

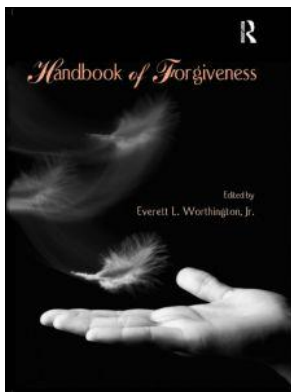
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Handbook of Forgiveness

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Unforgiveness, Forgiveness, and Justice: Scientific Findings on Feelings and Physiology

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Chapter Eighteen

Unforgiveness, Forgiveness, and Justice: Scientific Findings on Feelings and Physiology

Charlotte vanOyen Witvliet

Interpersonal hurts and offenses affect nearly everyone. Whether committed intentionally or unintentionally, between loved ones or strangers, transgressions can arouse strong and negative emotions connected to guilt and shame in transgressors, and sadness, fear, and anger in victims. These emotions can emerge as an amalgamation of hurt-filled bitterness, or unforgiveness. Transgressors are faced with the decision of whether to apologize and seek forgiveness. Even if never asked, victims are faced with the question of what to do about their unforgiveness. Some may seek to override their pain by stoking the fires of revenge; others may try to reduce their unforgiveness as they accept that bad things happen even to good people, tolerate it, minimize it, ignore it, excuse it, or forbear it. Alternatively, victims can also choose two potentially complementary options to respond to the injustice and reduce their attendant unforgiveness: They can pursue justice, and they can grant forgiveness. In this chapter, I address the peripheral physiological patterns—of facial muscles, skin conductance, and cardiovascular measures—associated with unforgiveness, forgiveness, and justice, organizing the accumulated data patterns within a framework of emotion.

VIEW OF UNFORGIVENESS, FORGIVENESS, AND JUSTICE

Interpersonal offenses often generate perceptions of injustice. Whether these offenses are betrayals, insults, or crimes, victims can experience a discrepancy between the way things are and the way they ought to turn out. Worthington (2003) has termed this an *injustice gap*, noting that it is charged with negative emotions that can coalesce as unforgiveness. Among the means of reducing the injustice gap and its associated unforgiveness are, in theory, justice outcomes that reduce the size of the remaining gap and forgiveness that can bridge the gap by juxtaposing positive emotions against negative emotions incurred by the injustice. Justice is important for holding offenders

accountable for their actions and preventing further societal harm. Restorative (cf. retributive) justice approaches further attend to the rights and needs of victims as well as offenders, often through a mediation process that maximizes the potential to arrive at mutually beneficial outcomes (chapter 29 by Hill, Exline, & Cohen and chapter 30 by Armour & Umbreit). Forgiveness carries with it the implication that its target is to blame for having caused harm, involves holding the offender accountable, and may still require justice-oriented interventions for the offender. Against this backdrop—and sensitive to first ensuring the victim's emotional, physical, and spiritual safety—forgiveness involves cultivating positive prosocial responses (e.g., empathy and desiring genuine and ultimate good) toward the offender so that victims eventually edge out the hurt and bitter emotions of unforgiveness.

Because forgiveness involves so many types of shifts— affective, behavioral, cognitive, social, spiritual, and physiological—it is valuable to view forgiveness and related constructs through a lens that can least interact with aspects of these multiple dimensions. My own approach is to situate research on the psychophysiological correlates of unforgiveness, forgiveness, and justice within a broad view of emotion that emphasizes the active response elements of emotion and integrates affective, attentional, and motivational functions. This view is sympathetic to Lang's (1979, 1995) bioinformational theory, which emphasizes that verbal/cognitive, behavioral, and physiological responses are inherent to emotion. It also is consonant with Thayer and Lane's (2000) dynamic systems neurovisceral integration model that further integrates affective, attentional, motivational, and physiological functions.

