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**FORGIVENESS, HEALTH, AND PSYCHOLOGICAL ADJUSTMENT IN OLDER
ADULTS**

by

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DISSERTATION

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of Wayne State University

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Advisor

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CHAPTER 1: INTRODUCTION

Forgiveness is typically an inter-and intra-personal task that requires a transition from negative emotions to more positive ones. The process of forgiveness often follows an interpersonal transgression, whereby the victim experiences some harm and is not required to forgive. Unforgiveness, another potential response to an interpersonal transgression, consists of delayed negative emotions such as hostility, hatred, anger and fear (Worthington & Scherer, 2004). Forgiveness includes the cultivation of beneficial responses, such as compassion and empathy, while also refraining from unforgiving responses that may terminate relationships. In other words, forgiveness involves letting go of the negative emotions associated with unforgiveness. Although much of the literature considers forgiveness to be a pro-social coping response that follows after an interpersonal injury, forgiveness can also follow after a myriad of perceived injuries, such as a loss of a loved one or a loss of a job (Luskin, Ginzburg & Thoresen, 2005). Regardless of the impetus, forgiveness can potentially lead to positive outcomes (Hansen, 2009). Specifically, research indicates that the ability to forgive is associated with psychological well-being and physical health (Lin, 2011). For example, higher levels of state and trait forgiveness have been associated with decreased symptoms of depression and anxiety; decreased physiological reactivity; and self-reported improvement in health and psychological well-being (e.g., McCullough, 2001; Lawler-Row, Piferi & Jones, 2006)

Although the relationship between forgiveness and well-being appears robust, few studies have examined the potential benefits of forgiveness in older adults. In general, there is a growing understanding that psychosocial factors can play an important role in improving physical and mental health outcomes in older adults (Krause & Ingersoll-Dayton, 2001). Avoiding illness in late life is not a viable goal, as almost all older adults will experience a

chronic disease. However, initiating cognitive and emotional adjustments to these illnesses may well be possible (Reichstadt, Depp, Palinkas & Jeste, 2010).

In this study, we examined the relationship between forgiveness and physical and emotional outcomes in older adults. By investigating factors that may be related to improved outcomes in older adults, this study could help inform treatments designed to promote health and adjustment in the aging population. A better understanding of forgiveness within a population of older adults may have implications for the management and treatment of chronic illnesses. Empirical evidence suggests that individuals can learn to become more forgiving, and by doing so, can have a positive influence on their physical and mental health (Thorsen, Luskin & Harris, 1998). On the contrary, maintaining unforgiveness is largely considered a stress response (Harris & Thoresen, 2001). The notion that unforgiveness is inherently a stress reaction is especially relevant to the current study, as psychological stress has been shown accelerate the aging process and influence a variety of diseases (Epel, 2009). In addition, unforgiveness is linked with rumination, and rumination has been found to interfere with healthy coping and to aggravate chronic illnesses that affect older adults, such as heart disease and cancer (Baider & De-Nour, 1997). It is possible that brief education-based interventions for older adults could be developed; these treatments could generate awareness of and encourage forgiveness, which may result in more positive outcomes in older adults.

Specific Aims in Brief

To accomplish the Specific Aims of this study (described below), we used data from the Religion, Aging, and Health Survey (RAHS), a nation-wide probability survey of older adults. The data collection for the RAHS included face-to-face interviews, which were performed in the homes of study participants. RAHS participants were asked a range of questions, including

questions related to forgiveness, mental health, and physical health. In this study, we proposed to accomplish the following aims:

Specific Aim 1.1: To determine the relationship between forgiveness and mental health, in older adults. To accomplish Specific Aim 1.1, we examined the simple correlations between measures of wave 1 (W1) forgiveness and W1 mental health. We also examined the simple correlations between measures of wave 2 (W2) forgiveness and W2 mental health. It was hypothesized that older adults with higher levels of forgiveness will report fewer mental health concerns. We expected to find this pattern at both W1 and W2.

Specific Aim 1.2: To determine the relative contributions of forgiveness in predicting mental health outcomes in older adults. To accomplish Specific Aim 1.2, we used cross-lagged path analyses to examine the cross-lagged effects of forgiveness and mental health measures. These analyses allowed us to explore the stability of forgiveness over time, as well as the reciprocal relationships between forgiveness and mental health at two time points (i.e., the extent to which W1 forgiveness predicted aspects of W2 mental health, and the extent to which aspects of W1 mental health predicted W2 forgiveness). Forgiveness subscales with adequate psychometric properties represented the latent construct of forgiveness. The following measured variables were hypothesized to represent the latent construct of mental health: depression, feelings of control, life satisfaction, self-esteem, and optimism. It was hypothesized that W1 forgiveness would predict W2 forgiveness and mental health.

Specific Aim 1.3: To determine the relative contribution of forgiveness in predicting change in mental health outcomes in older adults. To accomplish Specific Aim 1.3, we used scores from W1 and W2 to create residualized change scores for all mental health variables. We then conducted a series of hierarchical regressions, controlling for demographic variables, with

residualized change scores for mental health measures serving as the dependent variables. We hypothesized that W1 forgiveness would predict change in mental health symptoms, above and beyond demographic variables.

Specific Aim 2.1: To determine the relationship between forgiveness and physical health, in older adults. To accomplish this aim, we examined the bivariate correlations between measures of forgiveness and physical health at W1. We also examined the bivariate correlations between measures of forgiveness and physical health at W2. It was hypothesized that older adults with higher levels of forgiveness would report better health. We expected to find this pattern at both W1 and W2.

Specific Aim 2.2: To determine the relative contribution of forgiveness and unforgiveness in predicting physical health outcomes, in older adults. To accomplish this aim, a series of hierarchical regression equations were computed to examine the relative contributions of mental health and forgiveness variables in predicting physical health status. To help control for confounds, block one contained demographic variables; block 2 contained mental health variables; and block 3 contained each subscale from the forgiveness measures. For all regressions, the change in the adjusted R^2 was calculated at each step of the analysis and physical health, as measured by self-rated health, served as the dependent variable. It was hypothesized that forgiveness would predict self-rated physical health, above and beyond mental health and demographic variables.

Specific Aim 3: To test the emotional juxtaposition hypothesis proposed by Worthington and Scherer (2004). According to these authors, forgiveness is a stress-reducing coping response related to health via a mechanism whereby forgiveness reduces unforgiveness, which ultimately promotes positive emotions and simultaneously neutralizes negative emotions. However, the

extent to which forgiveness and unforgiveness may directly impact physical symptoms is not known.

To accomplish Specific Aim 3, and to test the emotional juxtaposition hypothesis, we used structural equation modeling, examining the direct and indirect effects of forgiveness on physical health. It was hypothesized that our results would support the emotional juxtaposition hypothesis. Specifically, we expected that both forgiveness and unforgiveness would have indirect effects on physical health outcomes, mediated by the latent variables of positive and negative psychological adjustment.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

For centuries, the topic of forgiveness has stimulated a rich contemplative history, extensively explored by various religious traditions (Rye et al., 2000). However, more recently, forgiveness has become a topic of interest among researchers, both secular and non-secular alike. Studies on forgiveness have been conducted by scholars from a wide range of academic backgrounds, including philosophy, anthropology, education, law, sociology, and psychology (Lawler-Row, 2007). Over the course of the past two decades, numerous studies have emerged, contributing to a greater understanding of the impact of forgiveness on a variety of outcomes (Vasiliauskas & McMinn, 2013). The expanding body of literature points to the many benefits of forgiveness, including enhanced physical health, mental health, and relationship satisfaction. (For a review see McCullough, 1994.) Overall, researchers have sought to better understand various aspects of forgiveness, including the best way to define the construct, the consequences of forgiving, and identifying factors that may promote or inhibit forgiveness (Davis, Hook, Van Tongeren & Worthington, 2012).

What is Forgiveness?

The systematic study of the effects of forgiveness, especially within the social sciences, has been relatively brief. Moreover, the initial body of literature that was produced was replete with disputes regarding the best way to define the construct. As a result, investigators have characterized forgiveness in dissimilar ways (McCullough, 2001). For instance, depending on which research team is involved in the study, forgiveness has been conceptualized as either a cognitive process, an emotional process, a behavioral process, a motivational process, or some combination of these processes (Tsang, McCullough & Fincham). Although some

disagreements remain, a general consensus has recently emerged and the literature now reflects a growing agreement among researchers.

Researchers who study forgiveness tend to concur that the process of forgiveness is a challenging undertaking, which requires a move away from negative inter- and intra-personal reactions, towards more positive ones (Lin, Enright & Klatt, 2011). Interpersonal disputes and disagreements are a normative component of the human experience. In response to these negatively-charged situations, the process of forgiveness begins with a complete awareness that the transgressor is culpable for the transgression. Hence, the victim is entitled to feel anger, and correspondingly, under no obligation to feel any compassion towards the transgressor (Fincham, 2000). However, the willingness to forgive helps individuals overcome interpersonal conflicts by deliberately letting-go of the resentment and anger that often follows an offense (Hansen et al., 2009). Being in a state of “unforgiveness” is marked by sentiments such as anger, hostility, resentment, bitterness, and shame (Harris & Thoresen, 2005). However, forgiveness can be seen as one possible alternative to unforgiveness, which enables a shift away from the potentially difficult and detrimental feelings associated with unforgiveness. Therefore, forgiveness, unlike unforgiveness, helps bring about more favorable, constructive feelings that generally have more positive connotations (Worthington, 2007). Finally, most researchers also agree that forgiveness is not purely a dichotomous decision, where an individual either does or does not forgive. Rather, the emotional shift that is inherently a part of forgiveness can evolve gradually over time (Sesan, Davis & Shure, 2009).

Researchers appear to be reaching some consensus regarding what forgiveness is, but more consistently, researchers are able to agree upon what forgiveness is not (Miller, Worthington & McDaniel, 2008). Although forgiveness has the potential to engender the repair

of a damaged relationship, forgiveness is not reconciliation (Fincham, 2000). Reconciliation implies an overt behavioral rejoining of two separated parties, whereas forgiveness is an internal response to a perceived injury. As such, it is possible to forgive without reconciliation. For example, an individual can forgive a transgressor even if it is impossible to physically restore the relationship, as is the case if the transgressor is deceased or incarcerated. Also, an individual can forgive a transgressor even if he or she has no desire to restore the relationship, as is the case if the transgressor was an abusive partner (McCullough, Bono & Root, 2005). Moreover, a reunion of a once-severed relationship does not imply that forgiveness has occurred. A victim and a transgressor may reunify for various reasons, such as loneliness or financial hardship, where the victim remains unforgiving. Additionally, forgiveness does not necessarily imply acceptance or pardon. Instead, the forgiver cultivates beneficial responses such as compassion and empathy, while suspending destructive responses that may terminate relationships (Enright, 1994). A forgiver may continue to disapprove of the initial offense indefinitely.

Though there is no universally accepted “gold-standard” definition of forgiveness, there is certainly some level of agreement among investigators. Perhaps forgiveness is best understood as a latent variable, or an amalgamation of various processes that work together and cannot be directly observed in isolation (Svalina & Webb, 2012). Indisputably, forgiveness is a multifaceted and complex construct, which has been examined both philosophically and empirically from various angles. Different aspects of forgiveness have been delineated, highlighting unique dimensions of the process of forgiveness, which include the state/trait and the inter/intrapersonal distinction.

State and trait forgiveness. Granting forgiveness can be conceptualized as either a state or trait dependent action. Forgiveness as a state has been explained as a psychological

transformation that occurs within the context of a particular interpersonal transgression (Webb et al., 2010). In other words, one's choice to forgive is offense-specific, where the act of forgiveness is directed toward a specific person for a specific transgression (Berry et al., 2005). In this way, one's willingness to forgive is variable, potentially influenced by countless contextual factors. For example, an apology, the severity of the transgression, and the closeness of the relationship are all external variables, which have been shown to predict acts of forgiveness (McCullough et al., 1998).

In addition to the view that forgiveness is a response to a particular transgression, forgiveness has also been regarded as a stable reaction, suggestive of a personality trait. Roberts (1995) coined the term "forgivingness" as a way to distinguish forgiveness as a personality disposition (trait) from forgiveness as a discrete act (state). A disposition to forgive has been theorized as a continuous personality trait, anchored by forgivingness on one end of the continuum and "unforgivingness" on the other (Koutsos, Wertheim & Kornblum, 2008). To support this view, evidence suggests that within a given individual, consistent levels of forgiveness are often observed following a wide range of interpersonal difficulties (Desmet, Cremer & Dijk, 2011).

Research on forgiveness has included the measurement of both state and trait dimensions, with the inclusion of a particular dimension generally contingent upon the research question under study. For example, nearly all of the literature that has examined health outcomes related to forgiveness has focused on the measurement of trait forgiveness. Researchers have argued that unforgiveness would only be associated with negative health effects if individuals were chronically unforgiving. Likewise, most researchers agree that a single episode of situational forgiveness, or state forgiveness, would not result in any long-term health promoting

consequences (Worthington & Scherer, 2004). On the other hand, research has also indicated that personality dispositions are not always good predictors of behaviors in particular instances. There are occasions when individuals with highly forgiving personalities chose to act in a way that was unforgiving, and not consistent with what their personality might predict. Therefore, the body of literature that has examined the antecedents and possible environmental influences of forgiveness most consistently examines forgiveness at the state level. This approach allows researchers to identify situational factors that may be related to the likelihood of someone granting, or not granting, forgiveness (Riek & Mania, 2012). Since it has been theorized that a more forgiving personality can be developed over time, the possibility exists that individuals can cultivate greater forgiveness and reap the associated benefits. Consequently, researchers have asserted that a better understanding of the conditions surrounding a single act of forgiveness may be best suited to inform intervention strategies, which could be geared towards increasing forgiveness (Sandage et al., 2000).

Interpersonal and intrapersonal forgiveness. Forgiveness is a construct that has been conceptualized to have both inter- and intra-personal dimensions. The interpersonal dimension requires an interaction between people. This measurement of forgiveness occurs following a transgression, whereby one individual perceives the actions of another as undeserved, harmful or immoral. The victim of a transgression is usually tempted to react in a way that may rescind affection for the transgressor (McCullough & Worthington, 1999). Forgiveness, on the other hand, represents an alternate response the victim can take towards the transgressor. As a consequence, interpersonal forgiveness necessitates at least a dyad, and often has a pro-social and restorative influence on interpersonal dynamics. According to North (1998), forgiveness is “outward-looking and other-directed” (p.19).

Forgiveness has also been conceptualized to have an intrapersonal dimension, which is related to a variety of internal processes and emotional reactions that don't require the presence of other people. Interpersonal forgiveness, or self-forgiveness, is directed inwardly, and has been described in a variety of ways. For instance, an individual who performed a transgression towards another may engage in a process, working towards self-forgiveness (Fincham, 2000). In this way, self-forgiveness is conceptualized as a willingness to abandon self-resentment, while concurrently cultivating tenderness and benevolence towards one's self, despite one's own wrongdoing. Self-forgiveness is an internally directed change process, which allows the transgressor to accept their behavior and initiate a process of moral development and growth (Holmgren, 1998). In addition, Thompson and colleagues (2005) indicate that there are often environmental situations that resemble a transgression, but where the "transgressor" is a non-human, such as an illness or natural disaster. In these situations, an individual engages in a type of intrapersonal forgiveness, which again, requires no interaction with another individual. Along these same lines, self-forgiveness can be generated as a response to feeling as if one has failed to live up to certain expectations or standards of perfection (Scherer et al., 2011). Self-castigating individuals may view undesirable life events as retribution for their inadequacies, potentially taking on unwarranted responsibility for things that may be out of their control. For example, if an individual believed that an illness or chronic disease came about as punishment for past behaviors. However, a self-forgiving individual would not blame themselves for undesirable life events, thereby reducing distress that may be associated with such events (Romero et al., 2006).

Theoretical Frameworks of Forgiveness

There has been a notable advancement within the empirical literature, outlining various aspects of forgiveness. However, present-day researchers have acknowledged the need to assimilate the available data, in order to establish an integrative theoretical framework of forgiveness. The development of an integrative theory of any human behavior, such as forgiveness, is a principal factor in better understanding the behavior. In order for the science of forgiveness to continue to progress, scientists must focus energies on establishing such comprehensive models (Fehr, 2010). To date, several theoretical frameworks of forgiveness have emerged; however, there is not always coherence amongst frameworks. Additionally, although these frameworks all have sound theoretical underpinnings, they vary in regard to the extent to which they have been supported by empirical research and/or clinical practice.

