

PSYCHOLOGICAL SELF-OTHER OVERLAP: IMPLICATIONS FOR PROSOCIAL
BEHAVIOR IN CLOSE RELATIONSHIPS

by

Mary Y. Liu

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Doctoral Committee:

Assistant Research Professor Sara H. Konrath, Co-Chair
Associate Professor Ethan F. Kross, Co-Chair
Professor Jane E. Dutton
Professor Phoebe C. Ellsworth

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DEDICATION

To my family, for their unwavering love, support, and sacrifice

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ABSTRACT

The present dissertation uncovers the processes by which self-other overlap influences prosocial behavior and its consequences across different close relationships. Chapter I reviews extant theory and research on self-other overlap and its role in relationships and prosocial behavior. Chapter II explores whether discrete emotions shift perceptions of self-other overlap, and how shifts influence downstream prosocial tendencies across 4 studies. Study 1 found that reflecting on an angry experience with a close friend led to less self-other overlap and subsequent prosocial tendencies toward that friend, relative to reflecting on a happy or more neutral experience. Furthermore, anger undermined helping through the mediating role of self-other overlap, relative to the other conditions. Study 2 ruled out a general negative valence explanation after finding no significant self-other overlap differences from reflecting on emotions similar in valence (i.e., sad, content, or control) involving a close friend. Study 3 tested emotions that directly implicate others (i.e., gratitude, anger, and control) among best friends. Anger undermined self-other overlap, relative to the control. However, there were no self-other overlap differences between gratitude and control, condition effects on helping, or mediation. Study 4 found null effects of anger on self-other overlap, relative to gratitude and control, suggesting that marital relationships may be one boundary condition. Chapter III explores whether relationship type, a proxy for self-other overlap, moderates the long-term health outcomes of providing support to close others. Giving to emotionally close partners predicted mortality risk, when giving to children. This likely occurred because children activate the caregiving system, which is hypothesized to benefit

stress-regulation. Study 5a found that providing support to adult children predicted reduced mortality risk 17 years later among older adult parents, but providing support to other partners (e.g., parents, siblings, other relatives, friends) did not predict mortality risk among either parents (Study 5a) or non-parents (Study 5b), controlling for a number of plausible confounds. Chapter IV concludes by discussing the implications of the research for a variety of research literatures and future directions. Together, the studies begin to illuminate the intricacies by which self-other overlap influences prosocial behavior and its consequences in different close relationships.

CHAPTER I

Introduction

One of the most fundamental distinctions in social psychology is the one between self and other. Theoretical exploration of these two spheres of human existence are supported by an extensive literature (for review, see Wiggins, 1991). For example, Bakan (1966) differentiated agency (the individuated self that strives for mastery, power, and self-protection) from communion (the connected self that strives for intimacy, union, and solidarity). These two modalities can be mapped onto an interpersonal circumplex that organizes interpersonal behavior (Wiggins, 1991). Parallel distinctions occur in Fromm's (1941) separate entity versus oneness with world, Erikson's (1950) autonomy versus basic trust, McAdams's (1985) power vs intimacy motivation, and more recently, Markus and Kitayama's (1991) independent versus interdependent self. Major areas of psychological research have incorporated distinctions between the self and other into their theorizing, such as research on self and identity (W. B. Swann & Bosson, 2010), close relationships (Clark & Lemay, 2010), prosocial behavior (Penner, Dovidio, Piliavin, & Schroeder, 2005), and aggression (Bushman & Huesmann, 2010). Over the last two decades theoretical interest has focused on how the self may be merged or overlap with others and how this self-other overlap influences different intrapersonal and interpersonal outcomes (Aron & Aron, 1996, 1997; Aron, McLaughlin-Volpe, et al., 2004; Aron, Aron, Tudor, & Nelson, 1991; Batson, 1987, 1991, 1997; Batson et al., 1997; Cialdini, Brown, Lewis, Luce, & Neuberg, 1997; Davis, Conklin, Smith, & Luce, 1996; Goldstein & Cialdini, 2007; Myers &

Hodges, 2012; Neuberg et al., 1997). Furthermore, social psychological theory and research suggest that self-other overlap has important implications for prosocial behavior in close and non-close relationships (Cialdini et al., 1997; Maner et al., 2002; Neuberg et al., 1997).

In this dissertation, I extend the current literature on psychological self-other overlap by exploring its relationship to prosocial behavior in close relationships within two contexts. First, previous theoretical and empirical work in social psychology suggests that self-other overlap has important implications for prosocial behavior. However, several important questions remain unanswered. The present work seeks to contribute to this literature by exploring how factors within close relationships (in this case, different interpersonal emotions) may influence the tendency to psychologically include others into the self and how shifts in self-other overlap from these interpersonal emotions impact prosocial tendencies directed toward that close other.

Second, the present research explores how self-other overlap moderates the health benefits of prosocial behavior over time. Research suggests that people are more willing to help emotionally closer others than non-close others (Cialdini et al., 1997), suggesting that they are more willing to help others who are perceived as sharing greater self-other overlap. Furthermore, giving to others has been associated with mental and physical health benefits for the self (for review, see Konrath & Brown, 2013). However, little is known about how self-other overlap moderates the health benefits of prosocial behavior over time for givers. Thus, the present research addresses this gap in the literature by exploring whether giving to different relationship partners (presumably, with varying levels of emotional closeness) affects the association between prosocial behavior and mortality risk over time.

Across 5 studies, the present research hopes to integrate theory and research from a variety of research literatures to examine the role of self-other overlap in prosocial behavior and close relationships.

What is the Self?

Psychology's search for the nature of selfhood has been an ongoing preoccupation in the field. Countless reviews attempt to organize the existing large body of research on the self with its various theories, definitions, and levels of analysis (Baumeister, 1998; Leary & Tangney, 2003; Mischel & Morf, 2003; Oyserman, 2004; W. B. J. Swann, Chang-Schneider, & Larsen McClarty, 2007; Tice & Baumeister, 2001). The self could be generally organized as a reflexive consciousness that is fundamentally interpersonal and capable of agency (Baumeister, 1998). Of particular interest to the present research is the self's reflexive sense of "me" within an inherently social world, and how that awareness can affect the choices people make within important social relationships. A person's sense of "me," or self-concept, encompasses the attributes, attitudes, beliefs, roles, scripts, prototypes, physical appearance, and material belongings that the individual thinks define who that individual is (e.g., James, 1890). In essence, an individual's self-concept answers the question, "Who am I?" As a fundamentally social being, the self does not exist in a void, and as such the self-concept is a dynamic reflection of the social world (e.g., Baumeister, 1998) and people's relationships in this social world (e.g., Aron & Aron, 1997; H. Markus & Wurf, 1987). Cues from the social environment and the relationships to the self can shift an individual's self-concept and the choices people make in social relationships. Furthermore, how the self behaves within people's social environment could potentially influence long-term consequences for the self. Based on these various properties of the self, the

present research examines one important construct of the self situated within a social world: self-other overlap.

What is Self-other Overlap?

In social psychology, research suggests that people sometimes psychologically include others into the self (Aron & Aron, 1986; Aron, McLaughlin-Volpe, et al., 2004; Aron, Aron, & Smollan, 1992; Cialdini et al., 1997; Myers & Hodges, 2012) in a process known as *self-other overlap*. Self-other overlap is a psychological construct that may be more or less directly accessible to respondents (Myers & Hodges, 2012). As representative of a psychological construct, self-other overlap can form with any partner, regardless of kinship, varies across social contexts and partners, and may be easily malleable depending on input from the social environment.

Multiple converging research literatures have contributed to the conceptualization of self-other overlap over time. Not only does this research literature use different terms somewhat interchangeably such as *inclusion of others in the self*, *oneness*, or *self-other merging*, it also uses different measures to reach its conclusions. Theorizing on self-other overlap originated from research by Aron and colleagues that explored self-other overlap in close relationships (Aron et al., 1991; Aron & Aron, 1996, 1997; Mashek, Aron, & Boncimino, 2003). They argued that self-other overlap, or *including others in the self*, emerges from people's motivation to form and maintain close relationships. This motivation manifests as the expansion of the sense of self to include close others' resources, perspectives, and traits as a means to increase their own self-efficacy, intrinsic motivation, and self-actualization. Similarly, self-other overlap has also been described as *oneness* or "shared or interconnected identities with others" (Cialdini et al., 1997, p. 483) within the empathy-altruism research literature. In this literature, Batson and colleagues

argued that taking the perspective of another person who is suffering produces feelings of empathic concern for that person and thus an altruistic motivation to improve that person's welfare (Batson, 1987, 1991, 1991, 1997; Batson et al., 1997). Countering this argument, Cialdini and colleagues argued that perspective-taking increases helping through more egoistic motivation because the helper feels more "at one with" than empathic concern toward the suffering other (Cialdini et al., 1997, p. 483; Goldstein & Cialdini, 2007; Neuberg et al., 1997). Lastly, self-other overlap has also been referred to as a *merging of self and other* defined as a cognitive phenomenon that occurs during perspective taking in which an increased overlap in mental representations between the self and other person occurs (Davis et al., 1996).

Bringing more clarity to the field, a factor analysis of popular measures of self-other overlap across the multiple literatures suggests that self-other overlap is a multidimensional construct comprising of two primary factors: a) perceived closeness and b) overlapping mental representations (Myers & Hodges, 2012). *Perceived closeness* "consist[s] of direct and conscious perceptions of closeness with the other person" (Myers & Hodges, 2012, p. 665) and this factor maps closely with Aron and colleagues' concept of inclusion of others in the self in the close relationship literature (Aron et al., 1992; Aron & Aron, 1986) and Cialdini's concept of oneness in the empathy-altruism literature (Cialdini et al., 1997). Perceived closeness has been experimentally manipulated by having participants reflect on particular individuals of varying closeness (i.e., a near stranger, an acquaintance, a good friend, or a close family member (Cialdini et al., 1997), or by having strangers complete a self-disclosure and relationship-building task in the lab (Aron, Melinat, Aron, Vallone, & Bator, 1997). Closeness is typically measured by the Inclusion of Others in the Self Scale (IOS, Aron et al., 1992), a one-item measure with 7 Venn diagram-like pairs of increasingly overlapping circles where one circle of

each pair represents the self and the other circle represents the relationship partner. This factor captures very broad conscious feelings of closeness with another person.

The second factor that underlies psychological self-other overlap is *overlapping mental representations*, which “capture[s] perceived overlap on specific traits and attributes” (Myers & Hodges, 2012, p. 665). The factor captures overlap in mental representations of specific traits between the self and other and maps closely with Davis and colleagues’ concept of self-other merging. As such, measures involve assessing the perceived traits or attributes of both the self and other, and calculating some type of difference score between the two (Batson et al., 1997; Davis et al., 1996; Slotter & Gardner, 2009). For example, high overlapping mental representation between the self and other would occur if a participant rates both the self and the other person as having similar levels of a particular trait, such as agreeableness, suggesting that the participant perceives little difference between the self and other on this particular mental representation. Because the measure of overlapping mental representations assesses traits or attributes of the self and other separately, the factor may be less directly accessible to respondents than the measure of perceived closeness, which typically assesses the self directly in relation to the other person.¹

The two factors of self-other overlap are generally not correlated. Of the studies that reported correlations between measures of perceived closeness (i.e., IOS measure) and overlapping mental representations (i.e., trait measures), correlations typically are between the range of $.03 \leq r \leq .20$ (Batson et al., 1997; Myers & Hodges, 2012). However, other research suggests that overlap in cognitive representations of self and others may be greater among emotionally close than non-close others (Aron et al., 1991 Study 3).²

How Does Self-other Overlap Relate to Relationships and Prosocial Behavior?

Over the past two decades, a large body of research has examined the role that self-other overlap plays in relationships and prosocial behavior. For instance, perceptions of more overlap between the self and other is associated with greater relationship satisfaction among couples (Acitelli & Young, 1996). Self-other overlap also predicts a multitude of positive outcomes across time. Longitudinal studies of self-other overlap and relationship commitment among romantic relationships suggest that they have mutually reinforcing relationships, where self-other overlap predicts subsequent increases in relationship commitment and relationship commitment predicts subsequent increases in self-other overlap (Agnew, Van Lange, Rusbult, & Langston, 1998). Among married couples, self-other overlap mediates the relationship between marital boredom and lower relationship satisfaction 9 years later (Tsapelas, Aron, & Orbuch, 2009). A meta-analysis of relationship factors that contribute to relationship dissolution over time found that self-other overlap is a strong predictor of lower relationship dissolution rates (Le, Dove, Agnew, Korn & Mutso, 2010). The research demonstrates that self-other overlap plays an important role in relationships.

Self-other overlap may also facilitate prosocial behavior toward close others. For example, relationship closeness (manipulated by having participants reflect on a close or less-close other, such as a family member, a good friend, an acquaintance, a near stranger) predicts greater helping of the other person in a distressing situation (e.g., if the other individual was evicted from his or her home; Cialdini et al., 1997). Furthermore, this effect is accounted by post-manipulation assessments of self-other overlap with the other person, but not by feelings of empathic concern for the other person (Cialdini et al., 1997). Based on the findings, the researchers argue that self-other overlap is an important mechanism in the empathy-altruism relationship, promoting self-other overlap as the key contributing factor to altruism (Cialdini et

al., 1997; Maner et al., 2002). Although the implications of the findings have been debated by other researchers within the empathy-altruism literature, who argue that empathic concern may be a better predictor of prosocial behavior than self-other overlap (Batson, 1987, 1991, 1997; Batson et al., 1997), subsequent tests taking into consideration methodological issues from both sides of the debate have concluded that self-other overlap is a better predictor of helping than empathic concern (Maner et al., 2002).

Given this review, it seems that self-other overlap plays an important role in relationships and prosocial behavior. However many questions remain. The present research attempts to clarify and extend the extant literature by exploring self-other overlap and prosocial behavior in close relationships in two contexts.

1. *First, what determines self-other overlap and how may this affect prosocial tendencies?* Chapter II addresses this question by exploring the factors that influence the tendency to form self-other overlap, and whether these shifts in self-other overlap affect downstream prosocial tendencies in close relationships.
2. *Second, does self-other overlap moderate the consequences of prosocial behavior?* Chapter III addresses this question by exploring whether a proxy for self-other overlap affects more long-term consequences of prosocial behavior, focusing on the important association between prosocial behavior and long-term health benefits.

What Determines Self-other Overlap and How May It Affect Prosocial Tendencies?

Self-other overlap develops and persists for a variety of reasons, such as from desiring to expand oneself (Aron & Aron, 1996, 1997; Aron, Norman, & Aron, 1998, 2001), sharing experiences with close others, disclosing intimate information about oneself (Agnew & Etcheverry, 2006; Aron et al., 1991, 1997), or simply desiring to draw another person closer to

the self (Slotter & Gardner, 2009). Less is known about what may hinder the process of including others into the self. One variable of interest is discrete emotions in close relationships. Emotions can influence relationship outcomes, but little is known about how emotions are related to and actively change perceptions of self-other overlap. Research on emotions and self-other overlap are mainly correlational and primarily emerge from the empathy-altruism literature, which explores self-other overlap when responding to the needs of a suffering person. The causal implications of discrete emotions on self-other overlap in close relationships, and its function in prosocial behavior, continue to elude researchers. Furthermore, little theory or research has framed self-other overlap within the broader literature on appraisal theory and social-cognition.

Chapter II addresses these gaps in the literature by exploring whether discrete emotions momentarily shift self-other overlap and how these shifts in self-other overlap may ultimately affect prosocial tendencies in close relationships. Guided by the appraisal tendency framework (Han, Lerner, & Keltner, 2007; Keltner, Horberg, & Oveis, 2006; Lerner & Keltner, 2000, 2001; Lerner & Tiedens, 2006; Tiedens & Linton, 2001), I hypothesize that discrete emotions (e.g., anger) contribute cognitive and motivational consequences that readily interrupt the naturally unfolding self-other overlap processes in close relationships. To test this hypothesis, participants were asked to reflect on various interpersonal emotions commonly experienced in close relationships (Study 1: anger, happiness, neutral emotion; Study 2: sad, content, neutral emotion; Studies 3 and 4: anger, grateful, neutral emotion) to see how these discrete emotions affect self-other overlap and subsequent helping. The impetus for choosing the five particular discrete emotions was to explore commonly experienced emotions in close relationships and to examine whether the emotions' unique appraisal patterns or valence predicted different levels of self-other

overlap. Also, whereas previous research examined the association between emotions and perceived *closeness*, the present research examined the role of emotions on *overlapping mental representations*, which is less directly accessible to participants and therefore makes the outcome less subject to experimental demand and social desirability. Furthermore, mental representations may be better situated within the broader framework of appraisal theory and social cognition, given the literature's emphasis on exploring more unconscious processing of judgments.

Does Self-other Overlap Moderate the Consequences of Prosocial Behavior?

Chapter II examines whether emotions may momentarily shift self-other overlap to affect prosocial tendencies in close relationships. A logical extension of this research is to examine the long-term consequences of self-other overlap for prosocial behavior in close relationships. Specifically, does self-other overlap moderate the long-term consequences of prosocial behavior?

Theory and research from close relationships suggests that self-other overlap may moderate prosocial behavior, so that people are motivated to help others with whom they share greater self-other overlap, namely others who are considered emotionally closer to the self (Cialdini et al., 1997). This motivation to help closer others most likely emerged from the caregiving system, a pattern of emotions, cognitions, and neurophysiology that has evolved to promote and maintain the formation of social bonds and to motivate helping (S. L. Brown, Brown, & Preston, 2011; S. L. Brown & Brown, 2006). The caregiving system is rooted in the maternal caregiving neural circuitry implicated during offspring care (S. L. Brown, Brown, et al., 2011), and as such, the helping of one's own children may activate the caregiving system to a greater degree than helping other targets. In fact, children are typically at the top of an individual's communal hierarchy, where communal relationships are organized in a pyramid,

with many weaker-strength communal relationships at the base (e.g., acquaintances), fewer medium-strength relationships in the middle (e.g., friends), and very few high-strength relationships at the top (e.g., children; Reis, Clark, & Holmes, 2004). People are motivated to meet the needs of individuals at the top of their hierarchy before the needs of others (Mills, Clark, Ford, & Johnson, 2004; Mills & Clark, 1982; Reis et al., 2004), suggesting that people are motivated to help their children. Furthermore, helping others has been associated with mental and physical health benefits for the self (Konrath & Brown, 2013). One particularly important consequence of helping others is that it can predict lower mortality risk; providing support to others has been shown to predict lower mortality risk among older adults and among patients with end-stage diseases (S. L. Brown, Nesse, Vinokur, & Smith, 2003; McClellan, Stanwyck, & Anson, 1993). Connecting various research literatures, Studies 5a and 5b examine how giving to people of varying emotional closeness moderates the relationship between prosocial behavior and health. More specifically, does giving to children (who presumably activate the caregiving system to a greater degree) predict greater health benefits for the self, compared to giving to less close others?

Chapter III addresses this question by examining the association between giving support at one time point and subsequent mortality risk, arguably a measure that captures cumulative physical health consequences across time. The study explores these associations a) within specific categories of close others that vary on emotional closeness, b) using healthy, non-clinical older adult samples, c) across an extensive timeframe (i.e., 17 years). Using data from the Wisconsin Longitudinal Study (WLS), Studies 5a and 5b examined whether giving support to specific support recipients (e.g., children, parents, siblings, other relatives, friends and acquaintances) predicted differences in mortality risk 17 years later among parents (Study 5a)

and among childless individuals (Study 5b). I hypothesize that giving to recipients who directly activate the maternal caregiving system, namely children, would predict greater long-term health benefits for the self, suggesting that giving to one's children may predict reduced mortality risk relative to giving to other support partners.

Summary of Research Questions

Figure I.1 presents schematic representations of the hypotheses. In Chapter II (see Figure I.1A), I will explore the research question “What determines self-other overlap and how may this affect prosocial tendencies?” by suggesting that discrete emotions could momentarily shift self-other overlap processes to impact downstream prosocial tendencies in close relationships. In Chapter III (see Figure I.1B), I will explore the research question “Does self-other overlap moderate the consequences of prosocial behavior?” by suggesting that self-other overlap may moderate the association between prosocial behavior and health.

Chapter IV will summarize and discuss the main findings from Chapters II and III. The implications of the findings will also be discussed and future research directions will be proposed.

CHAPTER II

What Determines Self-other Overlap and How May It Affect Prosocial Tendencies?

People desire to expand the self by including the resources, perspectives, and traits of others into the self to enhance their self-efficacy, intrinsic motivation, and self-actualization (Aron & Aron, 1996, 1997; Aron et al., 1998, 2001). This self-expansion motivation merges the self-concept of the close other with one's own, creating overlapping mental representations between the self and other, or more broadly, self-other overlap. Self-other overlap can develop and persist through the mechanisms of shared experiences (e.g., going to the movies together) and self-disclosures (e.g., telling the partner about one's past; Agnew & Etcheverry, 2006; Aron et al., 1991, 1997). However, in the absence of shared experiences or self-disclosure, the mere motivation to draw the other person closer is enough to evoke self-other overlap with existing and potential partners (Slotter & Gardner, 2009). In close relationships, people's self-concepts are so entwined with the mental representations of their close other that they sometimes confuse traits of the self with those of the other person (Mashek et al., 2003). When a relationship dissolves, people may experience reduced self-concept clarity, giving credence to the commonly posed post-breakup question, "Who am I without you?" (Slotter, Gardner, & Finkel, 2010).

How Do Emotions Relate to Self-other Overlap?

Research has primarily focused on the factors that contribute to and maintain self-other overlap within relationships, but little is known about what disrupts self-other overlap processes

in existing relationships. Relationships are fraught with emotions that could shift important relational outcomes and such emotions may be prime factors for exploration.

Existing research on emotion and self-other overlap arose mainly from the empathy-altruism debate, which explored whether self-other overlap mediates the empathy-altruism relationship. Within this context, measures of self-other overlap (typically measures of “oneness” that map onto the perceived closeness factor of psychological self-other overlap), empathic emotions (e.g., sympathetic, compassionate, softhearted, and tender), sadness (e.g., sad, low-spirited, and heavy-hearted), and personal distress (e.g., alarmed, worried, distressed, upset) are all moderately correlated (Cialdini et al., 1997; Maner et al., 2002). However, most research within this literature focuses on self-other overlap and emotions that were elicited in response to a suffering stranger (e.g., a person who was evicted from his or her apartment, or the Katie Banks story of a young college woman struggling after the death of her parents). Within the specific context of a suffering stranger, the experience of perceived closeness is mildly associated with a mixture of greater empathy, sadness and distress. *Rarely has research examined how emotions commonly experienced in relationships in general shift self-other overlap.* Furthermore, to date, no studies have experimentally manipulated discrete negative and positive emotions to explore its effects on self-other overlap in close relationships. Doing so will shed light onto the casual implications of discrete emotions on self-other overlap and its function in prosocial tendencies.

Why May Emotions Shift Overlapping Mental Representations?

Prior research offers a number of alternative predictions concerning how emotions experienced in relationships should influence self-other overlap. Some research suggests that a traditional valence approach to emotion may apply. Traditional approaches to the study of

emotion and its downstream outcomes typically separate emotions into negative and positive emotions. This approach applies to both integral emotions, where subjective emotional experiences influence relevant judgments and choices (e.g., anticipated regret of gambling influences willingness to gamble, Mellers, Schwartz, Ho, & Ritov, 1997), as well as incidental affect, where subject experiences effect irrelevant judgments and choices (e.g., the feeling-as-information model, see Schwarz, 1990). Emotion researchers from this approach may opt for a more parsimonious hypothesis regarding emotion and self-other overlap, positing that negative emotions, in general, may undermine self-other overlap, whereas positive emotions may promote self-other overlap. In support, past research has suggested that self-other overlap is correlated with dispositional positive and negative measures of emotions (i.e., how participants generally felt over the past two weeks or the last month) in response to a partner who is not suffering (e.g., a new roommate; Waugh & Fredrickson, 2006). Specifically, greater perceived closeness is associated with moderately less negative emotions and moderately more positive emotions at one time point (Waugh & Fredrickson, 2006). Although conclusions of causality cannot be made from these correlations, one interpretation of the findings suggests that inducing negative emotions may lead to less self-other overlap and inducing positive emotions may lead to more self-other overlap – regardless of the specific positive or negative emotions.