Furthermore, these theories and empirical investigations of psychophysiology and emotion have emphasized the importance of two dimensions of emotion that organize verbal/cognitive and physiological expressions in response to a broad range of stimuli (Faith & Thayer, 2001). These dimensions are valence (extending from negative to positive) and arousal (ranging from deactivated to highly activated).¹ Within this two-dimensional space, a variety of emotion categories can be situated, recognizing that even within categories, shifts in valence and arousal may occur from time to time. For example, both fear and anger (and unforgiveness) might occupy a negative and activated part of the valence \times arousal space, whereas pleasant relaxation and peace (and forgiveness) might be situated in a positive and calmer part of the state-space, although shifts in their precise valence and arousal qualities may vary across particular experiences within each emotion, anticipations of them, and ruminations about them.

REVIEW OF THE LITERATURE

Studies of Victims Using Their Autobiographical Offenses

Unforgiveness Versus Forgiveness: State Effects in Victims. Based on basic research linking the valence and arousal of *emotional imagery* to patterns of facial EMG, skin conductance, and heart rate (e.g., Witvliet & Vrana, 1995), Witvliet, Ludwig, and Vander

Laan (2001) tested hypotheses about the physiological response patterns that would occur when 71 (36 men and 35 women) college students each adopted two states of unforgiveness (i.e., rumination about the transgression; nursing a grudge toward the offender) versus two states of forgiveness toward a particular real-life offender (cultivating empathy for the offender; forgiving the offender by finding a way to genuinely wish him or her well while releasing hurt and angry emotions). Witvliet et al. (2001) adapted methods used in basic research on emotion and continuous physiology. In a within-subjects design, each participant imagined each of the four types of imagery eight times (32 trials total with continuous physiology), counterbalancing condition orders. For each measure, physiological reactivity during each imagery and recovery trial was calculated by subtracting that measure's values during each trial's 4-s pre-trial baseline from the 16-s imagery trial and 8-s recovery period means.

As predicted, the unforgiving imagery evoked higher arousal and more negative valence ratings, compared with the forgiving imagery. Consistent with the high arousal ratings, unforgiving imagery was associated with higher levels of tonic eye muscle tension (orbicularis oculi [eye] EMG) during imagery and higher heart rate and skin conductance-level scores (indicating sympathetic nervous system activation) during both imagery and recovery periods. Consistent with the negative valence of unforgiving imagery (versus the positive valence of forgiving imagery), participants showed more brow muscle tension (corrugator [brow] EMG) during imagery and recovery periods. Although blood pressure has not been specifically measured in reference to valence and arousal, heightened blood pressure has been linked to state and trait anger, which may be characterized as aroused and negatively valent. Witvliet et al. (2001) found that systolic blood pressure (SBP; during the middle of imagery), diastolic blood pressure (DBP), and mean arterial pressure (MAP) were all significantly higher during unforgiving versus forgiving imagery.

State and Trait Effects. Consistent with these findings, Lawler et al. (2003) found cardiovascular benefits of both trait and state forgiving in 108 (44 men and 64 women) college students. Higher trait forgivingness was associated with lower SBP, DBP, and MAP (when values for each measure were averaged across baseline, three time periods during the parent conflict and peer/partner conflict interviews, and two time periods during recovery from each type of interview). Lower state unforgivingness (i.e., using the Transgression-Related Inventory of Motivations [TRIM]; McCullough et al., 1998) and higher state forgiveness for both parent and peer/partner were associated with lower SBP, DBP, MAP, heart rate, and rate pressure product (SBP \times heart rate, an indicator of myocardial oxygen demand and stress). Lawler et al. (2003) also assessed the interaction of trait and state forgiveness variables on physiology during the two types of conflict interviews and the subsequent recovery periods, covarying baseline values. For an interview about a salient memory of conflict with a parent or primary caregiver, high trait forgivers had the least reactivity and best recovery patterns for SBP, DBP, and MAP, rate pressure product, and forehead EMG; low trait forgivers in unforgiving states had the highest levels of cardiovascular reactivity and poorest recovery patterns. When

the same participants were interviewed about a conflict with a friend or partner, the only significant effect was that women who were high in state forgiving showed smaller increases in rate pressure products than did the low state-forgiving women. In the subsequent recovery period, high trait forgivingness was associated with lower blood pressure for DBP and MAP. Lawler et al. further found that the physiological measures were unrelated to stress or hostility in their study. Path analyses indicated that trait forgivingness predicted state forgiveness; higher state forgiveness and lower hostility predicted lower stress levels, which in turn predicted lower self-reported illness.