Enright and the human development psychology group. Enright, along with his Human Developmental Psychology group, are credited with the first experimental investigations exploring the development of forgiveness (McCullough, Pargament & Thoresen, 2001). Enright's theory of forgiveness was modeled after Kohlberg's (1976) theory of moral reasoning. Enright and his collaborators used dilemmas that were similar to those used in the original studies done by Kohlberg, but, the dilemmas were altered slightly so that the central character was emotionally wounded at the end of the story (McCullough et al., 2001). For example, in one of the prototypical dilemmas used by Kohlberg, Heinz's wife is about to die from cancer. In order to save her, Heinz needs an expensive drug that he cannot afford. He begs the druggist to give him a discount on the life-saving medicine, but the druggist refuses. In the end, Heinz steals the drug in order to save his wife. In Enright's studies, the majority of this dilemma remained the same, but slight modifications were made. Mainly, the druggist in Enright's dilemma anticipates that Heinz will attempt to steal from him, and thus hides the drug. Since Heinz is

unable to obtain the drug, his wife dies. At the end of Enright's dilemma, Heinz is left angry, blaming the druggist for the death of his wife.

For Enright's experimental study, subjects were asked to read the aforementioned dilemmas and evaluate the influence of factors such as revenge, restitution, and social harmony on the decision of Heinz to forgive the druggist (Enright, Santos & Al-Mabuk, 1989). Using a cross-sectional design, their study included five age groups: fourth graders, seventh graders, 10th graders, college students, and adults. Results indicated that cognitive development regarding forgiveness progressed through a series of six stages, with each successive stage reflecting increasing maturity. The authors demonstrated that different age groups provided different rationales for why it was either appropriate, or not appropriate, to forgive. Overall, the results supported a developmental model, such that a distinct reason to forgive was relied on heavily by only one age group. These stages were considered "soft stages" since many participants demonstrated reasoning that was representative of two bordering stages, instead of reasoning exclusive to a single stage (Enright, 1994). During "Revengeful Forgiveness", the most basic stage, forgiveness can only occur following punishment of the wrongdoer. "Restitutional Forgiveness" occurs as a means to assuage feelings of guilt. "Expectational Forgiveness" is forgiveness following social pressures from significant others. "Lawful Expectational Forgiveness" is forgiveness due to the demands of religious, or other comparable institutions. "Forgiveness as Social Harmony" is forgiveness given in an effort to maintain peaceful relations. Finally, the most developmentally mature stage is "Forgiveness as Love." During this stage, forgiveness is an unconditional approach that promotes good will.

In sum, Enright and colleagues demonstrated that revenge and cancelation of consequences were governing principles for the youngest participants; perceptions of others and

religion were governing principles for adolescents; and restoration of social harmony was the governing principle for adults. Unconditional forgivers, of which there were very few, were exclusively adults (Girard & Mullet 1997).

McCullough's Model of Forgiveness. McCullough (2008) argues that forgiveness evolved in response to selection pressures for restoring relationships, which on average, increased lifetime reproductive fitness. Forgiveness can be understood as an important element in our evolutionary history, a human behavior that evolved because it was necessary to reestablish group harmony, and ultimately contributed to group success and survival. Much of McCullough's theory is drawn on work done by primatologists, which indicates that non-human primates, including chimpanzees and macaques, have been shown to organize revengeful acts after being wronged by another animal. In addition, studies of chimpanzees' peacemaking behaviors reveal that non-human primates also engage in reconciliation following conflicts, especially within a relationship that conveys the likelihood for considerable fitness gains (Watts, Dutton & Gulliford, 2006). Therefore, acts of forgiveness are used to promote continuity within interpersonal relationships, a behavior that started among our early ancestors and that continues today. In contrast, acts of revenge are considered by McCullough to be the antithesis of forgiveness, as revenge often promotes discontinuity in interpersonal relationships.

In addition to the evolutionary underpinnings, McCullough theorizes that forgiveness is best defined as a motivational concept. Interpersonal transgressions often result in the impulse to do one of two things: avoid the transgressor or seek revenge on the transgressor. Accordingly, forgiveness is a pro-social change that corresponds with decreases in these two motivations (McCullough et al., 1998). Instead of engaging in behaviors such as seeking revenge, retaliation, or terminating relationships, forgiveness is associated with different behaviors,

ranging from neutrality to kindness (McCullough, 2001). In sum, McCullough suggests that forgiveness represents motivational changes, which serve to maintain harmony within a relationship, thereby allowing a victim and transgressor to continue to receive the life-sustaining benefits of their interpersonal association.

Interdependence Models. Finkel and colleagues (2002), like McCullough, believe forgiveness is essentially a motivational concept. However, these authors use the principles of interdependence theory to help explicate the motivational underpinnings for why people choose to forgive. Interdependent relationships are those in which partners have the capacity to influence and affect each other within a variety of contexts (Rusbult et al., 2005). According to interdependence theory, interdependence dilemmas arise within interdependent relationships. An interdependence dilemma includes either a betrayal, or another such incident in which a partner deviates from the norms of equality and civility that are presumed to guide the relationship (Rusbult & Agnew 2010). At this point, the victim must simultaneously evaluate two possible courses of action: to act in a way that serves one's own interests, or act in a way that serves one's relationship. Generally, a victim's initial response to betrayal is in opposition to forgiveness; these immediate instinctive responses are described by interdependence theory as given preferences. However, given preferences do not direct actions, rather effective preferences direct actions (Kelley & Thibaut, 1978). Transformation of motivation occurs when an individual evaluates given preferences, in light of long-term objectives for the relationship, personal morals, and concern for the other's happiness. Consequently, in order to forgive, victims must move away from their initial given preference of not forgiving, and instead act on their effective preference of forgiving. This transformational process is sometimes automatic and habit driven, and sometimes mediated by internal events (Finkel, Rusbult, Kumashiro &

Hannon, 2002). In addition, interdependence theory proposes that forgiveness is not only related to characteristics of the individual, but also is most likely influenced by characteristics specific to the relationship between two individuals (Kirby & Johnson, 2005). Specifically, Finkel and co-authors (2007) have proposed that the level of commitment within a relationship is directly related to an individual's willingness to forgive. According to these authors, commitment is understood as a desire to maintain a long-term relationship in which a psychological attachment has been cultivated. Therefore, if a commitment is present, it is likely that both the victim and the transgressor will be motivated to seek a resolution.

Worthington's Model. Worthington (2006) has utilized a stress and coping model to describe forgiveness. Within the framework of this model, transgressions are considered stressors, such that they infringe upon an individual's mental or physical boundaries, and compel the victim to respond in some way. Following a transgression, a victim initially assesses whether or not the particular transgression conveys harm. If the victim deduces that the transgression is in fact harmful, they next assess how they will cope with such harm (Worthington, Jennings, & DiBlasio 2010).

Coping responses following a harmful transgression come in a variety of potential forms. Victims can try to cope with a transgression by attempting to restore justice; victims may enact revenge, seek a formal legal review, request an apology, or turn judgment over to a divine power. Victims also cope with a transgression by attempting to manage their emotions. For instance a victim may delay a response by suppressing anger and attempting to regulate negative feelings and reactions. Victims may also accept the transgression, whereby the wrong-doing is recognized, but the overall impact of the event is reduced and the need for reparation is released. Victims may also use narrative strategies; by justifying or excusing a transgression, the victim

begins to accept an alternate, more palatable, version of the transgression (Worthington & Scherer, 2004).

Of course, a victim may also choose to cope with a transgression by opting for forgiveness. According to Worthington (2006), there are two discrete forms of forgiveness: emotional forgiveness and decisional forgiveness. During emotional forgiveness, negative emotions, such as anger and resentment, are replaced by positive emotions, such as empathy and compassion. During this emotional transformation, victims are more likely to feel tenderness and love towards the transgressor, and consequently, less interested in seeking revenge. During decisional forgiveness, the victim makes choices among three options: Not to seek revenge, to avoid the transgressor, or to treat the transgressor with kindness. These decisions are made and enacted, even if the victim has not wholly forgiven the individual emotionally. In this way, decisional forgiveness is a concerted effort by the victim to change and control their conduct, as it relates to the transgression. Emotional forgiveness, on the other hand, is a process that often evolves, where unforgiving emotions reduce in intensity and frequency, being replaced with forgiving emotions over time.

Executive Functioning. Pronk and co-authors (2010) have recently proposed a novel theory, whereby individual differences in one's willingness and ability to forgive are explained by variations in one's executive functioning (EF) abilities. Although there is an on-going debate in the literature regarding a precise definition of EF, these authors describe executive functioning as a set of cognitive control mechanisms, which help to govern and adjust thoughts, feelings, and behaviors in a goal-directed manner. Some specific tasks that are thought to comprise executive functioning include: task switching, inhibition, and updating; all of which support the maintenance of interpersonal connections. For instance, for an individual to forgive a

transgressor, he or she may need to inhibit and regulate retaliatory and potentially destructive thoughts, feelings, and behaviors. Moreover, executive functioning may be critical in reducing rumination associated with a transgression. There is evidence that suggests that individuals who ruminate about a past transgression are less likely to forgive the transgressor (e.g., McCullough et al., 1998); additionally, research indicates that executive functioning is inversely correlated with rumination (e.g., Watkins & Brown, 2002).

Taken together, Pronk and co-authors propose that executive functioning would predict the ability to forgive, an association that would become more evident with the increased severity of a transgression. Also, these authors hypothesized that forgiveness would be more likely the less an individual ruminates following a prior transgression. To help support their theory, these researchers designed a series of four independent studies. For each study, participants were separate convenience samples of university students. Participants were given several measures of executive functioning (i.e., measures of task switching and inhibition) and questionnaires assessing their dispositional forgiveness, as well as their tendency to forgive following a specific transgression. In general, results revealed support for the assertion that executive functioning may be a cognitive requisite for one's ability and willingness to forgive. Study 1 indicated that higher levels of trait forgiveness were related to superior executive functioning; Study 2 indicated that executive functioning predicts forgiveness following a recent and severe transgression; Study 3 indicated that executive functioning predicts forgiveness regarding prior transgressions, especially as the perceived severity of the transgression increases; and finally, Study 4 indicated that rumination played the expected mediating role in the relationship between executive-functioning and forgiveness.

Theoretical frameworks of forgiveness: a summary. As the prior review indicates, researchers have conceptualized and investigated forgiveness in a multitude of ways, emphasizing certain dimensions of the construct over others. Enright centered his theory around the developmental aspects of forgiveness, such that the process of forgiving may depend on an individual's age-related developmental stage. McCullough and Finkel focus their theories on the motivational aspects of forgiveness. Other theories, such as the executive functioning theory, largely center on the cognitive and neural substrates that may facilitate forgiveness. Finally, Worthington's theories have described forgiveness as a coping response that enhances positive emotions and decreases negative emotions.

The Link Between Forgiveness and Health

There is mounting empirical support, demonstrating the link between the mind and body. Humans have been shown to exhibit meaningful physical and psychological transformations as a response to internal emotional and cognitive processes (Svalina & Webb). Along these same lines, research has indicated an association between health and forgiveness, where the use of forgiveness may have a significant effect on both mental and physical well-being (McCullough et al., 1998). Several researchers have explored the relationship between health and forgiveness, implicating direct and indirect mechanisms. Forgiveness is thought to be beneficial as it may initiate meaningful changes that influence psychological, behavioral, and physiological factors (Webb, Robinson & Brower 2011).

Forgiveness and mental health. Research has indicated that forgiveness leads to favorable consequences associated with the forgiver's mental health. For example, studies have demonstrated that individuals more prone to forgiveness report greater well-being and less anxiety, depression, hostility and anger (i.e., Sin & Lyubomirsky, 2009; Pargament et al., 2004;

Thoresen et al., 2000). Following a review of the literature, Toussaint and Webb (2005) reported that mental health benefits of forgiving were found in 18 studies. These authors argued that the accumulated evidence suggests that forgiveness conveys a direct psychological advantage, via a reduction in rumination and negative emotions that are an inherent aspect of forgiving.

Rumination and negative affect. Following an offense, rumination is a commonly employed coping strategy, exemplified by intrusive thoughts and images about a particular injustice (Skinner, Edge, Altman, & Sherwood, 2003). Besides rumination, Pargament (1997) suggested that negative mood states, such as hatred, anger, hostility and depression are also common following a transgression. In fact, several researchers assert that maintaining unforgiveness is inseparable from rumination and negative emotional states (Worthington et al., 2001). In contrast, high levels of interpersonal forgiveness are correlated with less negative affect, including decreased reports of anxiety and depression (Coyle & Enright, 1997; Seybold et al., 2001). In addition, individuals with higher levels of dispositional forgiveness are better able to regulate their emotions, control anger, and report more fulfilling interpersonal relationships (Emmons, 2000). It is important to note that both rumination and negative affect have been implicated as features of many mental health disorders, such as obsessive-compulsive disorder, post-traumatic stress disorder, depression, and generalized anxiety disorder. Taken together, it appears that engaging in the cognitive and behavioral tasks necessitated by forgiving is antithetical to certain negative mood states and ruminating. Therefore, forgiveness may assuage the detrimental effects associated with unforgiveness, potentially leading to less psychopathology and enhanced psychological well-being.

Self-unforgiveness. An inability to forgive the self is also potentially problematic for one's mental health. Examining ways in which one might have hurt others can result in remorse, despair and decreased self-esteem. Maintaining self-unforgiveness is associated with frequent ruminative thoughts about one's own failings, which in turn has been linked to depression (Ingersoll-Dayton, Torges & Krause, 2009). Toussaint et al. (2001) conducted a telephone survey, using a national probability sample of 1,423 respondents (ages 18-44, n=737; ages 45-64, n=410, 65 and older, n=276). A relationship between self-forgiveness and mental health was observed, where those individuals who scored lower on self-forgiveness reported greater psychological distress and higher levels of depression. Likewise, Mauger and colleagues (1992) reported that help-seeking clients from a Christian counseling center who reported difficulty forgiving themselves had significantly greater amounts of negative emotions, including greater depression.

Social interconnectedness. Another way forgiveness may impact mental health is through social interconnectedness. Having strong social support is linked with better psychological outcomes, by staving off by the initial occurrence of mental illness, and also increasing the likelihood of recovery in those diagnosed with mental illness (Baumeister & Leary, 1995). McCullough (1999) believes that individuals willing to forgive better facilitate the restoration and maintenance of social connections, whereas, individuals unwilling to forgive are more likely to inhibit and terminate their social connections. Therefore, forgiveness facilitates social support by helping individuals maintain interpersonal harmony, leading to healthy and supportive relationships and the opportunity to reap the benefits thereof. In addition, anger and rumination associated with unforgiveness may also lead to a loss of social support. For example, Nolen-Hoeksema and Davis (1999) reported that in individuals who had recently lost a loved

one, increased rumination was associated with a less supportive social network. Additionally, an individual with an unforgiving disposition, ruminating on past hurts and/or concerned about re-victimization, may be untrusting of others. In turn, this unforgiving disposition may result in distancing, or complete disconnection from potentially supportive social networks (Harris & Thoresen, 2012).

In sum, several psychometric studies have indicated that unforgiveness is associated with generally poorer mental health and lower life satisfaction (Coates, 2006; Maltby et al., 2001). In contrast, correlational evidence points to an association between forgiveness and decreased rumination, anger, depression and anxiety.

Physiological impact of forgiveness and unforgiveness. In addition to the psychological dysfunction associated with negative affect, unforgiveness can result in a cascade of physiological changes, including fluctuations in the function of sympathetic, endocrine, and immune systems (Kiecolt-Glaser, 1999). In fact, research indicates that the emotional disruption associated with unforgiveness resembles the patterns evident in individuals living with high levels of unremitting stress (Elliot et al., 2010). Over time, sustained unforgiveness can increase allostatic load (AL), a term that refers to the cumulative physiological deterioration that follows the body's recurrent efforts to adjust to stressors (McEwen & Seeman, 1999). The AL model is somewhat unique in that it does not emphasize one specific biological outcome. Rather AL is a composite score that reflects several biological risk factors, associated with dysfunction throughout multiple systems and stress-exacerbated diseases (McEwen & Wingfield, 2003). In general, an increase in AL reflects amplified neural, endocrine and immune responses, which over time can have an impact on various organs, and may lead to disease (Seeman, McEwen, Rowe & Singer, 2001). Interpersonal transgressions and the emotional consequences thereof

may contribute to allostatic load. Forgiveness, in contrast, may protect health by reducing AL (Witvliet, Ludwig & Laan, 2001).