Other approaches to emotion research, such as the appraisal tendency framework, take a more nuanced perspective on emotions that differentiates discrete positive and negative emotions by their appraisal tendencies (Han et al., 2007; Keltner et al., 2006; Lerner & Keltner, 2000, 2001; Lerner & Tiedens, 2006; Tiedens & Linton, 2001). Appraisal theorists argue that discrete emotions are distinguished by their distinct set of appraisals (Lazarus, 1991; C. A. Smith & Ellsworth, 1985). For example, anger can be distinguished from other negative emotions through

its unique appraisals of responsibility/agency (other person is responsible), control (high individual control over events), and certainty (high certainty; Averill, 1983; Betancourt & Blair, 1992; Ellsworth & Smith, 1988a, p. 1; C. A. Smith & Ellsworth, 1985; Weiner, Graham, & Chandler, 1982). More importantly, the appraisal tendency framework suggests that an emotion's distinct set of appraisals contributes to downstream emotion-specific influences on judgments and decision making (Han et al., 2007; Lerner & Keltner, 2000, 2001). Rather than engaging in the debate of directionality from cognition-to-emotion or emotion-to-cognition, the appraisal tendency framework adopts a recursive perspective in which discrete emotions arise from their unique appraisal patterns, but can also carryover to downstream judgments and decisions through their appraisal patterns and themes (Han, Lerner, Keltner, 2007). In essence, in the appraisal tendency framework, discrete emotions arising from their distinct set of appraisals could elicit implicit cognitive tendencies to appraise downstream events through specific processes known as "appraisal tendencies," and these appraisal tendencies facilitate appropriate responding to the emotion-triggering event, carrying over to downstream thought content and depth, and ultimately judgment and decision making (Han et al., 2007). The appraisal tendency framework can explain how cognitive appraisals of discrete emotions differentially predict judgments and choices like the perceptions of risk (Lerner & Keltner, 2000, 2001), attributions of causality and responsibility (Keltner, Ellsworth, & Edwards, 1993), assessments of losses and gains (Lerner, Small, & Loewenstein, 2004), and judgments of effort (Tiedens & Linton, 2001).

Situated within the appraisal tendency framework of emotions, the present study argues that specific discrete emotions may shift perceptions of self-other overlap (specifically, the overlapping mental representations factor). I hypothesize that the appraisal pattern within each discrete emotion can promote specific cognitive and motivational processes that could carryover

to subsequent social-cognitive consequences in close relationships. Because the carryover effects of discrete emotions may be deactivated when an individual becomes aware of his or her own judgment and choice processes (Han et al., 2007), a less conscious measure of self-other overlap may be more appropriate for the present paradigm. Deactivation of carryover effects may occur because cognitive appraisals of emotion are more automatic (Ekman, 1992; Lazarus, 1991; LeDoux, 1996). Supporting the greater automaticity of emotion-related appraisals, judgments of happiness and satisfaction with life can be altered by bringing awareness to other attributions that may explain the mood, and this may be more true for negative moods than positive moods (Schwarz & Clore, 1983). Given how awareness of judgment processes in carryover effects could disrupt the automatic carryover effects of appraisal tendencies, it may be more appropriate to examine the effects of discrete emotions on the less conscious factor of self-other overlap, that is, of overlapping mental representations (rather than closeness).

Because appraisal patterns automatically implicate downstream judgment and decision making, the present research posits that appraisal patterns of discrete emotions may disrupt or foster overlapping mental representations in close relationships. Furthermore because self-other overlap has been linked with prosocial behavior (Cialdini et al., 1997; Maner et al., 2002), disruption of overlapping mental representations from anger may undermine prosocial tendencies. Of particular interest may be the carryover effects of commonly experienced emotions within close relationships, such as anger, sadness, happiness, contentment, and gratitude.

Hypothesizing that anger elicits unique cognitive and motivational processes that would more readily impede self-other overlap and possibly subsequent prosocial tendencies, Study 1 asked participants to reflect on an angry experience with a close friend to examine anger's

effects on self-other overlap and prosocial tendencies, in comparison to a happy or neutral experience. Studies 2, 3, and 4 ruled out a general negative valence explanation (Study 2), examined interpersonal gratitude to explore whether other agency-related appraisal could shift self-other overlap among positive emotions (Study 3), and tested whether relationship type is a boundary condition for self-other overlap processes among marital partners (Study 4).

Study 1: Anger Versus Happiness and Control Among Close Friends

Anger toward close others is a normative occurrence in close relationships that may directly change self-other overlap and altruism. Based on research on the appraisal patterns of anger and the important role of self-other overlap for altruism, I predict that anger, compared to other positive or neutral emotions, should impede self-other overlap processes and the desire to help others in close relationships. Furthermore, anger should undermine the desire to help a close other, because it directly undermines self-other overlap.

First, anger is hypothesized to impede self-other processes in close relationships, compared to other emotions because of its appraisal tendencies (see Table II.1 for a summary of appraisals related to various discrete emotions outlined in Chapter II). Anger arises from appraisals of other-responsibility for a negative event, individual control, and a sense of certainty regarding the occurring event (Averill, 1983; Betancourt & Blair, 1992; C. A. Smith & Ellsworth, 1985; Weiner et al., 1982). People feel angry when they appraise that another person is responsible (e.g., Ellsworth & Smith, 1988a; Fischer, 1991; Frijda, 1986; Ortony, Clore, & Collins, 1988; C. A. Smith & Lazarus, 1993; Wierzbicka, 1992) for an event that blocks their goals or present obstacles for the self (Ellsworth & Smith, 1988a; Izard, 1977; C. A. Smith & Ellsworth, 1985) and involves a threat to self-esteem (Baumeister, Smart, & Boden, 1996; Kernis, Grannemann, & Barclay, 1989; C. A. Smith & Lazarus, 1993). If a person is angry at a

close other who is appraised to be responsible for contributing obstacles that block ones goals and poses a threat to self-esteem, then they may be more likely to judge that person to have negative traits and more hesitant to include those negative traits into the mental representations of the self. In partial support, some research suggests that during the process of including others into the self, people may be more hesitant to include negative traits into the self than positive traits (Davis et al., 1996; Myers & Hodges, 2012).

Furthermore, anger elicits cognitive or social outcomes that could undermine relationships. Anger creates more negative downstream judgment and decisions (for review, see Lerner & Tiedens, 2006). For instance, anger can undermine trust in co-workers, and this effect could be explained by other responsibility appraisals (J. R. Dunn & Schweitzer, 2005).

Incidental anger also leads to less trust and reception to advice than a neutral emotion (Gino & Schweitzer, 2008). Anger has been associated with the action tendency to move against the perceived obstacles created by the perpetrator through antagonistic approaches like opposition (Frijda, Kuipers, & ter Schure, 1989), the urge to hurt the other person (e.g., Frijda et al., 1989; Roseman, Wiest, & Swartz, 1994), and a recursive anger-blame loop against the perpetrator (Quigley & Tedeschi, 1996).

Could anger reduce helping in close relationships? Given the reviewed detrimental effects of anger for close relationships, I hypothesize that anger would undermine the desire to help a close other, compared to other emotions. Past evidence supports this prediction. For example, incidental anger makes people less likely to help others, compared to a neutral emotion (Small & Lerner, 2008). Also, an anger induction predicted more punitive attributions than an induction of a more neutral state (Lerner, Goldberg, & Tetlock, 1998). Therefore anger is expected to undermine helping in close relationships.

Lastly, I hypothesize that anger would lead to less helping in close relationships, because anger impedes self-other overlap processes in close relationships, compared to other positive or neutral emotions. In other words, I hypothesize that the relationship between anger and helping is mediated by changes in self-other overlap. This hypothesis is driven by past research suggesting that self-other overlap is an important precursor to altruism (Cialdini et al., 1997; Maner et al., 2002). In sum, anger may be a unique emotion that should specifically influence self-other overlap and helping.

Would Happiness Change Self-other Overlap and Helping?

Fredrickson's broaden-and-build theory of positive emotions (1998, 2001) posits that positive emotions broaden people's attention, thoughts, and behaviors to increase the range of potential thought-action tendencies. These broadened thought-action repertoires can ultimately build enduring physical, intellectual, psychological, and social resources. The broaden-and-build theory would predict that positive emotions broaden people's sense of self to include others, suggesting that the experience of positive emotions may lead to increased self-other overlap. In support, a correlational study found that the experience of positive emotions is associated with greater self-other overlap with new roommates among first-year college students (Waugh & Fredrickson, 2006). However, no research has examined whether these findings replicate in an experimental context, which would strengthen conclusions of causality. Furthermore, the correlations between self-other overlap and positive emotions were based on the *closeness* factor of self-other overlap instead of the overlapping mental representations factor. Moreover, the study used a merged construct of positive emotions from multiple discrete positive emotions, rather than exploring specific positive emotions. Based on these findings,

perhaps the induction of discrete positive emotions would increase overlapping mental representations since such emotions broaden thought-action repertoires.

Of particular interest is the experience of happiness in close relationships. Appraisal theories suggest that happiness does not involve appraisals that directly implicate self-other overlap. Happy emotions arise when an individual appraises a situation as pleasant, that involves little effort, high certainty, and captures attention (C. A. Smith & Ellsworth, 1985). Theorists agree that the central appraisal pattern of happiness is motive consistency (Ellsworth & Smith, 1988a; Ortony et al., 1988; Roseman, 2001; Klaus R. Scherer, 2001), meaning that the individual has fulfilled a desired motive, whether it is the human need for belonging or more specific goals (Lazarus, 1991). Most importantly, happiness does not involve a high other agency appraisal. Instead happiness is associated with appraisals of moderate self agency (i.e., the self may have brought about the events) and moderate human control (i.e., either the self or another person had the ability to influence what was happening; C. A. Smith & Ellsworth, 1985).

Although research has examined the appraisal dimensions of happiness (Lerner & Keltner, 2001; Tiedens & Linton, 2001), it is nevertheless generally considered the least differentiated positive emotion (Ellsworth & Smith, 1988a, 1988b; C. A. Smith & Ellsworth, 1985). From an appraisal tendency framework, research on the effects of discrete positive emotions on the content and depth of processing is still in its infancy. Some research has found that happiness is similar to anger in that they both elicit more optimistic judgments and choices (Lerner & Keltner, 2001), while others have found that happiness may lead to more heuristic processing because of its higher certainty appraisal (Tiedens & Linton, 2001). Given the recent interest and burgeoning research examining discrete positive emotions, a logical extension of the current literature involves examining how the experience of happiness, relative to anger, could

affect self-other overlap and altruism. Based on Fredrickson's broaden-and-build theory of positive emotions (1998, 2001), one hypothesis argues that discrete positive emotions would increase overlapping mental representations by broadening thought-action repertoires. Alternatively, because the appraisal patterns of happiness does not necessarily involve high other agency, an alternative hypothesis would argue that happiness may not necessarily shift overlapping mental representations.

Does happiness lead to greater helping? In general, happy individuals volunteer more at charities and community service than unhappy individuals, (Krueger, Hicks, & McGue, 2001; Thoits & Hewitt, 2001) and they spend more time volunteering (Thoits & Hewitt, 2001). In a number of studies, positive affect or mood has been shown to increase helping (Carlson, Charlin, & Miller, 1988; Isen, 1999). Experimental evidence generally supports the happiness-prosociality link. For example the induction of positive mood through positive events (i.e., receiving cookies or discovering a dime in a payphone) resulted in greater helping, relative to a neutral condition (e.g., no cookies or dime; Aderman, 1972; Isen & Levin, 1972). Based on this evidence, I hypothesize that happiness would lead to greater helping.

To summarize, I hypothesize that anger, compared to positive or neutral emotions, should impede self-other overlap processes and the desire to help others in close relationships because of its appraisal tendencies. Furthermore, anger is hypothesized to undermine the desire to help a close other, because it directly undermines self-other overlap. It is unclear how happiness will affect downstream social-cognitive consequences; a strictly valence approach would suggest that happiness will increase self-other overlap, but appraisal theory suggests it would not necessarily affect self-other overlap due to the absence of other agency in happiness. Happiness is expected to increase helping though, relative to the other conditions. To test these hypotheses, Study 1

examined whether reflecting on anger, happiness, and a neutral experience (as control condition) with a close friend differentially predicts self-other overlap and helping. Furthermore, because self-other overlap is an important precursor to helping, Study 1 also tested whether condition effects on helping are mediated by differences in self-other overlap.

Method

Participants and procedures. One hundred and three undergraduate students (33 men, 69 women; mean age = 18.75 years, SD = 0.97 years) participated in the lab in groups of 1 to 4 in partial fulfillment of a subject pool course requirement. The sample was 64.7% White/Caucasian, 5.9% Black/African American, 21.6% Asian, 2.0% Middle Eastern, 1% American Indian/Alaskan Native, 3.9% Other and 1% not reported. Participants completed the study in the lab on their own, guided by the online survey program Qualtrics. First, participants were informed that the present study explored feelings, memory, language, and visual spatial perception. After giving their informed consent, participants were randomly assigned to either recall an angry, happy, or neutral experience with a close friend. They then reflected on the causes and reasons underlying their emotional experience for 30 seconds, and completed manipulation checks of valence, arousal, and anger. Participants then rated their level of self-other overlap with the friend identified in the interpersonal experience and the degree to which they would help their friend if s/he were evicted from his/her home. Participants were then debriefed and compensated ½ hour of subject pool credit.

Exclusions. Two participants were excluded because the experiment program unexpectedly malfunctioned half way through the study.

Conditions. Participants were randomly assigned into one of three conditions in which they were asked to recall an angry, a happy, or a neutral experience (control condition) with a

close friend. See Appendix A for the verbatim instructions for each emotion manipulation. In the *angry condition*, participants were asked to recall a past experience in which they “felt angry at a close friend” and to “identify a specific experience ...that makes [them] feel overwhelmed with anger when [they] think about it now” ($n=35$). In the *happy condition* participants recalled an experience in which they “felt happy with a close friend” and to “identify a specific experience...that makes [them] feel overwhelmed with happiness when [they] think about it now” ($n=35$). In the *control condition*, participants recalled an experience in which they “completed a daily activity with a close friend...such as shopping for groceries, doing laundry or dishes, or studying in the library” and to “identify a specific experiencethat does not make [them] feel particularly positive or negative when [they] think about it now” ($n=32$). After recalling the experience, participants were instructed to reflect on the causes and reasons underlying the thoughts and feelings they experienced during the recalled experience for 30 seconds.

Manipulation checks.

Self-assessment manikin. Self-assessment manikin (SAM, Bradley & Lang, 1994) was assessed to evaluate participants’ valence and arousal to the recalled experience. The *valence* measure asked participants to use a series of graphic portraits to “rate how you are feeling RIGHT NOW from unhappy to happy” on a scale of 1 (*unhappy*) to 9 (*happy*); $M = 5.83$, $SD = 1.71$. The graphic portraits were arranged along a continuous scale, starting from a deep frown to a wide smile. The *arousal* measure asked participants to “rate how you are feeling RIGHT NOW from calm to excited” on a scale of 1 (*calm*) to 9 (*excited*), following a continuous scale of graphic portraits starting from sleepy, with eyes close to excited with eyes open; $M = 4.08$, $SD = 1.98$.

Anger. Anger was also assessed by asking participants “To what extent did you feel angry at the person you had previously identified as you thought about the experience?” on a scale from 1 to 9 (1 = *not at all*) to 5 (*somewhat*) to 9(*very much*) ; $M = 3.86$, $SD = 2.77$.

Self-other overlap. Participants then completed a trait measure of self-other overlap that was adopted from Slotter & Gardner (2009). Participants first rated themselves on 15 randomly presented traits (i.e., athletic, artistic, musical, theatrical, intelligent, studious, thoughtful, outgoing, enthusiastic, adventurous, creative, risk-taking, agreeable, ambitious, and inventive) on a scale from 1(*not at all characteristic of me*) to 3 (*somewhat characteristic of me*) to 7 (*extremely characteristic of me*). Afterwards, they rated the other person they had previously identified from the emotion recall on each of the randomly presented traits from 1 (*not at all characteristic of the other person*) to 7(*extremely characteristic of the other person*).

Self-other overlap was calculated by taking absolute value of the difference score between participant ratings and partner ratings for each of the 15 traits. These absolute value scores were then averaged across the 15 traits. For example, if a participant rated both the self and the partner as extremely high on the trait agreeableness, a rating of 7 for both, the absolute value of the difference score would yield a 0, suggesting a complete overlap in the mental representation of agreeableness and that lower scores from this calculation indicated greater self-other overlap. For ease of interpretation, the final score was then reverse scored so that larger values would indicate greater self-other overlap; $M = 5.60$, $SD = .59$.

Helping. To measure helping, the present study adopted Cialdini et al. (1997)’s measure of helping, which is commonly used in the empathy-altruism literature. Specifically, the measure asked participants to imagine that their close friend had been evicted from his or her apartment. The participants were then presented with seven options for helping: 1) I would do nothing, 2) I

would give the person apartment listing websites, 3) I would help the person find a new place to live by driving the person around for a few hours, 4) I would have the person stay with me for a couple of days (provided I had the space), 5) I would have the person come stay with me for a week (provided I had the space), 6) I would offer to have the person come stay with me until he or she found a new place (provided I had the space), and 7) I would offer to let the person come live with me rent free (provided I had the space); $M = 5.35$, $SD = 1.54$.

Results

Manipulation checks. Three separate one-way ANOVA's with condition as a between-subjects factor were conducted on SAM valence, SAM arousal, and anger. All significant condition effects were followed by post-hoc tests using a Tukey HSD correction (see Table II.2 for the means, standard errors, and post-hoc comparisons for all dependent variables by condition from Studies 1 to 4). A significant main effect of condition on SAM valence, $F(2, 99) = 32.95$, $p < .001$, $\eta^2 = .40$, indicated that participants in the angry condition ($M = 4.40$) were significantly less happy than those in the happy condition ($M = 6.91$), $p < .001$, and significantly less happy than those in control condition ($M = 6.22$), $p < .001$. Participants in the happy condition were marginally more happy than those in the control condition, $p = .089$.

A significant main effect of condition on anger, $F(2, 99) = 81.73$, $p < .001$, $\eta^2 = .622$, indicated that participants in the angry condition ($M = 6.83$) were significantly more angry than those in the happy condition ($M = 1.89$), $p < .001$, and significantly more angry than those in control condition ($M = 2.78$), $p < .001$. Participants in the happy condition were marginally less angry than those in the control condition, $p = .089$.

No significant main effect of condition was found for SAM arousal, $F < 1$, suggesting that participants in the angry ($M = 4.23$), happy ($M = 4.37$), and control ($M = 3.59$) conditions experienced similar levels of arousal.

Self-other overlap. A one-way ANOVA with condition as the between-subjects factor was conducted on self-other overlap. There was a significant condition effect $F(2, 99) = 8.40$, $p < .001$, $\eta^2 = .145$. Post-hoc tests indicated that participants in the angry condition ($M = 5.30$) had significantly less self-other overlap than those in the happy condition ($M = 5.68$), $p = .014$, as well as those in the control condition ($M = 5.84$), $p < .001$. There were no significant mean differences in self-other overlap between participants in the happy and control condition, $p = .475$.

Helping. A one-way ANOVA with condition as the between-subjects factor was conducted on helping. A significant condition effect was found, $F(2, 99) = 4.66$, $p = .012$, $\eta^2 = .086$. Post-hoc test indicated that participants in the angry condition ($M = 4.74$) were significantly less likely to help than those in the control condition ($M = 5.78$), $p = .014$, and marginally less likely to help those in the happy condition ($M = 5.57$), $p = .056$. There were no significant mean differences between those in the happy and control conditions, $p = .833$.

Mediation. To test the hypotheses, analyses examined whether self-other overlap mediated the condition effect on helping. Because the condition variable has 3 categories (i.e., anger, happy, and control), the analyses employed Hayes and Preacher's (2013) method of testing mediation with a multi-categorical independent variable using the MEDIANTE macro for SPSS. Indicator coding was specified to create 2 dummy independent variables (D_1 : anger = 0, happy = 1, control = 0; D_2 : anger = 0, happy = 0, control = 1), that implicitly designated the anger condition as the reference group (i.e., designated as 0 in both D_1 and D_2). D_1 and D_2 were then entered as predictors into 3 regression analyses to test 1) the total effect of condition on

helping, 2) indirect effect of condition on the mediator (self-other overlap), and 3) indirect effect of self-other overlap on helping and indirect effect of condition on helping through the mediator. The statistical coefficients presented report group differences between the comparison group (i.e., either happy in D_1 or control in D_2) in relation to the reference group (i.e., anger condition). Because the Sobel's test imposes distributional assumptions regarding the tests of significant indirect effects that make it less reliable in smaller samples, the bootstrapping method was used per recommendations by Preacher and Hayes (2004, 2008). The bootstrapping method randomly selected 10,000 bootstrapped samples to estimate the indirect effect within each of the resampled dataset. Figure II.1 presents the results of the mediation analyses testing whether self-other overlap mediates the relationship between condition and helping.

Condition predicting helping (total effects). When D_1 and D_2 were entered simultaneously as predictors of helping, results suggest that relative to those in the anger condition, participants in the happy condition ($b = .83, t = 2.33, p = .022$) and participants in the control condition ($b = 1.03, t = 2.86, p = .005$) were both more likely to help the close other, $F(2, 99) = 4.65, p = .012, R^2 = .09$.

Condition predicting self-other overlap (indirect effects). When D_1 and D_2 were entered simultaneously as predictors of self-other overlap, results suggest that relative to those in the anger condition, participants in the happy condition ($b = .38, t = 2.86, p = .005$) and participants in the control condition ($b = .54, t = 3.96, p < .001$) were both more likely to report greater self-other overlap with others, $F(2, 99) = 8.40, p < .001, R^2 = .15$.

Self-other overlap predicting helping and condition predicting helping, controlling for each other (indirect effects). When D_1, D_2 , and self-other overlap were entered simultaneously as predictors of helping, results suggest that self-other overlap predicted greater helping,

controlling for the effect of condition ($b = .75, t = 2.88, p = .005$), $F(2, 99) = 6.09, p < .001, R^2 = .16$. Furthermore, the condition effect of happy relative to anger (D_1) on helping was reduced to non-significance ($b = .55, t = 1.53, p = .130$), and the condition effect of control relative to anger was reduced to marginal significance (D_2) on helping ($b = .64, t = 1.69, p = .095$).

Bootstrapping. Bootstrapping based on 10,000 bootstrap samples and 95% bias-corrected confidence intervals for the relative indirect effect indicated that both the happy condition (relative to anger condition) and control condition (relative to anger condition) indirectly influenced helping through self-other overlap (D_1 : 95% CI = .056 to .738; D_2 95% CI = .097 to .894).

Discussion

Study 1 found that discrete emotions in close relationships have the ability to momentarily shift relationship processes like overlapping mental representations and helping. Specifically, reflecting on a past anger experience involving a close friend led to significantly lower inclusion of mental representations of that close friend into the individual's own mental representations, compared to reflecting on a past happy or neutral experience. This suggests that the experience of anger in close relationships undermines naturally unfolding self-other overlap processes that are crucial in close relationships, compared to reflecting on happiness or a more neutral experiences. Reflecting on anger also led to significantly less desire to help that friend in a time of need, compared to reflecting on an interpersonal neutral experience, and marginally less desire to help that friend compared to reflecting on happiness. Mediation analyses found that perceptions of self-other overlap mediate the relationship between condition and less helping. Together, these findings suggest that anger toward close others may ultimately impede helping in

close relationships because it undermines the self-other overlap processes that naturally unfold in close relationships.