In an interview study, Toussaint and Williams (2003) measured blood pressure in a diverse sample of 100 Midwestern community residents (25 in each cell: 2 SES [high, low] \times 2 race [Black, White]; with participant sex almost evenly divided across cells). Across participants, higher levels of total forgiveness (i.e., a composite of forgiveness of others and self, plus feeling forgiven by God) were associated with lower resting DBP. High SES White participants showed lower resting DBP for total forgiveness and, specifically, forgiveness of *self*. By contrast, low SES Blacks showed lower resting DBP with higher forgiveness of *others*, and lower resting cortisol levels with higher levels of total forgiveness, forgiveness of *others*, and perceived *divine* forgiveness. When assessing blood pressure for all participants at baseline, at two points during a 10-minute interview about “a time when you were treated unfairly” and a 5-minute recovery period, Toussaint and Williams found that being forgiving toward others and feeling God’s forgiveness were each associated with lower raw blood pressure values during the interview.

Intervention-Induced Forgiveness Effects in Victims. Waltman (2003) examined how learning to forgive influenced cardiovascular variables over time in 17 middle-aged and elderly men with coronary artery disease. Waltman contrasted those in a 10-week individualized program using an Enright forgiveness intervention to patients in a treatment program addressing the impact of their disease. At pretreatment, post-treatment, and a follow-up another 10 weeks after treatment, patients engaged in anger-recall tasks, focusing on a past real-life hurt, followed by measures of myocardial perfusion, heart rate, and blood pressure. The available abstract for this dissertation reports that comparing pretreatment to 10-week follow-up, patients who completed the forgiveness intervention versus the standard program had significantly better results for anger-induced myocardial perfusion defects. Waltman surmised that it took time for the psychological adjustment involved in forgiving to become evident on this cardiac measure.

Forgiveness Motivation Effects in Victims. Whereas the other forgiveness and physiology studies used United States samples, Huang and Enright (2000) studied Taiwanese community members. Blood pressure was assessed in 22 matched pairs of men and who tended to forgive, out of either obligation or moral love. When interviewed about a typical day, the groups did not differ in their blood pressure cuff measurements. When interviewed about a past experience with conflict, however, those with obligation-oriented

versus unconditional-love forgiveness motives showed differences on 3 of 12 raw blood pressure comparisons. Obligation-oriented forgivers had higher raw SBP at the beginning of the interview and higher raw SBP and DBP 1 minute into the interview, relative to unconditional-love forgiveness motives. The groups did not differ on self-reported anger, but the obligation forgivers cast down their eyes and showed more masking smiles, which the authors interpreted as signs of hidden anger.

Trait Unforgiveness, Forgiveness Toward Others, and Resting Physiology. In an exploratory study, Brenneis (2001) assessed correlations between single raw SBP and DBP blood pressure cuff recordings and their revenge, avoidance, and generally positive statement (i.e., TRIM, McCullough et al., 1998) scores for 175 male clergy recovering from substance dependence or compulsive behavior disorders. Unexpectedly, higher avoidance scores and lower positive statements scores were significantly associated with lower SBP and DBP blood pressures. Perhaps the clergy with more “favorable” scores forgave from obligation rather than genuine moral love (see Huang & Enright, 2000). The results may also be due to other person variables that were not measured (e.g., substance abuse and compulsive behaviors associated with blood pressure), environmental variables (e.g., the context of measurement in the continuing care program), or person X environment variables (e.g., perhaps those who felt obligated to forgive or to present themselves favorably were also more anxious or angry in the continuing care program, thereby increasing their blood pressure). Alternatively, these results may be spurious, reflecting high levels of error variation in the single baseline blood pressure measurements.