Cortisol. Reduced physiological arousal among forgiving individuals has been reported across several measures of neuroendocrine functioning (Whited, Wheat & Larkin, 2010). Cortisol, one element of AL, has shown to have a relationship with forgiveness. For instance, a study by Barry and Worthington (2001) measured trait forgiveness and cortisol levels in participants who were classified as being in either a happy ($n=19$) or unhappy ($n=20$) relationship. Trait unforgiveness was associated with increased salivary cortisol levels at baseline, regardless of relationship status. In addition, trait unforgiveness was also associated with increased cortisol reactivity, measured after participants were asked to think about typical, potentially unforgiving, scenes from their relationship. Tartaro, Luecken and Gunn (2005) reported similar findings, indicating that in undergraduate students ($n=60$), cortisol levels were also inversely correlated with trait forgiveness.

Cardiovascular biomarkers. In addition to elevated cortisol levels, empirical evidence suggests that physiological consequences of forgiveness are reflected in other indicators of AL, including biomarkers related to the cardiovascular system. According to Kaplan (1992), forgiveness reduces the physiological consequences of hostility and anger, and subsequently, promotes coronary health. Lawler-Row and researchers (2003) reported that, compared to those who have not forgiven a major transgression, those who had forgiven others for past transgressions had lower blood pressure, heart rate, and rate pressure product. Additionally, being unable to forgive specific offenders was related to increased levels of cardiovascular and sympathetic tone. In a later study, Lawler-Row et al. (2008) investigated the relationship between anger, forgiveness and health outcomes. These researchers reported that state and trait

forgiveness were negatively correlated with “anger-out”, a dispositional style of anger expression. Forgiveness and anger-out were also correlated with systolic blood pressure, rate-pressure product, and heart rate. Importantly, after controlling for gender and anger-out, partial correlations indicated that trait forgiveness accounted for significant variance in mean systolic blood pressure and rate-pressure product. These authors concluded that forgiveness conveys health benefits that are distinct from anger reduction.

Witvliet and researchers (2001), using a within-subject design, asked participants to alternate between imagining a hurtful incident from both an unforgiving and a forgiving perspective. Participants imagined taking on these two different perspectives for 16-second intervals, over the course of several minutes, while having their cardiovascular reactivity (CVR) measured. These authors reported that intervals spent imagining angry, unforgiving thoughts were correlated with increased CVR, compared to intervals spent imagining forgiving thoughts. These findings suggest that forgiveness may have immediate physiological consequences, which convey benefits to the individual practicing forgiveness. In a similar study, Larsen and colleagues (2012) measured CVR (including systolic blood pressure, diastolic blood pressure, and heart rate) while participants imagined forgiving and unforgiving responses to a prior offence. These authors also included a third condition: distraction. Results indicated that imagining forgiveness, compared to baseline and imagining unforgiveness, was associated with smaller increases in blood pressure. In addition the impact of forgiveness appeared to offer participants sustained benefits. Participants who imagined forgiving responses continued to show reduced blood pressure, while distraction appeared to offer no sustained benefits.

Taking a different approach, Whited, Wheat and Larkin (2010) initiated a “live transgression” procedure within the laboratory. In their study, participants in the experimental

group were asked to engage in a serial subtraction task, while they were unexpectedly berated by the experimenter. CVR was measured during and after the experimental transgression and findings revealed that participants high in dispositional forgiveness displayed more rapid diastolic and mean arterial blood pressure recovery than participants low in dispositional forgiveness.

The interconnection between forgiveness, mental health, and physical health.

Forgiveness requires cognitive and moral processes that, over time, cause an individual to move away from negative mood states. Forgiveness is one way in which individuals can help to regulate the intensity and frequency of negative affect, which results in a concurrent decrease in the aforementioned psychobiological reactions that might harm mental and physical health (Friedman et al., 2002). Many researchers agree that forgiveness, seen as one of the many ways to reduce unforgiveness, produces a simultaneous reaction whereby the forgiver experiences concurrent physical and mental health benefits.

Worthington et al. (2001) have suggested that the link between forgiveness and health works via mediating variables such as social support and interpersonal functioning, and health behavior. In their review, Worthington and Scherer (2004) propose a possible mechanism whereby forgiveness could lead to physical and psychological benefits, formulating their theory within the framework of emotion-focused coping. These authors argue that unforgiveness is interpersonally stressful, causing physical and psychological dysfunction. Following an interpersonal transgression, forgiveness is one potential coping strategy that an individual can utilize. A disposition to forgive may assuage the stress associated with unforgiveness, by facilitating an emotionally supportive social network, which in turn is known to support many beneficial health outcomes (Worthington & Scherer, 2004).

In their review, Thoresen and researchers (2000) suggested several potential processes that may also work in a symbiotic fashion to explain the link between health and forgiveness. According to their analysis of the literature, forgiveness was associated with: decreases in anger, hostility and chronic blaming; decreases in sympathetic nervous system hyperarousal and allostatic load; increases in positive self-evaluative cognitions and optimism; increases in available social and emotional support; and increases in religious and spiritual well-being.

Witvliet, Ludwig and Vander Lann (2001) used the bioinformational theory (Lang, 1979) to help inform their hypotheses regarding the relationship between forgiveness and health outcomes. According to the bioinformational theory, physiological reactions are interrelated with our emotions and memories. Valence and arousal are two qualities of an emotion that may produce physiological responses. For instance, a transgression is often associated with heightened arousal and a negative valence, which can produce increased facial tension and reactivity of the cardiovascular and sympathetic nervous systems (Witvliet & Vrana 1995). Therefore, by reducing cardiovascular and sympathetic reactivity, forgiveness conveys conceivable health benefits following a transgression. These authors tested their hypothesis, using a within-subjects design. Participants included 71 introductory psychology students, who had their physiological responses measured while thinking about a real-life transgressor in both forgiving and unforgiving ways. Measures included: self-reports of emotional valence, emotional arousal, perceived control, anger and sadness; facial electromyogram (EMG); skin conductance; heart rate; and blood pressure. Results of the study were consistent with bioinformational theory. In general, physiological and emotional reactivity was significantly greater when participants imagined unforgiving responses, compared to forgiving responses. When imagining unforgiving responses, participants reported feeling more negative, aroused,

angry, sad and less in control; EMG indicated increased facial tension; changes in skin conductance indicated greater sympathetic nervous system arousal; and increased heart rate and blood pressure indicated greater cardiovascular activity. The authors concluded that the emotional and physiological outcomes associated with unforgiveness provide evidence of the health-enhancing possibilities of forgiveness.

In sum, there do appear to be promising associations between forgiveness and both mental and physical health. However, it should be noted that research investigating the connection between forgiveness and health is still in its primary stages and presently lacks the methodological rigor necessary to resolutely establish the effects of forgiveness (Harris & Thoresen, 2005). Although there is evidence of a connection, our understanding regarding the ways in which forgiveness may affect health is relatively limited (Green, DeCourville & Sadava, 2012). To elucidate the forgiveness-health relationship Oman and Thoresen (2002) recommended systematically investigating mediators of the forgiveness and health relationship. Moreover, Worthington and co-authors (2005) suggest that longitudinal, experimental and intervention efficacy studies are currently lacking, and will be required to further the current understanding of the benefits of forgiveness.

Despite this caveat, positive relationships have been found, linking the ability to forgive with better mental and physical health outcomes. Unforgiving responses, such as ruminating and harboring a grudge, are considered harmful for health. On the other hand, forgiving responses, such as empathizing with the offender and reestablishing social connections, are considered beneficial for health (Witvliet, Ludwig & Vander Lann, 2001). Mechanisms of influence seem related to various factors, including: decreasing the stress response, decreasing negative affect, and improving social support.

Forgiveness Interventions

As the prior review indicates, empirical evidence is mounting that links forgiveness to improved psychological and physical outcomes. As a result, psychotherapeutic methodologies have been advanced in order to foster forgiveness in individuals, establishing various forms of “forgiveness therapy” (McKay et al., 2007). Although the literature reflects numerous interventions that seek to encourage forgiveness, three models have garnered significant empirical support. Specifically, the models of Enright, Worthington, and Luskin have been scientifically developed and assessed, and all three models are considered current “gold-standards” of forgiveness interventions (Toussaint et al., 2010). In general, these psychosocial interventions often define forgiveness as a process of letting go negative feelings, thoughts and reactions towards a transgressor, in addition to seeking a more compassionate understanding (Thoresen, Luskin & Harris, 1998)

Enright’s Forgiveness Therapy. Enright’s forgiveness therapy (FT) is based on the developmental model, initially published by Enright and the Human Development Study Group (1991). The FT treatment approach includes a 20-step model, which covers four phases. These phases are: uncovering, deciding, working, and deepening (Enright & Fitzgibbons 2000). The uncovering phase supports the individual in exploring the wrong he or she may have experienced, consider the amount of anger present, and identify ways in which the anger is having detrimental consequences. During the deciding phase, the individual reconsiders past efforts to solve the problem and regulate emotion, begins to explore the meaning of forgiveness, and chooses to forgive as their course of action. During the working phase of FT, the individual gives what Enright calls a “moral gift to the offender”, by not seeking retribution, despite the severity of the offense. During the final deepening phase of FT, individuals are encouraged to

find meaning in their suffering, taking ownership of their own imperfect state, and undergoing a release of negative emotions.

There have been various interventions developed using Enright's model, using the basic framework outlined above. At least 10 intervention studies have been conducted that generally show that the FT approach was more effective than support-oriented control conditions in a variety of adult samples (Harris et al., 2006). In addition, interventions based on Enright's model have been evaluated with various samples, including incest survivors (Freedman & Enright, 1996), men whose partners had abortions against their wishes (Coyle & Enright, 1997), inpatients diagnosed with a substance use disorder (Lin, Mack, Enright, Krahn & Baskin, 2004), and women with PTSD following spousal abuse (Reed & Enright, 2006).

Of particular relevance to the current study, Hansen and co-authors (2009) conducted a study that experimentally tested the effectiveness of a four-week forgiveness therapy, based on Enright's process model, in elderly and terminally ill cancer patients. Largely psychoeducational, participants learn the stages of forgiveness; learn how one progresses towards forgiveness, which includes changes in affect, cognition and behavior; and are encouraged to apply the ideas to their own personal stories. The intervention was tailored to the specific needs of older adults at the end of life, involving shorter sessions held in the participant's home. Twenty participants were randomly assigned to either a forgiveness therapy group, or a wait list control group. All participants completed measures of forgiveness, hope, quality of life, and anger at three different time points including: baseline, immediately after completing therapy, and four-weeks following the completion of therapy. The forgiveness therapy was a four week program, which consisted of once weekly 60 minute individual sessions. Results indicated that those participants who received forgiveness therapy improved on

all measures; specifically, they reported more forgiveness, more hope, improved quality of life, and less anger, compared to the control group. In addition, these gains were maintained during the follow up assessment.

The REACH model. McCullough and Worthington (1995) developed the five-step REACH model, used for forgiving a specific offense. REACH is considered a psychoeducational intervention, in which each letter in the word REACH is associated with a step that helps guide individuals towards forgiveness. The first step is Recall of the Hurt, where the victim remembers the transgression, minus self-pity or condemning the transgressor. Second, the victim attempts to Empathize and Emotionally Replace, whereby efforts are made to replace emotions such as hostility and bitterness with empathy and compassion. Third, throughout the Altruistic Gift of Forgiving stage, the victim begins to experience forgiveness. During the fourth step, Commit to the Forgiveness Experiences, the victim makes a public commitment to help firmly establish the desire and intent to forgive. Finally, this commitment leads to the fifth stage, Hold onto Forgiveness, which supports sustained forgiveness over time.

The REACH forgiveness model is an intervention to promote forgiveness, supported by over 20 randomized clinical trials indicating efficacy. REACH has been used within the context of psychotherapy for individuals, couples, and groups (Worthington, Lin & Ho 2012). Manuals for REACH are publically available, and the body of research investigating REACH has been the focus of reviews (Wade & Worthington, 2005) and meta-analysis (Wade, Worthington & Meyer, 2005). Interventions that use the REACH model have been found in several studies to help an individual forgive a transgressor more effectively than does no treatment, and in some cases, more effectively than does an active control (Harris et al., 2006). In addition, research has

indicated that REACH is efficacious with various populations, including: Christians, college students, couples, and parents.

Luskin's Model. Luskin (2002) developed a psychoeducational intervention that consists of nine steps. The first step in Luskin's model requires that the individual spend time considering and then verbalizing how they had been hurt. The second step encourages the individual to commit to feeling better, while also recognizing forgiveness is for their benefit, not the benefit of the wrongdoer. The third step includes educational components where individuals are taught the distinctions between forgiveness and reconciliation. In the fourth step, individuals pay attention to the source of their pain, which they are maintaining in the present, regardless of past offenses. In the fifth step, individuals are introduced to relaxation techniques, to counter the physiological arousal that often accompanies thoughts of a past transgression. The sixth step includes recognition of what Luskin calls the "unenforceable rules," or the expectations that an individual may have for people and life. Giving up these expectations is the key task in this step. Individuals are reminded that they can hope to have good things in their life, such as love and friendship, but not to presume that these things will happen. Suffering occurs when one places demands upon others and life, especially when one is powerless when it comes to enforcing these demands. During the seventh step, individuals are urged to redirect their energies into looking for alternate ways to get positive goals met, as opposed to ruminating about past hurts. During the final eight and ninth steps, individuals are prompted to focus on the positive gains that resulted from their past pain, finally amending a grievance story, which serves as a reminder of their growth and accomplishments.

Studies Examining Forgiveness in Older Adults

Although the forgiveness literature has grown in recent years, few studies have examined forgiveness across the life span. However, the few studies that have been conducted that include older adults report an “age trend” in forgiveness (Cheng & Yim, 2008). Specifically, the literature suggests that older adults, when compared to younger adults, possess a stronger propensity for forgiveness (Silton, Flannelly & Lutjen, 2013). For example, Girard and Mullet (1997) conducted a study in France, which included 236 participants, ranging in age from 15 to 96 years of age. These authors reported a linear increase in forgiveness, with older adults demonstrating significantly more forgiveness than adolescents. Findings from Girard and Mullet’s study indicated that participants that were 75 years of age and older were more likely to forgive unconditionally (i.e., did not require retribution or an apology to forgive). Moreover, older adults represented a majority (58%) of study participants who were willing to forgive unconditionally. In another study, Toussaint and co-authors (2001) collected data on the tendency to forgive, using a large random sample of U.S. adults, aged 18 and over. These authors reported that forgiveness was lowest in the youngest participants, and relatively higher in midlife and older adult participants.

Socioemotional Selectivity Theory. Much of the current research that has examined the connection between forgiveness and age has relied on the theoretical framework initially espoused by Enright and colleagues (1989). According to Enright et al., older adults may be reaching more advanced levels of forgiveness development, ultimately making forgiveness easier for this population. However, the empirical evidence supporting the relationship between aging and forgiveness, as described by Enright’s theory, is scant. The socioemotional selectivity theory (SST) is an alternate theoretical framework with some empirical support, also used to explain observed age related differences in forgiveness. According to the SST, the awareness of

one's future has repercussions for a person's social and emotional life (Carstensen, 1994). Specifically, the future time perspective (FTP), or the length of one's personal time horizon, can be a governing power that influences an individual's motivations and goals. This theory asserts that all humans have a conscious and subconscious understanding of the time they have left to live their lives. As a result, the perceived parameters of one's lifetime force attention towards the emotionally significant facets of life. Younger adults tend to view life as open-ended; therefore goals aimed at improving the future are of primary importance. On the contrary, older adults tend to view their life as limited; therefore goals aimed at improving their current emotional experience are of primary importance. As people age, relationships are cultivated for their emotional value and social interactions are adjusted in an effort to enhance emotional outcomes (Carstensen, 2000).