Interestingly, there were no significant mean differences in self-other overlap between participants in the happy and control condition, suggesting that the findings were asymmetric to anger impeding self-other overlap, whereas happiness and neutral experiences do not necessarily affect self-other overlap. This suggests that anger is a key emotion that serves important implications for subsequent self-other overlap and helping in close relationships. Furthermore, the findings could be interpreted from the framework of appraisal theory where the lack of other agency in happiness may account for the absence of effect for self-other overlap.

The findings from the manipulation checks suggest that the manipulation was effective in eliciting the desired emotion. Participants who reflected on a past angry experience with a close friend were significantly angrier and less happy than those who reflected on a past happy or a neutral experience. Participants who were in the happy condition were marginally less angry and happier than those who were in the control condition. Therefore the angry condition elicited anger and less happy feelings, whereas the happy and control conditions were only marginally different, though in the predicted direction. Explanations of why this may occur will be discussed later.

Study 2: Sadness Versus Contentment and Control Among Close Friends

One interpretation of the negative effect anger has on self-other overlap and helping points to the unique appraisal tendencies of anger. However, an alternative interpretation suggests that the differences between anger and the other emotions in Study 1 could be simply explained by a more parsimonious valence framework (i.e., negative vs. positive emotions). Past research suggest that negative emotions are correlated with less self-other overlap with close

others, whereas positive emotions are correlated with more self-other overlap (Waugh & Fredrickson, 2006), suggesting that a valence framework may account for the social-cognitive differences between anger and happiness. Therefore one point of inquiry in Study 2 is to test whether the induction of *any* negative emotion would undermine self-other overlap and helping, relative to the induction of any positive emotion or control. To address this concern, Study 2 extends on Study 1's experimental paradigm by having participants reflect on alternative emotions that match on valence (i.e., sadness and contentment) that are also prevalent in close relationships.

Would Sadness Reduce Self-other Overlap and Helping?

Guided by the appraisal theories of emotion, I predict that alternative negative emotions, like sadness, would not undermine self-other overlap compared to positive and neutral emotions because sadness does not elicit similar appraisal themes as anger. Furthermore, this hypothesis emphasizes that an appraisal tendency framework may be more appropriate than a strict valence approach when examining emotions' effects on downstream social-cognitive outcomes. Sadness arises with appraisal themes of irrevocable loss (Lazarus, 1991), and may promote reward seeking, relative to other negative emotions (Raghunathan & Pham, 1999). Like anger, sadness is a response to goal failure and frequently co-occurs with anger (Levine, 1995; Stein & Levine, 1989). The differentiating appraisal between anger and sadness concerns agency: people feel angry when they appraise the situation as caused by another person's intentional harm or negligence; people feel sad when they appraise the situation as caused by circumstances beyond the other person's control (Averill, 1982; Ellsworth & Smith, 1988a; Ortony et al., 1988). Directly comparing the appraisal tendencies of the two emotions on social judgments suggests that sad participants, compared to angry participants, are more likely to perceive a negative event

as situationally caused and to attribute responsibility of an ambiguous event to be more situationally caused than by human agency (Keltner et al., 1993). Therefore sadness arises when people appraise a situation as impersonal, where perhaps nothing can be done to set it right. Because sadness does not directly draw upon an agency appraisal in which another person is responsible for the event or is hurting or threatening the self, I would not expect sadness to undermine self-other overlap.

How would sadness implicate helping? Previous research suggests that while incidental anger leads to less helping, compared to a neutral emotion, sadness leads to more helping (Small & Lerner, 2008). However, the relationship between induced sadness and helping is dependent on whether participants believe helping will be instrumental to improving their mood. This may be related to the more reward seeking nature of sadness, relative to other negative emotions (Raghunathan & Pham, 1999). For example, saddened participants are more likely to help than neutral mood controls only if they believe that their mood is changeable. When saddened participants believe that helping cannot improve their mood, they are no more helpful than neutral mood participants (Manucia, Baumann, & Cialdini, 1984). Based on this research, I do not have specific hypotheses regarding how sadness would affect helping, because whether participants believe helping would be instrumental to improving their mood or not is beyond the scope of the present research. Even if sadness predicts more helping, I would not expect that process to occur through self-other overlap because sadness is not expected to predict self-other overlap.

Would Contentment Change Self-other Overlap and Helping?

Like happiness, an appraisal theory of contentment involves appraisals that are not hypothesized to directly implicate self-other overlap. Because positive emotions are less

differentiated than negative ones, less research has been done to distinguish contentment from happiness. In general, the two emotions are regarded as very similar. The core appraisal pattern of contentment, like happiness, involves motive consistency, where contentment arises when an individual attains a motive that is desired (Lazarus, 1991). However, it remains unknown whether contentment involves human agency or circumstantial agency. Some evidence suggest that contentment is associated with perceived individual control to cope with situations (Goetz, Frenzel, Stoeger, & Hall, 2010). Based on this literature, one hypothesis is that the induction of contentment may not necessarily increase self-other overlap because it is not necessarily related to other-oriented appraisal patterns of agency.

How does contentment predict helping? Because contentment is generally not differentiated from happiness, past research linking positive mood and helping may apply to contentment as well. Past research on positive affect or mood suggest that it leads to greater helping (Aderman, 1972; Carlson et al., 1988; Isen & Levin, 1972; Isen, 1999). Therefore we would expect contentment, like happiness, to increase helping, relative to the other conditions.

Calling to mind the research suggesting that sadness does not share the same appraisal tendencies as anger in attributing blame on other agency, I hypothesized that reflecting on a sad experience relative to a content experience and neutral control would not predict differences in self-other overlap. Sadness may still predict helping, depending on whether people believe helping may improve their mood, relative to positive or neutral emotions, but even so, I would not expect that process to occur through self-other overlap because sadness is not expected to predict self-other overlap. Lastly, contentment, relative to sadness or control, may or may not increase self-other overlap, but it is hypothesized to increase helping based on past research.

Method

Participants and procedures. Seventy-six undergraduate students (28 men, 48 women; mean age = 19.05 years, SD = 1.06 years) participated in the lab in groups of 1 to 4 in partial fulfillment of a subject pool course requirement. The sample was 63.2% White/Caucasian, 5.3% Black/African American, 22.4% Asian, 2.6% Middle Eastern, 1.3% Native Hawaiian or Pacific Islander, and 5.3% Other. Participants completed the study in the lab on their own, guided by the online survey program Qualtrics. The procedure of Study 2 was very similar to that of Study 1, except that participants were randomly assigned to either recall a sad, content, or neutral experience with a close friend.

Exclusions. Four participants were excluded because they were interrupted during the experiment by either loud talking in the adjacent room or by a late participant. In addition, one participant was excluded because of a computer malfunction halfway through the study and one was excluded because the experimenter thought the participant appeared to be rushing through the study.

Conditions. Participants were randomly assigned into one of three conditions in which they were asked to recall a sad, content, or neutral experience (control condition) with a close friend. See Appendix A for the verbatim instructions in each of the emotion manipulations. In the *sad condition*, participants were asked to recall a past experience in which they “felt sad or depressed because of an experience you shared with a close friend” and to “identify a specific experience... that makes [them] feel overwhelmed with sadness when [they] think about it now” ($n=25$). In the *content condition* participants recalled an experience in which they “content or satisfied because of an experience you shared with a close friend” and to “identify a specific experience...that makes [them] feel overwhelmed with contentment when [they] think about it now” ($n=25$). The instructions for *control condition* followed the same wording as the control

condition of Study 1 ($n=26$). After recalling the experience, participants were instructed to reflect on the causes and reasons underlying the thoughts and feelings they experienced during the recalled experience for 30 seconds.

Manipulation checks.

Self-assessment manikin. The Self-Assessment Manikin (SAM, Bradley & Lang, 1994) was assessed to evaluate participants' valence and arousal to the recalled experience. The *valence* measure asked participants to use a series of graphic portraits to "rate how you are feeling RIGHT NOW from unhappy to happy" on a scale of 1 (*unhappy*) to 9 (*happy*); $M = 5.76$, $SD = 1.76$. The graphic portraits were arranged along a continuous scale, starting from a deep frown to a wide smile. The *arousal* measure asked participants to "rate how you are feeling RIGHT NOW from calm to excited" on a scale of 1 (*calm*) to 9 (*excited*), following a continuous scale of graphic portraits starting from sleepy, with eyes close to excited with eyes open; $M = 3.36$, $SD = 1.65$.

Sadness. Sadness was also assessed by asking participants "To what extent did you feel sad as you thought about the experience?" on a scale from 1 to 9 (1 = *not at all*) to 5 (*somewhat*) to 9 (*very much*); $M = 3.96$, $SD = 2.22$.

Self-other overlap. Participants completed the same trait measure of self-other overlap as Study 1, where they rated themselves and the other person on 15 randomly presented traits (e.g., athletic, intelligent, creative, etc.) on a scale from 1 (*not at all characteristic of me*) to 3 (*somewhat characteristic of me / the other person*) to 7 (*extremely characteristic of me / the other person*). The final self-other overlap variable followed the same calculation process as that of Study 1; $M = 5.48$, $SD = .56$.

Helping. Helping was measured by the same measure used in Study 1, where participants were asked to imagine that their close friend had been evicted from his or her apartment and rate which of the seven present options they would do to help their friend, e.g., from 1) I would do nothing to 7) I would offer to let the person come live with me rent free (provided I had the space); $M = 5.59$, $SD = 1.50$.

Results

Manipulation checks. Three separate one-way ANOVA's with condition as a between-subjects factor were conducted on SAM valence, SAM arousal, and sadness. All significant condition effects were followed by post-hoc tests using a Tukey HSD correction (see Table II.2). A significant main effect of condition on SAM valence, $F(2, 73) = 21.80$, $p < .001$, $\eta^2 = .373$, indicated that participants in the sad condition ($M = 4.28$) were significantly less happy than those in the content condition ($M = 6.80$), $p < .001$, and significantly less happy than those in control condition ($M = 6.19$), $p < .001$. There were no significant differences in feeling happy between participants in the content and the control condition, $p = .279$, though the means were in the predicted direction.

A significant main effect of condition on sadness, $F(2, 73) = 18.91$, $p < .001$, $\eta^2 = .341$, indicated that participants in the sad condition ($M = 5.80$) were significantly more sad than those in the content condition ($M = 3.16$), $p < .001$, and significantly more sad than those in control condition ($M = 2.96$), $p < .001$. There were no significant differences in feeling sad between participants in the content and the control condition, $p = .921$.

No significant main effect of condition was found for SAM arousal, $F < 1$, suggesting that participants in the sad ($M = 3.04$), content ($M = 3.44$), and control ($M = 3.58$) conditions experienced similar levels of arousal.

Self-other overlap. No significant condition effect was found for self-other overlap, $F < 1$, suggesting that participants in the sad ($M = 5.46$), content ($M = 5.42$), and control ($M = 5.56$) conditions reported similar levels of self-other overlap.

Helping. A one-way ANOVA with condition as the between-subjects factor was conducted on helping. A significant condition effect was found, $F(2, 73) = 3.55, p = .034, \eta^2 = .089$. Post-hoc tests indicated that participants in the sad condition ($M = 4.96$) were significantly less likely to help than those in the control condition ($M = 5.92$), $p = .053$, and marginally less likely to help those in the content condition ($M = 5.88$), $p = .07$. There was no significant difference between those in the content and control conditions, $p = .994$.

Discussion

The main hypothesis for Study 2 predicted that reflecting on a sad experience would not undermine self-other overlap, relative to reflecting on a content or neutral emotion because sadness does not elicit patterns of appraisals that attribute blame on human agency. Findings support the hypothesis; there was no significant condition effect for self-other overlap, suggesting reflecting on sadness, contentment, or control did not affect reports of self-other overlap with the close friend. Furthermore, the findings suggest that a valence perspective may not be as appropriate in the present paradigm as an appraisal tendency framework. Implications for theoretical contribution will be discussed later.

Exploratory analyses regarding whether sadness would undermine helping were also conducted, and the results suggest that participants in the sadness condition reported significantly lower subsequent desire to help the close other than those in the control condition and marginally less desire to help those in the contentment condition. No significant difference in helping was found between participants in the contentment and control conditions.

A potential explanation for why sadness led to less helping, compared to the other conditions is that participants may have felt that helping would not be instrumental in improving their mood, which is one driver for why induced sadness typically leads to more helping in the first place (Manucia et al., 1984). The sadness induction instructions specified participants to reflect on an experience that had already happened in the past. Furthermore, the prompt had given examples of potential events that cause interpersonal sadness to aid the recall of a specific event. These examples involved “being rejected by a friend, or feel depressed about something their friend has said or done.” The nature of the reflected event and the fact that it occurred in the past may contribute to the belief that helping the friend in a future scenario would not necessarily relieve the sadness one felt in the past. In short, helping in a future event may be beyond the window of opportunity to change sadness from the past.

More importantly, the findings suggest that the condition differences in helping cannot be explained by self-other overlap because there were no significant condition differences in self-other overlap. Therefore participants who feel sad may be less likely to help their close other, compared to those who are content or more neutral, but this does not operate through the mediating role of self-other overlap.

Study 2 found that the manipulation was effective in eliciting the desired emotion; participants reflecting on a past sad experience with a close friend, were significantly sadder and less happy than those asked to recall a past contentment experience or those asked to recall a neutral experience. There were no significant differences in sad or happy feeling between participants in the content and the control condition, though the means were in the predicted direction.

Study 3: Anger Versus Gratitude and Control Among Best Friends

Study 1 found that anger in relationships undermined self-other overlap with close friends to impede downstream prosocial tendencies toward that close friend, compared to happiness or a neutral emotion, while Study 2 found that similarly-valenced emotions like sadness and contentment did not undermine self-other overlap processes, relative to a neutral emotion. Supporting the appraisal tendency framework, these findings suggest that appraisals of other-oriented agency can affect self-other overlap and helping, at least with negative emotions. What remains unclear is whether the other agency appraisal is asymmetric to negative emotions, wherein it shifts self-other overlap and helping among negative emotions only, or whether the other agency appraisal implicates self-other overlap and helping among positive emotions as well. Specifically, would a positive emotion associated with an other-oriented agency appraisal increase self-other overlap in close relationships? To test this question, Study 3 replaced the positive emotion condition with gratitude, a discrete emotion that is linked with other agency appraisals, and compared it to anger and a neutral control.

Would Gratitude Increase Self-other Overlap and Helping?

Gratitude involves an appraisal tendency that directly implicates close others. Gratitude usually occurs when an individual acknowledges another's good deeds or prosocial behavior as providing a benefit for the self. It has been defined as "a sense of thankfulness and joy in response to receiving a gift, whether the gift be a tangible benefit from a specific other or a moment of peaceful bliss evoked by natural beauty" (Emmons, 2004, p. 554). Gratitude is considered a social emotion because young children learn to be grateful from role models, it involves the acknowledgment of another's good deeds, affirms social resources, and motivates prosocial behavior (Emmons & Shelton, 2002) and the reciprocation of aid (Bartlett & DeSteno, 2006; McCullough, Kilpatrick, Emmons, & Larson, 2001; Tsang, 2006). People experience

gratitude when they appraise a positive event with other agency; in fact grateful people tend to believe other people are responsible for positive and desirable outcomes (Ellsworth & Smith, 1988a; Emmons & McCullough, 2003; McCullough, Tsang, & Emmons, 2004; Ruth, Brunel, & Otnes, 2002; Soscia, 2007).

Appraisal tendencies of gratitude may influence downstream judgment and decision making, especially judgments related to the self and other in relationships. For example, gratitude is related to more agreeableness and less narcissism (McCullough et al., 2001). Experimentally inducing gratitude within a negotiation context lowers self-concern, but increases other-concerns (Butt & Choi, 2006). The induction of incidental gratitude, compared to incidental anger, also has consequences for downstream unrelated judgments, such as more trust and receptiveness to advice in an weight estimation task (Gino & Schweitzer, 2008). Relative to other positive emotions, gratitude motivates people to acknowledge the benefactor or repay for the positive deed, to spontaneously notice new positive traits in the benefactor, be more willing to associate with the benefactor in the future, and adopt a positive relationship focus toward the benefactor (Algoe & Haidt, 2009). In relationships, grateful feelings are associated with better perceptions of relationship quality, such as greater liking of or closeness to benefactor and feeling better understood by the benefactor (Algoe, Haidt, & Gable, 2008). Furthermore, evidence suggests that gratitude initiates relationship-building between the benefactor and the recipient, suggesting that it is important for relationship formation and maintenance (Algoe et al., 2008). Taken together, the present study predicts that gratitude would increase self-other overlap in close relationships.

How might gratitude implicate helping? Extant research generally supports the idea that gratitude leads to more prosociality. Gratitude-related prosociality occurs with both benefactors

(Bartlett & DeSteno, 2006; Tsang, 2006, 2007), as well as unrelated others, even when it's costly for the self (Bartlett & DeSteno, 2006). People who are high on trait gratitude are rated by their social networks as more generous and helpful (McCullough, Emmons, & Tsang, 2002). Based on this, the present research predicts that gratitude would also increase helping, relative to the other conditions.

Other Confounds

Study 3 also addressed some limitations in Study 1. For example, an alternative explanation for anger's detrimental effects in close relationships concerns a procedural confound, where participants identified a close friend *as part of* the emotion induction. The confound potentially allows participants in the angry condition to identify a friend with whom they initially shared lower self-other overlap, suggesting that anger's effects on lower self-other overlap and helping, relative to the other conditions, may have emerged in part from reflecting on a friend who generally has lower self-other overlap with the self regardless of the emotion induction. A second and related limitation concerns the vague definition of what is considered a "close" friend, which could vary greatly depending on the participant, potentially contributing noise to the data. The vague definition of what constitutes a close friend allows for a broad pool of partners varying on self-other overlap from which to draw upon when reflecting on an emotional experience. Study 3 addressed these limitations by asking participants to identify their best friend prior to emotion induction instructions, and to reflect on the emotional experiences regarding this friend. The study also only recruited participants who were not married because married partners may be uniquely different from friends and may present a boundary condition, which was tested in Study 4.

Method

Participants and procedures.

Recruitment. Participants were recruited from Amazon's Mechanical Turk (mTurk), an online crowdsourcing marketplace that allows researchers (known as requesters) to post jobs and participants (known as workers) to choose which jobs to complete. The marketplace has recently become popular among experimental psychologists, in part due to its efficiency in collecting data from human subjects, diverse sample, and low cost (e.g., Buhrmester, Kwang, & Gosling, 2011; Crump, McDonnell, & Gureckis, 2013; Mason & Suri, 2012). Furthermore, research has replicated various cognitive behavioral tasks using a mTurk sample (e.g., Stroop, attentional blink, subliminal timing, etc.; Crump et al., 2013), suggesting that it is a validated tool for experimental behavioral research. An mTurk study was posted for a "10-15-minute Psychology Study" with a payment of \$0.50. mTurk allows requesters to limit the type of worker who could participate in a particular study based on specific qualifications. To ensure higher data quality and reduce noise, the study was limited to the workers with an approval rate of 95% or greater and those from the United States.

Two hundred and fifty-six workers took part in the study (138 men, 106 women, 12 gender unknown; mean age = 31.44 years, SD = 12.14 years).

Exclusions. Fifty participants were excluded from analyses because they failed an instructional manipulation check designed to check negligence (see below for more details on the experiment checks). The percentage of exclusion based on this task was consistent with prior research (e.g., Goodman, Cryder, & Cheema, 2013; Oppenheimer, Meyvis, & Davidenko, 2009).

Twenty-eight participants were deemed sufficiently distracted to be excluded from the study (e.g., websurfing, watching Netflix or TV, listening to music, talking to their children,

writing a letter, etc.) based on a free-response question asking participants to describe the activities they were engaging in while they completed the study.

Fifteen participants were excluded because they had identified a person other than their close friend (i.e., 3 participant identified their wife/husband, 3 work or academic colleague, and 9 acquaintances).

Six participants were excluded because they either gave illogical responses to the question, “Where were you when taking this survey?,” implying they were more negligent (i.e., October 18 2014, my friend, nothing, afternoon weekday, evening) or in a potentially distracting location (e.g., a pizza shop).

Although the study limited worker eligibility to only workers residing within the U.S., meaning that the study would not have been visible to workers from non-US countries, sometimes workers from non-US countries do end up participating in the study. As a second check of country residence, the IP address of each study participant was tracked for the country of origin using an online tracker. Seven participants’ IP addresses indicated that they resided outside of the U.S. (2 in Thailand, 1 in Philippines, 1 in Singapore, 1 in Tanzania, 1 in Puerto Rico, and 1 in Belgium) and were excluded.

Taken together, the exclusions (41.41% of the original sample) consist of the following. The majority of the exclusions (32.81%) involved negligent participants (based on 19.53% instructional manipulation check, 10.94% self-reported distraction during study, and 2.34% negligent in answer a basic question). This percentage is consistent with experimental checks of negligence (e.g., 35% in Oppenheimer et al., 2009). The remaining exclusions consist of 5.86% participants who identified a partner who was not close friend and 2.73% were non US participants.³ After the exclusions, 150 participants (89 men, 61 women; mean age = 33.11 years,

SD = 12.96 years) were included in the analyses. The sample was 81.3% White/Caucasian, 5.3% Black/African American, 10.0% Asian, 1.3% Middle Eastern, and 1.3% Other.

Unmarried participants screening. Because married participants may be more likely to identify their marital partners as their best friend, presenting another confound and potential boundary condition, the study secretly screened for participants who are unmarried to better examine the relation between emotion and self-other overlap among close friends only. The screening task was designed to appear as a formality prior to the actual study and included a number of demographic distracter items (i.e., gender, race, ethnicity, race) as well as a question on current marital status. Participants were given 5 options for current marital status: 1) never married, 2) currently married, 3) separated, 4) divorced, and 5) widowed. Only participants who reported that they were never married, divorced, or widowed were forwarded to the actual study. All other participants (i.e., those who were currently married or separated) were notified that they were ineligible.

Participants who passed the screening were informed that the present study explored feelings, memory, language, and visual spatial perception. After giving their informed consent, participants were asked to identify and reflect on their best friend, and then were randomly assigned to either recall an angry, grateful, or neutral experience with that friend. They then reflected on the causes and reasons underlying their emotional experience for 30 seconds, and completed manipulation checks of valence and arousal. Participants then rated their level of self-other overlap with their best friend in the experience and the degree to which they would help this friend. Participants were then debriefed and compensated.

Identify partner. Participants were asked to think about their best friend and to take a few moments to imagine that person in front of them right now. They were then asked to enter

the person's initials. The task was designed to ensure that participants were indeed reflecting on their best friend as they were going through the emotion manipulation.

Conditions. Participants were randomly assigned into one of three conditions in which they were asked to recall an angry, grateful, or neutral experience (control condition) with their best friend. See Appendix A for the verbatim instructions in each of the emotion manipulations. In the *angry condition*, participants were asked to recall a past experience in which they “felt angry at [friend's initials].” The initials were collected during the partner identification and were automatically entered into the prompt. Participants were asked to “identify a specific experience ...that makes [them] feel overwhelmed with anger when [they] think about it now” ($n=49$). The instructions were fairly similar to that of Study 1, except that example anger scenarios were added to aid the recall of an event: “They may have felt angry because their friend treated them unfairly, or because their friend did or said something mean or inconsiderate.” In the *gratitude condition* participants recalled an experience in which they “felt grateful because of [friend's initials]” and to “identify a specific experience...that makes [them] feel overwhelmed with gratitude when [they] think about it now” ($n=49$). Examples of gratitude scenarios involved feeling “grateful because their friend helped them with something important, or because their friend supported them during a time of need.” In the *control condition*, participants recalled an experience in which they “completed a daily activity with [friend's initials].” The control scenarios were changed from previous studies to emphasize activities that adult friends may do together (e.g., “simply going about their daily activities with their friend, such as walking or driving somewhere, waiting in line, or watching TV to just pass some time”) to reflect the older non-student mTurk population. They were told to “identify a specific experience ...that makes [them] feel neutral when [they] think about it now” ($n=52$). After recalling the experience,

participants were instructed to reflect on the causes and reasons underlying the thoughts and feelings they experienced during the recalled experience for 30 seconds.

