

## Forgiveness, physiological reactivity and health: The role of anger

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### Abstract

Research has revealed that forgiveness may have beneficial effects for the forgiver's health. The present research explored whether reductions in anger underlie such effects, or whether forgiveness has beneficial health effects above and beyond the effects of decreasing anger. State and trait forgiveness were examined, along with styles of anger expression, for their relationship to physiological responses during recalled betrayal, and to self-reported health indices. State and trait forgiveness were negatively associated with anger-out; however, with one exception, no other styles of anger expression were linked with forgiveness. Both forgiveness and anger-out were associated with systolic blood pressure, heart rate and rate-pressure product. Partial correlations revealed that trait forgiveness accounted for significant variance in mean systolic blood pressure and rate-pressure product, and state forgiveness predicted mean heart rate, even after gender and anger-out had been controlled. On the other hand, anger-out fully mediated the trait forgiveness–heart rate and state forgiveness–rate pressure product effects. Trait forgiveness was significantly associated with fewer medications and less alcohol use, lower blood pressure and rate pressure product; state forgiveness was significantly associated with lower heart rate and fewer physical symptoms. Neither of these sets of findings were the result of decreased levels of anger-out being associated with forgiveness. These findings have important theoretical implications regarding the forgiveness–health link, suggesting that the benefits of forgiveness extend beyond the dissipation of anger.

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### 1. Introduction

Forgiveness has become an important area of research in positive psychology, with proposed beneficial implications for both mental and physical well-being. While there are religious (Cohen et al., 2005) and philosophical (Lamb and Murphy, 2002; Murphy, 2003) arguments for and against forgiveness, the psychological literature has focused on the benefits associated with forgiveness. Several recent volumes have summarized the status of research on forgiveness (e.g., Worthington, 2005;

Enright and Fitzgibbons, 2000; McCullough et al., 2000; Peterson and Seligman, 2004); two key assumptions of this research are first, that forgiveness has important connections to physical health, and second, that this relationship is mediated by the associations between lack of forgiveness and anger. However, there is scarce empirical evidence for both of these assumptions. The goal for the present research is twofold. First we seek to provide further evidence for the claim that forgiveness may positively affect physical health. Second, we will more closely examine the role of anger in the association between forgiveness and health, an issue which has rarely been addressed explicitly.

While a formal definition of forgiveness is still evolving (Lawler-Row et al., 2007), there is consensus that two primary processes underlie forgiveness: (1) letting go of one's right to resentment and negative judgment and (2) fostering undeserved compassion and generosity toward the perpetrator (Enright,

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1991). Letting go of one's right to resentment may be expressed as a reduction in negative emotions, such as anger, behaviors (Worthington, 2001), such as revenge, or thoughts (Thoresen et al., 2000), such as rumination. Fostering undeserved compassion involves increasing positive feelings and thoughts and may include reconciliation. Within both processes, more research has focused on emotions, either positive or negative, than thoughts or behaviors; furthermore, more emphasis has been placed on letting go of negative affect than on fostering positive affect.

### 1.1. *Forgiveness and health*

Evidence for a connection between forgiveness and health is accumulating. Seybold et al. (2001) found that lower forgiveness was associated with poorer health habits, such as alcohol and cigarette use, as well as with lower hematocrit levels. Similarly, Lawler et al. (2003) found a negative correlation between state forgiveness (i.e., level of forgiveness regarding a specific offense) and self-reported symptoms of physical illness in young adults. In addition, examination of a sample of community adults (Lawler et al., 2005) found strong negative correlations between both state and trait forgiveness and physical symptoms, numbers of medications taken, poor quality of sleep, fatigue and somatic symptoms. Finally, in a sample of adults over 55 years of age, trait forgiveness was associated with higher levels of healthy behaviors (Lawler-Row and Piferi, 2006), while in a group of college women, both state and trait forgiveness were associated with decreased smoking behavior. In sum, both state and trait forgiveness have been linked to healthier behaviors and fewer symptoms of illness.