Attempting to test tenets of the SST, Cheng & Yim (2008) conducted a study in which they examined the possible association between age differences in forgiveness and FTP. Participants included eighty-nine younger adults and ninety-one older adults, randomized into one of three experimental conditions. All participants were given scenarios, depicting a relatable transgression that commonly occurs (i.e., forgiving someone for dishonest actions). Each of the experimental conditions was hypothesized to increase, decrease, or have no influence on the participant's personal time horizon. Specifically, in the time expanded condition, participants were asked to respond to the scenario as if they just received a new drug that gives them good health and extends their lifespan by two decades; in the time-limited condition, participants were asked to respond to the scenario as if they were going to soon leave the country; in the time-neutral condition participants received no manipulation. Results indicated that older adults were more forgiving than younger adults. In addition, irrespective of age, participants in the time-

limited condition were more forgiving than those in the time-expanded and neutral conditions. These authors concluded that one's tendency to forgive could be a function of FTP, and may point to a relationship between age and forgiveness.

Allemand (2008) also using the SST framework, examined age differences in the disposition of forgiveness between older and younger adults. Older and younger participants were asked to judge their willingness to forgive as a function of social proximity and FTP. Participants in this study were given hypothetical scenarios, and they were asked to imagine a situation where they were being deliberately harmed by another person. For the social proximity manipulation, participants were asked to imagine that the transgressor was either a friend, or an acquaintance. For the FTP manipulation, participants were asked to imagine that they were either healthy, with a long life ahead (open-ended FTP); or critically ill, with death looming (limited FTP). After controlling for self-reported FTP, results revealed that older adults, compared to younger adults, were more willing to forgive. For older adults, willingness to forgive was not influenced by social proximity. On the contrary, younger adults were more willing to forgive a friend, as opposed to an acquaintance. It was speculated that this finding reflects a greater selectivity among the older participants, such that as individuals age they narrow their contacts so that forgiveness may represent a strategy whereby older adults maintain valuable, and potentially limited, social connections. Results also indicated that FTP was an influential variable related to forgiveness. Specifically, an age by FTP effect was found, providing evidence that the effect of a limited FTP was smaller in older adults than in younger adults. In other words, participants were more willing to forgive when their future time was perceived as limited and less willing to forgive when their future time was perceived as open-ended.

Studies Examining the Link Between Forgiveness and Outcomes in Older Adults

Toussaint et al.'s (2001) telephone survey (described above in the self-unforgiveness section) examined differences in forgiveness among various age cohorts. These researchers reported that forgiving others was more strongly related to self-reported psychological and physical well-being in middle aged participants (45-64 years old) and older adult participants (65 years old and older), when compared to their younger counterparts. Based on these findings, Toussaint and co-authors (2001) concluded that as an individual ages, the benefits of forgiveness likely increase.

Lawler-Row and Piferi (2006) assessed the relationships among dispositional forgiveness, potential mediating variables, and health outcomes in 425 older adults, 50-95 years of age. Surveys were administered to study participants, which included measures of forgiveness, physical illness/health, stress, depressive symptoms, subjective well-being, psychological well-being, health behaviors, perceived social support, and spiritual well-being. The authors reported that individuals who scored higher on the forgiveness measure reported lower levels of depression and stress, and higher levels of subjective and psychological well-being. In addition, these researchers asserted that forgiveness not only reduces negative affect, as the literature indicates, but that forgiveness also has a relationship with enhancing positive experiences. Specifically, Lawler-Row and Piferi reported that all six scales of the psychological well-being measure used in their study were higher in more forgiving adults; these scales included: autonomy, environmental mastery, personal relationship with others, purpose in life, personal growth, and self-acceptance.

Silton, Flannelly, and Lutjen (2013) used data from a sample 1,629 U.S. adults to explore the relationships among age, forgiveness, hostility and subjective health. These authors reported

that older adults were more forgiving and that forgiveness was inversely associated with hostility. Additionally, SEM analyses revealed that forgiveness had an indirect beneficial effect on health, via the negative relationship between forgiveness and hostility. These authors concluded that as an individual grows older, forgiveness might provide an advantage to the extent that more forgiving individuals experience less hostility, which ultimately impacts one's physical health.

Summary and Conclusions

The connections between forgiveness and health are well documented. In general, the link between forgiveness and health may be associated with two interdependent pathways. First, forgiveness reduces unforgiveness and the associated physiological activation and stress reactivity that the body experiences when maintaining negative emotions (Worthington, Witvliet, Pietrini, & Miller 2007). Secondly, forgiveness promotes pro-social and positive emotions, which not only helps to calm physiological changes associated with negative affect, but also increases the likelihood of enhanced social support and interpersonal connection, and the array of benefits associated with such support (Witvliet et al., 2002). The health benefits associated with forgiveness appear to be pertinent to older adults. However, the body of literature that explores forgiveness in older adults is relatively small. Therefore, our study will add to the literature by exploring the relationship between forgiveness, psychological well-being, and physical health.

CHAPTER 3: METHODS

Participants

In this study, we used data from the Religion, Aging and Health Survey (RAHS), a nationally representative longitudinal survey (Krause, 2008). The study population was selected from the Centers for Medicare and Medicaid (CMS) beneficiary list and included all household residents who were either Black or White, non-institutionalized, English-speaking, and at least 66 years of age. Of note, the RAHS was initially designed to explore a range of issues related to religion; members of the research team reasoned that developing a comprehensive set of religious measures suitable for all faiths would be exceedingly difficult. Therefore, individuals who identified with a faith other than Christianity were excluded and participants in the final sample fell into one of three categories: practicing Christians, former Christians no longer practicing religion, and those who were never allied with any religious faith. The data collection for the RAHS included face-to-face interviews, which were performed in the homes of study participants.

Two waves of data collection were analyzed for this study. The original wave (wave 1) of the Survey was conducted in 2001, where a total 1,500 interviews were completed. Older Black Americans were over-sampled so that sufficient statistical power would be available to assess race differences in religion. The wave 1 sample consisted of 748 older Whites and 752 older Blacks. The overall response rate for wave 1 was 62%.

Wave 2 of the Survey was conducted in 2004, where a total of 1,024 of the original 1,500 interviewees were re-interviewed. Attrition between wave 1 and wave 2 was attributed to the following factors: refusing to participate (n=75), illness (n=70), moved to a nursing home (n=11)

and death (n=208). Therefore, the re-interview rate for wave 2 was 80%, when disregarding those participants who had moved to a nursing home or had died.

Measures

The following measures were used to complete data analyses. Measures were selected based on psychometric properties and the theoretical relevance to the current study.

Forgiveness measure. Forgiveness was measured by a total of 22 items, which are listed below. The response set of these items was a 4-point Likert scale; items were re-coded, so that higher values represent higher levels of the construct. Forgiveness Items: How often do you feel resentful towards others for the things they have done? [1=very often, 4=never]; How often do you hold a grudge? [1=very often, 4=never]; How hard is it for you to forgive others? [1=extremely hard, 4=I forgive others easily]; How often do you forgive others for the things they have done to you? [1=very often, 4=never]; Before I can forgive others, they must apologize to me for the things they have done [1=strongly agree, 4=strongly disagree] ; Before I can forgive others, they must promise not to do the same thing again [1=strongly agree, 4=strongly disagree] ; Before I can forgive others, they must repay me or compensate me for what they have done [1=strongly agree, 4=strongly disagree] ; Others do not have to do anything before I forgive them [1=strongly agree, 4=strongly disagree] ; I can forget as well as forgive [1=strongly agree, 4=strongly disagree]; I still remember times when others hurt me, but I no longer feel sad about what they have done [1=strongly agree, 4=strongly disagree] ; I have done some things that even God may not forgive [1=strongly agree, 4=strongly disagree]; I believe that God forgives me for the things I have done wrong [1=strongly agree, 4=strongly disagree] ; In order to be forgiven by God, I must ask God to forgive me [1=strongly agree, 4=strongly disagree]; In order to be forgiven by God, I must promise God I will not make the same mistake again [1=strongly agree,

4=strongly disagree]; In order to be forgiven by God, I must correct what I have done wrong [1=strongly agree, 4=strongly disagree]; God forgives me right away for the things I have done, there is nothing I must do first [1=strongly agree, 4=strongly disagree]; I still feel bad about things I have done in the past [1=strongly agree, 4=strongly disagree]; I forgive myself for the things I have done wrong [1=strongly agree, 4=strongly disagree]; How hard is it for you to forgive yourself for the things you have done wrong? [1=extremely hard, 4=I forgive others easily]; As far as I know, other people have forgiven me for the things I have done [1=strongly agree, 4=strongly disagree]; I know there are people who still hold a grudge about things I have done in the past [1=strongly agree, 4=strongly disagree]; I know there are people who still blame me for things I have done in the past [1=strongly agree, 4=strongly disagree]

Optimism. Optimism was measured with 4 items. The response set of these items was a 4-point Likert scale, such that higher scores indicated a greater degree of optimism. The measure included the following items:

I always look on the bright side of things.

I am optimistic about my future.

In uncertain times, I usually expect the best.

I feel confident that the rest of my life will turn out well.

Self-esteem. Self-esteem was measured with three items. The response set of these items was a 4-point Likert scale, such that higher scores indicated a greater degree of self-esteem. The measure included the following items:

I feel I am a person of worth, or at least on an equal plane with others.

I feel I have a number of good qualities.

I take a positive attitude toward myself.

Feelings of control. Feelings of control were measured with four items. The response set of these items was a 4-point Likert scale, such that higher scores indicated a greater degree of control. The measure included the following items:

I have a lot of influence over most things that happen in my life.

I can do just about anything I set my mind to do.

When I make plans, I am almost certain to make them work.

When I encounter problems, I don't give up until I solve them.

Life-satisfaction. Life satisfaction was measured with four items. The response set of these items was a 4-point Likert scale, such that higher scores indicated a greater life satisfaction.

The measure included the following items:

These are the best years of my life.

As I look back on my life, I am fairly well satisfied.

I would not change the past even if I could.

Think about your life as a whole. How satisfied are you with it?

Depressive symptoms. Eight indicators from the Center for Epidemiological Studies Depression Scale were used to assess depressive symptoms. The response set of these items was a 4-point Likert scale, such that higher scores indicated a greater degree of depressive symptoms.

The measure included the following items:

I felt I could not shake off the blues even with the help of my family and friends.

I had crying spells.

I felt depressed.

I felt sad.

I did not feel like eating, my appetite was poor.

I felt that everything I did was an effort.

My sleep was restless.

I could not get going.

Rumination. Rumination was measured during W2 only. Rumination was measured by 4 items from the White Bear Suppression Inventory (Wegner & Zanakos, 1994). The response set of these items was a 4-point Likert scale, such that higher scores indicate a greater degree of rumination. The measure included the following items:

I often have thoughts I try to avoid.

There are thoughts that keep jumping into my head.

I wish I could stop thinking about certain things.

I have thoughts I cannot stop.

Self-rated health. The response set of these items included a 4-point Likert scale, such that higher scores indicated better self-rated health. Health was measured using the following items, during wave 1 and wave 2:

How would you rate your overall health at the present time?

Do you think your health is better, about the same, or worse than it was a year ago?

Do you think your health is better, about the same, or worse than most people your age?

Health was measured with an addition questions, during wave 2 only:

How satisfied are you with your health?

Cardiovascular risk factors index. The following questions, which will comprise a measure of cardiovascular risk factors, were asked at W2 only. The measure will include the following items:

Do you have hypertension/high blood pressure/have taken medication for it?

Do you have diabetes/high sugar/have taken medication for it?

Have you had a heart Attack or heart trouble?

Procedure

Data was freely available and contained no identifiable information. Both W1 and W2 data were downloaded from the Inter-university Consortium for Political and Social Research.

Data Analyses

Descriptive statistics were computed on all data in order to better characterize the sample. Correlation matrices were calculated in order to examine the bivariate relationships among variables. The data was assessed for violations of univariate and multivariate normality, screened for multivariate outliers, and evaluated for missing data.

In order to obtain the forgiveness measures, forgiveness items were submitted to a principal components analysis with promax rotation, using polychoric correlations.

For SEM analyses, model fit was evaluated by examining the root mean square error of approximation (RMSEA) values, the comparative fit index (CFI), the standardized root mean residual (SRMR), residuals centered around a value of zero, and the chi-square (Hu & Bentler, 1999). Model parsimony was assessed using Akaike's Information Criterion (AIC).

The following describes the measured indicators, which constituted the latent variables included in our SEM analysis. Questions from the survey, which focused on forgiveness, were used as measured indicators of the latent variables of forgiveness and unforgiveness. Questions from the survey that focused on depression, self-esteem, feelings of control, optimism, and life-satisfaction were used as measured indicators of the latent variable of mental health (aim 1.2). Questions from the survey that focused on, self-esteem, feelings of control, optimism, and life-

satisfaction were used as measured indicators of the latent variable of positive psychological adjustment (aim 3). Scores from the eight indicators from the Center for Epidemiological Studies Depression Scale and the White Bear Suppression Inventory were used as measured indicators of the latent variable of negative psychological adjustment (aim 3). Questions from the survey, which assess self-rated health, were used as measured indicators of the latent variable of physical health.

Specific Aim 1.1: To determine the relationship between forgiveness and mental health, in older adults. To accomplish Specific Aim 1.1, we examined the simple correlations between measures of wave 1 (W1) forgiveness and W1 mental health. We also examined the simple correlations between measures of wave 2 (W2) forgiveness and W2 mental health. It was hypothesized that older adults with higher levels of forgiveness will report fewer mental health concerns.

Specific Hypothesis 1.1a: Forgiveness scales will be positively related to life-satisfaction, as measured by the four life-satisfaction survey items. We anticipate finding this relationship at W1 and W2. Unforgiveness scales will be inversely related to life-satisfaction, as measured by the four life-satisfaction survey items. We anticipate finding this relationship at W1 and W2.

Specific Hypothesis 1.1b: Forgiveness scales will be positively related to self-esteem, as measured by the three self-esteem survey items. We expect to find this relationship at W1 and W2. Unforgiveness scales will be inversely related to self-esteem, as measured by the three self-esteem survey items. We expect to find this relationship at W1 and W2.

Specific Hypothesis 1.1c: Forgiveness scale will be positively related to feelings of control, as measured by the four control survey items. We expect to find this relationship at W1

and W2. Unforgiveness scales will be inversely related to feelings of control, as measured by the four control survey items. We expect to find this relationship at W1 and W2.

Specific Hypothesis 1.1d: Forgiveness scale will be inversely related to depression, as measured by the eight indicators from the Center for Epidemiological Studies Depression Scale. We expect to find this relationship at W1 and W2. Unforgiveness scales will be positively related to depression. We expect to find this relationship at W1 and W2.

Specific Hypothesis 1.1e: Forgiveness scales will be inversely related to rumination, as measured by four items from the White Bear Suppression Inventory. Unforgiveness scales will be positively related to rumination, as measured by four items from the White Bear Suppression Inventory. Since this measure was only administered at W2, we will examine the relationship between forgiveness and rumination at W2 only.

Specific Aim 1.2: To determine the relative contributions of forgiveness in predicting mental health outcomes in older adults. To accomplish Specific Aim 1.2, we used cross-lagged path analyses (see figure 1). The longitudinal design of the RAHS provided an opportunity to analyze the cross-lagged effects of forgiveness and mental health at two time points over the course of 3 years. Specifically, our analysis consisted of three steps. First the forgiveness and mental health measurement model was specified and preliminary analysis were conducted in order to test the successful operationalization of the constructs into the observed variables. Next, stability models were tested for forgiveness and mental health indicators. Finally, nested structural equation models were used in order to examine the predictive relationship between forgiveness and mental health. The following models were estimated: no cross-lagged predictive relationship estimated; single cross-lagged associations; full cross-lagged model. The goodness-of-fit of each model was judged using several criteria, including: the chi-square test, RMSEA

CFI, and AIC values. These analyses allowed us to explore the stability of forgiveness over time, as well as the reciprocal relationships between forgiveness and mental health at two time points (i.e., the extent to which W1 forgiveness predicted aspects of W2 mental health, and the extent to which aspects of W1 mental health predicted W2 forgiveness). Forgiveness subscales with adequate psychometric properties represented the latent construct of forgiveness. As described above, the following measured variables represented the latent construct of mental health: feelings of control, life satisfaction, self-esteem, depression, and optimism.