In another exploratory investigation, Seybold, Hill, Neumann, and Chi (2001) assessed 68 (12 women, 46 men) Veterans Administration Medical Center and university participants. They correlated Mauger et al.’s (1992) scales of difficulty forgiving oneself, others, and a combined score with a single measure of corrugator EMG and BP obtained at 30 minutes into a period of rest.² Given that for each physiological measure, only one data point was obtained (similar to Brenneis’ methods), and only at baseline rest, it is not surprising that no statistically significant relationships were found.³

Studies of Victims Using Scenario-Based Offenses

The previously discussed research on victims focused on autobiographical offenses, often measuring physiological responses during emotional imagery or interviews about them. Another method is to assess physiology during imagery about offenses described in scripted scenarios. This approach enables us to investigate justice-related outcomes that for procedural and/or ethical reasons we cannot investigate *in vivo*. The use of standardized scripts of scenarios also improves internal validity by standardizing—to the extent that it is possible—the content of participants’ imagery. The benefits of improved internal validity are offset, however, by costs to external validity (e.g., the standard images may not be similar to other real-life offenses or

to the experiences of some participants). The following justice-related studies used scenario-based imagery (much like a substantial portion of basic research on emotion and psychophysiology; see Witvliet & Vrana, 1995). The imagery paradigm parallels that used by Witvliet et al. (2001).

Granting Forgiveness in Response to an Apology and Restitution. Examining interpersonal forgiveness, empathy, and unforgiveness as dependent variables, Witvliet, Worthington, and Wade (2002) conducted a within-subjects psychophysiology study of college students ($N = 61$; 29 women, 32 men). They imagined four different outcomes to a scenario in which their residence was burglarized: The offender later apologized, made restitution, both, or neither (2 Apology \times 2 Restitution design). Both a strong apology and restitution reliably reduced unforgiveness and increased empathy and forgiveness. Each also had emotional benefits, including reduced arousal, more positively valent emotion, and reduced corrugator EMG reactivity. The apology alone reliably ameliorated orbicularis oculi EMG and heart rate reactivity—consistent with lower emotional arousal reports—and improved rate pressure product reactivity and recovery patterns associated with lower stress.

Granting Forgiveness in Response to No Justice, Punitive Justice, and Restorative Justice Outcomes. Using the same burglary scenario, Witvliet, Root, Sato, and Ludwig (2003) conducted another within-subjects imagery study ($N = 56$; 29 women, 27 men college students) crossing three justice outcomes (no justice, punitive justice, restorative justice) with 2 forgiveness responses (granted, not). Echoing data patterns for an autobiographical offense (Witvliet et al., 2001), imagery of granting (vs. not granting) forgiveness to a fictitious burglar reduced arousal and prompted more positively valent emotion ratings. Consistent with lower arousal levels, orbicularis oculi EMG was lower during forgiveness imagery (as long as the no-justice outcome occurred), and heart rate scores were lower both during imagery and recovery periods. Consistent with its more positive valence, corrugator brow tension levels were lower during forgiveness imagery.

The general pattern of justice effects was that across no justice to punitive justice to restorative justice; unforgiving motivations and anger systematically decreased; and empathy, forgiveness, and positive emotions increased. Furthermore, the reported benefits of the restorative justice condition were similar to those associated with forgiveness imagery. The physiology results indicated two significant justice effects that emerged when forgiveness was not imagined. Skin conductance-level scores were lower—suggesting less sympathetic nervous system activation—during imagery of restorative justice, compared with punitive justice. Rate pressure products were also lower—suggesting lower stress levels—for punitive justice versus no-justice imagery and recovery periods.

Studies of Transgressors Using Their Autobiographical Offenses

As a complement to victim research, Witvliet, Ludwig, and Bauer (2002) conducted a within-subjects psychophysiology imagery study of 40 (20 women, 20 men) college students who reflected on a particular transgression they previously committed. The study compared the effects of ruminating about one's transgression with seeking forgiveness, then compared the effects of three possible responses they could receive from their real-life victims: begrudging, forgiving, or reconciling.