Rather than health or healthy behaviors, a number of studies have examined physiological correlates of forgiveness, as a mechanism by which forgiveness could have a variety of health impacts (see Manuck, 1994; Pickering, 1996 for justification). Witvliet et al. (2001) reported the first empirical study of the physiological correlates of forgiveness. When participants imagined responses to a real betrayal event, forgiveness imagery was accompanied by smaller corrugator EMG, skin conductance, heart rate and mean arterial pressure increases from baseline than grudge-holding or rumination imagery. While Seybold et al. (2001) found that forgiveness was not associated with resting blood pressure, facial EMG, heart rate or immune cell levels, Lawler et al. (2003) found associations between both state and trait forgiveness and resting blood pressure.

In the Lawler et al. (2003) study, physiological responses were measured during two interviews of recalled betrayal experiences, one with a parent and one with another relationship partner. Acute reactivity differences were found for mean arterial pressure during the parent interview: individuals with both low trait and state forgiveness scores had the highest mean arterial pressure and rate-pressure product responses, both during the interview and afterward, during a recovery interval. In 2005, Lawler et al. found that low trait forgiveness was linked to higher rate-pressure product during a single interview (specification of offender left to participant). Recently, Friedberg et al. (2007) examined cardiovascular responses, including impedance cardiography variables, during both interpersonal

(anger recall) and standard (mental arithmetic) laboratory stressors. Employing Mauger et al.'s (1992) Forgiveness of others (FOO) scale, they found no reactivity differences between high and low forgivers; however, all participants fell in the range normally associated with high forgiveness scores (participants were volunteering for a study on the effects of yoga or aerobics exercise). Thus, the range of forgiveness scores may have limited their ability to identify reactivity differences during anger recall. While FOO was inversely correlated with baseline diastolic blood pressure, they found no differences in myocardial or vascular response levels. Overall, the preponderance of evidence supports the contention that both state and trait forgiveness tend to be positively correlated with healthier physiological responses, as measured by various cardiovascular responses.

### 1.2. *Mechanisms linking forgiveness to health*

Lacking direct evidence, the status of empirical research linking forgiveness to physical health (see Witvliet, 2001) was originally based primarily upon the well-tested associations between anger, hostility, Type A behavior and health (e.g., Barefoot et al., 1983; Booth-Kewley and Friedman, 1987; Smith, 1992; Linden et al., 1997; Miller et al., 1996; Williams, 1987). Assuming that forgiveness and anger–hostility–aggression are polar opposites, with the latter sometimes labeled unforgiveness (e.g., Worthington et al., 2001; Harris and Thoresen, 2005), the conclusion of expecting benefits from forgiveness was logically deduced from the literature on anger, hostility and health. In fact, Kaplan (1992) wrote that forgiveness was an important antidote to hostility; he suggested that forgiveness might promote coronary health by reducing the adverse physical effects of sustained anger and hostility. Similarly, Witvliet et al. (2001) noted that chronic, unforgiving responses perpetuate anger, heightening sympathetic arousal and cardiovascular reactivity. The expression of anger was proposed to lead to chronically elevated blood pressure, especially if the expressions of anger were frequent and enduring. However, Lawler et al. (2003) found no direct relationship between forgiveness and hostility, even when forgiveness was measured by a revenge subscale (McCullough et al., 2001). On the other hand, Lawler et al. (2005) examined several mediation models linking forgiveness (both state and trait) to symptoms of physical illness. Both reductions in stress and negative affect (anxiety, anger, depression) were found to mediate the forgiveness–health relationships.

Several studies have examined the associations between forgiveness and anger with both positive and mixed results. Using three or four unspecified items for both forgiveness and anger, Weiner et al. (1991) found that confession was associated with both forgiveness and decreased angry feelings toward the offender. Huang (1995) found that groups differing on levels of forgiveness maturity also differed on anger; however, Huang and Enright (2000) found no association between forgiveness levels and anger expression. Four studies have found that three different measures of forgiveness were associated with trait anger (Seybold et al., 2001; Berry and Worthington, 2001; Berry et al., 2005). In each case, higher

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