Manipulation checks. Self-assessment manikin (SAM, Bradley & Lang, 1994) was assessed to evaluate participants' valence and arousal to the recalled experience like in previous studies from 1 (unhappy/calm) to 9(happy/excited), respectively: *valence* ($M = 5.93, SD = 1.93$); *arousal* ($M = 3.77, SD = 2.04$).

Self-other overlap. Participants completed the same trait measure of self-other overlap as Study 1 and 2, where they rated themselves and the other person on 15 randomly presented traits (e.g., athletic, intelligent, creative, etc.) on a scale from 1(*not at all characteristic of me*) to 3 (*somewhat characteristic of me / the other person*) to 7 (*extremely characteristic of me / the other person*). The final self-other overlap variable followed the same calculation process; $M = 5.55, SD = 0.60$.

Helping. Helping was measured by the same measure used in Studies 1 and 2, where participants were asked to imagine that their close friend had been evicted from his or her apartment and rate which of the seven present options they would do to help their friend, e.g., from 1) I would do nothing to 7) I would offer to let the person come live with me rent free (provided I had the space; $M = 5.87, SD = 1.22$).

Experiment checks.

Identified friend. Because the study asked participants to identify a best friend to reflect upon during the emotion manipulation, presumably participants should have thought about their close friend. Whether this was the case was checked again at the end of the study. Participants answered the question: "The person you had previously identified is:" by selecting one of the 6 options: 1) my wife/husband, 2) my girlfriend/boyfriend, 3) a close friend who is not my

romantic partner or work or academic colleague, 4) a work or academic colleague, 5) an acquaintance, 6) a near stranger. Only participants who selected that they had reflected on their close friend or girlfriend/boyfriend were included in the analyses.

Instructional manipulation check. At the end of the study, participants completed an instructional manipulation check that was designed to identify negligent participants. Inclusion of an IMC has been shown to increase statistical power and reliability of the data in offline studies (Oppenheimer et al., 2009), as well as benefit online studies involving mTurk participants that require more time (~16 minutes; Goodman et al., 2013). Because the original version of the IMC asked about “sports participation” which is unrelated to the study and may arouse suspicion, the question was modified to focus on internet activities. Participants were presented with instructions that asked “In order to facilitate our research we are interested in knowing certain factors about you. Specifically, we are interested in whether you actually take the time to read the directions. So, in order to demonstrate that you have read these instructions, please select online shopping and check email only below and then click to the next screen. Thank you very much.” Then in a clearly demarcated paragraph, the instructions asked “Which of these Internet activities do you engage in regularly? (Select all that apply),” followed by a list of common internet activities (i.e., read the news online, check email, twitter, facebook, tumblr, blogger, pinterest, instagram, online shopping, other(please specify).” Only participants who followed the instructions correctly by selecting “online shopping” and “check email” were included in the analyses.

Distractions. Distractions were checked with two questions at the end of the study. First, participants were asked “Where were you when taking this survey?” Then they were also asked to describe the activities they were engaging in while they completed the survey.

Results

Manipulation checks. Two separate one-way ANOVA's with condition as a between-subjects factor were conducted on SAM valence and SAM arousal. All significant condition effects were followed by post-hoc tests using a Tukey HSD correction (see Table II.2). A significant main effect of condition on SAM valence, $F(2, 147) = 29.45, p < .001, \eta^2 = .286$, indicated that participants in the angry condition ($M = 4.49$) were significantly less happy than those in the gratitude condition ($M = 6.90$), $p < .001$, and significantly less happy than those in control condition ($M = 6.38$), $p < .001$. There were no significant differences in feeling happy between participants in the gratitude and control condition, $p = .261$, though the means were in the predicted direction.

A significant main effect of condition on SAM arousal, $F(2, 147) = 3.14, p = .05, \eta^2 = .041$, indicated that participants in the gratitude condition ($M = 4.24$) were significantly more aroused than those in the control condition ($M = 3.25$), $p = .038$. There were no significant differences in arousal between participants in the gratitude and the angry condition ($M = 3.86$), $p = .608$, nor between participants in the angry condition and control condition, $p = .288$.

Self-other overlap. A one-way ANOVA with condition as the between-subjects factor was conducted on self-other overlap. There was a significant condition effect, $F(2, 147) = 3.21, p = .043, \eta^2 = .042$. Post-hoc tests indicated that participants in the angry condition ($M = 5.41$) had significantly less self-other overlap than those in the control condition ($M = 5.71$), $p = .035$. There were no significant mean differences in self-other overlap between participants in the angry and gratitude condition ($M = 5.53$), $p = .583$, though the means were in the predicted direction. No significant mean differences in self-other overlap between participants in the gratitude and control condition were found as well, $p = .291$.

Helping. No significant condition effect was found for helping, $F(2, 147) = 1.01, p = .368, \eta^2 = .014$, suggesting that participants in the angry ($M = 5.96$), grateful ($M = 5.98$), and control ($M = 5.67$) conditions reported similar levels of helping.

Discussion

Study 3 replicated the effect that anger in close friendships undermined self-other overlap, relative to a neutral emotion, even after controlling for the level of initial self-other overlap by having participants reflect on their best friend prior to the emotion induction. Specifically, reflecting on a past anger experience involving a best friend led to significantly lower inclusion of mental representations of that friend into the individual's own mental representations, compared to reflecting on a past neutral experience.

However, anger did not undermine helping, relative to the neutral control in this better controlled sample. The findings suggest that the mediation model where anger undermined self-other overlap to undermine helping may be unreliable. Future research should explore the role of anger on helping more to fully explore the model among other contexts and populations.

Interestingly, reflecting on a grateful experience did not elicit significantly different levels of self-other overlap than reflecting on anger nor a neutral emotion. In fact, the means for gratitude on self-other overlap were not in the predicted direction. Participants in the gratitude condition reported self-other overlap levels that were in between those in the angry and control conditions. Gratitude also did not elicit greater levels of helping than the other conditions, suggesting that it did not replicate previous research linking gratitude with greater helping (Bartlett & DeSteno, 2006; Tsang, 2006, 2007).

However, the lack of significant differences between gratitude and the other conditions may be explained by the difficulty in effectively manipulating gratitude. Because gratitude was

not measured directly, which in hindsight poses a limitation, interpretation will have to rely on post-manipulation valence scores in assessing the effectiveness of the gratitude manipulation. Although participants in the angry condition were less happy than those in both the gratitude and the control condition, participants in the gratitude condition did not report greater levels of happiness than those in the control, though the means were in the predicted direction and the effect can be considered trending. This suggest that perhaps the manipulation did not effectively manipulate gratitude, relative to the control condition, and this may be a function of issues with power. Another interpretation suggests that participants in the control condition were still mildly happy, once again highlighting the difficulty in eliciting a truly neutral control in close relationships. Most likely, both interpretations may apply: perhaps Study 3 had difficulty in effectively manipulating an intensely grateful experience and a truly neutral emotion.

Study 4: Anger Versus Gratitude and Control Among Marital Partners

Both Studies 1 and 3 found that anger experiences may be especially detrimental in close friendship relationships, because anger undermines the process of including mental representations of that close friend into the self, relative to a more neutral emotion condition. Study 4 seeks to test this effect in another type of relationship, by exploring whether it would still operate in relationships characterized by stronger and perhaps more enduring self-other overlap, such as marital couples. I hypothesize that marital couples, like close friendships, would exhibit momentary fluctuations in self-other overlap processes in response to anger, relative to the other conditions, because anger could carry over into social-cognitive judgments related to the self and other. This hypothesis is supported by theory and research from the appraisal tendency framework (Han et al., 2007; Keltner et al., 2006; Lerner & Keltner, 2000, 2001; Lerner & Tiedens, 2006; Tiedens & Linton, 2001), as well as findings from Studies 1 and 3

suggesting that anger undermines self-other overlap relative to the control among close friendships.

Study 4 examined how anger may operate among married participants reflecting on past emotional experiences with their marital partner. It was ran concurrently with Study 3 on mTurk, so the two studies share a similar procedure. Participants in Study 4 were screened for marital status, asked to identify their marital partner, randomly assigned to reflect on an anger, grateful, or neutral control experience with their marital partner, and then to report self-other overlap and helping toward their marital partner.

Method

Participants and procedures.

Recruitment. Participants were recruited from Amazon’s Mechanical Turk (mTurk). An mTurk study was posted for a “10-15-minute Psychology Study” with a payment of \$1. Like in the previous mTurk study, Study 4 was limited to the workers with an approval rate of 95% or greater and those from the United States. One hundred and fifty workers took part in the study (53 men, 97 women; mean age = 38.29 years, SD = 12 years).

Exclusions. Twelve participants who failed the instructional manipulation check were excluded from analyses.

Based on the distraction question, 12 people were deemed sufficiently distracted enough to be excluded from the study (e.g., watching TV or listening to music, talking to their children, etc.).

Four people were excluded because they had identified a person other than their married partner (i.e., 1 participant identified a work or academic colleague, 1 participant a close friend who was not their romantic partner, and 2 participants their girlfriend / boyfriend).

Four participants were excluded from the analyses because their IP address indicated that they did not reside in the U.S. (2 participants resided in Mexico, 1 in Romania, and 1 in the Philippines).

Taken together, the exclusions (21.33% of the original sample) consist of the following. The majority of the exclusions (16%) involved negligent participants (based on 8% instructional manipulation check and 8% self-reported distraction during study). The remaining exclusions consist of 2.67% participants who identified a partner who was not their marital partner and 2.67% were non US participants.⁴ After the exclusions, 118 participants (42 men, 76 women; mean age = 39.54 years, SD = 11.95 years) were included in the analyses. The sample was 88.1% White/Caucasian, 5.1% Black/African American, 2.5% Asian, 0.8% American Indian/Alaskan Native, and 3.4% Other.

Married participants screening. To better control for closeness level to the relationship partner, the study secretly screened for marital status. Using the same screening task as in Study 3, participants were presented with 5 options for current marital status: 1) never married, 2) currently married, 3) separated, 4) divorced, and 5) widowed. Only participants who reported to be currently married were forwarded to the actual study, whereas the remaining workers were notified that they were ineligible. Participants who passed the screening followed similar procedures as those in Study 3.

Identify partner. Participants were asked to think about their current romantic partner (e.g., wife or husband) and to take a few moments to imagine that person in front of them right now. They were then asked to enter the person's initials. The task was designed to ensure that participants are indeed reflecting on their wife or husband as they are going through the emotion manipulation.

Conditions. Participants were randomly assigned into one of three conditions in which they were asked to recall an angry, grateful, or neutral experience (control condition) with their relationship partner. See Appendix A for the verbatim instructions in each of the emotion manipulations. In the *angry condition*, participants were asked to recall a past experience in which they “felt angry at this person” and to “identify a specific experience ...that makes [them] feel overwhelmed with anger when [they] think about it now” ($n=33$). The same example anger scenarios were presented as those from Study 3 to aid the recall of an event (e.g., “their partner treated them unfairly, or ... did or said something mean or inconsiderate”). In the *gratitude condition* participants recalled an experience in which they “felt grateful because of this person” and to “identify a specific experience...that makes [them] feel overwhelmed with gratitude when [they] think about it now” ($n=42$). The same example gratitude scenarios were presented as those from Study 3 (e.g., “their partner helped them with something important, or... supported them during a time of need”). In the *control condition*, participants recalled an experience in which they “completed a daily activity with this person...such as shopping for groceries, doing laundry or dishes, or cleaning the house” and to “identify a specific experience ...that makes [them] feel neutral when [they] think about it now” ($n=43$). After recalling the experience, participants were instructed to reflect on the causes and reasons underlying the thoughts and feelings they experienced during the recalled experience for 30 seconds.

Manipulation checks. Self-Assessment Manikin (SAM, Bradley & Lang, 1994) was assessed to evaluate participants’ valence and arousal to the recalled experience like in previous studies from 1 (unhappy/calm) to 9(happy/excited), respectively: *valence* ($M = 5.57, SD = 2.03$); *arousal* ($M = 4.03, SD = 1.94$).

Self-other overlap. Participants completed the same trait measure of self-other overlap, where they rated themselves and the other person on 15 randomly presented traits (e.g., athletic, intelligent, creative, etc.) on a scale from 1 (*not at all characteristic of me*) to 3 (*somewhat characteristic of me / the other person*) to 7 (*extremely characteristic of me / the other person*). The final self-other overlap variable followed the same calculation process; $M = 5.52$, $SD = 0.55$.

Helping. Helping was measured by two questions that reflect high-cost helping scenarios commonly used in the prosocial behavior literature (Curry, Roberts, & Dunbar, 2013; Fitzgerald, Thompson, & Whitaker, 2010; Lieberman, Tooby, & Cosmides, 2007). These questions were chosen because they may be more appropriate for married partners than the eviction helping scenario because married participants are presumably living with their partners and because high-cost scenarios may reduce the chance of obtaining a ceiling effect. Participants were asked to imagine that the person they had identified needs a kidney transplant and to indicate how likely they would be to donate a kidney to this person. They were then asked to imagine that the person is trapped in a burning house and to indicate how likely they would be to rescue this person. Both questions involved choices from 1 (extremely unlikely) to 9 (extremely likely), $M_{\text{kidney}} = 8.40$, $SD_{\text{kidney}} = 1.45$; $M_{\text{house}} = 8.69$, $SD_{\text{house}} = 1.00$; $r = .42$, $p < .01$. They were averaged into one index of helping, $M_{\text{both}} = 8.54$, $SD_{\text{both}} = 1.04$.

Experiment checks.

Identified married partner. Because the study previously screened participants who are married and asked them to identify their current romantic partner to reflect upon for the emotion manipulation, presumably participants should have thought about their wife or husband. Whether participants actually reflected on their marital partner was checked again at the end of the study. Participants answered the question: “The person you had previously identified is:” by selecting

on of the 6 options: 1) my wife/husband, 2) my girlfriend/boyfriend, 3) a close friend who is not my romantic partner, 4) a work or academic colleague, 5) an acquaintance, 6) a near stranger. Only participants who selected that they had reflected on their wife/husband were included in the analyses.

Instructional manipulation check. At the end of the study, participants completed the same instructional manipulation check as the one from Study 3. The IMC was designed to identify negligent participants, and inclusion of it has been shown to increase statistical power and reliability of the data (IMC; Oppenheimer et al., 2009).

Distractions. Distractions were checked with two questions at the end of the study. First, participants were asked “Where were you when taking this survey?” Then they were also asked to describe the activities they were engaging in while they completed the survey.

Results

Manipulation checks. Two separate one-way ANOVA’s with condition as a between-subjects factor were conducted on SAM valence and SAM arousal. All significant condition effects were followed by post-hoc tests using a Tukey HSD correction (see Table II.2). A significant main effect of condition on SAM valence, $F(2, 115) = 39.66, p < .001, \eta^2 = .408$, indicated that participants in the angry condition ($M = 3.70$) were significantly less happy than those in the gratitude condition ($M = 6.95$), $p < .001$, and significantly less happy than those in control condition ($M = 5.65$), $p < .001$. Participants in the gratitude condition were significantly more happy than those in the control condition, $p < .001$.

A significant main effect of condition on SAM arousal, $F(2, 115) = 7.06, p = .001, \eta^2 = .109$, indicated that participants in the angry condition ($M = 5.06$) were significantly more aroused than those in the gratitude condition ($M = 3.64$), $p = .004$, and significantly more aroused

than those in control condition ($M = 3.63$), $p = .003$. There were no significant differences in arousal between participants in the gratitude and the control condition, $p = .999$.

Self-other overlap. No significant condition effect was found for self-other overlap, $F(2, 115) = 1.31$, $p = .274$, $\eta^2 = .022$, suggesting that participants in the angry ($M = 5.40$), grateful ($M = 5.52$), and control ($M = 5.61$) conditions reported similar levels of self-other overlap.

Helping. No significant condition effect was found for helping, $F(2, 114) = 1.42$, $p = .246$, $\eta^2 = .024$, suggesting that participants in the angry ($M = 8.30$), grateful ($M = 8.70$), and control ($M = 8.57$) conditions reported similar levels of helping.

Discussion

Study 4 tested the boundary conditions of anger's effect in undermining self-other overlap. Specifically the present study hypothesized that reflecting on an anger would undermine self-other overlap among married participants, relative to the other conditions. Participants were screened for marital status and asked to reflect on an angry, grateful, and neutral emotion. Study 4 found that there were no significant differences in self-other overlap among the 3 emotion conditions, suggesting that married participants reported similar levels in self-other overlap regardless of whether they reflected on an angry, grateful, or neutral emotion control experience with their marital partner.

The findings, although initially surprising, have interesting implications for the shifting nature of self-other overlap. The findings suggest that marital relationships may be one boundary condition for the effect of anger in undermining self-other overlap and that interpersonal emotions may not as readily shift overlapping mental representations among married people. Examining the means suggests that the effect cannot be explained by a ceiling effect; after all, the self-other overlap levels in Study 4 are fairly similar to that of the other studies. One

implication of the findings is that perhaps self-other overlap processes among married couples are more enduring and resistant to momentary shifts of emotion, compared to people from other relationship groups. The null finding may have occurred because marital partners have already merged and solidified the mental representations of the self and other over time, making these representations more resistant to shifts from momentary factors within the relationship. Theory and research suggests that self-other overlap changes typically occur in the form of rapid self-expansion during the initial stages of relationship development (Aron & Aron, 1996; Aron, McLaughlin-Volpe, et al., 2004; Aron, Paris, & Aron, 1995), but slow in more long-term relationships that offer fewer opportunities for self-expansion or as marital boredom sets in (Aron & Aron, 1996). As marital partners witness their partner in a variety of contexts across time, they gain a better understanding of the other person and therefore may form enduring mental representations of them. Furthermore, the process of including others into the self may have slowed to the extent to which the self and other have become merged into the one's own self-concept. That could explain why relationship dissolution is emotionally distressing and predicts self-concept confusion (Slotter et al., 2010), manifesting in statements like "I don't know who I am anymore" (Haber, 1990), or people reporting that they have "lost part of themselves," or that they feel "incomplete as a person" in counselling settings (Mika & Bloom, 1981). Relationship dissolution is considered a rapid self-constriction in which the self loses a major source of identity, resources, and perspectives that was formerly a part of the self (Aron, McLaughlin-Volpe, et al., 2004). Given that anger does not undermine self-other overlap, relative to the other conditions, among marital partners, one conclusion is that marital partners have more stable mental representations of self and others that are more resistant to momentary shifts from discrete emotions. One avenue for future direction is to examine moderators that

could influence this, such as the extent to which marital partners are happy in their relationships. Perhaps among unhappy spouses, self-other overlap shifts may occur more readily after reflecting on an anger experience.

The manipulation was effective in eliciting the desired emotion. Participants in the angry condition were less happy than those in the gratitude and control conditions. Furthermore participants in the gratitude condition were significantly happier than those in the control condition, suggesting that Study 4 was more effective in manipulating gratitude and a more neutral emotion control. This also suggests that the null effects in self-other overlap cannot be explained by the difficulty in manipulating the desired emotion.

Like in Study 3, Study 4 failed to replicate the condition effect on helping. This may have been a result of a ceiling effect of helping among married partners; in general participants in all 3 conditions were overwhelmingly willing to help their married partner (e.g., donating kidney, or saving partner from burning house).

General Discussion

Across 4 studies, Chapter II explored the role that emotion plays in momentarily shifting self-other overlap in close relationships. Reflecting on an anger experience with a close or best friend impaired downstream judgments of self-other overlap, relative to reflecting on a more neutral emotion, suggesting that anger could carry over into judgments of overlapping mental representations of self and other (Studies 1 and 3). Furthermore, the significant differences between anger and happiness in self-other overlap (Study 1), discrete emotions that maximally differ on an appraisal of other agency, suggest that other agency account for the effects of emotion for self-other overlap. Pitting an appraisal tendency framework against a valence framework (Study 2) lends credence to the appraisal tendency framework, providing further

support that other agency appraisal may be one key appraisal that explains the effect, at least with negative emotions. The present research, however, did not effectively test whether other agency appraisals among positive emotions may operate similarly among close friendships, because it did not fully manipulate gratitude, relative to a more neutral control (Study 3). However, gratitude was effectively manipulated, relative to the other conditions, among marital couples (Study 4), but the study found null effects of condition for self-other overlap and helping, suggesting that an other agency appraisal among positive emotions does not influence self-other overlap among this particular sample. Future research should explore more effective means of manipulating gratitude relative to a neutral control among close friendships to test whether other agency is one key appraisal that shifts self-other overlap among both negative and positive emotions, or whether the effect of other agency is asymmetric to negative emotions only.

Examining the research questions among marital partners indicates that the negative effects of anger on self-other overlap, relative to a more neutral control, does not apply to married participants reflecting on their romantic partners (Study 4). This boundary condition cannot be explained by a ceiling effect, meaning that married couples are not simply rating themselves and their partners as very high in overlapping mental representations; instead married couples may face a boundary condition because their judgments of self-other overlap may be more resistant to momentary shifts from anger. This is an idea that could be more fully examined in future research, for example, by examining whether couples who have been together longer or who report more stable and satisfying relationships are less susceptible to anger influencing their overlapping mental representations.

Anger undermined self-other overlap in close friendships, relative to a more neutral emotion (Study 1), and this was replicated in a subsequent study (Study 3). Particular aspects of anger specifically may have led to its interference in judgments of self-other overlap. Evidence from appraisal theories of anger suggests that anger is associated with appraisals that the other person poses a threat to self-esteem (Baumeister et al., 1996; Kernis et al., 1989; C. A. Smith & Lazarus, 1993), caused the situation (e.g., Ellsworth & Smith, 1988; Fischer, 1991; Frijda, 1986; Ortony et al., 1988; C. A. Smith & Lazarus, 1993; Wierzbicka, 1992), and creates obstacles to achieving one's goals (Ellsworth & Smith, 1988a; Izard, 1977; C. A. Smith & Ellsworth, 1985).

Therefore, anger in certain relationships may create lower levels of self-other overlap because it is associated with appraisals that blame and perhaps vilify the other person, therefore interfering with the downstream judgments about whether to incorporate mental representations from the other person into those of the self. Furthermore, the relationship between anger and lower self-other overlap may be better explained by the appraisal patterns of anger than by valence. This findings are in accordance with the emerging literature suggesting a valence framework alone cannot explain the effects of emotion on judgments (e.g., DeSteno, Petty, Wegener, & Rucker, 2000; Keltner et al., 1993; Tiedens & Linton, 2001). This prior research upholds the idea that appraisal tendencies may present a more nuanced framework for research on emotions and self-other overlap than a strictly valence-based approach. Because the experience of anger is not the same as the experience of sadness, averaging them into one index of negative emotion may involve a level of analysis that is too simple. Most importantly, the findings suggest that theory on the social-cognitive consequences of emotion for self-other overlap should move beyond a strictly valence-based approach and that differentiating emotions

on particular cognitive dimensions, such as other agency, may be one fruitful avenue for further exploration.