Compared with ruminations about one's transgression or an unforgiving response from the victim, imagery of forgiveness-seeking and merciful responses from victims (forgiveness and reconciliation) prompted improvements in basic emotions (e.g., sadness, anger), moral emotions (e.g., guilt, shame, gratitude, hope), and greater perceived interpersonal forgiveness. Imagery of forgiveness-seeking and of victims' merciful responses prompted less furrowing of the brow muscle (corrugator EMG) associated with negative emotion. Imagery of merciful responses from one's victim also increased smiling activity (zygomatic EMG), consistent with the positive and interpersonal nature of the imagery. Autonomic nervous system measures were largely unaffected by imagery, although skin conductance data suggested greater sympathetic nervous system engagement when victims reconciled with transgressors. When considered in combination with the studies of forgiveness in victims, these data suggest that when it comes to physiological patterns and forgiveness, *it is even better to give than to receive* forgiveness.

SUMMING IT UP: WHAT DOES THE EXTANT EVIDENCE TELL US?

Schwartz et al. (2003) have proposed that lab studies of cardiovascular reactivity often do not generalize well to real life unless they employ tasks that mirror daily life (e.g., recalling, retelling, imagining), aggregate repeated measures across tasks, and measure physiology before, during, and after the conditions of interest. Of the studies reviewed here, those with designs closest to Schwartz et al.'s (2003) ideals show self-report, cardiovascular reactivity, and facial EMG patterns that reliably distinguish unforgiving responses toward others (as a state or trait) as generating more negative and aroused affect and greater reactivity and prolonged activation than do forgiving responses toward others. Nevertheless, it is important to keep in mind that *sustained* elevations in blood pressure predict end-organ damage. The impact of the brief blood pressure peaks measured in the forgiveness studies is unclear (see Schwartz et al., 2003). Hence, the extant data speak primarily to immediate short-term patterns.⁴ As we interpret the autonomic and cardiovascular effects, we must keep in mind that they may reflect not only heightened sympathetic nervous system arousal but also impaired parasympathetic response.

NEW RESEARCH DIRECTIONS

Linking Studies of Forgiveness and Physiology with a Theory to Guide Future Investigations: A Dynamic Systems Model of Neurovisceral Integration

Thayer and Lane (2000) have proposed a model of neurovisceral integration that ties together the systems involved in attention, emotion, and motivation—systems that in my view are involved in the multidimensional facets of unforgiveness and forgiveness. In the neurovisceral integration model, a variety of physiological systems underlie and integrate attention, motivation, and emotion, which from a dynamic systems perspective involve feedback and feed-forward circuits that enable self-regulation and efficient functioning. One of the most important features of this model is that it highlights the importance of inhibition. Inhibitory processes are negative feedback circuits that enable one to interrupt behavior and reallocate attention and responses to another task. In our case, inhibition would permit a victim to let go of rumination or grudge-holding to cultivate an empathic and forgiving response.

As Thayer and Lane (2000) detail, when these inhibitory processes fail or when negative feedback mechanisms are ineffective, the resulting *disinhibition* leads to positive feedback loops that perpetuate behaviors in a feed-forward fashion (e.g., when people persist in ruminating about a past injustice or about getting revenge). When emotion is disordered, such as in anxiety disorders (with the most evidence accrued for generalized anxiety disorder), people have a distorted emotional system that prevents them from shifting to process information and generate responses that would be more appropriate or beneficial. This state of being emotionally “stuck” or “inflexible” reflects not only difficulty in shifting to a more appropriate response but also—and more likely—*being unable to inhibit inappropriate responses* (Thayer & Lane, 2000).

This may well correspond to what happens in unforgiveness (see Witvliet et al., 2001; Worthington & Scherer, 2004), because people seem unable to shift their attention to information that could promote empathy or forgiveness. Instead, they seem drawn like magnets to ruminate about past hurts, embellish these narratives with bitter adjectives and adverbs that stir up contempt, exhibit avoidance and revenge motivations, cogitate about the negative features of the offender and offense, and even rehearse a repertoire of grudge and revenge plots. Such processes may both reflect and perpetuate feed-forward circuits subserved by attentional, motivational, physiological, and behavioral subsystems of emotion. Thayer and Lane (2000) further propose that this kind of inefficiency in affective information processing results in affective dysregulation. This can ultimately lead to such problems as a hostile personality, anxiety and depressive disorders, hypertension, and coronary heart disease.