Specific Hypothesis 1.2a: W1 forgiveness scales will predict W2 forgiveness.

Specific Hypothesis 1.2b: W1 forgiveness scales will predict W2 mental health.

Specific Hypothesis 1.2c: W1 mental health will not predict W2 forgiveness scales.

Specific Aim 1.3: To determine the relative contribution of forgiveness in predicting change in mental health outcomes in older adults. To accomplish Specific Aim 1.3, we used scores from W1 and W2 to create residualized change scores for mental health variables. To calculate the residualized change scores, we used bivariate regression, using W1 scores on mental health measures to predict W2 scores on mental health measures and saving the standardized residual for each participant. This approach helped to identify individual differences in change in an unbiased manner, which corrects for regression to the mean and practice effects. Then, we enter demographic variables on block one. On block two, we entered each subscale from the forgiveness measures. For this set of analyses, the residualized change scores from each mental health measure was serve as the dependent variable.

Specific Hypothesis 1.3a: W1 forgiveness scales will predict change in life-satisfaction, as measured by the four life-satisfaction survey items, after controlling for demographic variables.

Specific Hypothesis 1.3b: W1 forgiveness scales will predict change in self-esteem, as measured by the three self-esteem survey items, after controlling for demographic variables.

Specific Hypothesis 1.3c: W1 forgiveness scales will predict change in feelings of control, as measured by the four control survey items, after controlling for demographic variables.

Specific Hypothesis 1.3d: W1 forgiveness scales will predict change in depression, as measured by the eight indicators from the Center for Epidemiological Studies Depression Scale, after controlling for demographic variables.

Specific Aim 2.1: To determine the relationship between forgiveness and physical health, in older adults. To accomplish this aim, we will examine the bivariate correlations between measures of forgiveness and physical health at W1. We will also look at the bivariate correlations between measures of forgiveness and physical health at W2. It is hypothesized that older adults with higher levels of forgiveness will report better health.

Specific Hypothesis 2.1a: Forgiveness scales will be positively related to health, as measured by self-rated health survey items. We expect to find this relationship at T1 and T2. Unforgiveness scales will be inversely related to health, as measured by self-rated health survey items. We expect to find this relationship at T1 and T2.

Specific Hypothesis 2.1b: Forgiveness scales will be inversely related to cardiovascular risk factors, as measured by survey items that assess hypertension, diabetes, and heart attack/heart trouble. Unforgiveness scales will be positively related to cardiovascular risk factors, as measured by survey items that assess hypertension, diabetes, and heart attack/heart trouble. Since these items were only administered at W2, we will examine the relationship between forgiveness and cardiovascular risk factors at W2 only.

Specific Aim 2.2: To determine the relative contribution of forgiveness and unforgiveness in predicting physical health outcomes, in older adults. To accomplish this aim, a series of hierarchical regression equations were computed to examine the relative contributions of mental health and forgiveness variables in predicting physical health status. To help control for confounds, block one contained demographic variables; block 2 contained mental health variables; and block 3 contained each subscale from the forgiveness measures. For all regressions, the change in the adjusted R² was calculated at each step of the analysis and physical health, as measured by the self-rated health, was the dependent variable.

Specific Hypothesis 2.2a: It is predicted that forgiveness scales will account for differences in self-rated health, over and above depression, as measured by the eight indicators from the Center for Epidemiological Studies Depression Scale, and demographic variables.

Specific Hypothesis 2.2b: It is predicted that forgiveness scales will account for differences in self-rated health, over and above life-satisfaction, as measured by the four life-satisfaction survey items, and demographic variables.

Specific Hypothesis 2.2c: It is predicted that forgiveness scales will account for differences in self-rated health, over and above control, as measured by the four control survey items, and demographic variables.

Specific Aim 3: To test the emotional juxtaposition hypothesis proposed by Worthington and Scherer (2004). Worthington et al. has proposed a broad theoretical model, explaining the forgiveness-health relationship. Although several empirical investigations support the health benefits of forgiveness, Worthington et al.'s model is the only such model that provides a comprehensive explanatory framework for understanding the direct and indirect associations between health and forgiveness (Webb et al., 2012). According to these authors, forgiveness is a

stress-reducing coping response related to health via a mechanism whereby forgiveness reduces unforgiveness, which ultimately promotes positive emotions and simultaneously neutralizes negative emotions. However, the extent to which forgiveness and unforgiveness may directly impact physical symptoms is unknown. To accomplish this aim, we used structural equation modeling (SEM). This analysis allowed us to relate the dependent variable of physical health symptoms to various structural components theorized by Worthington and colleagues to have a direct and/or indirect influence on the dependent variable. Specifically, we created two models, using wave two data. Our first model (model 1) contained paths from forgiveness to unforgiveness; paths from forgiveness and unforgiveness to the latent variables of positive and negative psychological adjustment; and paths from the latent variables of positive and negative psychological adjustment to the latent variable of physical health. The second model (model 2) was the same as model 1; however, model 2 contained an additional path that represents the direct relationships between unforgiveness/forgiveness and the latent variable of physical health. The estimated path coefficients were used to explore which variables had significant effects, and model-fit indices were examined to test which SEM model is the best fit for the data in the current study. In addition, incremental fit indices were examined to determine if the model modification resulted in a relative improvement in fit. In the end, the use of structural equation modeling allowed us to determine the model that best represents the associations between forgiveness, mental health, and physical health variables. The primary latent variables included in the SEM were: forgiveness, positive adjustment, negative adjustment, and physical health (see figure 2).

Specific Hypothesis 3a: Both forgiveness and unforgiveness will have indirect effects on physical health outcomes, mediated by the latent variables of positive and negative psychological

adjustment.

CHAPTER 4: RESULTS

Preliminary Analysis

Descriptive statistics were computed in order to characterize the sample (Table 1 and Table 2). Regarding marital status, two categories were created included married (W1 $n=710$, W2 $n=477$) and not married (W1 $n=777$, W2 $n=545$). Participant responses that included “widowed,” “divorced,” “never married,” and “separated” were all recoded as “not married.” Regarding race, the small percentage of respondents who indicated their race was either “other” or “multiracial” were dropped from the analysis (W1 and W2 $n=39$). In general, participant responses that include “decline to answer,” “no answer” and “not sure” were recoded as missing. For the forgiveness and mental health measures, all items were recoded so that higher numbers equated to greater amounts of the construct. The physical health measure was not recoded, such that larger numbers equated to worse self-rated health.

Forgiveness scales. The forgiveness scales used in the analyses were constructed by submitting all 22 forgiveness items from W1 to a principal components analysis (PCA) with promax rotation. Because the forgiveness measure relied on ordinal data, the polychoric correlation matrix of the items was used in completing the PCA and also when examining the ordinal alpha coefficients. Component loadings and items from W1 data were then used to create W2 forgiveness scales, where the W1 component loading was multiplied by the W2 item score for each item on a particular component. Psychometric criteria for the forgiveness scales included the following: 1) factor eigenvalue >1 , 2) factor loadings $>.3$, 3) no cross loadings $>.39$, 4) item-total correlations $>.20$, 5) no appreciable increase in alpha if item was deleted, and 6) ordinal alphas $>.68$. The PCA revealed a six-factor solution, although only the factors with adequate reliability were retained for the analyses. A total of four forgiveness components were

retained. Table 3 contains the scales, items, eigenvalues, alpha coefficients, and factor pattern coefficients for the forgiveness components used in this study.

The four scales used in the study included: unconditional forgiveness, unforgiveness, unconditional forgiveness by God, and self-unforgiveness. As described above, all forgiveness items used a 1-4 Likert response scale and were recoded so that higher values represented higher levels of the construct. The unconditional forgiveness scale captured items related to a need for acts of contrition (i.e., apology, repayment) in order to grant forgiveness to others. Higher scores on the unconditional forgiveness scale were related to less/no need for acts of contrition, lower scores were related to a stronger need for acts of contrition. In other words, high scores on this scale were interpreted as being more forgiving, in that certain behaviors were not required of others before granting forgiveness. The unforgiveness scale captured items most closely associated to the description of unforgiveness in the literature, including items related to holding resentments and grudges. Higher scores on the unforgiveness scale were related to more unforgiveness (i.e., more resentment), lower scores were related to less unforgiveness. The unconditional forgiveness by God scale captured items related to feeling forgiven by God, and the need for one to engage in acts of contrition in order to receive God's forgiveness. Higher scores on the unconditional forgiveness by God scale were related to less/no need to engage in acts of contrition in order to receive God's forgiveness, lower scores were related to a stronger need to engage in acts of contrition in order to receive God's forgiveness. Finally, the self-unforgiveness scale captured items related to feeling bad about transgressions committed by the participant on others, and feeling as if others were continuing to experience blame and resentment regarding transgressions committed by the participant on others. Higher scores on the

self-unforgiveness scale were related to feeling more strongly that others were unforgiving and the participant feeling greater pain regarding past offenses he/she may have committed.

Specific Aim 1

The goal of this aim was to determine the relationship between forgiveness and mental health in older adults.

Specific aim 1.1. Correlations were examined between each forgiveness scale and each mental health measure. Table 4 reports correlations between forgiveness scales and mean mental health measures at Wave 1. Table 5 reports correlations between forgiveness scales and mean health measures at Wave 2.

To ensure that the same cases were used in each comparison, listwise deletion was used for all correlations. Examining W1 relationships included correlations among the four forgiveness scales and five mental health variables; examining W2 relationships included correlations between the four forgiveness scales and six mental health variables (the rumination measure was administered at W2 only.) Therefore, correlations were examined among 19 total variables across the two waves. If a participant had a missing value on any of the forgiveness scales and/or mental health measures (in W1 or W2) they were subsequently dropped from the analysis. This approach reduced the number of subjects considerably, leaving a total of 287 remaining participants. When examining patterns of missing values, it should be noted that missing values were most frequently found on the self-unforgiveness scale. This particular scale required that participants comment on the resentment and grudges held by others, as such “not sure” was a relatively common response. For instance, the item “I know there are people who still hold a grudge about things I have done in the past” received a total of 364 (24.3% of total W1 sample) “not sure” responses in W1 and a total of 204 (13.6% of total W2 sample) “not

sure” responses in W2. As mentioned above “not sure” responses were recoded as missing. Therefore, missing data on the self-unforgiveness scale accounted for the largest percentage of missing values in the data. For W1, 13% of the forgiveness and mental health data and 12% of the W2 forgiveness and mental health data was dropped due to missing values on only the self-unforgiveness scale. The unconditional forgiveness by God scale accounted for the second highest percentage of missing values, with 4% of the W1 data and 3% of the W2 data dropped due to missing data on only the unconditional forgiveness by God scale. Finally, missing values on only the optimism scale accounted for 3% of the missing W1 data and 1% of the W2 data. All other patterns of missing data occurred at a frequency of less than 1%.

Unconditional forgiveness at W1 was significantly correlated with depression ($r=-.12$), life satisfaction ($r=.21$), self-esteem ($r=.33$), and optimism ($r=.27$). At W2, unconditional forgiveness was significantly correlated only with self-esteem ($r=.27$), control ($r=.14$) and optimism ($r=.22$).

Unforgiveness at W1 was significantly correlated with depression ($r=.12$), life satisfaction ($r=-.25$), self-esteem ($r=-.29$), control ($r=-.21$) and optimism ($r=-.32$). At W2, unforgiveness was significantly correlated with depression ($r=.19$), life satisfaction ($r=-.24$), self-esteem ($r=-.24$), control ($r=-.13$), optimism ($r=-.28$) and rumination ($r=.30$).

Unconditional forgiveness by God at W1 was significantly correlated with control ($r=-.18$). At W2, unconditional forgiveness by God was significantly correlated with life-satisfaction ($r=-.13$) and control ($r=-.15$).

Self-unforgiveness at W1 was significantly correlated with depression ($r=.22$), life-satisfaction ($r=-.11$), and optimism ($r=-.11$). At W2, self-unforgiveness was significantly correlated with depression ($r=.25$), self-esteem ($r=-.16$), optimism ($r=-.19$) and rumination ($r=.46$).

Specific aim 1.2. Cross-lagged path analyses were used within a SEM framework to estimate the effect of each latent forgiveness factor (i.e., unconditional forgiveness, unforgiveness, unconditional forgiveness by god, and self-unforgiveness) on a latent mental health factor and vice versa across two time points. The goal of this aim was to examine whether forgiveness exerts an influence on mental health over time and whether reciprocal effects exist. For each forgiveness latent factor, individual items corresponding to the forgiveness scale served as the indicators. For the mental health latent factor, mental health measure average scores served as indicators, including average depression (Ordinal $\alpha=.92$), average optimism (Ordinal $\alpha=.66$), average control (Ordinal $\alpha=.89$), average life satisfaction (Ordinal $\alpha=.89$), and average self-esteem (Ordinal $\alpha=.94$) scores. Before conducting the cross-lagged path analyses, a confirmatory factor analysis (CFA) was conducted to test the structure of the latent mental health factor.

In order to investigate associations between forgiveness and mental health, stability models were first assessed. The stability of each forgiveness scale and the mental health latent variable over time (i.e., autoregressive effects) were examined. After establishing stability of the constructs, comparisons were then made among nested models. For each forgiveness scale, we compared three cross-lagged models with different patterns of inter-factors effects, as shown in Figure 1. Nested model testing was used to determine whether models with single cross lagged effects (i.e., W1 forgiveness to W2 mental health or W1 mental health to W2 forgiveness) fit the data better than the full cross-lagged model. In other words, comparisons were made between models leading with forgiveness (Model a), models leading with mental health (Model b), and models with both cross-lagged paths specified (Model c). In addition, path coefficients were examined to identify potentially significant effects between forgiveness and mental health.

Overall model fit was evaluated using several different model fit indices, including: the Comparative Fit Index (CFI), Root Mean Squared Error of Approximation (RMSEA), the Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC) and the Standardized Root Square Residual (SRMR). Models' chi-square fit indices were reported, although not given much interpretative consideration, as these indices are often statistically significant in analyses with large sample sizes. Comparisons among nested models were evaluated using a likelihood-ratio test (chi-square difference test) in which significant results suggest that the less restrictive model (i.e., model c) is a better fit for the data. When the likelihood ratio test was not significant, the more parsimonious model (i.e., the model with more degrees of freedom) was considered a better fit for the data (Bentler & Mooijaart, 1989).

Mental health CFA. A CFA was specified, with average self-esteem, average feelings of control, average life satisfaction, average depression and average optimism scores as indicators to define the latent factor of mental health. The model fit the data well ($\chi^2 = 13.60$, $df = 5$, $p = 0.02$, RMSEA = .04, CFI = .99). All indicators loaded significantly on the latent factor as expected.

Autoregressive effects. Prior to conducting the cross-lagged path analysis, autoregressive effects of all forgiveness scales and mental health were first examined, to assess stability in the measured constructs over time. All models assessed fit the data well. Each W1 forgiveness scale significantly predicted each W2 forgiveness scale. In addition, the W1 mental health latent factor significantly predicted the W2 mental health latent factor. These findings suggest that the forgiveness scales and mental health latent factor were stable over time.

Unconditional forgiveness. Findings are presented in Table 6 and Table 7. All models (models a, b and c) fit the data well. For the full cross-lagged model, the structural path from

W1 unconditional forgiveness to W2 mental health was not significant. Likewise, the structural path from W1 mental health to W2 unconditional forgiveness was not significant. Using the likelihood ratio criterion, the unconditional forgiveness led cross-lagged model and the mental health led crossed-effects model could not be rejected when compared to the full cross-lagged model.

Unforgiveness. Findings are presented in Table 8 and Table 9. All models (models a, b and c) fit the data well. For the full cross-lagged model, the structural path from W1 unforgiveness to W2 mental health was significant. However, the structural path from W1 mental health to W2 forgiveness was not significant. Using the likelihood ratio criterion, the unforgiveness led cross-effects model could not be rejected when compared to the full cross-lagged model. However, the mental health led crossed effects model could be rejected, suggesting that effects running from unforgiveness to mental health are stronger than effects running from mental health to unforgiveness.