Anger's effect on the overlapping mental representations is probably a more unconscious process. For one, some theorists believe that the overlapping mental representations factor of self-other overlap is not as directly accessible to people (Myers & Hodges, 2012), suggesting that it may be a less conscious construct. The measure of overlapping mental representations assesses traits or attributes of the self and other separately, making it more difficult for participants to be aware of the construct being assessed. Also, the traits were presented randomly to participants, further promoting unconscious processing of judgments. Secondly, self-other overlap was not assessed directly in relation to the anger experience. Theory and research on appraisal tendency framework argue that appraisal tendencies carryover to judgment and decisions through less conscious incidental emotional influences, and these carryover effects may be deactivated when an individual becomes aware of his or her own judgment and choice processes (Han et al., 2007). One direction for future research could be to examine whether awareness of anger's role in relationships could interrupt anger's effect in undermining self-other overlap. For example, one interesting question is whether marital partners are more aware of how anger influences negative judgments of their marital partner, therefore providing a potential alternative explanation for why anger does not undermine their self-other overlap with that partner. Future directions should unpack these two constructs to better understand anger's role in influencing self-other overlap.

One potential limitation of the findings is that the studies did not measure appraisals directly. However, because of the overwhelming evidence linking the discrete emotions to their respective appraisal patterns, assessing appraisals in the studies may create more harm than good. For one, assessing appraisal tendencies may disrupt the naturally unfolding psychological

processes under exploration by directing participants' attention to how the appraisal (e.g., other responsibility) may affect ratings of others and themselves. This awareness of judgment and choice processes may deactivate the carryover effects of discrete emotions (Han et al., 2007). As such, research situated within the appraisal tendency framework typically does not directly assess appraisals within their experimental paradigm (e.g., Lerner & Keltner, 2001; Lerner et al., 2004).

The present research only examined the ways in which anger could undermine self-other overlap. The finding, however, does not preclude the possibility that anger could also build self-other overlap, which could occur by shifting the other-agency component of anger. The present research found that the other-agency component of anger may be the explanatory appraisal tendency that affects downstream judgments of self and other. Shifting anger's other-agency to perhaps a third-party agency would be one interesting line of research for future directions. Said simply, the experience of being angry at a close partner is different than that of both the self and close partner being angry at a third party who is responsible for the anger-eliciting event. Potential strategic interventions for anger in close relationships may involve shifting anger toward a third-party or circumstantial agency being responsible for the anger eliciting event. Past research on conflict resolution and intergroup behavior among social groups suggest that refocusing the conflicting groups on more superordinate goals may be effective in reducing conflict, at least among groups (Sherif, White, & Harvey, 1955).

The present research also examined downstream consequences of shifting self-other overlap, by testing mediation models where anger undermined self-other overlap to affect subsequent helping in close relationships, relative to the other conditions. Specifically, Study 1 found that reflecting on an anger experience involving a close other undermined subsequent

helping in close friendships, relative to the other conditions, through the mediating role of self-other overlap. However, subsequent tests of this model failed to replicate the findings from Study 1, because of a failure to replicate the effect of anger in undermining helping in close friendships (Study 3) or because of a ceiling effect of helping among married couples (Study 4). Therefore, the particular pathway from which anger undermines self-other overlap to undermine subsequent helping may be an unreliable model and future research should examine the model more fully among different contexts and populations.

One limitation of the study is that the helping measure is self-reported measure instead of an actual behavioral measure. Self-report measures of helping may be more vulnerable to social desirability and self-presentation concerns. This may be evident in the ceiling effect in helping found among marital partners (Study 4). Of course marital partners may have truly desired to help their partners, but they may also have been answering in a socially desirable way. Future research should examine the mediating role of self-other overlap in anger and more covert measures of helping that do not suffer the same vulnerabilities as self-report measures.

In all 4 studies, the positive emotion condition and the control condition elicited similar levels of self-other overlap and helping. Specifically, the positive emotion condition (regardless whether it was happiness, contentment, or gratitude) did not differ significantly from the control condition in both self-other overlap and in the desire to help. This finding contradicts previous research and the present research hypotheses where the induction of more positive emotions would lead to more helping, compared to the control. One interpretation of the null findings points to the difficulty with distinguishing the positive emotion condition and the control condition. Examinations of the post-manipulation emotion checks suggest that in Study 1, participants who were in the happy condition were marginally less angry and happier than those

who were in the control condition. Therefore the happy and control condition did elicit differences in emotion, albeit only marginally. In Studies 2 and 3, there were no significant differences in feeling happy between participants in the positive emotion condition (whether contentment or gratitude) and the control condition, though they were in the predicted direction. In Study 4, participants in the gratitude condition were significantly happier than those in the control condition, though as previously discussed, marital relationships may be the boundary condition for the effect of emotion on self-other overlap and there was a ceiling effect of helping. The similar levels of post-manipulation emotion between the positive emotion and control conditions in Studies 2 and 3 could have been partially affected by the fact that it is difficult to induce a truly neutral control in relationships in which positive emotions dominate. Future research would need to improve the instructions of control condition to improve its ability to induce a more neutral experience, or future researchers may want to exclude a neutral control condition altogether.

The present set of studies precludes other aspects of emotions in influencing self-other overlap and helping. For one, arousal, along with valence, has historically been an interesting dimension that differentiates emotions (Russell, Lewicka, & Niit, 1989). According to the Circumplex Model, different emotions may be plotted along two axes, the arousal dimension on the vertical axis and the valence dimension on the horizontal axis, to allow the distribution of the emotions in a two-dimensional circular space (Russell et al., 1989). In the model, anger and happiness from Study 1 are considered higher in arousal than sadness and contentment from Study 2. Consideration of the arousal dimensions by merging the two studies would allow a more thorough examination of how the arousal dimension of emotions affects self-other overlap and prosocial tendencies in close relationships. Exploratory analyses of high (anger, happiness)

versus low arousal (sadness, contentment) emotions on self-other overlap and helping suggest that both did not differ by arousal.⁵ Furthermore, tests of arousal by valence interactions on self-other overlap formally replicated the significant difference between angry versus happiness in Study 1 and the lack of significant differences between sadness and contentment in Study 2 for self-other overlap. Lastly, there were no valence by arousal interactions on helping, suggesting that arousal does not implicate prosocial tendencies in close relationships. Although sadness has been traditionally considered a low arousal emotion, extreme sadness could be highly arousing; furthermore the emotion prompts urged participants to identify extreme experiences that were overwhelming. Examining the post-manipulation arousal levels found no condition effect on arousal in both studies for both sadness and contentment, suggesting that arousal was not elicited, relative to a neutral control. Also, examining the means for all the emotion conditions in Studies 1 and 2 suggest that they were relatively neutral in arousal. Therefore, although sadness or contentment could have been highly arousing, this was not the case for the present studies. Taken together, the present research suggests that the arousal dimension of emotion is not implicated in self-other overlap or helping.

One alternative interpretation suggests that anger undermines self-other overlap because participants in the angry condition are simply judging the close other in less positive terms, relative to other conditions. This assertion is in part driven by the fact that the measure of self-other overlap includes only positive attributes or traits, suggesting that greater endorsement of the traits as characteristic of the self or other actually implies more positive ratings of the self or other. The present research tested this argument by examining the effect of condition on self and other ratings separately in several exploratory analyses.⁶ Across the 3 studies where angry and control conditions were included, participants in the two conditions did not differ on how

positively they rated themselves or how positively they rated the close others, controlling for the effect of sample. Furthermore, within the angry condition, the experience of positive (relative to negative) emotion, as measured by the SAM valence after the emotion induction, was not associated with how positively participants rated the self or close other. Therefore, anger's effect on self-other overlap cannot be explained by participants in the angry condition simply rating the close other as having less positive traits.

In conclusion, the present chapter explored the causal role that emotions play in momentarily shifting self-other overlap and the boundary conditions for this process. Anger toward close others may be one factor that can momentarily shift self-other overlap among close friendships, but not among marital relationships. Furthermore, adopting a more nuanced appraisal framework may be a more fruitful pursuit for future research on the effect of discrete emotion and self-other overlap than a strictly valence-based framework. More research is needed to examine the role of positive emotions, specifically, gratitude, on self-other overlap processes in close relationships.

CHAPTER III

Does Self-other Overlap Moderate the Consequences of Prosocial Behavior?

This dissertation aims to uncover the relationship between self-other overlap and prosocial behavior in close relationships. Chapter II explored the research topic within an experimental context to uncover whether discrete emotions shift self-other overlap in the moment, and whether shifts in self-other overlap would affect downstream prosocial tendencies. Chapter III builds and extends upon research on the relationship between self-other overlap and prosocial behavior in close relationships by exploring whether self-other overlap moderates the consequences of prosocial behavior over time from a longitudinal lifespan perspective. Guided by research and theory from a variety of literatures, the present research argues that giving to emotionally close others (i.e., others who overlap highly with the self) would predict pronounced long-term health benefits for the self, whereas giving to less close others may not. This hypothesis is supported by converging research and theory on the benefits of prosocial behavior for mental and physical health, the stress-regulating benefits of the caregiving system for long-term health outcomes, the nature of hierarchical communal relationships as a proxy for emotional closeness, and the health benefits of parenting.

Prosocial Behavior Implicates Physical Health and Mortality Risk

Previous research has discovered a host of health benefits from giving to others. Giving support is associated with fewer health conditions, lower blood pressure, lower viral loads in AIDs patients, and even a reduced mortality risk in older adults and chronically ill patients (S. L.

Brown et al., 2003; W. M. Brown, Consedine, & Magai, 2005; Ironson, 2007; Ironson et al., 2002; McClellan et al., 1993; Piferi & Lawler, 2006; Schwartz, Keyl, Marcum, & Bode, 2009). Experimental studies point to mechanisms within the neuroendocrine system: giving support decreases givers' cortisol, a stress hormone (Field, Hernandez-Reif, Quintino, Schanberg, & Kuhn, 1998; A. M. Smith, Loving, Crockett, & Campbell, 2009), and increases progesterone and oxytocin, social bonding hormones (S. L. Brown, Konrath, Seng, & Smith, 2011). Perhaps the definitive health outcome associated with giving behavior is that of a reduced mortality risk. Previous research suggests that providing support to others predicts lower mortality risk (S. L. Brown et al., 2003; McClellan et al., 1993). However, research has not examined how the association between giving and lower mortality risk may differ by targets varying on emotional closeness, and whether giving to one's children may predict reduced mortality risk compared to giving to other people.

Caregiving System

Why would giving to others varying in emotional closeness differentially affect health outcomes? Supporting evidence may be found in the theoretical model of caregiving and health, which argues that i) giving to others could benefit one's own health to the extent that giving engages a biological caregiving system and ii) this caregiving system may be moderated by relationship variables, such as emotional closeness (Konrath & Brown, 2013).

Health implications of caregiving system. The caregiving system is a pattern of emotions, cognitions, and neurophysiology that has evolved to promote and maintain the formation of social bonds and to motivate helping (S. L. Brown, Brown, et al., 2011; S. L. Brown & Brown, 2006). The model of caregiving and motivation posits a pathway in which cues of need elicit caregiving motivation, which in turn predicts helping behavior, and as a

consequence, stress-regulation (Konrath & Brown, 2013). Rooted in maternal caregiving neural circuitry, the caregiving system directs maternal motivation in response to salient need of others (S. L. Brown, Brown, et al., 2011; S. L. Brown & Brown, 2006; Numan, 2006) by either increasing the motivation to help (i.e., approach motivation) or decreasing the avoidance of harm to the self (i.e., avoidance motivation; Numan, 2006).

Most importantly, the model of caregiving and health posits that the caregiving system may elicit downstream physical and psychological health benefits through its stress-regulating functions (Konrath & Brown, 2013). Specifically, when responding to cues of need from others, the caregiving system activates neuroprotective hormones like oxytocin and progesterone (S. L. Brown et al., 2009), which are released in both human parents during parent-infant interactions as well as in animal maternal behavior (Feldman, Gordon, Schneiderman, Weisman, & Zagoory-Sharon, 2010; Numan, 2006). Furthermore, hormones released in the caregiving system, such as oxytocin and progesterone, serve important neuroprotective functions that could benefit long-term health outcomes the self. For example, progesterone released in response to cortisol could operate as a down-regulating mechanism that promotes long-term coping (Wirth & Schultheiss, 2006). Oxytocin has also been shown to interact with the presence of social support to provide pronounced stress-regulation during a stressful speech task; among this sample, male participants who were administered oxytocin (vs. placebo) and given social support from a friend (vs. no support) had the lowest cortisol response during the stressful speech (Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003). Therefore, the caregiving system may elicit downstream health benefits via stress-buffering mechanisms.

The moderating role of emotional closeness may favor children. The model of caregiving and health argues that relationship variables may moderate the extent to which

caregiving motivation is elicited, which would affect downstream health outcomes (Konrath & Brown, 2013). The present research examines one particular relationship variable of interest: emotional closeness, a factor underlying psychological concept of self-other overlap. The impetus for this approach is supported by the model of caregiving and health, which argues the stress-regulating benefits of prosocial behavior may be more pronounced when giving to others who are emotionally closer or perceived as more interdependent to the self (Konrath & Brown, 2013). Further supporting this idea, experimental manipulation of emotional closeness among humans has been found to activate hormones commonly released in the caregiving system (e.g., salivary progesterone; S. L. Brown et al., 2009).

The role of caregiving motivation in promoting downstream health outcomes may be more pronounced among parents responding to the needs of their children, arguably regarded as among the most emotionally close individuals in a person's life. Many reasons for why this may be the case exist. For one, the caregiving system is biologically rooted in caregiving toward offspring, and helping toward non-related others is theorized to be an extension of this system (S. L. Brown, Brown, et al., 2011). Caregiving motivation becomes activated when need is salient in close relationships (Konrath & Brown, 2013). Because children tend to be emotionally closer targets that demonstrate a history of being needy and vulnerable, they may be more likely to elicit caregiving motivation to activate the stress-buffering benefits of the system. Chronic activation of the caregiving system from responding to the needs of children may accumulate in long-term habitual dyadic interactions that would ultimately benefit long-term health outcomes. This suggests that caregiving motivation may be activated more when responding to the needs of one's children compared to other recipients, therefore contributing to greater health benefits for the self.

The health benefits of giving support to others may also be more pronounced among parents responding to their children because the parent-child bond is arguably more communal in nature, and is organized hierarchically to favor the needs of the one's own children above others, an idea that is supported by theory and research on communal relationships. Communal relationships are those in which benefits are provided in response to others' needs or out of general concern, without feelings of indebtedness or expectations of repayments (Clark & Mills, 1993). They are organized hierarchically in a pyramid, with many weaker-strength communal relationships at the base (e.g., acquaintances), fewer medium-strength relationships in the middle (e.g., friends), and very few high-strength relationships at the top (e.g., children; Reis et al., 2004). Within the hierarchy of communal relationships, the communal strength (i.e. the degree of motivation to respond to a partner's needs) of each relationship predicts which partner's needs should take precedence (Mills et al., 2004; Mills & Clark, 1982). When there are motivational conflicts to respond to the needs of two different communal partners, the partner from the stronger communal category typically takes precedence. For example, individuals will be more likely to attend their child's graduation than a niece's graduation occurring on the same day. Therefore, psychological theories on communal relationships suggest that people are highly motivated to help their children, who are typically at the top of their communal hierarchies (Mills et al., 2004; Mills & Clark, 1982; Reis et al., 2004). Because children's needs take precedence above others lower on the communal hierarchy (presumably, less emotionally close) and people are attuned to their children's needs, responding to children's needs may activate the caregiving system to a greater degree than interacting with less close others. Therefore, theory and research on communal hierarchies further support the idea that caregiving motivation may benefit

downstream health benefits to a greater extent among parents interacting with their children, than interacting with less close others.

Communal hierarchy as a proxy for emotional closeness. Directed by the commonalities between theory and research on communal hierarchies and emotional closeness, the present research uses communal hierarchy as the basis for the degree of emotional closeness. For one, prominent theorists on self-other overlap have explicitly linked self-other overlap with communal relationships, describing self-other overlap as the “foundation for spontaneously being concerned with the others’ needs (‘because others’ needs are my needs’) and thus both directly facilitating communal motivation (attention to and acting on others’ needs) and having possibly functioned historically to help create a social norm of communal orientation in close relationships” (Aron, Mashek, & Aron, 2004, p. 36). Second, experimental inductions of the emotional closeness factor of self-other overlap in the past have typically asked participants to think about different close and non-close targets that mirror levels of the communal hierarchy (e.g., in order of close to non-close: a close family member, a good friend, an acquaintance, a near stranger; Cialdini et al., 1997). Lastly, research and theory suggest that both hierarchical communal relationships and the degree of emotional closeness similarly drive the motivation to preferentially provide help to partners with higher communal strength or emotional closeness. Indeed research has confirmed that the degree of relationship closeness to individuals accounts for a larger amount of variance in the desire to help than other plausible mediators, and that one’s willingness to help is exponentially higher for those from relationship categories that are typically considered higher in communal strength (Cialdini et al., 1997).

Parenting and Health

Parenting is one of life's most stressful yet simultaneously most rewarding relationships. As such, there may be mechanisms in place to help regulate the stress of parenting. For example, parents have reduced ambulatory blood pressure (Holt-Lunstad, Birmingham, Howard, & Thoman, 2009), are better at regulating stressors (Wartella et al., 2003), and have stronger social networks after children have left the home (Ishii-Kuntz & Seccombe, 1989) than non-parents – and all of these mechanisms have been linked with reduced mortality (e.g., Cohen & Wills, 1985; Kikuya et al., 2005; Seeman, Kaplan, Knudsen, Cohen, & Guralnik, 1987). Parents also report that they are happier and have greater meaning in life than non-parents, and report greater happiness and meaningfulness on a daily basis, especially during childcare compared to other daily activities (Nelson, Kushlev, English, Dunn, & Lyubomirsky, 2013).

Emotionally-involved parenting may lead to maternal reward or stress-regulation. For example, giving support to loved ones who are experiencing distress increases the activation a reward-related brain region that is also activated during maternal caregiving behavior (Inagaki & Eisenberger, 2012). Parents who tend to prioritize their children's well-being above their own are more likely to experience greater well-being and meaning in life derived from their children (Ashton-James, Kushlev, & Dunn, 2013). During parental behaviors in rats (e.g. licking, grooming), hormones are released to restore and regulate the stresses of parenting (Numan, 2006).

Taken together, research suggests that parents may experience physical health benefits, compared to non-parents. Yet, not much prior research has specifically examined whether the degree or continuation of parental involvement predicts better health outcomes, especially among aging parents. Simply being a parent does not imply being a continually responsive and caring

parent. Presumably these health outcomes should be maximized for lifelong parents who continue to be highly involved in parenting.

The Present Research

Drawing from the model of caregiving and health (Konrath & Brown, 2013), research and theory on communal hierarchies and emotional closeness, and the health benefits of parenting, the present research empirically tests whether emotional closeness may be one relationship variable that implicates the stress-regulating benefits of caregiving. Furthermore, the present research explores whether giving to targets who are presumably very emotionally close, such as one's own children, may lead to more pronounced benefits for health than giving to targets who are less emotionally close.

In summary, given the extant theory and research, the present research hypothesizes that only giving to one's children would predict reduced mortality risk over time, whereas giving to other people may not influence mortality risk because children are emotionally close others who may be more likely to activate caregiving motivation to affect long-term health outcomes.

Study 5a: Giving Support to Adult Children Predicts Mortality Risk Among Parents

Study 5a tested the research hypothesis using data from the Wisconsin Longitudinal Study (WLS) to examine the association between giving and mortality risk a) within different relationship categories that presumably vary on degree of emotional closeness, b) using healthy, non-clinical samples of older adults, c) across an extensive timeframe. Older adults are a prime population to test the hypotheses, because they experience greater mortality risk and therefore may experience more pronounced health benefits from providing ongoing support to emotionally close others. In the study, participants were asked to rate their support provisions to recipients from various relationship categories (i.e. adult children, parents, siblings, other relatives, and

friends and acquaintances) at one time point to see how giving support would predict mortality status 17 years later. To isolate the unique effects of giving support to one particular category of individuals on mortality risk, the analyses controlled for factors that may influence both of these variables, such as giving support to any of the other recipient groups, receiving support from the different recipient groups, and socio-economic demographic, physical and mental health, and risk factors. Based on the reasoning outline above, I hypothesize that providing support to adult children would predict reduced mortality risk among older adults, whereas providing support to the other categories of people would not.

Method

The Wisconsin Longitudinal Study (2009) has followed a random sample of 10,317 Wisconsin high school graduates since their graduation in 1957 until the present. The original sample consisted of about 66.7% non-Hispanic White men and women who completed at least 12 years of schooling and has very poor representation of African-American, Hispanic, or Asian participants. Because the research hypotheses explore how support transactions with various categories of people (e.g., parents, children, siblings) influence mortality risk, the sample was limited to participants who had those specific individuals with whom support transactions could occur. Specifically, of all of the respondents with data collected at Time 1 in 1992 (n=10,143), only respondents who had at least 1 child (92.1% of total sample), at least 1 parent who was alive (63.1% of total sample), and at least 1 sibling who was alive (98.6% of total sample) at Time 1 were selected for the study. After constraining the sample based on these criteria, 4,469 respondents (65.0% of total sample) were included in the present study. The final study sample was 47.1% male, and the median age was 53 years (range 51 to 56) in Time 1 (1992) and 70 years (range 68 to 71) in Time 2 (2009).

Overview of data analysis. A hierarchical logistic regression was conducted to examine the effect of support given to various recipients in Time 1 on mortality risk 17 years later (in Time 2), controlling for support received from the same recipients, and demographic and health variables. All covariates were assessed in Time 1.

Mortality data. Mortality status was assessed in Time 2 in 2009 with a dichotomous variable (0=alive, 1=deceased) based on the Social Security Death Index, an objective database of death records created by the US Social Security Administration. Of the subsample of 4,469 respondents, 445 (9.96%) were deceased and 4,024 (90.04%) were alive in 2009.

Baseline measures.

Support given. Support given was assessed in Time 1 by asking respondents whether they had given social support to five recipient categories: (a) adult children (“sons or daughters 19 and older”), (b) parents, (c) siblings (“brothers or sisters”), (d) other relatives (other than parents, children, or siblings), and (e) friends and acquaintances (“friends, neighbors, co-workers”) in the past month. There were four types of support: (a) help with transportation, errands, or shopping, (b) housework, yard work, repairs or other work around the house, (c) advice, encouragement, moral or emotional support, and (d) childcare (0=no, 1=yes), which were then averaged to create an index of support given to each recipient group.

Control variables. Control variables were assessed and entered into a hierarchical logistic regression of support given predicting mortality risk (Step 1). Specifically respondents reported their *support received* from the same categories of people and types of support (Step 2), their demographic information (Step 3), and their health and risk factors (Step 4).

Demographics. Demographics included respondents’ *age* (range 68-73 at Time 2), *gender* (0=female, 1=male), *marital status* (1=married, 0=not married, i.e. separated, divorced,

widowed, never married), *number of children* (1 to 14), and frequency of *religious attendance* in the past year (0=never, or less than once per year, 11=approximately once per day or more).

Socioeconomic status was assessed using the number of years of education, respondents' and spouse's combined net worth, and respondents' employment status (0=not employed, 1=employed).

Health. Health was assessed using respondents' total number of illnesses, self-reported health, and functional status. The total number of illnesses was a continuous variable calculated by summing 17 items asking respondents whether a medical professional has ever informed them that they had a specific health problem (e.g., cancer, diabetes, heart trouble, etc). Self-reported health was assessed from 1 (poor) to 5 (excellent). Respondents indicated their functional status by reporting any long-term physical or mental condition, illness or disability that limited their daily activities (0=no, 1=yes). *Risk factors* included a history of regular smoking (0=no, 1=yes), and body mass index (BMI), which was calculated based on respondent's weight and height.