Self-regulation is critical to Thayer and Lane’s (2000) model and to an understanding of forgiveness and physiology. A successful shift from unforgiveness to forgiveness requires flexibility in attentional, affective, and motivational processes. Currently, the strongest indicator of self-regulation in attention and affect is cardiac

vagal tone (Porges, 1992), often assessed with heart rate variability (HRV). Spectral analysis is a noninvasive method used to transform HRV mathematically in order to determine relative sympathetic and parasympathetic activity (see McCraty, Atkinson, Tiller, Rein, & Watkins, 1995). As a general example, two people may have the same mean heart rate, but one will show less variation around the mean, indicative of lower heart rate variability, lower vagal tone, and poorer self-regulation. Heart rate variability is a quantifiable indicator of self-regulation, reflecting neural feedback mechanisms involved in the integration between the central and autonomic nervous systems (Thayer & Lane, 2000).

FUTURE DIRECTIONS FOR RESEARCH: RESEARCH AND CLINICAL ADVANCES SHOULD BE LINKED TO THEORY

For psychophysiological research and clinical applications of forgiveness and justice to advance, we will need to study additional physiological measures, integrate central and peripheral nervous system measures with each other and with psychological variables, use rigorous designs that are ecologically valid, and evaluate long-term effects—all with a view to advance not only basic research but also clinical applications.

As Thayer and Lane's (2000) neurovisceral integration model suggests, HRV and its related measures (e.g., respiratory sinus arrhythmia) and methods will be important complements to measures of heart rate because they point to the important role of the parasympathetic nervous system, inhibitory processes, and self-regulation. Whereas most research has assessed physiological measures as dependent variables, advances are even more likely to occur if we additionally consider them as *independent* individual difference variables that may exert main effects and also interact with environmental variables. Considering HRV as an individual difference variable, people with predispositions to have poor vagal control will—according to Thayer and Lane's (2000) model—have poorer inhibitory processes and self-regulation.

How might such individual differences in self-regulation interact with values-oriented, spiritual, and religious factors? Might having poor vagal control make it more difficult to grant forgiveness, even for people of faith who value this virtue? Do people with better vagal control find it easier to embody virtues that hinge on self-regulation? Might people devoted to embodying virtue as a way of life ultimately be able to shift their sympathovagal balance in favor of vagal control? Self-regulation appears to be at the heart of a range of virtues and values, including those in Peterson and Seligman's (2004) classification of human strengths and virtues. In addition to forgiveness, for example, courage and temperance seem to hinge on affective, attentional, and motivational modulation as people engage positive responses while steering away from or overriding negative ones. With advances in psychophysiological assessment, more effective applied interventions can be designed, perhaps incorporating relaxation and belief-sensitive meditation approaches in order to improve HRV as an adjunct to various forgiveness intervention models.

We will be most likely to make substantial advances in the field if we employ multimethod designs that integrate genetic, central and peripheral nervous system, neurohormonal, and behavioral measures. In line with Schwartz et al.'s (2003) observations, cardiovascular (and other mental and physical health) responses to stressors ought to be studied in interaction with stress exposures and genetic susceptibilities. For example, chronic or repeated injustices (stressors) are likely to be more strongly associated with the development of cardiovascular disease and mortality. Perhaps the unforgiving personality will show similar patterns because, in effect, such persons tend to interpret even minor slights as major and ruminate about them, thereby generating repeated stressors. This relates to McCullough and Hoyt's (2002) theorizing that neuroticism may involve heightened perceptions of behaviors as offenses and to their data linking neuroticism with unforgiving revenge and avoidance motivations. In emotion and personality research, Yik and Russell (2001) found that neuroticism was strongly associated with negative valence, regardless of arousal level. Agreeableness (inversely related to unforgiving motivations) was associated with positive valence, slightly activated/aroused. Other research links vengeful imagery with negatively valent and aroused emotion reports, and more stressful physiological reactivity and recovery patterns (see Witvliet et al., 2001; Witvliet et al., 2003).