Unconditional forgiveness by God. Findings are presented in Table 10 and Table 11. All models (Models a, b and c) fit the data well. For the full cross-lagged model, the structural path from W1 mental health to W2 unconditional forgiveness by God was significant; however, the structural path from W1 unconditional forgiveness by God to mental health was not significant. Using the likelihood ratio criterion, the mental health led cross-lagged model could not be rejected when compared to the full cross-lagged model. However, the unconditional forgiveness by God led model could be rejected, suggesting that effects running from mental health to forgiveness by God were stronger than effects running from unconditional forgiveness by God to mental health.

Self-unforgiveness. Findings are presented in Table 12 and Table 13. All models (Models a, b and c) fit the data well. For the full cross-lagged model, the structural path from W1 self-unforgiveness to W2 mental health was not significant. Likewise, the structural path from W1 mental health to W2 self-unforgiveness was not significant. Using the likelihood ratio criterion, the self-unforgiveness led cross-lagged model and the mental health led crossed-effects model could not be rejected when compared to the full cross-lagged model. **Specific aim 1.3.** A series of hierarchical regression equations was computed to examine the relative contributions of W1 forgiveness variables in predicting change (from W1 to W2) in mental health measures. After controlling for demographic variables, W1 unforgiveness predicted change in mean optimism scores (R^2 change=.02, $F(1,281)=6.61$, $p=.01$); change in mean control scores (R^2 change=.01, $F(1,281)=4.71$, $p=.03$), and change in mean life satisfaction scores (R^2 change=.01, $F(1,281)=5.85$, $p=.02$). The remaining W1 forgiveness components (unconditional forgiveness, unconditional forgiveness by God, and self-unforgiveness) did not predict change in any mental health variables.

Specific Aim 2

The goal of this aim was to determine the relationship between forgiveness and physical health, in older adults.

Specific aim 2.1. Correlations were examined between each forgiveness scale and average self-rated health scores, are presented in Table 14. At W1, average self-rated health was not correlated with any of the forgiveness scales. At W2, average self-rated health was significantly correlated with forgiveness ($r=-.11$). At W2, the cardiovascular risk factor index (CVRF) was significantly correlated with self-unforgiveness ($r=.15$).

Specific aim 2.2. A series of hierarchical regression equations was computed to examine the relative contributions of mental health and forgiveness scales in predicting physical health status. After controlling for demographic variables and each mental health variable in turn, W1 forgiveness scales did not predict self-rated physical health.

After controlling for demographic variables and life satisfaction scores, W2 forgiveness predicted W2 self-rated health (R^2 change=.03, $F(1,256)=9.72$, $p=.002$). After controlling for demographic variables and depression scores, W2 forgiveness predicted W2 self-rated health (R^2 change=.02, $F(1,256)=11.04$, $p=.001$). After controlling for demographic variables and self-esteem scores, W2 forgiveness predicted W2 self-rated health (R^2 change=.02, $F(1,256)=7.60$, $p=.01$). After controlling for demographic variables and control scores, W2 forgiveness predicted W2 self-rated health scores (R^2 change=.03, $F(1,256)=7.79$, $p=.01$). After controlling for demographic variables and optimism scores, W2 forgiveness predicted W2 self-rated health scores (R^2 change=.03, $F(1,256)=7.50$, $p=.01$).

Specific Aim 3

The goal of this aim was to test the emotional juxtaposition hypothesis (EJH) proposed by Worthington and Scherer (2004). A two-phase SEM analysis was conducted. The first phase included the assessment of a measurement model, which contained all of the latent variables needed to test the EJH. After assessing the measurement model, a structural model was created, which included paths consistent with the EJH. This commonly utilized two-phase approach serves to simplify the identification of sources of data-model misfit, helping to address misspecification issues prior to assessing the structure among latent variables in the model (Mueller & Handcock, 2007).

Measurement model. In order to assess the measurement model, latent variables were allowed to freely covary, with no causal structure in place. The CFA consisted of the following latent variables: forgiveness, unforgiveness, positive psychological adjustment, negative psychological adjustment, and physical health. Individual items from the unconditional forgiveness scale and the unforgiveness scale served as indicators to define the latent factors of forgiveness and unforgiveness, respectively. Average self-esteem, control, life satisfaction, and optimism scores served as the indicators to define the latent factor of positive psychological adjustment (PPA). Average rumination and average depression scores served as the indicators to define the latent factor of negative psychological adjustment (NPA). Finally, individual self-rated health items served as the indicators to define the latent factor of physical health. All latent factors were comprised of observed variables from W2 data. The model fit the data well ($\chi^2 = 344.353$, $df = 109$, $p < .001$, RMSEA = .054, CFI = .95, SRMR=.044). All indicators loaded significantly on the corresponding latent factor as expected.

Model 1. The first model assessed contained paths from forgiveness and unforgiveness to physical health, via the latent factors of positive psychological adjustment and negative psychological adjustment (see Figure 3). Paths from forgiveness to PPA (standardized regression coefficient= .19), PPA to physical health (standardized regression coefficient= -.35), NPA to physical health (standardized regression coefficient=.33), unforgiveness to NPA (standardized regression coefficient=.24) and unforgiveness to PPA (standardized regression coefficient= -.27) were all statistically significant ($p < .001$). The path from forgiveness to NPA (standardized regression coefficient= -.03) was not statistically significant ($p = .45$). Overall, the data fit the model well, as detailed in Table 15.

Model 2. The second model assessed the same paths included in Model 1, and added additional direct paths from forgiveness and unforgiveness to physical health (see Figure 3). Paths from forgiveness to PPA (standardized regression coefficient= .18), PPA to physical health (standardized regression coefficient= -.37), NPA to physical health (standardized regression coefficient=.42) and unforgiveness to NPA (standardized regression coefficient=.33) and unforgiveness to PPA (standardized regression coefficient= -.29) were all statistically significant ($p < .001$). The path from forgiveness to NPA (standardized regression coefficient= -.01) was not statistically significant ($p = .81$). The direct path from forgiveness to physical health (standardized regression coefficient= -.14) and the direct path from unforgiveness to physical health (standardized regression coefficient= -.26) were both statistically significant ($p < .001$). Overall, the data fit the model well, as detailed in Table 15. The likelihood ratio test comparing Model 1 and Model 2 was significant, suggesting that the additional direct paths from forgiveness and unforgiveness to physical health improved the model. In addition, model-fit statistics were superior for Model 2 relative to Model 1, again suggesting that Model 2 represents a better fit for the data.

CHAPTER 5: DISCUSSION

The overarching goal of this dissertation was to examine the effect of forgiveness on mental health and physical health in a national sample of older adults. The aims of this project were to identify possible relationships between forgiveness and mental health outcomes, and to also examine whether baseline forgiveness could predict mental health outcomes after 3 years. In addition, the relationships between forgiveness and physical health were explored, including examining the effects of forgiveness on physical health, above and beyond mental health. Finally, the emotional juxtaposition hypothesis was tested, examining the direct and indirect relationships between forgiveness, positive psychological adjustment, negative psychological adjustment, and physical health. Taken together, results were expected to provide a greater understanding of the possible impact forgiveness could have on mental health and physical health.

Specific Aim 1.1

It was first hypothesized that older adults with higher levels of forgiveness, and lower levels of unforgiveness, would report fewer mental health concerns. This hypothesis is consistent with prior studies, which have examined the links between forgiveness and mental health. For instance, researchers have reported that forgiveness is positively related to global mental health (Berry & Worthington, 2001), negatively related to depression (Brown, 2003) and negatively related to state anxiety (Subkoviak et al., 1995). In addition, studies have reported that unforgiveness is positively related to depression and anxiety (i.e., Seybold, Hill, Neumann & Chi, 2001; Maltby, Macaskill & Day, 2001). Our findings generally support the hypothesis that forgiveness is related to mental health in older adults. Specifically, at W1, unconditional forgiveness was related to depression, life satisfaction, self-esteem, and optimism; at W2,

unconditional forgiveness was related to self-esteem, control and optimism. At W1, unconditional forgiveness by God was related to control; at W2, unconditional forgiveness by God was related to control and life-satisfaction. At both W1 and W2, unforgiveness was related to depression, life-satisfaction, self-esteem, control, and optimism. In addition, at W2, unforgiveness was related to rumination. Finally, at W1, self-unforgiveness was related to depression, life-satisfaction, and optimism; at W2, self-unforgiveness was related to depression, self-esteem, optimism and rumination.

Interestingly, depression was consistently related (both at W1 and W2) to only the unforgiveness scales (unforgiveness and self-unforgiveness), and not the forgiveness scales (unconditional forgiveness, unconditional forgiveness by God). Moreover, the correlations between the self-unforgiveness scale and the depression scale were larger in magnitude, relative to the forgiveness scale. Previous research indicates that self-unforgiveness is distinct from unforgiveness of others. For instance, self-unforgiveness is associated with distinctive emotional responses not typically related to unforgiveness of others, such as shame, guilt, embarrassment, and regret (Tangney, Boone & Dearing, 2005). Mauger et al. found that less self-forgiveness, compared to forgiveness of others, was more strongly correlated with greater levels of anxiety, depression, and anger. Also, Thompson and co-authors (2005) reported associations between difficulty engaging in self-forgiveness and greater levels of anxiety and depression. In addition, the strongest correlation revealed by the analyses was between self-unforgiveness and rumination. Macaskill (2012) found an association between greater levels of self-unforgiveness corresponding with greater levels of anxiety. Based on these findings and clinical observations, Macaskill argues that individuals with higher levels of self-unforgiveness are likely to worry excessively, with preoccupations about their behavior and concerns that others are judging them;

separating from such worry is challenging, as the focus is the self. These associations between unforgiveness, anxiety and worry are supported by the correlations found in this study between rumination, depression, and the self-unforgiveness scale. Conceptually, there is overlap between worry and rumination, and both cognitive processes have been tied to greater levels of anxiety and depression (Segerstrom, Tsao, Alden & Craske, 2000).

Our findings may offer some insights into a particular aspect of unforgiveness; however, such findings should be interpreted with caution. Very few studies have actually examined self-unforgiveness, and those studies that have done so have generally utilized a convenience sample of college students (Wilson et al, 2008). Moreover, studies that have compared unforgiveness of the self versus unforgiveness of others have generally not accounted for the severity of the transgression that is unforgiven. This is an important limitation in prior work, as the severity of the transgression is one of the most consistent relationships found within the forgiveness literature (Hall & Fincham, 2005). Specifically, more severe transgressions are associated with less forgiveness of others (Darby & Schenkler, 1982; Girard & Mullet, 1887). It is therefore possible that unforgiveness of others and self-unforgiveness could exert unique effects on mental health, which are based on the severity of the transgression. Future studies should consider transgression severity when examining the distinctions between the various domains of self and other unforgiveness.

A majority of the observed forgiveness mental health correlations in our study were consistent with our predictions. For instance, W1 unconditional forgiveness was inversely related to depression and W2 unforgiveness was positively related to depression. However, there were unexpected negative correlations between W1 unconditional forgiveness by God and control ($r=-.18$), W2 unconditional forgiveness by God and life-satisfaction ($r=-.13$), W2

unconditional forgiveness by God and control ($r=-.15$). More specifically, feeling that God is unconditional, such that one need not engage in specific behaviors to receive forgiveness from God, was related to feeling as if one has less control in life. In addition, unconditional forgiveness by God, relative to the other scales assessed, was related to the fewest mental health constructs. Finally, while statistically significant, the magnitude of these correlations is relatively small, suggesting only a small proportion of variance is shared in common between these items and the mental health outcomes. Taken together, it appears that the forgiveness by God scale was distinct from the other scales in our study. At the same time, making parallels between our results and the existing literature is challenging, as most of the studies that examine forgiveness and mental health have done so in regards to forgiving others. One exception, however, is a study by Toussaint, Williams, Musick, and & Everson (2001). These authors reported that for middle-aged adults, feeling forgiven by God was negatively associated with life-satisfaction. Another study, which used a sample of adults 18 and older, reported that forgiveness by God was related to less depression for women, but found no relationship between forgiveness by God and depression in men (Toussaint et al., 2008). As a point of comparison, data from this study found that forgiveness by God was not correlated with depression for either women or men. Specifically, there were no significant relationships between W1 unconditional forgiveness by God and depression in women ($r(783)=.00, p=.79$) or men ($r(458)=-.05, p=.24$). Also, there were no significant relationships between W2 unconditional forgiveness by God and depression in women ($r(574)=.01, p=.70$) or men ($r(336)=-.03, p=.55$).

The literature on spirituality and health has identified that a belief in a forgiving God, deemed “positive religious coping,” is associated with better outcomes. On the contrary, a belief in an unforgiving God, deemed “negative religious coping,” is associated with worse outcomes

(Pargament, Koenig, Tarakeshwar & Hahn, 2004). For instance Koenig, Pargament, and Nielsen (1998) examined the impact of religious coping on health status in a population of medically ill hospitalized older adults. Although this study did not examine forgiveness directly, the authors reported negative attitudes towards God (i.e., a view of God as punishing or unforgiving) were related to greater depression and poorer quality of life. The relationships observed in our study between the forgiveness by God scale and the mental health variables appear inconsistent with the theoretical and empirical ideas of positive and negative religious coping.

Specific Aim 1.2

It was hypothesized that the W1 forgiveness scales would predict W2 forgiveness scales and W2 mental health. By conducting a series of cross-lagged path analyses, we were able to investigate the relationships between W1 forgiveness scales, W1 mental health, W2 forgiveness scales, and W2 mental health. There were no significant unconditional forgiveness or self-unforgiveness paths, suggesting that W1 unconditional forgiveness or W1 self-unforgiveness had no influence on mental health after 3 years (and vice-versa).

The results indicated that W1 unforgiveness significantly predicted W2 mental health, but W1 mental health did not predict W2 unforgiveness. These findings suggest that being unforgiving has a significant negative relationship with mental health after 3 years, but that initial mental health appears to be unrelated to unforgiveness after 3 years. An unforgiving state has been associated with rumination, resentment, hatred, anger, bitterness and fear. Furthermore, these negative emotions associated with unforgiveness, if sustained, can lead to mental health difficulties (Worthington et al., 2001; Witvliet, Ludwig, & Vander Laan, 2001; Toussaint & Webb, 2005). Because we found an effect of unforgiveness on mental health after 3 years, yet

we found no effect of forgiveness on mental health after 3 years, it is conceivable that the harms of unforgiveness are more impactful than the benefits of forgiveness.

The results also indicated that W1 mental health predicted W2 unconditional forgiveness by God, but W1 unconditional forgiveness by God did not predict W2 mental health. These findings suggest that W1 mental health is related to W2 unconditional forgiveness by God after three years, but W1 unconditional forgiveness by God is unrelated to W2 mental health after three years. Specifically, higher scores on the latent mental health factor corresponded with the belief in a more forgiving (less conditional) God. This finding is consistent with the “positive religious coping” literature, detailed above in the discussion for Specific Aim 1. However, we did not find that W1 forgiveness by God predicted W2 mental health, suggesting that mental health has a greater impact on forgiveness by God after 3 years, compared to the effect of forgiveness by God on mental health. This finding suggests that better mental health scores could impact the way one perceives the forgiving/unforgiving nature of God. Again, forgiveness by God is a relatively unstudied aspect of forgiveness, making it difficult to disambiguate these features in the results.

Specific Aim 1.3

It was hypothesized that forgiveness would predict change in mental health measures. The unconditional forgiveness, unconditional forgiveness by God, and the self-unforgiveness scales did not predict change in any of the mental health measures. We found that after controlling for demographic variables, unforgiveness predicted change in optimism, control, and life-satisfaction scores. Given the studies that connect depression and unforgiveness, we also expected unforgiveness to predict changes in depression. Toussaint and Webb (2005) have theorized that there is a direct relationship between unforgiveness and poor mental health,

including depression. Surprisingly, results indicated that there was no significant relationship between unforgiveness and change in depression. We did, however, find support for links between unforgiveness and positive affectivity, although few studies have reported on such connections. More common are studies of forgiveness (not unforgiveness) and positive psychological adjustment. For instance, forgiveness has been associated with increased kindness, empathy, life-satisfaction, and positive affect (Mazaheri, Nikneshan, Daghighzadeh & Afshar, 2015). The connections between less unforgiveness and increases in optimism, control and life satisfaction are interesting. It seems reasonable that if an individual experiences fewer of the negative emotions associated with unforgiveness, such as resentment and hatred, that they may be more likely to experience more positive emotions, such as optimism. However, this is a purely theoretic argument and connections between unforgiveness and positive affect are speculative. Additional research will be needed to clarify the relationships between decreases in unforgiveness and increases in positive affect.