Personality. Personality was assessed with the Big 5 (John, 1990). Respondents were asked the extent to which they see themselves as having a number of characteristics from 1 (Strongly Agree) to 6 (Strongly Disagree). *Extraversion* sample items are "talkative" and "full of energy." *Agreeableness* sample items are "generally trusting" and "considerate to almost everyone." *Conscientiousness* sample items are "does a thorough job" and "a reliable worker." *Neuroticism* sample items are "can be tense" and "worries a lot." *Openness* sample items are "values artistic, aesthetic experiences" and "has an active imagination." The items are coded and summed so that higher values indicated greater endorsement of a particular personality trait.

Mental health. Mental health was assessed with measures of depressive symptoms and well-being. *Depressive symptoms* were assessed with the Center for Epidemiologic Studies Scale

(CES-D; Radloff, 1977) which asked respondents to rate “on how many days during the past week did you” do the following from 0 to 7 days. Sample items included “feel sad,” “feel lonely” “have crying spells” “feel that people disliked you,” and “feel you could not ‘get going.” CES-D scores were calculated based on WLS’s recommended method, which differed slightly from the traditional method. Specifically, according to the WLS scoring instructions, if “respondents answered at least 10 questions, then a sum is computed. Other respondents answered questions scattered throughout [the questionnaire] and left the remainder of the questions blank. It was assumed that these respondents only answered the questions that applied to them. If at least 3 items throughout the page were answered and all items answered received a nonzero response; a sum was computed...using 0 as the score for unanswered questions” (“Wisconsin Longitudinal Study: 1992-1993 Primary Respondent Mail Follow-Up Survey,” n.d.). The total number of depressive symptoms could range from 0 to 140 with higher values indicating greater psychological distress.

Well-being. Well-being was measured by the Psychological Well-Being Scale (Ryff & Keyes, 1995; Ryff & Singer, 1998; Ryff, 1995). Respondents rated a series of statements on the extent to which each statement describes them from 1(*Strongly Agree*) to 6(*Strongly Disagree*). The scale assessed 6 dimensions of well-being: Autonomy (e.g., “I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people”), Environmental mastery (e.g., “I am quite good at managing the many responsibilities of my daily life”), Personal growth (e.g., “I have the sense that I have developed a lot as a person over time”), Positive relations with others (e.g., “It seems to me that most other people have more friends than I do”), Purpose in life (e.g., “I don't have a good sense of what it is I'm trying to accomplish in life”), and Self-acceptance (e.g., “In general, I feel confident and positive about myself”).

Psychological well-being was created by summing the scores across the 6 dimensions, such that higher scores indicate greater well-being.

Results

Descriptive statistics. Table III.1 reports correlations between all social support variables, showing that respondents who *gave* support to one recipient category (e.g. child) were also more likely to *receive* support from that same category ($.28 < r < .40$, all p 's $< .01$). This suggests some degree of reciprocity in giving-receiving relationships, which further justifies the inclusion of received support as a covariate.

To examine whether respondents *gave* more support to any specific relationship group, I conducted a repeated measures ANOVA with a Greenhouse-Geisser correction with 5 within-subjects levels representing support given to (a) adult children, (b) parents, (c) siblings, (d) other relatives, and (e) friends and acquaintances, $F(3.27, 11488.06) = 1250.81$, $p < .001$, $\eta_p^2 = .26$. Follow-up post-hoc tests indicated that respondents gave the most support to their adult children ($M = 0.53$) followed by their friends and acquaintances ($M = 0.42$), their parents ($M = 0.36$), their siblings ($M = 0.12$), and their other relatives ($M = 0.10$). All comparisons were significant, all p 's $< .001$.

To examine whether respondents *received* more support from any specific relationship group, I conducted another repeated measures ANOVA with a Greenhouse-Geisser correction, $F(3.04, 7832.88) = 847.57$, $p < .001$, $\eta_p^2 = .25$. Follow-up post-hoc tests indicated that respondents received the most support from their friends ($M = .52$) followed by their adult children ($M = 0.48$), $p < .05$, and then their parents ($M = 0.16$), siblings ($M = 0.15$), and other relatives ($M = 0.08$). Respondents received the same amount of support from parents as from siblings, *ns*, but all other comparisons were significantly different, all p 's $< .001$.

Effect of support given on mortality among respondents with children. A hierarchical logistic regression tested the effect of support given on 17-year mortality risk (Step 1) among respondents with children, and also examined whether these effects remained significant after controlling for support received (Step 2), demographic variables (Step 3), and physical and mental health and risk factors (Step 4), and personality traits (Step 5). Table III.2 reports descriptive statistics for all variables of interest and test statistics from each step of the analysis. Assets were non-normally distributed (skewness = 2.23, kurtosis = 4.66), so this variable was rescaled to > 0 and log transformed (skewness = -.78, kurtosis = -.32).

In support of the hypothesis, respondents who gave support to adult children had significantly reduced mortality risks 17 years later, $\beta=-0.59$, $p=.004$, *Odds ratio*=0.55, *C.I.*[0.37-0.82], which represents a 45% decline in mortality risk for each cumulative type of support given to adult children. This effect remained when controlling for: receiving support, $\beta=-0.69$, $p=.002$, *Odds ratio*=0.50, *C.I.*[0.32-0.78], demographic and socioeconomic factors, $\beta= 0.64$, $p=.006$, *Odds ratio*=0.53, *C.I.*[0.34-0.83], and physical health and risk factors, $\beta=-0.61$, $p=.009$, *Odds ratio*=0.55, *C.I.*[0.35-0.86], and personality traits, $\beta=-0.56$, $p=.017$, *Odds ratio*=0.57, *C.I.*[0.36-0.90]. With all covariates included, mortality risk is reduced 43% for each cumulative type of support given to adult children. There was no difference in mortality risk associated with giving or receiving support from any of the other relational categories (β 's $<|0.45|$, p 's > 0.197 ; See Table III.2).

Type of support given to children. To explore whether these effects were driven by a specific type of support given to children, a logistic regression tested the individual effects different kinds of support on later mortality risk, that is, (a) transportation, errands, or shopping, (b) housework, yard work, repairs or other work around the house, (c) advice, encouragement,

moral or emotional support, and (d) childcare. No specific type of support given to children individually predicted change in mortality risk: Transportation, $\beta=0.02$, $p=.92$, *Odds ratio*=1.03, *C.I.*[0.65-1.62]; Housework, $\beta=-0.28$, $p=.27$, *Odds ratio*=0.76, *C.I.* [0.46-1.25]; Emotional Support, $\beta=-.30$; $p=.20$, *Odds ratio* =0.74, *C.I.* [0.47-1.17]; and Childcare, $\beta=0.24$, $p=.29$, *Odds ratio*=1.28, *C.I.*[0.82-1.99]. Thus, all forms of support must be considered together in order to predict later mortality risk benefits.

Effect of covariates on mortality. Of the covariates that were included in the model, only gender, $\beta=0.38$, $p<.05$, *Odds ratio*=1.46, *C.I.*[1.04-2.04], employment status, $\beta=-0.52$, $p<.01$, *Odds ratio*=0.59, *C.I.*[0.41-0.87], self-rated health, $\beta=-0.58$, $p<.001$, *Odds ratio*=0.56, *C.I.*[0.45-0.70], history of smoking $\beta=0.46$, $p<.01$, *Odds ratio*=1.59, *C.I.*[1.15-2.19] agreeableness, $\beta=0.04$, $p<.05$, *Odds ratio*=1.04, *C.I.*[1.00-1.08], and conscientiousness, $\beta=-0.04$, $p<.05$, *Odds ratio*=0.96, *C.I.*[0.92-1.00] predicted mortality risk in the final model. The findings suggest that participants who were male or employed or who reported poorer health, a history of smoking, more agreeableness, or less conscientious had higher mortality risk than their respective counterparts. Net worth marginally predicted lower mortality risk only when it was initially entered in the model, $\beta=-0.38$, $p=.088$, *Odds ratio*=0.68, *C.I.*[0.44-1.06], but became non-significant once health and risk factors were entered as well, $\beta=-0.20$, $p=.376$, *Odds ratio*=0.81, *C.I.*[0.52-1.28], and remained non-significant once personality factors were entered, $\beta=-0.16$, $p=.489$, *Odds ratio*=0.85, *C.I.*[0.54-1.35].

Discussion

Study 5a examines whether a proxy for emotional closeness (i.e., relationship type) affects the degree of health benefits associated with giving to others. Specifically, the present research hypothesized that giving to recipients who are from a very emotionally close

relationship category, such as one's own children, may lead to more pronounced benefits for health than giving to targets from a less emotionally close relationship category. This may be because children may be more likely to activate the stress regulating properties of the caregiving system compared to non-children. In support, Study 5a found that providing support to adult children predicted reduced mortality risk of older adult support providers by 43% per support type 17 years later, even after controlling for covariates that may influence mortality like receiving support, and demographic and physical and mental health variables. Providing support to other recipients (i.e., parents, siblings, other relatives, and friends) was not significantly associated with mortality risk, controlling for covariates. Nor was receiving support associated with mortality risk.

Giving support to children was hypothesized to predict pronounced health benefits. Although this study did not examine why these effects occur, I hypothesize that it is because responding to the needs of one's children may activate caregiving motivation (and therefore its stress-regulating benefits) to a greater extent than responding to others who are not children. The extent to which caregiving motivation is activated could be approximated by the amount of support given to the different targets. Supporting the hypothesis, the study found that support providers are most likely to provide support to their adult children, followed by their friends and acquaintances, parents, siblings, and their other relatives. This suggests that support providers are highly attuned to the needs of their adult children, which may have activated their caregiving motivation, which in turn may have influenced health outcomes. In alignment with theory on the caregiving system, the findings suggest that giving to children predicted reduced mortality risk because doing so activated the caregiving motivation to a greater extent than giving to non-children targets.

The type of support, whether emotional support, or instrumental support, does not seem to independently affect mortality risk, suggesting that all forms of support must be considered together in order to predict later mortality risk benefits. Furthermore, the covariates predict mortality risk in accordance with previous research, which establishes the validity of this sample.

One limitation of the research is that the current sample only included parents, making it difficult to assess the mortality effects of support given to non-children. Given that parents are highly attuned to their children's needs above those of others, perhaps giving to one's adult children predicted a greater likelihood of being alive 17 years later among this sample because parents are primarily focusing on their children's needs, leaving fewer support provisions for others. After all, respondents did report giving the most type of support to their adult children than other categories of people. Therefore the sample may be skewed to favor assessing mortality benefits among parents who give to their children, and disfavor assessing mortality benefits among parents who give to others who are not their children. This suggests that the present parent sample may limit validity of analyses on support provisions to non-child targets and mortality risk. Study 5b aimed addressed this limitation by testing the role of support provisions on mortality risk among non-parents.

Study 5b: Giving Support Does Not Predict Mortality Risk Among Non-parents

Although Study 5a analyses of support provisions to non-children targets on mortality risk statistically controlled for the degree of giving to children and the number of children parents have, an alternative test of the whether giving to non-child targets influences mortality risk involves examining the support-mortality association among a sample of individuals without children (i.e., non-parents). To examine this exploratory research question, Study 5b examined how giving to various categories of people (who are not children) influences mortality risk

among the unique population of respondents without children using a hierarchical logistic regression model similar to that of Study 5a.

Method

Study 5b used data from the Wisconsin Longitudinal Study (2009) as in Study 5a, but limited the sample to participants without any children. Specifically, of all of the respondents with data collected at Time 1 in 1992 (n=10,143), only respondents who did not have any children (7.9% of total sample), at least 1 parent who was alive (63.1% of total sample), and at least 1 sibling who was alive (98.6% of total sample) at Time 1 were selected for the study. After constraining the sample based on these criteria, 351 respondents (3.4% of total sample) were included in the present study. The final study sample was 42.7% male, and the median age was 53 years (range 52 to 56) in Time 1 (1992) and 69 years (range 68 to 71) in Time 2 (2009).

Overview of data analysis. A hierarchical logistic regression was conducted to examine the effect of support given to various recipients in Time 1 on mortality risk 17 years later (in Time 2), controlling for support received from the same recipients, and demographic and health variables. All covariates were assessed in Time 1.

Effect of support given on mortality among respondents without children. A hierarchical logistic regression tested the effect of support given on 17-year mortality risk (Step 1), and also examined whether these effects remained significant after controlling for support received (Step 2), demographic variables (Step 3), and physical and mental health and risk factors (Step 4), and personality traits (Step 5). Because respondents in the sample do not have any children, the analyses did not include covariates of support given to and received from adult children as well as the number of children. Table III.3 reports descriptive statistics for all variables of interest and test statistics from each step of the analysis.

Respondents who gave support to friends had marginally reduced mortality risks 17 years later in Step 1, $\beta=-1.28$, $p=.059$, *Odds ratio*=0.28, *C.I.*[0.74-1.05], but this effect disappeared and remained non-significant when controlling for: receiving support, $\beta=-0.95$, $p=.216$, *Odds ratio*=0.39, *C.I.*[0.09-1.74], demographic and socioeconomic factors, $\beta=-0.83$, $p=.318$, *Odds ratio*=0.44, *C.I.*[0.09-2.22], and physical and mental health and risk factors, $\beta=-0.88$, $p=.312$, *Odds ratio*=0.41, *C.I.*[0.07-2.30], and personality traits, $\beta=-0.94$, $p=.345$, *Odds ratio*=0.39, *C.I.*[0.06-2.75].⁷ This suggests that any health benefit associated with giving support to friends is explained by these covariates. There was no difference in mortality risk associated with giving or receiving support from any of the other relational categories (β 's<|1.39|, p 's > 0.240; See Table III.3).

Effect of covariates on mortality. Of the covariates that were included in the model, only history of smoking, $\beta=1.19$, $p=.06$, *Odds ratio*=3.30, *C.I.*[0.98-11.15], well-being, $\beta=-0.04$, $p<.01$, *Odds ratio*=0.97, *C.I.*[0.94-0.99], and conscientiousness, $\beta=-0.27$, $p<.01$, *Odds ratio*=1.31, *C.I.*[1.08-1.59] predicted mortality risk in the final model. The findings suggest that participants who reported a history of smoking, less well-being, or more conscientious had higher mortality risk than their respective counterparts.

Discussion

Study 5b found that providing support to others did not predict mortality risk among childless older adult support providers. Although providing support to friends initially predicted reduced mortality risk, the effect became non-significant after controlling for the covariates that may influence mortality like receiving support, and demographic and physical and mental health variables. The findings suggest that providing support to non-child targets does not predict mortality risk across time, further lending support to the idea that the benefits of caregiving

motivation for long-term health outcomes may be more pronounced when interacting with children. Lastly, it appears that emotional closeness does not moderate the role of giving support and mortality risk outside of children.

General Discussion

Chapter III explored the relationship between self-other overlap and prosocial behavior in close relationships by demonstrating that relationship type, a proxy for emotional closeness (i.e. one factor in self-other overlap), moderates prosocial behavior to influence long-term health benefits for the self. Specifically, giving support to one's children, who are typically found to be at the top of the communal hierarchy (Mills et al., 2004; Mills & Clark, 1982; Reis et al., 2004), predicted reduced mortality risk among older adults (Study 5a). Giving to other recipient groups did not predict mortality risk among either parents (Study 5a) or non-parents (Study 5b). To our knowledge, the current study was the first to demonstrate that people are more likely to experience reduced mortality risk from supporting their children, specifically, but not from supporting other recipient groups (and not from receiving support).

Why may giving to children predict reduced mortality risk? Although this study did not examine potential mediators of this effect, reasons point to the stress-regulating benefits of caregiving motivation on health (Konrath & Brown, 2013). The model caregiving and health posits that cues of need elicit caregiving motivation to promote helping behavior, which in turn influences stress-regulation (Konrath & Brown, 2013). In other words, this model argues that giving to others could benefit one's own health to the extent that more caregiving motivation is elicited by the giving behavior (Konrath & Brown, 2013). The degree to which caregiving motivation was activated could be approximated by the amount of helping (i.e., support provided) in the present research. Specifically, the present research assumes that the amount of helping reported by respondents is a proxy for the degree to which caregiving motivation was elicited. Study 5a found that respondents reported giving the most types of support to their adult children, followed by their friends, parents, siblings, and their other relatives. This may mean

that caregiving motivation was activated more when responding to the needs of their children compared to other people. The caregiving system affects health through the activation of neuroprotective hormones like oxytocin and progesterone when helping others (e.g., salivary progesterone; S. L. Brown et al., 2009). Over time, habitual dyadic interactions of helping could accumulate and result in long-term health benefits if caregiving motivation is regularly activated.

The caregiving system model also argues that the extent to which caregiving motivation is activated when responding to cues of need may be moderated by relationship variables, such as emotional closeness (Konrath & Brown, 2013). The present research argues that the caregiving system may be more pronounced when responding to the needs of emotionally close others, like the needs of one's children. This is because the caregiving system is rooted in maternal circuitry and also occurs in communal relationships that favors children's needs above others. Caregiving motivation may therefore be elicited to a greater extent when helping children compared to non-children. In support, findings from Study 5a suggest that older adult parents were more likely to be alive when they reported giving support to their adult children 17 years earlier. Furthermore, respondents reported giving the most types of support to their adult children, suggesting that they are highly attuned to the needs of their children, a finding that both support assumptions within the hierarchy of communal relationships and the caregiving system model. Therefore, the results suggest that emotional closeness may moderate the degree to which caregiving motivation is activated in a manner that favors the needs of children. Giving support to children may turn into habitual dyadic interactions that ultimately accumulate in long-term health benefits for givers, such as reduced mortality risk.

Although responding to the needs of children may be inherently stressful, the model of caregiving and health specifically addresses such stress (Konrath & Brown, 2013). Because

respondents reported giving more support to their children than other people, there may be more inherent stress from these interactions (e.g., from experiencing the pain or need of the child, from having less time or energy for the self). However, the model of caregiving and stress-regulation hypothesizes that "caregiving motivations can help to alleviate givers' stress responses regardless of why they occur, even if they originate from the giving behavior itself" (Konrath & Brown, 2013, p. 11). This occurs because the activation of caregiving motivation regulates the stress of parenting via the release of neuroprotective and stress-regulating hormones.

Unfortunately the study did not include parallel measures of giving and receiving support to spouses, who are relational partners with potentially similar levels of communal strength as children. There were no measures of the amount of support given to and received from one's spouse within the same time period that could be used in the analyses. Future research should examine whether providing more support to one's spouse versus one's child (which may be a great motivational conflict for many) has greater health benefits.

The relationship between providing support to adult children and mortality risk remained significant, taking into consideration several covariates that may influence mortality risk. In terms of other moderators within the model of caregiving and health system, the present research controlled for a series of factors that would influence resources for helping (e.g., socioeconomic status, physical health, health risk factors, mental health) and individual differences variables (e.g., demographics, personality traits). Furthermore, the study also controls for social integration and support (e.g., social support given and received from other recipients). Given this, it may be that the primary mechanism through which social support to adult children predict reduced mortality risk involves the mechanism of stress-regulation, as theorized by the model of caregiving and health.

Although the caregiving and health model points to stress-regulating benefits of neuroprotective hormones like oxytocin and progesterone, this was not tested directly given limitations inherent within the data. For example, it is possible that parents who provide support to their adult children experience elevated moods (Danner, Snowdon, & Friesen, 2001; E. W. Dunn, Aknin, & Norton, 2008), a greater sense of purpose or meaning (Boyle, Barnes, Buchman, & Bennett, 2009), or direct physiological benefits such as lower cortisol and blood pressure, and higher oxytocin (Field et al., 1998; Gleason, Iida, Bolger, & Shrout, 2003; Holt-Lunstad, Birmingham, & Light, 2008; Krause, Herzog, & Baker, 1992; Piferi & Lawler, 2006; Schoorlemmer, Peeters, Van Schoor, & Lips, 2009; Taylor et al., 2000), all of which have independently been shown to be associated with both giving to others and better health outcomes.

In the data, there were no measures of self-reported stress or hormones directly between the assessment of support and mortality that we can test as potential mediators of the reported effect between support given to children and mortality risk. A measure of the number of stressful events did exist, but the measure covered the total number of stressful events that occurred across the respondent's lifespan and was therefore too broad to include as a covariate. Alternative measures of stress between the assessment of support and mortality could be approximated by mental health variables like depression, well-being, or positive and negative emotions. Measures of these constructs did exist (in 2004) between the measures of support (1992) and mortality (2009). However analyses that included these potential mediators as a covariate were unreliable because of the extensive missing data that occurred after their inclusion.

Taken together, the present research was not able to test the stress-regulating pathways by which support provisions to children affect mortality risk. However, the research was

theoretically driven by the model of caregiving and health, which itself was based on substantive evidence that indicates that caregiving system implicates health via stress-regulating hormones (Konrath & Brown, 2013). Nevertheless, future directions should attempt to replicate the findings in a more representative sample with appropriate measures of support, mortality, and potential mediators.

Giving support to adult children may predict reduced mortality risk among older adults partially due to genetic overlap and propagation. In terms of more distal outcomes, the results could partially be explained by evolutionary theories of kin selection, since providing support to adult children may increase the likelihood of directly passing on one's genes. When considering resource allocation, providing support to one's adult children ensures that resources are being invested in future generations to maximize fitness benefits. In contrast, providing support to one's parents would divert such resources from needy future generations to an older generation that may no longer directly contribute fitness benefits. Providing support to one's siblings or other relatives would only lead to indirect fitness benefits through the survival of the relatives' children.

When considering why people may be motivated to provide ongoing support during their post-reproductive period, one's own fitness may be increased during this time by supporting adult children during *their* reproductive years. In what is known as the "grandmother hypothesis," evolutionary theorists argue that grandmothers were a central determinant in human longevity because of their ability to contribute to childcare after menopause (Hawkes, 2004). Indeed, evidence in support of the grandmother hypothesis finds that the presence of grandmothers during adult children's reproductive years correlates with offsprings' fitness (i.e., greater number of surviving grandchildren; (Lahdenperä, Lummaa, Helle, Tremblay, & Russell,

2004). Therefore, providing support to adult children (during their reproductive years) may make parents better at passing on their own genes, whereas providing support to siblings or other relatives' would promote the passing of these relatives' genes more directly.

One limitation of this study is its inability to tease apart emotional closeness and genetic relatedness explanations. Previous research has demonstrated that emotional closeness is an important proximal cause of prosocial behavior that partially explains the relationship between genetic relatedness and the likelihood of helping during life-threatening situations (Korchmaros & Kenny, 2001). In Study 5a, it may be that the proximal explanation for the support-mortality association may be emotional closeness to the child, and the distal outcome of post-reproductive parenting is the survival and continuation of one's genes. Yet since emotional closeness to each of the recipients of support was not measured, we cannot determine whether it is a good explanation for the findings.

The study is limited by the self-report nature of the support measures, which are subjected to biases toward being a good parent. To the best of our knowledge, the relatively new field on the benefits of giving support has not examined whether self-report ratings of giving support correlate with potentially more objective observer reports of giving. Future studies should code observed interactions between older parents and their adult children to see if the more objective measures of support provisions would predict later morbidity or mortality risk. Regardless, the use of self-report support measures in the present research is in line with past research linking support provisions to reduced mortality risk (S. L. Brown et al., 2003).

The study is also limited by its homogenous sample, which consists of a majority Caucasian sample from a similar birth cohort and a single geographic area, making it unclear if these patterns generalize more broadly. Although the use of such homogenous population groups

can help to illuminate interesting relationships by keeping some variables constant (Danner et al., 2001), we recommend that future studies examine the research questions among more diverse populations.

Finally, because the analyses were limited to support transactions between known partners, this does not mean that there would never be health benefits associated with giving to unknown others (Konrath & Brown, 2013). Rather, perhaps such health benefits are weaker, or exist for other reasons than those that would explain why giving to children is associated with reduced mortality risk. Regardless, the present studies have provided evidence that although there are many reasons to help and support others, regardless of the benefits that may accrue for givers, mortality benefits from providing support may only arise when providing support to one's children.

