5
Serene				1	2 3 4 5
Upbeat				1	2 3 4 5
Discouraged				1	2 3 4 5
Tense				1	2 3 4 5
Frustrated				1	2 3 4 5
Relaxed				1	2 3 4 5
Elated				1	2 3 4 5
Disappointed				1	2 3 4 5
Fearful				1	2 3 4 5
Disgusted				1	2 3 4 5

MOTIVATION ITEMS

Instructions. On this page we will be asking you several questions regarding the **alien task** you completed. Please read each question carefully and answer as honestly as possible.

1 Strongly Disagree	2 Disagree	3 Neither Agree Nor Disagree	4 Agree	5 Strongly Agree					
I enjoyed doing the task very much					1	2	3	4	5
The task was fun to do					1	2	3	4	5
I thought the task was boring					1	2	3	4	5
The task did not hold my attention at all					1	2	3	4	5
I would describe the task as very interesting					1	2	3	4	5
I thought the task was quite enjoyable					1	2	3	4	5
While I was doing the task, I was thinking about how much I enjoyed it					1	2	3	4	5
I believe I had some choice about doing the task					1	2	3	4	5
I felt like it was not my own choice to do the task					1	2	3	4	5
I didn't really have a choice about doing the task					1	2	3	4	5
I felt like I had to do it					1	2	3	4	5
I did the task because I had no choice					1	2	3	4	5
I did the task because I wanted to					1	2	3	4	5
I did the task because I had to					1	2	3	4	5
I think I was pretty good at the task					1	2	3	4	5
I think I did pretty well on the task, compared to other students					1	2	3	4	5
After working on the task for awhile, I felt pretty competent					1	2	3	4	5
I am satisfied with my performance on the task					1	2	3	4	5
I was pretty skilled at the task					1	2	3	4	5
This was a task that I couldn't do very well					1	2	3	4	5

MANIPULATION CHECKS

Instructions. On this page we will be asking you several questions regarding the conflict event you previously recalled. Please read each question carefully and answer as honestly as possible.

1	2	3	4	5
Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree

I would describe the consequences of what happened to me as severe	1	2	3	4	5
I currently share a close relationship with the person who offended me	1	2	3	4	5
I have forgiven my offender	1	2	3	4	5
I took revenge against my offender	1	2	3	4	5

DEMOGRAPHICS

What is your age? _____

What is your gender? _____ Female _____ Male

What is your first language? _____

Which of the following BEST describes your ethnic or racial background? Please check only ONE response.

<input type="checkbox"/> African American	International (please specify)
<input type="checkbox"/> Asian American	_____
<input type="checkbox"/> Caucasian	
<input type="checkbox"/> Hispanic	Biracial _____
<input type="checkbox"/> Native-American	_____
	Other _____

APPENDIX D: INFORMED CONSENT, DEBRIEF, AND COUNSELING
DOCUMENTS

INFORMED CONSENT FORM

Why is this research being done?

This is a research project being conducted by Michele Gelfand and Ryan Fehr at the University of Maryland, College Park. We are inviting you to participate in this research project because you are a PSYC 361 student. The purpose of this research project is to study your ability to solve a variety of problems. We are interested in studying your completion of certain tasks to better understand the different ways people complete certain tasks.

What will I be asked to do?

The procedure involves completing problem solving tasks and answering some questions about hypothetical events and actual events from your past. You will also be asked to fill out several questions about your own preferences and values. Participation in this study will take approximately 20 minutes.

What about confidentiality?

We will do our best to keep your personal information confidential. To help protect your confidentiality, all physical documents will be stored in a locked office in the Biology-Psychology building. The corresponding electronic files will also be kept in a locked office on a disc. The electronic data will be password protected and only the study investigators (Michele Gelfand and Ryan Fehr) will have access to the files. Regarding the handling of your data, no identifying information will be recorded. If we write a report or article about this research project, your identity will be protected to the maximum extent possible. Your information may be shared with representatives of the University of Maryland, College Park or governmental authorities if you or someone else is in danger or if we are required to do so by law.

What are the risks of this research?

You may experience some emotional stress or discomfort while trying to complete the problem solving exercises or recalling events from your past.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about the different ways people complete tasks. We hope that, in the future, other people might benefit from this study through improved understanding of problem solving.

Do I have to be in this research? May I stop participating at any time?

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

What if I have questions?

This research is being conducted by Michele Gelfand at the University of Maryland, College Park. If you have any questions about the research study itself, please contact Ryan Fehr at rfehr@psyc.umd.edu. If you have questions about your rights as a research subject or wish to report a research-related injury, please contact the IRB at irb@deans.umd.edu. This research has been reviewed according to the University of Maryland, College Park IRB procedures for research involving human subjects.

Statement of Age of Subject and Consent

Your signature indicates that: you are at least 18 years of age; the research has been explained to you; your questions have been fully answered; and you freely and voluntarily choose to participate in this research project.

DEBRIEF

In the current study we were interested in investigating the impact of forgiveness on creativity. We believe that students who have a greater tendency to forgive will express higher levels of creativity in our tasks than those students who are not. We believe this because we feel that creativity and forgiveness are linked. For instance, it is clear that often times the act of forgiving can be very difficult. To forgive an offender requires an ability to think outside of the box and understand a situation from many points of view. To be creative one also must see things from many points of view, and have an open mind.

We believe that students primed in the beginning of our study towards forgiveness will complete the creativity tasks with more originality than those students who are primed towards revenge. Priming refers to an earlier stimulus affecting later results, for example, we believe someone who is primed towards revenge will not complete tasks creatively. Through this study, we hope to understand more about the impact of responses to conflict on creativity.

If you have any further questions about this study please do not hesitate to ask the experimenter or to contact the investigators (Ryan Fehr: rfehr@psyc.umd.edu, (301) 405-5934; Michele Gelfand: mgelfand@psyc.umd.edu, (301) 405-6972). We really appreciate your participation in this study!

NOTIFICATION OF AVAILABLE COUNSELING SERVICES

Oftentimes, the recollection of painful events can lead to emotional distress. The University of Maryland offers a variety of services to help deal with these emotional issues. The list below offers a few suggestions. You may also contact the principle investigators of this project at any time with questions about the study or counseling services that are available to you at rfehr@psyc.umd.edu or mgelfand@psyc.umd.edu.

- UMD Counseling Center
 - Call 301-314-7651 for an individual appointment
- UMD Interpersonal Therapy Group
 - An interpersonal therapy group designed to provide students with an opportunity to get to better know their interpersonal style, interpersonal strengths and areas for growth. Wednesdays, 2:00-3:30 pm, call 301-314-7651 to participate
- UMD Stress Management Group
 - A group that teaches you how to cope with anxiety in healthy ways (e.g. meditation practice). Mondays, 2:00-3:00 pm, call 301-314-7651 to participate
- UMD General Therapy Group
 - Talk with other members of the campus community who are experiencing difficult life issues, led by a trained group therapist. Times TBA, call 301-314-7651 to participate
- UMD Self-Help Information
 - Visit <http://www.counseling.umd.edu/Selfhelp/selfhelp.htm> for information on coping with many difficult life events

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