In addition, given the extensive literature linking forgiveness and positive affect, it was surprising that unforgiveness was the only scale to predict changes in mental health measures. (As mentioned above, the forgiveness scale did not predict change in any of the mental health measures.) At the same time, the literature also suggests that the advantageous consequences of forgiveness are not necessarily related to forgiveness per se, but may be more closely related to the reductions in unforgiveness that follow a forgiving response (Witvliet et al., 2002). It is possible that the negative emotions associated with unforgiveness, especially if those emotions are sustained over time, may have a greater impact on mental health relative to the positive and or neutral emotions associated with forgiveness.

Specific Aim 2.1

It was hypothesized that forgiveness would be positively related to health, during W1 and W2. In addition, it was hypothesized that forgiveness would be inversely related to the cardiovascular risk factor (CVRF) index at W2. While there is a paucity of literature in this area, the evidence suggests that forgiveness is generally associated with better physical health (Lawler et al., 2004; Webb et al., 2010; Worthington et al., 2007). For instance, Worthington (2006) consolidated the empirical evidence and proposed that forgiveness was good for health, as forgiveness reduced stress, hostility, and rumination, and it increased positive pro-social emotions. Contrary to our expectations, W1 self-rated health was not correlated with any of the forgiveness scales. However, W2 self-rated health was correlated with unconditional forgiveness, such that higher scores on the unconditional forgiveness scale corresponded with better self-rated health.

In addition, the CVRF index was correlated with the self-unforgiveness scale, such that higher scores on this scale corresponded with higher scores on the CVRF index. A majority of the studies that have examined links between cardiovascular health and forgiveness have not specifically examined unforgiveness of self or others. For instance, studies have demonstrated links between greater levels of forgiveness and lower blood pressure (Larsen et al., 2012). Additionally, Friedberg and co-authors (2009) reported that for patients with heart disease, forgiveness was associated with a reduced risk of myocardial ischemia and lower cholesterol. Regarding unforgiveness in general, Sapolsky (2003) has theorized that chronic unforgiveness may be linked to chronic physiological arousal, which has the potential to lead to illness and/or exacerbate preexisting health conditions. Research has also indicated that grudge holding, an aspect of unforgiveness, can be accompanied by increased sympathetic nervous system reactivity (Witvliet et al., 2001). Our study did not support all of the unforgiveness/forgiveness health

links that we predicted to find. However, results did add to the current literature by highlighting the possible significant impact that feeling self-unforgiveness may have on cardiovascular health.

Specific Aim 2.2

It was hypothesized that after controlling for demographic and mental health variables, forgiveness scales would predict physical health. Our results did not support our initial hypothesis for W1; we found that all W1 forgiveness scales did not predict W1 self-rated physical health scores. However, a series of regression equations revealed that W2 unconditional forgiveness predicted self-rated health, after controlling for demographic variables and depression, control, optimism and self-esteem scores. In other words, greater W2 unconditional forgiveness scores were related to better self-rated physical health, above and beyond demographic variables, and all of the mental health variables.

Again, it was surprising that there was no relationship between unforgiveness and physical health. At the same time, much of the literature has not made the distinctions between forgiveness and unforgiveness, as was made in this study. Worthington and Wade (1999) have argued that forgiveness and unforgiveness are distinctive constructs. However, researchers often combine discrete elements of forgiveness and unforgiveness together (McCullough et al., 1998). Therefore, it is challenging to place this finding (and several other findings from this study) into the context of the broader literature, given that distinctions between forgiveness and unforgiveness have not always been made.

Specific Aim 3

It was hypothesized that our results would lend support for the emotional juxtaposition hypothesis (EJH). Specifically, we hypothesized that both forgiveness and unforgiveness would have indirect effects on physical health outcomes, mediated by the latent variables of positive

and negative psychological adjustment. To test this hypothesis, two models were created and compared. Model 1 included only indirect paths from forgiveness (unconditional forgiveness) and unforgiveness to physical health, via negative psychological adjustment (NPA) and positive psychological adjustment (PPA). Model 2 included the indirect paths described above, in addition to direct paths from forgiveness and unforgiveness to physical health.

Results from these analyses indicated that model 2, with both indirect and direct paths, was the best fit for the data. In some ways, our results were consistent with the EJH. The EJH argues that forgiveness has an impact on physical health in that forgiveness increases positive emotions and neutralizes the negative emotions associated with unforgiveness. In addition, the EJH conceptualizes unforgiveness as a stress response and argues that such stress has a direct impact on physical health (i.e., stress can reduce immune functioning). We found that a model that included direct paths from forgiveness and unforgiveness to physical health, in addition to indirect paths via positive and negative psychological adjustment, was the best fit for the data. Moreover, there were significant paths between forgiveness and PPA and PPA and physical health. Specifically, greater amounts of forgiveness predicted higher PPA scores, and higher PPA scores predicted fewer self-rated health concerns. There were also significant paths from unforgiveness to NPA and from NPA to physical health. Specifically, greater amounts of unforgiveness predicted higher NPA scores and higher NPA scores predicted more self-rated physical health concerns. The path from unforgiveness to PPA was also significant, but the path from forgiveness to NPA was not significant. The paths from forgiveness and unforgiveness to physical health revealed inverse relationships, such that greater forgiveness and greater unforgiveness were both predictive of fewer physical health concerns. This finding was surprising, as the EJH would predict that greater unforgiveness would be associated with more

(not fewer) physical health concerns. It is possible that our results are related to inadequacies in our measure of physical health, which asked participants simply to rate their overall health, to compare their health to their peers, to compare their current health to their health one year ago, and to rate their satisfaction with their health. It is conceivable that this self-rated health measure does not adequately capture the nuances of physical health in older adults. Also, it may be that the features of unforgiveness that are thought to be problematic for health, including grudge-holding and rumination, do not necessarily have a negative impact on self-rated health.

Another consideration, albeit inconsistent with the majority of the literature, is that unforgiveness may in fact offer benefits. Cosgrove and Konstram (2008) have stressed the possibility that certain expressions of forgiveness may not always be favorable. For example, Sandage et al. (2003) argued that forgiveness may be detrimental in certain situations, including tendencies to forgive based on an reluctance to recognize one's own anger or avoid confrontation. In this way, forgiveness has been conceptualized as an "immature defense mechanism" as opposed to an honorable and healthy characteristic (Cosgrove & Konstram, 2008). Along these same lines, it is conceivable that unforgiveness can denote a constructive form of coping? For instance, research has identified "engagement coping strategies" that are directed towards a stressor and "disengagement coping strategies," such as avoidance, denial and withdrawal, that are directed away from a stressor (Compas et al., 2001). Of relevance to our study, disengagement strategies have been linked to worse health status (Davey, Tallis & Hodgson, 1993). Therefore, unforgiveness could represent an engagement coping strategy, which in turn, could have benefits for health. Benefits of unforgiveness have not been identified or discussed empirically, as such, and additional investigation is needed to clarify these possible connections.

Significance and Implications

Our results highlight the connections between forgiveness and mental and physical health. Much of the research on forgiveness and mental health outcomes has occurred within the context of intervention studies, which do not provide evidence of relationships between forgiveness and outcomes in naturally occurring settings (Worthington, 2007). Our study adds to the literature by investigating naturally occurring forgiveness in a large national sample. In addition, using data from two time points separated by three years is of value, as few studies have examined longitudinal relationships between forgiveness, physical health and mental health.

Examined as a whole, this study provides some noteworthy insights into the nature of forgiveness and unforgiveness. First, we found different relationships between the four forgiveness scales and the physical health and mental health variables included in the study. The fact that there were differences amongst the forgiveness scales supports the complex, multi-faceted nature of forgiveness. In addition, there were some important distinctions that emerged between the forgiveness and unforgiveness scales, related to mental health and physical health. Unforgiveness was correlated with more mental health measures, compared to forgiveness. Cross-lagged path analyses indicated that W1 unforgiveness was related to W2 mental health, but no such relationships were found for forgiveness. Regressions controlling for demographic variables revealed that unforgiveness predicted change in mental health variables, whereas forgiveness did not. SEM analyses showed significant paths from unforgiveness to both positive and negative psychological adjustment; forgiveness was only significantly related to positive psychological adjustment. On the other hand, forgiveness was correlated with physical health, while unforgiveness was not correlated with physical health. Forgiveness (and not

unforgiveness) also predicted better physical health, after controlling for demographic and mental health variables. Taken together, this pattern of findings suggests that for older adults, unforgiveness may have a substantial impact on mental health, while forgiveness may promote better physical health.

Limitations

Our study relied on data from the Religion, Aging and Health survey. Therefore, we selected measures that were available through the survey. These measures may not necessarily have been based on the best empirical evidence. The measurement of most of the variables in this study was conducted with unstandardized instruments. It is possible that our pattern of findings would have been different if the measures used had better psychometric properties. Moreover, there are certain constructs relevant to our study, which were not assessed in the RAH. For instance, anger has been reported as a significant mediator between health and forgiveness, yet we could not examine this relationship in this study. Although there was several measures that assessed a range of aspects of positive affect (i.e., optimism, self-esteem, life-satisfaction) included in the survey, there were fewer measures that evaluated dimensions of negative affectivity. In this way, our analyses were somewhat limited, and comparisons between our study and other studies may be more difficult to make.

The RAH is based on self-report data, which are not always reliable. Specifically, the measure of self-reported health might not have been an adequate proxy for actual health status. In addition, some measures were not given at both time points (i.e., rumination) limiting the analytic usefulness of some of the measures included in our study. The study sample enrolled only older adults and only Christians and former Christians. Generalizability to members of other religious faiths and to other age groups may be limited.

Future Directions

Our study focused on forgiveness and physical and mental health in older adults. Future studies should replicate findings with more diverse populations. In addition, several researchers have discussed the associations between forgiveness and religion (i.e., Mullet et al., 2003; McCullough & Worthington, 1999). Theories suggest that religious faith wields a unique social pressure, such that individuals who have experienced a transgression feel more of an obligation to forgive, as forgiveness is seen as a desirable and faith-consistent response. The impact of religiosity was not explored in our study, but it should be a variable of interest in future investigations. A better understanding of the links between religion, specifically religious teachings and forgiveness, could help inform future psychoeducational interventions. If years of religious tradition are helping to shape forgiveness in ways that are advantageous, psychologists could benefit from applying similar secular strategies within the context of psychotherapy.

Forgiveness is a complex psychological process. However, our findings and much of the literature tend to discuss forgiveness in a simplified manner: forgiveness is good and unforgiveness is bad. This type of dichotomous thinking, common in psychology (Cosgrove & McHugh, 2000), may not capture some of the important nuances or dimensions associated with forgiving. Cosgrove and Konstam (2008) caution that forgiveness interventions, based on the current research, may encourage clients to conceptualize forgiveness as a dualistic construct (i.e., either you have it or you don't). In the end, this type of treatment may miss the mark, as important elements of the process of forgiveness are not addressed. Although admittedly challenging, future research should attempt to identify more specific process components associated with reaching forgiveness. A better understanding of the cognitive and emotional

aspects of the forgiveness/unforgiveness process may offer some significant insights relevant to treatment.

Finally, although some progress has been made, there is still a lack of consensus regarding the definition and measurement of forgiveness (Gangdev, 2009). Our study has emphasized the distinctions between various aspects of forgiveness (i.e., unforgiveness, forgiveness by God). Along similar lines, there may be important differences even within forgiveness domains. For example, some researchers have indicated that there are likely important distinctions between the expression of forgiveness and the experience of forgiveness (Worthington, 2007). Baumeister et al. (1998) also defined different types of forgiveness, describing “hollow forgiveness,” where forgiveness is spoken, but not experienced psychologically, and “silent forgiveness,” where forgiveness is experienced internally, yet never communicated to others. Future investigations should continue to refine and clarify the definition of forgiveness, as well as to elucidate various dimensions of the construct.

Table 1

Wave 1 Sample Characteristics (n =1,500)

	Mean (or %)	SD
Age	75	6.67
Gender		
Male	38.2% (n = 573)	
Female	61.8% (n = 927)	
Education		
Earned high school diploma	58.5% (n=887)	
Earned college degree	13.8% (n=207)	
Marital status		
Married	47.3% (n=710)	
Widowed	37.9% (n=569)	
Divorced	7.8% (n=117)	
Never married	4.5% (n=68)	
Separated	1.6% (n=24)	
Race		
White	48.5% (n = 728)	
Black	46.5% (n=698)	
Other/multiracial	5% (n= 39)	

Table 2

Wave 2 Sample Characteristics (n =1,024)

	Mean (or %)	SD
Age	77	6.19
Gender		
Male	25.3% (n = 380)	
Female	42.9% (n = 644)	
Marital status		
Married	31.8% (n=477)	
Widowed	27.5% (n=412)	
Divorced	5.5% (n=82)	
Never married	2.3% (n=35)	
Separated	1.1% (n=16)	
Race		
White	48.5% (n = 728)	
Black	46.5% (n=698)	
Other/multiracial	5% (n= 39)	

Table 3

Descriptive and Psychometric Characteristics of the Forgiveness Measures

Scale	Λ	Ordinal α	Loading
<i>Unconditional forgiveness</i>	5.60	.89	
Before I can forgive others, they must apologize to me for the things they have done.			.95
Before I can forgive others, they must promise not to do the same things again.			.97
Before I can forgive others, they must repay me or compensate me for what they have done.			.80
<i>Unforgiveness</i>	2.04	.78	
How often do you feel resentful towards other for the things they have done? ^{rc}			.70
How often do you hold a grudge? ^{rc}			.78
How often do you forgive other for the things they have done to you?			.61
How hard is it for you to forgive others? ^{rc}			.68
<i>Unconditional forgiveness by God</i>	1.55	.81	
In order to be forgiven by God, I must ask God to forgive me.			.66
In order to be forgiven by God, I must promise God that I will not make the same mistake again.			.82
In order to be forgiven by God, I must correct what I have done wrong.			.83
<i>Self-unforgiveness</i>	1.48	.77	
I still feel bad about things I have done in the past. ^{rc}			.45
I know there are people who still hold a grudge about things I have done in the past. ^{rc}			.88
I know there are people who still blame me for things I have done in the past. ^{rc}			.89

*Note: All items responses were on a 4 point Likert scale where 1= very often and 4= never. Items marked with an rc indicate items that were reverse coded, such that larger numbers consistently equaled larger amounts of the construct.