One potential avenue for future directions involves examining how different types of givers may moderate the relationship between giving to children and mortality risk. Specifically, in reality people regularly face many motivational conflicts, forcing them to juggle the desire to help multiple people simultaneously. Furthermore, although the communal hierarchy would argue that the child's needs trump those of others, this may not always be the case. There are people who follow the traditional model and give most of their support provisions to their children only, and not as much to other relationship partners. But other types of givers exist as well. For example, people may face difficulty balancing support provisions to more than one group of people, such as those who give support to both their adult children and aging parents simultaneously. This latter group of individuals may experience stress-overload from being unable to juggle the demands of both parties, suggesting that the stress-regulating benefits from giving to their children may not be able to regulate the stress of giving support to their aging

parents. There may other types of givers who are overall very compassionate, other-focused individuals who give indiscriminately to everybody. Although giving to others has been associated with a host of mental and physical health benefits (for review, see Konrath & Brown, 2013), too much giving has also been associated with compassion fatigue (e.g., Figley, 1995a, 1995b). Therefore, it would be interesting for future directions to explore how the relationship between giving to emotionally close others and mortality risk operates among the different types of givers.

In conclusion, the present chapter tested whether self-other overlap moderates the consequences of prosocial behavior. Conclusions argue that emotional closeness, one factor of self-other overlap, moderates the relationship between support provisions to other and mortality risk. Specifically, giving to adult children predicts reduced mortality risk among older adults, whereas giving to others do not. Taken together, the findings extend research and theory from a variety of research literatures, such as the model of caregiving and health, hierarchy of communal relationships, and association between prosocial behavior and health.

CHAPTER IV

Conclusion

Over the last few decades, research has found that self-other overlap processes are important for both close relationships (Acitelli & Young, 1996; Agnew et al., 1998; Aron, McLaughlin-Volpe, et al., 2004; Le, Dove, Agnew, Korn, & Mutso, 2010; Murray, Holmes, Bellavia, Griffin, & Dolderman, 2002; Tsapelas et al., 2009) and prosocial behavior (Cialdini et al., 1997; Maner et al., 2002). The present dissertation aimed to extend the current literature on self-other overlap, prosocial behavior, and close relationships by examining the two research questions posed in the introduction: 1) What determines self-other overlap and how may this affect prosocial tendencies? 2) Does self-other overlap moderate the consequences of prosocial behavior? Across five studies, the dissertation has illuminated the intricacies in which self-other overlap relate to prosocial behavior and its consequences in close relationships by examining these constructs within both experimental and longitudinal contexts and across a variety of relationship partners (e.g., friends, married partners, children, parents, siblings, and other relatives).

Summary of Key Findings

What determines self-other overlap and how may this affect prosocial tendencies?

Addressing the first question, Chapter II empirically explored whether discrete emotions shift perceptions of self-other overlap through changes in overlapping mental representations of close others in relationships. Furthermore, the research explored whether these changes in overlapping

mental representations influence immediate prosocial tendencies toward close others. Findings contribute evidence that psychological self-other overlap is flexible in the moment and is easily shifted by factors like anger in close relationships, but not by other emotions like sadness, happiness, contentment, and gratitude.

However, shifts in self-other overlap from anger (relative to a more neutral control) only occurred among close (Study 1) or best friends (Study 3), but not among married partners (Study 4), suggesting that marital relationships may be one boundary condition for the shifting nature of self-other overlap. Interestingly, Chapter II found mixed evidence on whether shifts in self-other overlap from anger relative to a more neutral control would implicate downstream prosocial tendencies in close relationships. Study 1 initially found that reflecting on an anger experience in close friendships undermined subsequent helping, relative to the other conditions, through the mediating role of self-other overlap. However, subsequent tests failed to replicate this model among best friends (Study 3) or married partners (Study 4).

The findings suggest that shifts in perceptions of self-other overlap after reliving anger experiences may not necessarily implicate downstream prosocial tendencies, and more research is needed to examine the conditions under which this process may or may not occur.

Nevertheless, the present studies are the first, to the best of my knowledge, to directly explore the manner in which emotions causally impact self-other overlap. The pattern of data contributes converging evidence on the shifting potential of self-other overlap in close relationships, as well as bridge formerly disconnected research on self-other overlap and appraisal theory of emotion to present potential avenues for future research.

Does self-other overlap moderate the consequences of prosocial behavior?

Addressing the second research question, Chapter III empirically examined whether a proxy for

the emotional closeness factor of self-other overlap would moderate the association between prosocial behavior and mortality risk across time. The findings suggest that providing support to children (i.e., who are often considered the most emotionally close relationship partners) predicted lower mortality risk, but providing support to other relationship partners was not associated with later mortality risk.

Specifically, older adult parents who reported providing support to their adult children at one time point were more likely to be alive 17 years later, controlling for covariates that may influence mortality risk (Study 5a). In fact, older adult parents reported that they provided the most types of support to their adult children, followed by their friends and acquaintances, parents, siblings, and their other relatives. Providing support to partners who are not adult children, whether parents, siblings, other relatives, or friends, did not predict mortality risk among either older adult parents (Study 5a) or non-parents (Study 5b), after controlling for plausible confounds.

The findings are interpreted within the framework of the caregiving and health model (Konrath & Brown, 2012), which argues that 1) giving to others could benefit one's own health to the extent that giving engages the biological caregiving system and 2) the caregiving system may be moderated by relationship variables, such as emotional closeness. The pattern of data contributes empirical support for the model of caregiving and health, while serving important implications for the more enduring nature of self-other overlap across time.

Implications and Future Directions

Taken together, Chapters II and III extend research on the nature of self-other overlap and prosocial behavior in close relationships with conclusions that pose important implications and future directions for a variety of research literatures. Specifically, the two chapters comment

on the importance of investigating the shifting nature of self-other overlap, taking into consideration the type of relationship, while bridging research on self-other overlap with other literatures within the field of psychology.

The shifting nature of self-other overlap. Chapter II contributes to the growing evidence that self-other overlap may shift in the moment. Past theory and research has suggested that self-other overlap may be influenced by a host of relationship factors, such as shared experiences, self-disclosures, or the mere motivation to draw another person closer to the self (Agnew & Etcheverry, 2006; Aron et al., 1991, 1997; Slotter & Gardner, 2009). The present dissertation contributes one additional factor, arguing that particular discrete emotions, such as anger directed at a close or best friend, could momentarily undermine self-other overlap in relationships. The findings are framed within the appraisal tendency framework (Han et al., 2007; Keltner et al., 2006; Lerner & Keltner, 2000, 2001; Lerner & Tiedens, 2006; Tiedens & Linton, 2001), which argues that anger may undermine self-other overlap because of its unique appraisal patterns that carry over to more negative downstream judgments. The research is the first, to the best of my knowledge, to bridge theory and research from appraisal theory of emotions with self-other processes in relationship. Connecting these two literatures not only informs theoretical support for the present research, but also presents fruitful avenues for future research. Specifically, future directions could elaborate on the effects of anger on self-other overlap by altering the cognitive-motivational properties underlying the anger experience, as well as manipulating factors related to emotions, such as the duration or intensity.

Cognitive-motivational properties of anger. Although Studies 1 and 3 found that anger undermined self-other overlap among close and best friends, relative to a more neutral control, the findings do not necessarily rule out all types of anger in close relationships as undermining

self-other overlap. Specifically, future directions could examine how changing the cognitive-motivational properties of anger may influence how anger affects self-other overlap. For example, incidents in which both friends are angry at a common source of the anger outside of the relationship (e.g., a horrible boss) may strengthen instead of undermine self-other overlap, and this may occur via mechanisms of shared experience or self-disclosures.

Emotional duration and intensity. Other avenues for future directions involve examining how long the negative effects of anger endure in close relationships and whether the intensity of the emotional experience matters. Perhaps in stronger close relationships, shifts in self-other overlap are more ephemeral in nature, lasting only a few minutes or a few hours before quickly bouncing back to pre-conflict levels. After all, Study 4 found that marital partners did not shift their self-other overlap after reflecting on an anger experience with their spouse, even though they indeed felt more negative emotion than other participants. This suggests that either marital partners did not shift their self-other overlap with their partner in the first place, or that whatever shifts that occurred were too short-lived to be captured by the present paradigm. Barring the duration of an emotional experience, the intensity of the experience may matter as well. Intense emotional experiences may have more enduring long-term effects for self-other overlap and the relationship (e.g., an epic fight that changes the fundamental nature of the relationship). Therefore, given all the unique intricacies of emotional experiences and relationship processes, future researchers should examine how properties of the emotional experience may change the manner in which it undermines or strengthens self-other overlap in close relationships.

Self-other overlap moderate cumulative long-term health benefits. Although findings from Chapter II suggest that self-other overlap may fluctuate in the moment, Chapter III suggests that self-other overlap may exert more enduring influences across time. The model of caregiving

and health (Konrath & Brown, 2013) posits that giving support to others benefits one's own health through the activation of the biological caregiving system, and that the caregiving system is moderated by emotional closeness. Emotional closeness is a factor of self-other overlap that could contribute more long-term health outcomes, but only to the extent to which emotional closeness activates the biological caregiving system.

Specifically, the model of caregiving and health posits that the type of chronic activation of the caregiving system likely to be present from responding to the needs of one's children – even one's adult children – would ultimately accumulate in long-term health benefits for the self via chronic activation of neuroprotective hormones. From this perspective, emotional closeness may exert more enduring influences on health because of the habitual motivation of parents to support their children in need. This assumption was supported by findings from Study 5a suggesting that older adult parents are not only motivated to help their adult children, but that they also are more likely to derive health benefits from doing so in the form of reduced mortality risk.

Of course there may be parents who are not emotionally close to their children (e.g., emotionally distant parents) in the sample, but research paradigm takes these individuals into account. These emotionally distant parents would likely not be very involved in providing regular support to their children, and would therefore be less likely to report providing support to their adult children in our study. Our findings suggest that parents who reported providing support to their adult children at one time point were the ones that were more likely to be alive 17 years later. Furthermore, in general, parents reported that they provided the most type of support to their children than other groups, suggesting that indeed, their children may be at the top of their communal hierarchies in terms of giving support.

The beauty of the caregiving and health model is that it does not preclude momentary fluctuations in emotional closeness within relationship partners. For example, an older adult parent may experience momentary conflict with their adult children (e.g., over how best to raise their grandchild), and such conflicts may undermine emotional closeness in the moment. But ultimately over the course of years in which an adult child may express his or her needs countless times, the older adult parent is probably more likely to support the child than not, which would unleash the cascading benefits of neuroprotective hormones that accumulate into health benefits across time. Therefore, although emotional closeness may fluctuate in the moment just like overlapping mental representations factor of self-other overlap, emotional closeness nevertheless could exert cumulative long-term health benefits for the self.

Mechanisms. Future directions should examine the mechanisms through which self-other overlap influences long-term health. The model of caregiving and health (Konrath & Brown, 2013) point to the mechanisms of neuroprotective hormones, such as oxytocin and progesterone, but actual test of these mechanisms were constrained by the nature of the dataset. Future direction could clarify the pathways by which giving support to emotionally close others that activate the caregiving system would predict reduced mortality risk across time.

The type of relationship partner matters for self-other overlap. Both Chapters II and III speak to the importance of considering the type of relationship when examining self-other overlap and prosocial behavior in close relationships. Chapter II suggested that anger only undermined self-other overlap among close (Study 1) and best friends (Study 3), relative to a neutral condition, but not among marital partners (Study 4). Chapter III suggested that only giving to adult children predicted reduced mortality risk because adult children are considered extremely emotionally close targets that would be more likely to activate the caregiving system

(Study 5a). Giving to other targets who are not one's own children, such as parents, siblings, or friends, did not predict mortality risk among both parents (Study 5a) and non-parents (Study 5b). Taken together, the research suggests that future research on self-other overlap should consider the type of relationship because different types of relationships influence the manner in which self-other overlap processes develop or persist.

Measurement of self-other overlap. Both factors of self-other overlap, overlapping mental representations and emotional closeness, pose limitations inherent within their measurement that pave the way for future directions. The overlapping mental representations factor could benefit from the assessment of positive as well as negative traits to enlighten the manner in which discrete emotions affect self-other overlap. Furthermore, it would be interesting to examine how individual differences moderate the inclusion of negative and positive traits. The emotional closeness factor is partially confounded by genetic relatedness, a construct that is difficult to tease apart from emotionally close relationships. Future direction should tease part the two constructs to illuminate the manner in which emotional closeness influences long-term health outcomes.

Overlapping mental representations. The overlapping mental representations factor of self-other overlap is commonly measured by assessing trait adjectives of the self and other (Batson et al., 1997; Davis et al., 1996; Myers & Hodges, 2012; Slotter & Gardner, 2009). The measure was first developed by Davis et al. (1996) but has been refined by many researchers over time, given a variety of measurement issues. Davis and colleagues (1996) first measured self-other overlap with an adjective checklist of 159 positive, negative, and neutral traits attributed to the self and other. Although the measure more directly addresses the concept of self-other merging than the other commonly used measure of emotional closeness (i.e., IOS

measure), the global yes-no checklist suggests that the self-other overlap scores could potentially be influenced by the number of traits actually checked, which may create interpretational problems (Batson et al., 1997). Addressing these concerns, Batson and colleagues (1997) modified the Davis et al. (1996)'s trait checklist to use a rating scale that assesses 16 personal traits relevant to the need situation on a scale of 1 (not at all true of myself/Katie Banks) to 9 (extremely true of myself/Katie Banks). Self-other overlap was calculated by taking the reversed score of the mean absolute difference between self and other ratings. Slotter and Gardner (2009) further refined the trait rating measure by using 15 attributes based on personality research by Anderson (1968) that were controlled to be neutral or slightly positively valenced.

Although the present research used Slotter and Gardner (2009)'s measure of overlapping mental representations, the most refined measure of overlapping mental representations in the current literature, the measure nevertheless still presents interpretational problems within the current experimental paradigm. For one, the measure only has positive traits. One alternative interpretation of the findings is that anger undermined self-other overlap because it makes participants judge close others in less positive terms, relative to the other conditions. After all, the measure of self-other overlap only includes positive traits, suggesting that people in the angry relative to the control condition may have rated the positive traits as less characteristic of their close friend. This interpretation was tested and ruled out, suggesting that anger's effect on self-other overlap cannot be explained by participants in the angry condition simply rating the close other as having less positive traits.⁶

The overlapping representation measure also precludes the assessment of whether anger affects the inclusion of negative traits from close friends. Although the present research tested whether anger undermined inclusion of positive traits, it would be interesting to test how it

would affect the inclusion of negative traits. Past research has found that people are more resistant to including negative than positive traits into the self (Davis et al., 1996; Myers & Hodges, 2012). This process may occur because people generally strive to maintain positive self-concepts when faced by negative or threatening information, by engaging in self-enhancement, self-protection, or self-affirmation processes (Alicke & Sedikides, 2009; Sedikides & Gregg, 2008; Steele, 1988; Tesser, Crepaz, Collins, Cornell, & Beach, 2000). Therefore, it may be that anger does not affect inclusion of negative traits because people are resistant to their inclusion in the first place.

However, there are exceptions to this rule, especially considering situations when people are motivated to include the negative traits of others into their own self-concepts. For example, past research has suggested that relationship motivations matter for self-other overlap. The mere motivation to draw another person closer to the self predicts the inclusion of positive traits (Slotter & Gardner, 2009). Furthermore, single individuals are more likely to include negative traits of potential romantic partners than non-romantic partners, and this effect is magnified by the extent to which they desire to meet the potential partner (Slotter & Gardner, 2012). Therefore, relationship-promoting motivations, such as romantic desire, can affect the inclusion of negative traits. Lending this rationale to the present paradigm, priming relationship-promoting motivation after the anger experience may allow the inclusion of negative traits from the close partner who caused the anger experience into the self (e.g., “she may have been inconsiderate, but I desire to be with her, so in reflection maybe I was inconsiderate too”).

Individual differences could moderate the effect to which discrete emotions affect self-other overlap. In general, people seek close others to verify their own self-concepts, even if they already possess negative self-views (Kwang & Swann, 2010; W. B. Swann, Hixon, & de la

Ronde, 1992). Therefore personality traits pertaining to the self and others could moderate the inclusion of positive as well as negative traits. Research has suggested that attachment anxiety predicted more malleability of the self, and greater susceptibility to self-concept change or confusion with the close partner (Slotter & Gardner, 2012). Future directions could examine how traits like self-esteem could moderate the relationship between anger and self-other overlap. Given that low self-esteem individuals may be more likely to seek out information that verify their poor self-concepts, they may be more likely to include negative traits of others into the self. Anger can be a discrete emotion that undermines this process, by diverting the negative focus on the self to negative focus on others. In contrast, anger could enhance self-other overlap by allowing the self to further include more negative qualities of others into the self. Future directions testing these scenarios could enlighten the processes by which discrete emotions affect the inclusion of negative traits, as well as positive traits and how this process may be moderated by individual differences.

Emotional closeness. The emotional closeness factor of self-other overlap is commonly measured by the Inclusion of Others in the Self Scale (IOS, Aron et al., 1992), a one-item measure with 7 Venn diagram-like pairs of increasingly overlapping circles where one circle of each pair represents the self and the other circle represents the relationship partner. Some researchers have argued that there are problems inherent in the measure because while it's useful in capturing very broad feelings of closeness (Myers & Hodges, 2012), the measure may be too ambiguous, making it difficult to know whether the scores on the IOS reflect the degree of merging self-other concepts or something else (Batson, 1997).

One such problem that results with the vaguer conceptualization of emotional closeness is that it is difficult to tease apart from genetic relatedness, especially considering the role of

emotional closeness in prosocial behavior. Although traditional manipulations of emotional closeness within an experimental context typically have participants reflect on particular individuals of varying closeness (i.e., a near stranger, an acquaintance, a good friend, or a close family member; (Cialdini et al., 1997), these categories of people often overlap with the degree of genetic relatedness, presenting an inherent confound. Furthermore, emotional closeness is a proximal cause of prosocial behavior in the relationship between genetic relatedness and prosocial behavior during life-threatening situations (Korchmaros & Kenny, 2001). This confounding is difficult to tease apart, and should be pursued by future directions. One pursuit would involve examining the role of emotional closeness and prosocial behavior in long-term health outcomes among highly emotionally close partners who are not genetically related, such as spouses. After all, Study 4 found a ceiling effect in helping toward marital partners, suggesting that people overwhelmingly desire to help their spouses in need. Comparing the health benefits of providing support to spouses versus children would be an interesting direction for future research to tease apart these confounds. Another pursuit could examine the health consequences of support provided to biological versus non-biological children who are considered emotionally close to better separate the two constructs. Regardless, future directions should aim to tease apart emotional closeness from genetic relatedness to illuminate the ways in which self-other overlap impacts more cumulative long-term outcomes.

Conclusion

The present dissertation examined self-other overlap and prosocial behavior in close relationships within different contexts, using an integrative approach that incorporates multiple levels of analysis, such as experimental and longitudinal analysis, to explore both short-term and long-term consequences. It highlights self-other overlap processes across many common types of

relationships, including close friends, married partners, adult children, parents, siblings, and other relatives. A key challenge for future direction is to develop an increasing nuanced understanding of how self-other overlap is measured, develops in relationships, and persists across time, depending on factors within individual situations and the relationship. Addressing these concerns, along with other questions raised by the findings, pave way for enriching knowledge on how self-other overlap and prosocial behavior operate in close relationships.

ENDNOTES

¹ Please note that self-other overlap can also be measured by assessing reaction times to trait adjectives (e.g., Aron et al., 1991). However because this measure was excluded from Myers & Hodges (2012)'s factor analysis, which focused only on the most popular measures of self-other overlap, it remains unclear whether the measure would factor into the overlapping mental representations factor of self-other overlap.

² A caveat to this statement is that the experiment paradigm assessed reaction time to whether traits of self, spouse, or an entertainment figure was true or not true of the target, rather than the trait adjective rating measure of overlapping mental representations (Batson et al., 1997; Davis et al., 1996; Slotter & Gardner, 2009). Results suggest that respondents were slower and made more errors when responding to traits that differed between the self and the spouse, suggesting that mental representations of the self and other are more closely overlapping. This was not the case for the non-close other (i.e., entertainment figure).

³ Analyzing the entire sample without any exclusions in Study 3 did not significantly alter the findings of condition on self-other overlap or helping. The pattern of results were consistent with those reported in the final study, though they were weakened most likely by the extra noise from not excluding negligent participants: condition effect on self-other overlap, $F(2,253)=2.85$, $p=.06$; condition effect on helping, $F(2,254)=1.59$, $p=.207$.

⁴ Analyzing the entire sample without any exclusions in Study 4 did not significantly alter the findings of condition on self-other overlap or helping. The pattern of results were consistent with those reported in the final study: condition effect on self-other overlap, $F(2,147)=.39$, $p=.676$; condition effect on helping, $F(2,145)=.59$, $p=.555$.

⁵ Exploratory analyses were conducted to test whether arousal was a factor by merging data from studies 1 and 2 together. Dummy coding designated the high arousal emotion conditions (i.e., angry, happiness) as 1 and low arousal emotion conditions (i.e., sadness, contentment) as 0. This new arousal factor was then entered as a between subjects factor in a one-way ANOVAs on self-other overlap. The main effect of arousal was non-significant, $F<1$, suggesting participants in the high ($M = 5.49$) versus low arousal ($M = 5.44$) emotion conditions did not report significantly different levels of self-other overlap. Then, dummy coding designated positive emotion conditions (i.e., happiness, contentment) as 1 and negative emotion conditions (i.e., anger, sadness) as 0, and a 2 arousal (high vs. low) X 2 valence (negative vs. positive) ANOVA was conducted on self-other overlap. A marginal interaction emerged, $F(1, 116) = 3.70$, $p=.06$, $\eta^2=.031$. Simple tests suggest a significant main effect of valence among high arousal emotions, $F(1, 68) = 7.15$, $p<.01$, $\eta^2=.095$, where participants in the angry condition ($M = 5.30$) report lower self-other overlap than those in the happy condition ($M = 5.68$). There was no main effect

of valence among low arousal emotion conditions, $F < 1$, suggesting participants in the sad ($M = 5.46$) and content ($M = 5.42$) conditions reported similar levels of self-other overlap. Essentially the interaction formally tested the statistical difference found for self-other overlap in Study 1 (i.e., anger vs. happiness), but non-significant difference in Study 2 (i.e., sadness vs. contentment). The same tests were then applied to helping; there was no main effect of arousal, $F < 1$, suggesting that high ($M = 5.16$) versus low arousal ($M = 5.42$) emotion conditions did not report significantly different levels of helping. There was also no significant 2 arousal (high vs. low) X 2 valence (negative vs. positive) interaction on helping, $F < 1$, ($M_{angry} = 4.74$, $M_{sad} = 4.96$, $M_{happy} = 5.57$, $M_{content} = 5.88$).