Finally, research is needed to ascertain the relationship between laboratory findings and real-life experiences. Experimental conditions that closely resemble real-life experiences will have the most ecological validity and stronger associations to applied costs and benefits. Perhaps for these reasons, forgiveness and physiology studies have most often used imagery and interview paradigms. Further advances in research may occur with ambulatory monitoring studies that provide a better indication of the role of anticipation, exposure, and remembering/ruminating in the psychophysiological reactivity, and recovery patterns associated with transgressions and contact with transgressors/victims. Additionally, physiological investigations will need to employ longitudinal designs and "hard" health measures.

RELEVANCE FOR CLINICAL AND APPLIED INTERVENTIONS

Unforgiveness and forgiveness involve emotional processes that intersect with a range of clinical issues. Unforgiveness includes a negative emotion complex that overlaps to some extent with rumination and hostility. Psychophysiology research has shown that negative emotion has longer lasting effects on heart rate than does positive emotion (Brosschot & Thayer, 2003). Also, rumination associated with negative emotion may prolong blood pressure activation (Glynn, Christenfeld, & Gerin, 2002). Additionally, states of rumination in normals and persons with generalized anxiety disorder (vs. controls) show impaired parasympathetically mediated HRV; treatments that reduced such worry also improved HRV (see Thayer & Lane, 2000; Thayer, Friedman, & Borkovec, 1996). Both rumination (Kubzansky et al., 1997) and hostility have been associated with coronary heart disease risk (Miller, Smith, Turner, Guijarro, & Hallet,

1996) and lower levels of HRV (Thayer & Lane, 2000), possibly due to inadequate parasympathetic antagonism to sympathetic activity. Further punctuating this view is evidence that sympathetic nervous system activity was more dominant when people recalled life events that continued to arouse anger and/or frustration, whereas beneficial HRV changes occurred when participants focused on feeling sincere appreciation or similarly positive emotions toward someone (McCraty et al., 1995). These data suggest that to the degree that forgiveness can increase such positive emotions, the parasympathetic nervous system may exert better control. In addition, to the extent that forgiveness can reduce or eclipse anger and rumination, sympathetic nervous system activation may be mitigated. These hypotheses warrant testing in light of their promise for interventions.

Clinically, it is also important to consider forgiveness in relation to the various behavioral strategies people use to cope with the stress of unforgiveness. Some coping strategies will likely exacerbate mental and physical health problems, some strategies will mitigate against them, and some will introduce positive effects. People who suppress, binge, smoke, misuse alcohol and other substances, aggress, withdraw, and ruminate to manage unforgiveness will engage in behaviors with known links to adverse health outcomes. Such behaviors may interact with genetic factors, such that some people will increase the likelihood of negative effects on their health (see Schwartz et al., 2003). By contrast, research has demonstrated benefits of several factors that are part of a multidimensional forgiveness response, including reappraising a difficult situation rather than suppressing one's negative emotions (see Gross & John, 2003), engaging social support (see Christenfeld & Gerin, 2000), and cultivating positive emotions (Fredrickson, 1998). For example, McCraty et al. (1995) theorized that the increased parasympathetic mediation associated with positive emotion may assist hypertension treatment and reduce the probability of sudden death in persons with congestive heart failure.

In terms of assessment, psychophysiology may prove useful both to determine individual differences in the capacity for self-regulation and to provide useful outcome measures in clinical trials of forgiveness interventions. Physiological measures can supplement self-reports, other-reports, and behavioral observations. In individual therapy, psychophysiological feedback could be used to inform clients of the physiological changes that accompany their choice to focus on empathy and forgiveness versus transgression rumination or grudge holding. If justice-oriented interventions are developed for clinical use—such as family therapy interventions in which a wayward spouse is directed to seek forgiveness on bended knee (Madanes, 1990)—psychophysiological assessments could also be incorporated for both transgressor and victim.