Table 4

W1 Listwise correlations between Forgiveness Scales and Mean Mental Health Scores (n=287)

	Unconditional Forgiveness	Unforgiveness	Unconditional Forgiveness by God	Self- Unforgiveness
Depression	-.12 <i>p</i> = .04	.12 <i>p</i> = .04	-.10 <i>p</i> = .08	.22 <i>p</i> < .001
Life Satisfaction	.21 <i>p</i> < .001	-.25 <i>p</i> < .001	-.08 <i>p</i> = .08	-.11 <i>p</i> = .04
Self-Esteem	.33 <i>p</i> < .001	-.29 <i>p</i> < .001	-.09 <i>p</i> = .12	-.12 <i>p</i> = .05
Control	.08 <i>p</i> = .14	-.21 <i>p</i> < .001	-.18 <i>p</i> < .001	-.03 <i>p</i> = .64
Optimism	.27 <i>p</i> < .001	-.32 <i>p</i> < .001	-.06 <i>p</i> = .25	-.11 <i>p</i> = .04

Table 5

W2 Listwise correlations between Forgiveness Scales and Mean Mental Health Scores (n=287)

	Unconditional Forgiveness	Unforgiveness	Unconditional Forgiveness by God	Self- Unforgiveness
Depression	.00 <i>p</i> = .99	.19 <i>p</i> < .001	-.02 <i>p</i> = .69	.25 <i>p</i> < .001
Life Satisfaction	.11 <i>p</i> = .05	-.24 <i>p</i> < .001	-.13 <i>p</i> = .01	-.01 <i>p</i> = .78
Self-Esteem	.27 <i>p</i> < .001	-.24 <i>p</i> < .001	.04 <i>p</i> = .43	-.16 <i>p</i> = .01
Control	.14 <i>p</i> = .01	-.13 <i>p</i> = .01	-.15 <i>p</i> = .01	-.08 <i>p</i> = .12
Optimism	.22 <i>p</i> < .001	-.28 <i>p</i> < .001	-.11 <i>p</i> = .05	-.19 <i>p</i> < .001
Rumination	.01 <i>p</i> = .82	.30 <i>p</i> < .001	-.10 <i>p</i> = .07	.46 <i>p</i> < .001

Table 6

Goodness of Fit Statistics for Lagged Forgiveness and Mental Health Models

	Lagged Model A	Lagged Model B	Lagged Model C
χ^2 (df)	315.571(100)	315.819(100)	315.562(99)
CFI	.943	.943	.942
AIC	13183.281	13183.529	13185.272
BIC	13409.889	13410.136	13416.237
RMSEA	.061	.061	.062
SRMR	.068	.068	.068
p-value from LR test against corresponding Model a			.92
p-value from LR test against corresponding Model b			.61

Table 7

Cross-lagged panel for Unconditional Forgiveness (Forgiveness) and Mental health Over Time

	Standardized coefficient	S.E.	<i>p</i> -value
W1 forgiveness → W2 mental health	.025	.049	.61
W1 mental health → W2 forgiveness	.004	.049	.92
W1 mental health → W2 mental health	.293	.05	.00
W1 forgiveness → W2 forgiveness	.311	.044	.00

Table 8

Goodness of Fit Statistics for Lagged Unforgiveness and Mental Health Models (n=567)

	Lagged Model A	Lagged Model B	Lagged Model C
χ^2 (df)	406.424 (131)	413.87(131)	379.79 (130)
CFI	.89	.89	.90
AIC	16174.79	16182.243	16175.29
BIC	16426.53	16433.984	16431.37
RMSEA	.061	.062	.061
SRMR	.059	.064	.059
p-value from LR test against corresponding Model a			.22
p-value from LR test against corresponding Model b			.002

Table 9

Cross-lagged Panel for Unforgiveness and Mental health Over Time

	Standardized coefficient	S.E.	<i>p</i> -value
W1 unforgiveness → W2 mental health	.19	.06	.00
W1 mental health → W2 unforgiveness	.07	.06	.21
W1 unforgiveness → W2 unforgiveness	.42	.06	.00

Table 10

Goodness of Fit Statistics for Lagged Forgiveness by God and Mental Health Models

	Lagged Model A	Lagged Model B	Lagged Model C
χ^2 (df)	265.04	261.43	261.18
CFI	.938	.939	.939
AIC	13862.269	13858.651	13860.402
BIC	14086.005	14082.387	14088.441
RMSEA	.055	.054	.055
SRMR	.052	.052	.052
p-value from LR test against corresponding Model a			.049
p-value from LR test against corresponding Model b			.61

Table 11

Cross-lagged panel for Unconditional Forgiveness by God and Mental Health Over Time

	Standardized coefficient	S.E.	<i>p</i> -value
W1 forgiveness God → W2 mental health	.026	.051	.62
W1 mental health → W2 forgiveness	-.10	.049	.04
W1 forgiveness by God → W2 forgiveness by God	.39	.046	.00

Table 12

Goodness of Fit Statistics for Lagged Self-Unforgiveness and Mental Health Models

	Lagged Model A	Lagged Model B	Lagged Model C
χ^2 (df)	258.48(100)	257.83(100)	257.67(99)
CFI	.920	.92	.919
AIC	10041.203	10040.554	10042.401
BIC	10247.041	10246.392	10252.197
RMSEA	.064	.064	.064
SRMR	.063	.062	.062
p-value from LR test against corresponding Model a			.37
p-value from LR test against corresponding Model b			.69

Table 13

Cross-lagged Panel for Self-unforgiveness and Mental Health Over Time

	Standardized coefficient	S.E.	<i>p</i> -value
W1 self- unforgiveness → W2 mental health	.02	.06	.76
W1 mental health → W2 self- unforgiveness	.01	.06	.95
W1 mental health → W2 mental health	.30	.06	.00
W1 self- unforgiveness → W2 self-forgiveness	.32	.05	.00

Table 14

Listwise correlations between Forgiveness Scales and Mean Physical Health Scores (n=352)

	Unconditional Forgiveness	Unforgiveness	Unconditional Forgiveness by God	Self- Unforgiveness
W1 Physical Health	-.09 <i>p</i> = .11	.01 <i>p</i> = .89	-.02 <i>p</i> = .66	.00 <i>p</i> = .93
W2 Physical Health	-.11 <i>p</i> = .03	-.00 <i>p</i> = .96	.03 <i>p</i> = .48	.02 <i>p</i> = .71
W2 CVRF Index	.01 <i>p</i> = .76	.09 <i>p</i> = .08	.00 <i>p</i> = .98	.15 <i>p</i> < .001

Table 15

Goodness of Fit Statistics for Models testing the Emotional Juxtaposition Hypothesis

	Measurement Model	Model 1	Model 2
χ^2 (df)	344.35(109)	494.418(112)	468.275(110)
CFI	.95	.919	.924
AIC	14004.406	14148.472	14126.328
BIC	14284.749	14415.027	14402.075
RMSEA	.054	.068	.067
SRMR	.044	.077	.070
p-value from LR test against Model 1			.00

Figure 1: Cross-Lagged Models

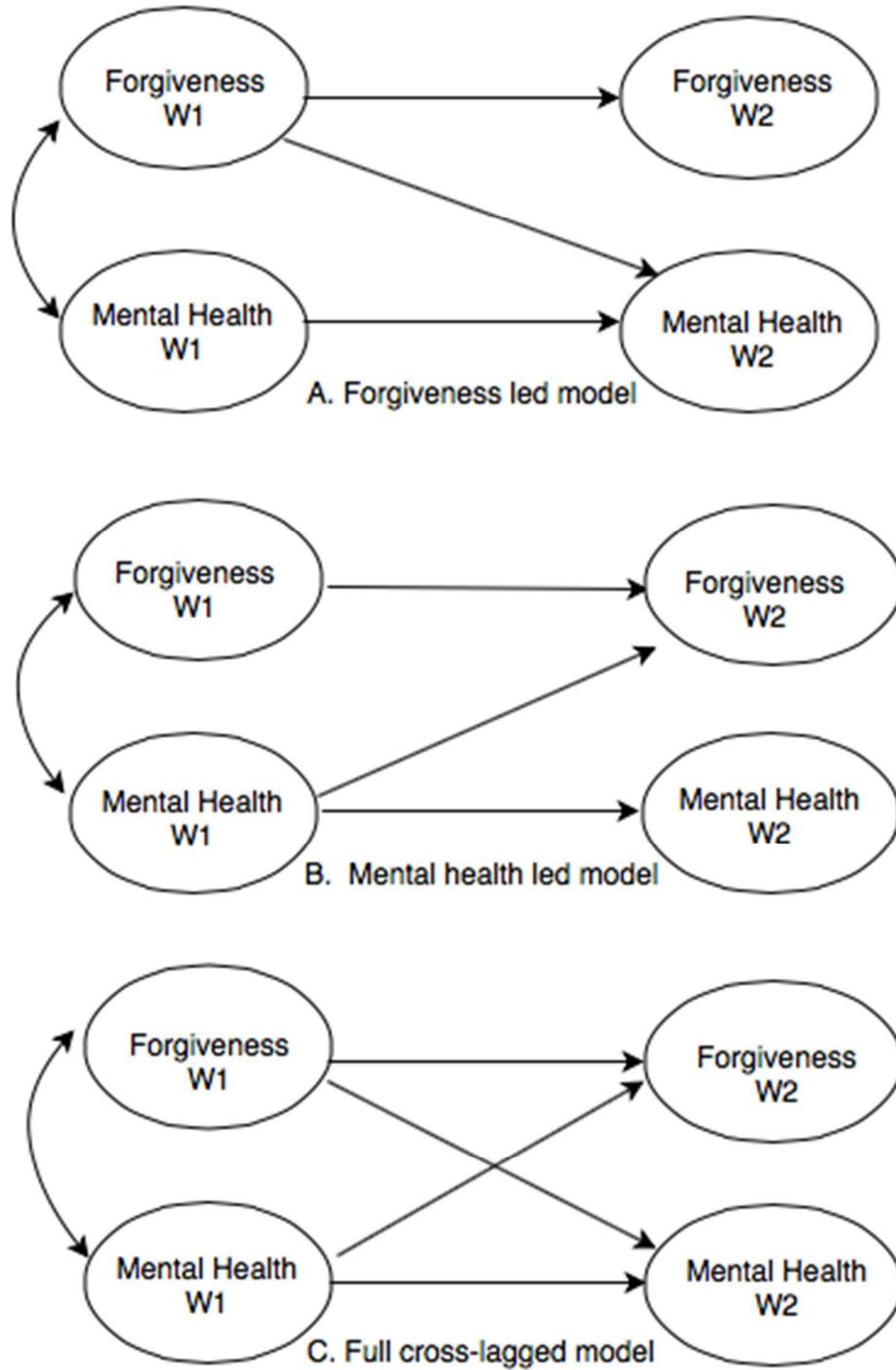
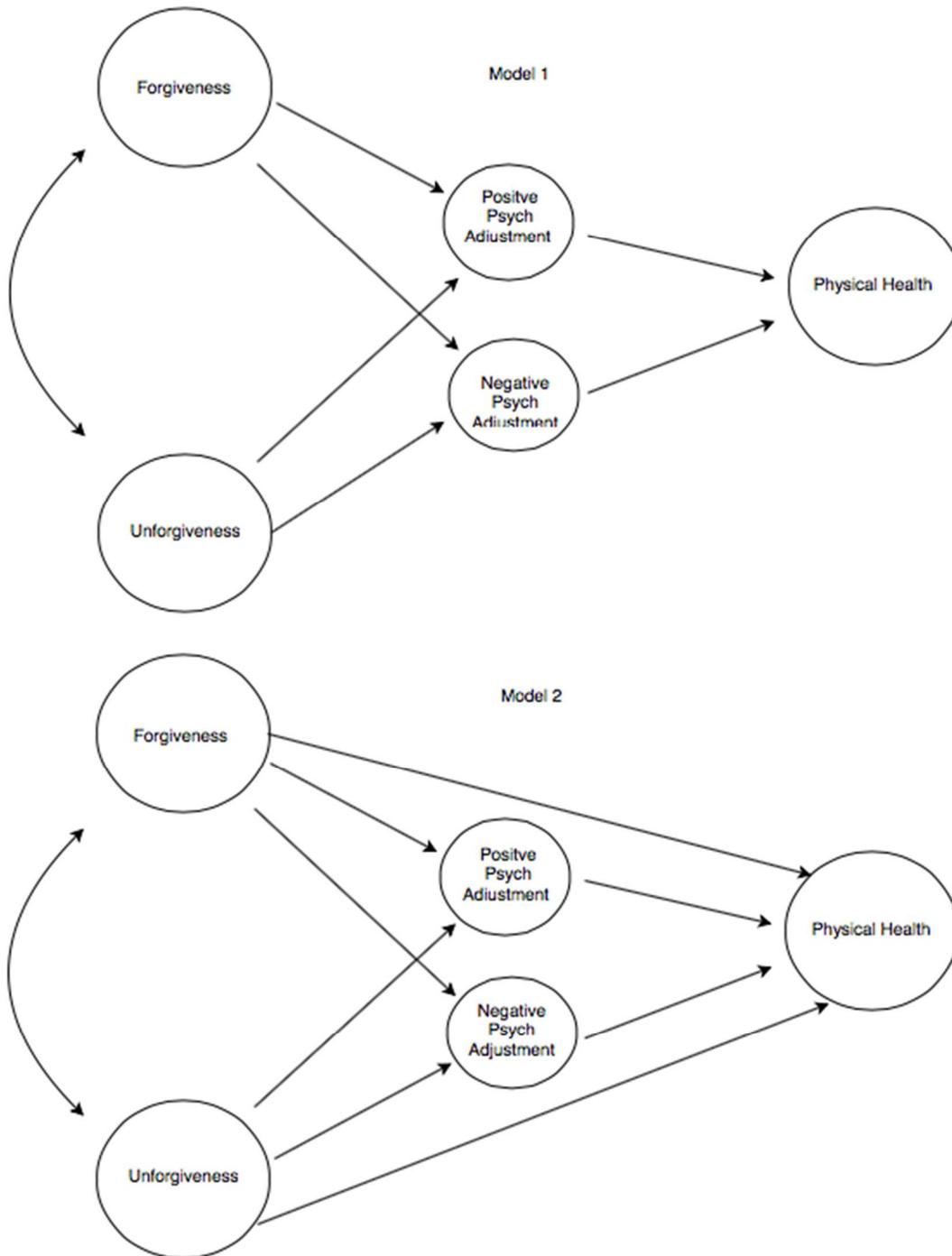


Figure 2: SEM Models used to Test the Emotional Juxtaposition Hypothesis



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ABSTRACT**FORGIVENESS, HEALTH, AND PSYCHOLOGICAL ADJUSTMENT IN OLDER ADULTS**

by

EMILY E. STANDISH**May 2016****Advisor:** Dr. John L. Woodard**Major:** Psychology (Clinical)**Degree:** Doctor of Philosophy

The overarching goal of this dissertation was to examine the relationships between forgiveness and physical and emotional outcomes in older adults. Data for the analyses was from the Religion, Aging, and Health Survey, a nation wide probability survey of older adults. Data were collected at two time points separated by three years, wave 1(W1) in 2001 and wave 2 (W2) in 2004. The main measures used in the analyses included four forgiveness scales (unconditional forgiveness, unforgiveness, unconditional forgiveness by God, and self-unforgiveness), five mental health measures (self-esteem, life-satisfaction, optimism, depression, feelings of control, rumination), a self-rated physical health measure, and a cardiovascular risk factor index.

The first aim of this study included investigating relationships between the four forgiveness domains and mental health variables. At W1 the unconditional forgiveness scale was correlated with depression, life-satisfaction, self-esteem, and optimism; at W2 unconditional forgiveness was correlated with self-esteem, control and optimism. At W1 and W2 unforgiveness was correlated with depression, life-satisfaction, self-esteem, control and optimism; W2 unforgiveness was correlated with rumination. At W1 unconditional forgiveness

by God was correlated with control; at W2 unconditional forgiveness by God was correlated with life-satisfaction and control. At W1 self-unforgiveness was correlated with depression, life-satisfaction, and optimism; at W2 self-unforgiveness was correlated with depression, self-esteem, optimism, and rumination. Cross-lagged path analyses revealed that W1 unforgiveness predicted W2 mental health and W1 mental health predicted W2 unconditional forgiveness by God. A series of hierarchical regressions, controlling for demographic variables, indicated that unforgiveness predicted three-year change in average optimism, average control and average life-satisfaction scores.

The second aim of this study included investigating relationships between the four forgiveness domains and physical health variables. W2 forgiveness was correlated with self-rated physical health and self-unforgiveness was correlated with the cardiovascular risk factor index. A series of hierarchical regressions, controlling for demographic variables and each mental health variable in turn indicated that unforgiveness predicted physical health, above and beyond self-esteem, optimism, depression, and control scores.

The third aim of this study included investigating the emotional juxtaposition hypothesis (EJH). Structural equation modeling revealed that a model that contained both direct paths from unforgiveness and forgiveness to physical health, as well as indirect paths from unforgiveness and forgiveness to physical health via positive psychological adjustment and negative psychological adjustment was the best fit for the data. In general, our results were consistent with the EJH, however there were inverse relationships between both unforgiveness and forgiveness and physical health.

Results from our study indicate that there are connections between forgiveness domains and mental health and physical health in a sample of older adults. Forgiveness was more

consistently related to mental health variables, whereas unforgiveness was more consistently related to physical health variables. Implications of these findings are discussed.

AUTOBIOGRAPHICAL STATEMENT

Emily E. Standish received her Bachelor of Arts at the University of North Carolina at Wilmington. During her undergraduate career, she became involved in several areas of research, including the long-term cognitive consequences of cardio-pulmonary bypass surgery and animal models of fluoxetine induced hippocampal neurogenesis. After completing her undergraduate degree, she spent four years providing clinical services to children with autism and juvenile offenders. In 2008, she moved to Detroit, Michigan to pursue a Ph.D. in Clinical Psychology at Wayne State University. While at Wayne State University, she was a member of John L. Woodard's laboratory, where she studied neuropsychology and cognitive impairment in older adults.