⁶ To test whether participants in the angry condition are simply judging the close other in less positive terms, relative to the other conditions, Studies 1, 3, and 4 were merged to test the condition effect on self-ratings and other-ratings. Self-ratings were calculated by taking the mean of all 15 trait ratings for the self. Other-ratings were calculated by taking the mean of all 15 trait ratings for the other. Because the measure only included positive traits, higher values on self- and other-ratings may signify that participants thought the positive traits were more characteristic of either themselves or of their partner, respectively. Because across the 3 studies (Studies 1, 3, and 4), only the angry and control condition overlap, the condition variable was dummy coded to reflect 1 = angry condition and 0 = control condition. Then two independent samples t-test were performed with condition (1 = angry, 0 = control) on self-rating and other-ratings separately. Results suggest that participants in the angry ($M = 4.54$) and control condition ($M = 4.53$) reported similar degree of endorsement of positive traits for themselves, $t(258) = -.13$, *ns*. Similarly, participants in the angry ($M = 4.47$) and control condition ($M = 4.59$) reported similar degree of endorsement of positive traits for the other person, $t(258) = 1.16$, *ns*. An alternative test involves splitting the data by condition, and testing the associations between post-manipulation SAM valence and self-ratings, and between post-manipulation SAM valence and other-ratings, both controlling for the effect of sample (i.e., study number). First, two dummy variables were created to represent the study covariates (Dummy1: Study 1 = 0, Study 3 = 0, Study 4 = 1; Dummy 2: Study 1 = 0, Study 3 = 1, Study 4 = 0). Then the data were split by condition, and self-ratings were regressed on SAM valence and both dummy variables representing sample. Among participants in the angry condition, the degree to which they felt happy after the manipulation did not predict how positively they rated themselves ($b = .049$, $\beta = .11$, $t = 1.32$, *ns*), or how positively they rated others ($b = .001$, $\beta = .003$, $t = 0.03$, *ns*), controlling for the specific sample. Among participants in the control condition, the degree to which they felt happy after the manipulation predicted greater endorsement of positive traits of themselves ($b = .168$, $\beta = .31$, $t = 3.85$, $p < .001$), and greater endorsement of positive traits of others ($b = .172$, $\beta = .31$, $t = 3.71$, $p < .001$), controlling for the specific sample.

⁷ One potential limitation concerns low power given the smaller sample size after including the large number of covariates in the model ($N = 193$). Exploratory tests were analyzed to address this concern. Specifically, model was analyzed without inclusion of any covariates to examine the effects of giving to various others on mortality risk ($N = 264$). Findings suggest that giving support to friends, $\beta = -0.70$, $p = .242$, *Odds ratio* = 0.50, *C.I.* [0.16-1.60], parents, $\beta = -0.19$, $p = .747$, *Odds ratio* = 0.83, *C.I.* [0.27-2.58], siblings, $\beta = -0.12$, $p = .856$, *Odds ratio* = 0.89, *C.I.* [0.24-3.31], or other relatives, $\beta = -1.19$, $p = .264$, *Odds ratio* = 0.31, *C.I.* [0.04-2.45], did not predict mortality risk.

Table II.1

Summary of appraisals related to the discrete emotions in Chapter II

Emotion	Appraisals
Anger	negative valence other-responsibility for event other person blocks goals or present obstacles other person is a threat to self-esteem goal failure individual control high certainty
Happiness	positive valence moderate self agency moderate individual control pleasantness low anticipated effort high attentional activity high motive consistency high certainty
Sadness	negative valence circumstantial agency low control goal failure irrevocable loss
Contentment	positive valence human agency or circumstantial agency? motive consistency perceived individual control
Gratitude	positive valence other agency

Table II.2

Means, standard errors, and post-hoc comparisons for all dependent variables by condition in Studies 1 to 4

Study 1 DVs	Condition					
	Anger		Happiness		Neutral	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
Valence	4.40 ^{hn}	.26	6.91 ^{an†}	.15	6.22 ^{ah†}	.27
Anger	6.83 ^{hn}	.19	1.89 ^{an†}	.22	2.78 ^{ah†}	.44
Arousal	4.23	.33	4.37	.37	3.59	.31
Self-other overlap	5.30 ^{hn}	.10	5.68 ^a	.10	5.84 ^a	.08
Helping	4.74 ^{h†n}	.33	5.57 ^{a†}	.19	5.78 ^a	.21
Study 2 DVs	Sadness		Contentment		Neutral	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
	Valence	4.28 ^{cn}	.29	6.80 ^s	.22	6.19 ^s
Sadness	5.80 ^{cn}	.32	3.16 ^s	.36	2.96 ^s	.40
Arousal	3.04	.31	3.44	.31	3.58	.36
Self-other overlap	5.46	.11	5.42	.12	5.56	.11
Helping	4.96 ^{c†n}	.37	5.88 ^{s†}	.22	5.92 ^s	.25
Study 3 DVs	Anger		Gratitude		Neutral	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
	Valence	4.49 ^{gn}	.30	6.90 ^a	.20	6.38 ^a
Arousal	3.86	.31	4.24 ⁿ	.30	3.25 ^g	.25
Self-other overlap	5.41 ⁿ	.10	5.53	.08	5.71 ^a	.06
Helping	5.96	.17	5.98	.16	5.67	.18
Study 4 DVs	Anger		Gratitude		Neutral	
	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>	<i>M</i>	<i>SE</i>
	Valence	3.70 ^{gn}	.26	6.95 ^{an}	.27	5.65 ^{ag}
Arousal	5.06 ^{gn}	.32	3.64 ^a	.28	3.63 ^a	.29
Self-other overlap	5.40	.08	5.52	.09	5.61	.08
Helping	8.30	.24	8.70	.12	8.57	.14

Note: Superscript *a* denotes a significant mean difference with anger condition, superscript *h* denotes a significant mean difference with the happiness condition, superscript *s* denotes a significant mean difference with the sad condition, superscript *c* denotes a significant mean difference with the contentment condition, superscript *g* denotes a significant mean difference with the gratitude condition, and superscript *n* denotes a significant mean difference with the more neutral control condition. Superscript *a*, *h*, *s*, *c*, *g*, or *n* followed by † denotes a marginal significance of $p < .10$.

Table III.1

Zero-Order Correlations of Support Given and Received Variables in Study 5a

		Support Given				
		1	2	3	4	5
Support Received	1. Child	.40**	-.06**	.15**	-.01	-.12**
	2. Parent	.12**	.28**	.21**	.05**	-.14**
	3. Sibling	.08**	.22**	.38**	.12**	.12**
	4. Other Relatives	-.03	.10**	.12**	.30**	.02
	5. Friend	-.30**	.02	.04*	-.07**	.38**

Note. Support received-given correlations are reported on the diagonal, $N=2545$. Cross-people correlations within support given are reported above the diagonal, $N=3518$. Cross-people correlations within support received are reported below the diagonal, $N=2577$ for support received.

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

Table III.2

Hierarchical Logistic Regression Model Used to Predict Mortality Risk among Participants with Children in Study 5a

	Descriptives	Step 1			Step 2			Step 3			Step 4			Step 5		
	M (SD) or %	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio
Support Given																
Children	0.53 (0.37)	-0.59	.004	0.55	-0.69	.002	0.50	-0.64	.006	0.53	-0.61	.009	0.55	-0.56	.017	0.57
Parents	0.36 (0.36)	-0.24	.251	0.78	-0.29	.198	0.75	-0.19	.414	0.83	-0.13	.565	0.88	-0.14	.552	0.87
Sibling	0.12 (0.24)	0.09	.763	1.10	0.17	.599	1.19	0.24	.475	1.27	0.21	.532	1.23	0.22	.508	1.25
Other Relatives	0.10 (0.23)	0.10	.744	1.11	0.17	.607	1.18	0.14	.658	1.16	0.22	.502	1.25	0.25	.465	1.28
Friends	0.42 (0.37)	-0.08	.685	0.92	-0.02	.919	0.98	0.01	.958	1.01	0.01	.954	1.01	0.02	.934	1.02
Support Received																
Children	0.48 (0.44)				0.14	.465	1.15	0.17	.376	1.19	0.15	.461	1.16	0.14	.499	1.15
Parents	0.16 (0.32)				0.15	.536	1.16	0.10	.683	1.10	0.12	.629	1.13	0.11	.649	1.12
Siblings	0.15 (0.31)				-0.18	.492	0.83	-0.18	.498	0.83	-0.16	.571	0.86	-0.18	.523	0.84
Other Relatives	0.08 (0.24)				-0.27	.416	0.76	-0.32	.345	0.73	-0.45	.197	0.64	-0.45	.203	0.64
Friends	0.52 (0.43)				-0.12	.518	0.88	-0.08	.674	0.92	-0.08	.690	0.92	-0.09	.648	0.91
Demographics																
Age	53.21 (0.62) / 69.13(0.49)							0.07	.621	1.08	0.08	.589	1.08	0.10	.521	1.10
Gender	52.9%♀ / 47.1%♂							0.41	.010	1.51	0.33	.050	1.39	0.38	.027	1.46
Marital status	85.8%M / 14.2%NM							-0.31	.116	0.73	-0.29	.149	0.75	-0.32	.118	0.73
Number of Children	3.23 (1.46)							0.05	.362	1.05	0.05	.358	1.05	0.04	.458	1.04
Religious attendance	4.73 (2.83)							-0.03	.242	0.97	-0.01	.585	0.99	-0.02	.495	0.98
Socioeconomic status																
Education	13.63 (2.28)							-0.04	.317	0.97	0.002	.954	1.00	0.01	.888	1.01
Net worth	\$215,146.61 (271,837.06)							-0.38	.088	0.68	-0.20	.376	0.81	-0.16	.489	0.85
Employment status	85.2%E / 14.8%UE							-0.72	<.001	0.49	-0.53	.006	0.59	-0.52	.008	0.59
Physical Health																
Number of illnesses	1.03 (1.26)										0.06	.290	1.06	0.07	.221	1.07
Self-rated health	4.16 (0.68)										-0.57	<.001	0.56	-0.58	<.001	0.56
Functional status	82.7%NL / 16.6%L / 0.7%UK										0.03	.886	1.03	0.02	.912	1.02

Risk Factors								
Smoking	36.8%NS / 44.6%S / 18.6%UK		0.45	.006	1.56	0.46	.005	1.59
BMI	26.69 (4.42)		0.002	.896	1.00	-0.004	.826	1.00
Mental Health								
Depressive symptoms	16.57 (15.74)		0.002	.774	1.00	0.003	.639	1.00
Well-being	198.67(29.06)		0.003	.384	1.00	0.004	.323	1.00
Personality								
Extraversion	22.86 (5.59)					-0.01	.741	0.99
Agreeableness	28.20 (4.77)					0.04	.045	1.04
Conscientiousness	28.83 (4.53)					-0.04	.029	0.96
Neuroticism	15.78 (5.08)					-0.02	.369	0.98
Openness	21.56 (5.18)					-0.01	.392	0.99

N=2352. P-values<.10 are bolded for clarity.

Note: ♀ = Female; ♂ = Male; M = Married; NM = Not Married; E = Employed; UE = Unemployed; L = Limited Functional Status; NL = Not Limited Functional Status; S= History of Regular Smoking; NS = No History of Regular Smoking; UK = Unknown

Table III.3

Hierarchical Logistic Regression Model Used to Predict Mortality Risk among Childless Participants in Study 5b

	Descriptives	Step 1			Step 2			Step 3			Step 4			Step 5		
	M (SD) or %	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio	β	<i>p</i>	Odds ratio
Support Given																
Parents	0.51 (0.40)	-0.56	.384	0.57	-0.57	.425	0.57	-0.49	.517	0.61	-0.59	.456	0.55	-0.88	.305	0.42
Sibling	0.22 (0.31)	-0.01	.983	0.99	-0.03	.965	0.97	0.18	.827	1.19	0.005	.996	1.00	0.12	.904	1.13
Other Relatives	0.13 (0.25)	-1.30	.240	0.27	-1.15	.338	0.32	-1.18	.350	0.31	-1.39	.340	0.25	-1.09	.454	0.34
Friends	0.56 (0.38)	-1.28	.059	0.28	-0.95	.216	0.39	-0.83	.318	0.44	-0.88	.312	0.41	-0.94	.345	0.39
Support Received																
Parents	0.21 (0.35)				0.35	.607	1.42	0.38	.605	1.47	0.48	.537	1.61	0.97	.270	2.65
Siblings	0.29 (0.40)				0.11	.867	1.11	0.37	.600	1.45	0.40	.600	1.49	0.26	.753	1.30
Other Relatives	0.10 (0.25)				-0.59	.629	0.55	-0.43	.740	0.65	-0.46	.741	0.63	0.20	.898	1.22
Friends	0.66 (0.42)				-0.45	.502	0.64	-0.22	.760	0.80	-0.22	.771	0.80	0.11	.896	1.11
Demographics																
Age	53.18 (0.66) / 69.09 (0.50)							0.52	.202	1.69	0.59	.180	1.80	0.80	.106	2.23
Gender	57.3% ♀ / 42.7% ♂							0.40	.430	1.49	0.15	.777	1.17	0.40	.513	1.49
Marital status	38.7%M / 61.3%NM							-0.79	.196	0.46	-0.72	.262	0.49	-0.54	.436	0.58
Religious attendance	4.24 (3.24)							0.001	.989	1.00	0.03	.663	1.03	0.02	.779	1.02
Socioeconomic status																
Education	14.54 (2.54)							-0.05	.569	0.95	-0.01	.927	0.99	-0.10	.457	0.90
Net worth	\$217,194.61 (\$284,698.01)							-0.79	.245	0.45	-0.52	.474	0.59	-0.93	.243	0.40
Employment status	86.9%E / 13.1%UE							0.62	.454	1.86	0.63	.474	1.88	0.32	.730	1.38
Physical Health																
Number of illnesses	0.98 (1.15)										0.18	.426	1.19	0.05	.834	1.05
Self-rated health	4.17 (0.66)										-0.16	.715	0.85	-0.33	.471	0.72
Functional status	80.6% NL / 19.4%L										0.38	.547	1.46	0.67	.354	1.95
Risk Factors																
Smoking	41.6%NS / 40.7%S / 17.7% UK										0.67	.202	1.96	1.19	.055	3.30
BMI	26.13 (4.55)										0.04	.426	1.04	0.07	.214	1.07
Mental Health																
Depressive symptoms	16.42 (14.55)										0.003	.883	1.00	0.01	.779	1.01
Well-being	195.24 (30.11)										-0.01	.382	0.99	-0.04	.007	0.97

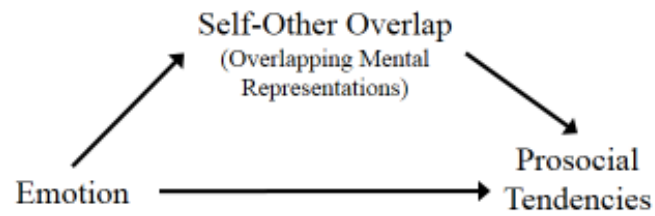
Personality			
Extraversion	21.15 (6.01)	0.06	.363 1.06
Agreeableness	27.38 (5.04)	-0.05	.459 0.95
Conscientiousness	28.82 (5.17)	0.27	.007 1.31
Neuroticism	16.39 (4.95)	-0.03	.657 0.97
Openness	22.19 (5.07)	0.11	.189 1.11

N=193. P-values<.10 are bolded for clarity.

Note: ♀ = Female; ♂ = Male; M = Married; NM = Not Married; E = Employed; UE = Unemployed; L = Limited Functional Status; NL = Not Limited Functional Status; S= History of Regular Smoking; NS = No History of Regular Smoking; UK = Unknown

Figure 1.1 Schematic representation of the research questions in Chapters II and III

A. Chapter II (Studies 1 to 4)



B. Chapter III (Study 5a and 5b)

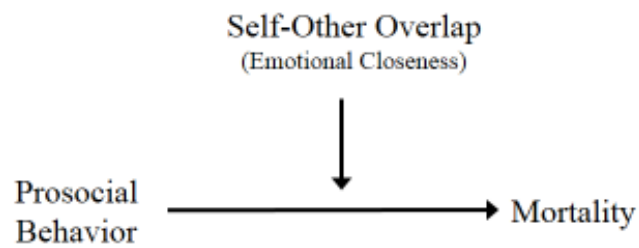
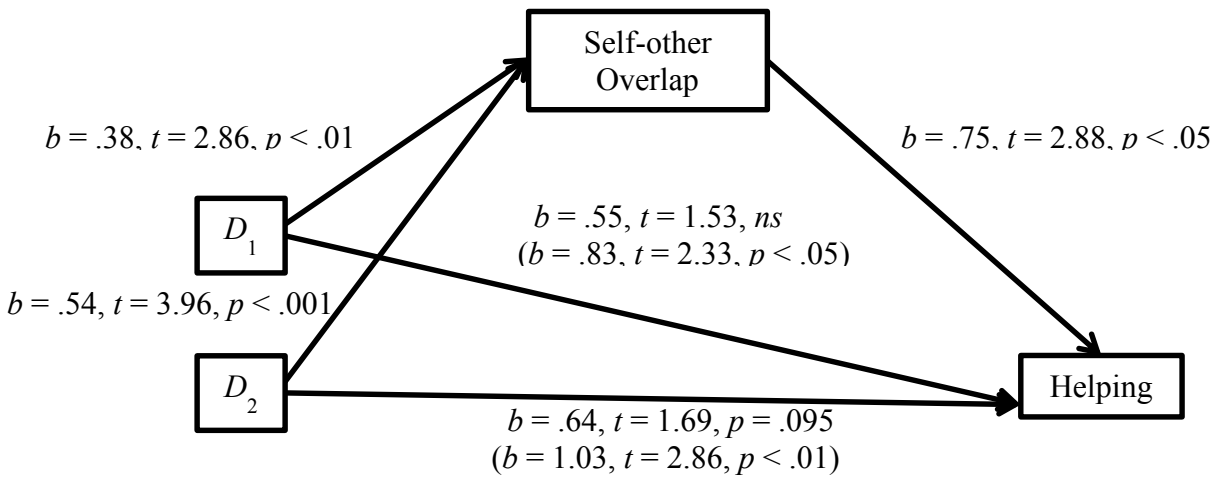


Figure II.1 Self-other Overlap Mediates the Relationship between Condition and Helping in Study 1

	Indicator Coding		
	Anger	Happy	Control
D ₁	0	1	0
D ₂	0	0	1



Appendix A

Experimental Manipulations in Study 1 to 4

Participants were asked to recall a particular emotion (i.e., Study 1: anger, happiness, control; Study 2: sadness, contentment, control; Study 3: anger, gratitude, control; Study 4: anger, gratitude, control). Then they asked to reflect on the causes and reasons underlying their emotional experience for 30 seconds.

Manipulation for Anger Condition (Study 1)

We would now like you to think about a time from your past in which you felt angry at a close friend.

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme anger at another person – times in which they are overwhelmed with anger and negativity.

Take a few moments **RIGHT NOW** to think about times from your past with a close friend that make you feel angry when you think about that person **RIGHT NOW**.

As you do this, try to identify a specific experience with a close friend from your past that makes you feel overwhelmed with anger when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Happiness Condition (Study 1)

We would now like you to think about a time from your past in which you felt happy with a close friend.

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme happiness with another person – times in which they are overwhelmed with joy and positivity.

Take a few moments **RIGHT NOW** to think about times from your past with a close friend that make you feel happy when you think about that person **RIGHT NOW**.

As you do this, try to identify a specific experience with a close friend from your past that makes you feel overwhelmed with happiness when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Sadness Condition (Study 2)

We would now like you to think about a time from your past in which you felt sad or depressed because of an experience you shared with a close friend.

Although people experience a variety of positive and negative experiences in their life, there are times when they become extremely sad in response to the actions of other people – times in which they are overwhelmed with sadness and negativity. They may have felt sad from being rejected by a friend, or feel depressed about something their friend has said or done.

Take a few moments **RIGHT NOW** to think about times from your past with a close friend that make you feel sad when you think about them **RIGHT NOW**.

As you do this, try to identify a specific experience with a close friend that makes you feel overwhelmed with sadness when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Contentment Condition (Study 2)

We would now like you to think about a time from your past in which you felt content or satisfied because of an experience you shared with a close friend.

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme contentment with other people – times in which they are overwhelmed with satisfaction and positivity. They may enjoy spending a sunny afternoon outside with a friend after a long winter semester, or sharing a delicious and satisfying treat with a friend.

Take a few moments **RIGHT NOW** to think about times from your past with a close friend that make you feel content when you think about them **RIGHT NOW**.

As you do this, try to identify a specific experience with a close friend that makes you feel overwhelmed with contentment when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Control Condition (Study 1 and 2)

We would now like you to think about a time from your past in which you completed a daily activity with a close friend.

Although people experience a variety of positive and negative experiences in their life, there are times when they don't feel any particular emotions at all with another person – times in which they are simply going about their daily activities, such as shopping for groceries, doing laundry or dishes, or studying in the library.

Take a few moments **RIGHT NOW** to think about times from your past with a close friend when you completed daily activities with that person.

As you do this, try to identify a specific experience with a close friend from your past that does not make you feel particularly positive or negative when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Anger Condition (Study 3)

We would now like you to think about a time from your past in which you felt angry at [friend's initials].

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme anger at their close friend – times in which they are overwhelmed with anger and negativity. They may have felt angry because their friend treated them unfairly, or because their friend did or said something mean or inconsiderate.

Take a few moments **RIGHT NOW** to think about times from your past with [friend's initials] that make you feel angry when you think about this person **RIGHT NOW**.

As you do this, try to identify a specific experience with your friend from your past that makes you feel overwhelmed with anger when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Gratitude Condition (Study 3)

We would now like you to think about a time from your past in which you felt grateful because of [friend's initials].

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme gratitude toward their close friend – times in which they are overwhelmed with gratitude and positivity. They may have felt grateful because their friend helped them with something important, or because their friend supported them during a time of need.

Take a few moments **RIGHT NOW** to think about times from your past with [friend's initials] that make you feel grateful when you think about this person **RIGHT NOW**.

As you do this, try to identify a specific experience with your friend from your past that makes you feel overwhelmed with gratitude when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Control Condition (Study 3)

We would now like you to think about a time from your past in which you completed a daily activity with [friend's initials].

Although people experience a variety of positive and negative experiences in their life, there are times when they don't feel any particular emotions at all with their close friend – times in which they are simply going about their daily activities with their friend, such as walking or driving somewhere, waiting in line, or watching TV to just pass some time.

Take a few moments **RIGHT NOW** to think about times from your past with [friend's initials] when you completed daily activities with this person.

As you do this, try to identify a specific experience with your friend from your past that makes you feel neutral when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Anger Condition (Study 4)

We would now like you to think about a time from your past in which you felt angry at this person.

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme anger at their partner – times in which they are overwhelmed with anger and negativity. They may have felt angry because their partner treated them unfairly, or because their partner did or said something mean or inconsiderate.

Take a few moments **RIGHT NOW** to think about times from your past with your partner that make you feel angry when you think about that person **RIGHT NOW**.

As you do this, try to identify a specific experience with your partner from your past that makes you feel overwhelmed with anger when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Gratitude Condition (Study 4)

We would now like you to think about a time from your past in which you felt grateful because of this person.

Although people experience a variety of positive and negative experiences in their life, there are times when they experience extreme gratitude toward their partner – times in which they are overwhelmed with gratitude and positivity. They may have felt grateful because their partner helped them with something important, or because their partner supported them during a time of need.

Take a few moments **RIGHT NOW** to think about times from your past with your partner that make you feel grateful when you think about that person **RIGHT NOW**.

As you do this, try to identify a specific experience with your partner from your past that makes you feel overwhelmed with gratitude when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Manipulation for Control Condition (Study 4)

We would now like you to think about a time from your past in which you completed a daily activity with this person.

Although people experience a variety of positive and negative experiences in their life, there are times when they don't feel any particular emotions at all with their partner – times in which they are simply going about their daily activities with their partner, such as shopping for groceries, doing laundry or dishes, or cleaning the house.

Take a few moments **RIGHT NOW** to think about times from your past with your partner when you completed daily activities with that person.

As you do this, try to identify a specific experience with your partner from your past that makes you feel neutral when you think about it now. Although it may be difficult, most people can usually remember at least one event. Take your time as you try to do this.

Press the next button when you are ready to continue.

Reflection (occurs after emotion manipulation)

Now that you have recalled a specific experience, spend a few moments right now focusing on the causes and reasons underlying the thoughts and feelings you experienced during that situation. Try to understand the emotions you experienced during that event. Take a few moments to do this. We'll continue in thirty seconds.

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