Of the topics in this chapter, the study of forgiveness in connection to justice is the most nascent, yet it may be among the most significant for victims. When faced with a hurtful offense, the victim generally experiences unforgiveness, which can be reduced in a number of ways—seeking justice and forgiving among them. These two options are not antithetical to one another, although cognitive, emotional, and situational constraints on the victim may necessitate devoting one's energy to pursuing

them sequentially rather than concurrently. So far, the available data suggest that justice outcomes can promote forgiveness, with restorative justice enhancing forgiveness more than punitive justice, and punitive more than no-justice outcomes (Witvliet et al., 2003). Questions remain as to whether granting forgiveness affects one's motives to pursue justice, for whom this may hold true, and under what conditions.

PERSONAL THEORETICAL PERSPECTIVES ON THE FIELD

Our current understanding of the psychophysiology of forgiveness and unforgiveness is still in its infancy. The data accrued so far, however, carry more weight than they would in isolation because we can view them through an emotional lens that considers verbal/cognitive, behavioral, and physiological responding as inherent to emotional expression (see Lang's bioinformational theory) and views the systems involved in affect regulation as integrating attentional, motivational, and physiological subsystems (Thayer & Lane's, 2000 neurovisceral integration model). This view highlights connections between findings from the forgiveness literature and the broader literature on emotion and psychophysiology. The data on unforgiveness can also be connected to specific literature on rumination, anger, and hostility, providing further insights that can guide the formation of our hypotheses, methodologies, theoretical interpretations, and applications.

CONCLUSIONS

People have a propensity to offend and be offended. Unforgiveness naturally bubbles up in the wake of hurtful offenses. Both forgiveness and justice may be beneficial in reducing victims' unforgiveness, which is associated with prolonged physiological activation, which in turn is theorized to have more cardiovascular health implications than short-term stress reactivity (Brosschot & Thayer, 2003). Forgiveness research suggests it also promotes positive and prosocial emotions for victims and offenders, calming physiological indicators of negative and aroused emotion. To the degree that forgiveness can calm emotion and make it more positive, the parasympathetic nervous system may exert better control (see McCraty et al., 1995). To the extent that forgiveness may eclipse or reduce anger, sympathetic nervous system activation may be mitigated (McCraty et al., 1995). The net effect may be one that enhances health-promoting effects and buffers against health-eroding effects (see also Witvliet et al., 2001). Justice research suggests that some restorative approaches may be more psychophysiologicaly beneficial than punitive justice, even promoting forgiveness in victims. Research in this area is in its infancy, and the time is ripe for advances in this area fertile with promise to offer a healing balm.

NOTES

1. Much of the psychophysiology of emotion literature has emphasized valence and arousal. Yik and Russell (2001) assessed the valence and arousal dimensions, as well as a rotation of them: positive activation (extending from high arousal positive to low arousal negative) and negative activation (extending from high arousal negative to low arousal positive). They found that neither set of dimensions was more “basic” than the other.
2. Brenneis (2001) also measured total cholesterol, high-density lipoprotein, low-density lipoprotein, and blood glucose levels, finding no significant relationships with the TRIM inventory by McCullough, Rachal, Sandage, Worthington, Brown, and Hight (1998).
3. Seybold et al. (2001) also assessed blood and plasma assays. Lower forgiveness of others and total forgiveness (Mauger et al., 1992) were associated with higher hematocrit scores, higher total white blood cell counts, and lower TxPA levels. Lower forgiveness of others and self were correlated with higher T-helper/T-cytotoxic cell ratios.
4. Waltman’s (2003) study provides the first long-term evidence of health impact. Waltman’s study tested a complex 20-step intervention. Although intervention research is important, the complexity of interventions can possibly obscure the effects of forgiveness by confounding them with demand characteristics of the treatment, differential effects of the components of the intervention, and effects of leaders’ and participants’ personalities. Furthermore, Waltman used only a 10-week follow-up. Of note, Toussaint and Williams (2001) found that differences in health outcomes with respect to forgiveness emerged only at age 65 and older.

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