

## The soothing effects of forgiveness on victims' and perpetrators' blood pressure

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### Abstract

A laboratory experiment tested whether conciliatory behavior predicts lower blood pressure following spouses' discussion of a recent marital transgression. Sixty-eight married couples discussed unresolved transgressions—with random assignment determining whether the husband or the wife was in the victim role—and then rated victim and perpetrator conciliatory behavior (with the former akin to forgiveness and the latter akin to amends) while watching a videotape of their just-completed discussion. Participants' blood pressure was measured 40 min later. Actor–partner interdependence modeling analyses revealed that victim conciliatory behavior during the discussion predicted not only lower victim blood pressure but also lower perpetrator blood pressure after the discussion. Perpetrator conciliatory behavior during the discussion was not associated with victim or perpetrator blood pressure.

Forgiveness is the economy of the heart . . .  
forgiveness saves the expense of anger, the  
cost of hatred, the waste of spirits.

—Hannah Moore

Relative to individuals who harbor grudges, individuals who forgive transgressions tend to experience enhanced psychological and physical well-being (Witvliet, Ludwig, & Vander Laan, 2001; Worthington & Scherer, 2004; Worthington, Witvliet, Pietrini, & Miller, 2007), especially in close, committed

relationships (Karremans, Van Lange, Ouw-erkerk, & Kluwer, 2003). As suggested by the quote above, forgiveness also predicts healthy physiological functioning, including lower systolic and diastolic blood pressure (Lawler et al., 2003; Witvliet et al., 2001). A recent review of the forgiveness literature suggests that forgiveness, particularly in close relationships, leads to reduced psychological tension; this reduction in psychological tension promotes physical well-being (Karremans & Van Lange, 2008).

Extant forgiveness research has focused almost exclusively on the effects of forgiving on the health of the victim (i.e., the forgiver). The only study that directly examined physiological responses to *receiving* forgiveness demonstrated that the brows of perpetrators who imagined receiving forgiveness for a past transgression furrowed less (suggesting less negative emotion) than did the brows of perpetrators who imagined their victims holding a grudge (Witvliet, Ludwig, & Bauer, 2002). No studies to date have examined perpetrators' physiological responses to receiving forgiveness during interactions with

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victims. However, it seems that not being forgiven—especially by a close relationship partner—could increase perpetrators' psychological tension and have negative effects on their physical health as well.

Given that people often fail to accurately predict or forecast their emotional responses to their partners (DeSteno, 2010; Eastwick & Finkel, 2008), forgiveness research studying live interactions involving real transgressions is necessary to further advance our understanding of how forgiveness affects victims and perpetrators. In this report, we examine whether victim forgiveness of a recent marital transgression yields physiological benefits for perpetrators as well as victims.

Why might forgiveness and amends yield better physiological functioning? Victims may ruminate about a betrayal for long periods of time (Fincham, 2000; McCullough, Bono, & Root, 2007). Victims may also retaliate—people are inclined to “fight fire with fire,” responding in kind to a partner's real or imagined negativity (Gottman, 1998; Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991; Yovetich & Rusbult, 1994). In their turn, perpetrators may suffer sadness, shame, or guilt (Baumeister, Stillwell, & Heatherton, 1995). Perpetrators may also exhibit defensive maneuvers, seeking to justify their behavior to themselves and their partners (Baumeister, Stillwell, & Wotman, 1990). Thus, both victims and perpetrators are susceptible to negative emotional states, increased tension, and negative partner interactions while dealing with a transgression, all of which could yield increased physiological arousal.

To end the cycle of negative emotions and interactions, victims can forgive the perpetrator; the perpetrator can offer amends for the transgression. In our prior work, we have defined victim forgiveness as the victim's willingness to (a) forego vengeance and demands for retribution and (b) react to the betrayal in a constructive, less judgmental manner (Finkel, Rusbult, Kumashiro, & Hannon, 2002). We define perpetrator amends as accepting responsibility for an act of betrayal, and offering genuine atonement for one's actions (Hannon, Rusbult, Finkel, & Kumashiro, 2010). Given that

victim forgiveness and perpetrator amends have been shown to simultaneously contribute to transgression resolution or “closure” for both partners (Hannon et al., 2010), they may also yield decreased physiological arousal for both partners.

Forgiveness may be particularly relevant to health outcomes in the context of marriage, as marital conflict appears to be hazardous to health; distressed couples are at risk for a variety of poor health outcomes including impaired cardiovascular and immune function (Gottman & Levenson, 1992; Kiecolt-Glaser & Newton, 2001). One path from marital conflict to poor health may be the stress that partners experience during conflict interactions. Both partners show increased physiological arousal during conflict discussions (Levenson & Gottman, 1983, 1985), including increased blood pressure (Robles & Kiecolt-Glaser, 2003). Furthermore, increased physiological arousal during conflict discussions predicts later declines in marital satisfaction (Levenson & Gottman, 1985) and dysfunction in marital interaction (Gottman & Levenson, 1999).

The marital conflict literature has a rich tradition of measuring the behaviors and health outcomes of *both* partners during conflict discussions. To answer our research questions, we employed a dyadic discussion method similar to that used in marital conflict studies. However, rather than asking couples to identify a “conflict issue” for the discussion, we asked couples to discuss a recent transgression in their marriage. In a transgression, one partner is the victim and the other is the perpetrator. These distinct roles make it possible to study whether and how role (perpetrator or victim) interacts with conciliatory behavior during transgression interactions to influence health indicators. Prior studies examining forgiveness and health have not explored perpetrator behavior and victim behavior simultaneously, making it difficult to determine (a) whether the positive effects for victims are driven solely by their own forgiving behavior or also by perpetrators' amend-making behavior or (b) whether there are positive health effects for perpetrators from amends and forgiveness as well. A

study that measured both perpetrator and victim behavior during transgression interactions, and then measured both partners' health indicators, would be well positioned to explore these questions.

To investigate these ideas, we identified recent transgressions in married partners' relationships, randomly determined which transgression partners would discuss, and videotaped partners' discussion of the transgression. We then asked each partner to rate their conciliatory behavior as they watched a videotape of the discussion. We also measured each partner's blood pressure, a well-established predictor of morbidity and mortality (Chobanian et al., 2003). We used actor-partner interdependence modeling (APIM; see Campbell & Kashy, 2002; Kenny, Kashy, & Cook, 2006) to estimate within-spouse and between-spouse effects of conciliatory behavior on victims' and perpetrators' blood pressure. This method allowed us to test our two research questions: (a) Does victim conciliatory behavior predict victim and perpetrator blood pressure? and (b) Does perpetrator conciliatory behavior predict victim and perpetrator blood pressure?

## Method

### *Participants*

Participants were recruited for a study of marital processes via notices posted on the campus and in the local community.<sup>1</sup> Seventy-nine couples took part in the study; we deleted 11 couples from the analyses described in this article (5 couples did not follow instructions or had missing data on one or more key measures, 4 couples had one partner with unreliable blood pressure readings, 1 couple due to technical equipment failure, and 1 couple was not married). The 136 participants (68 married couples) we retained were 33 years old on average ( $SD = 10$  years), and most were Caucasian (80% Caucasian, 10% African American, 4% Hispanic, 2% Asian

American, and 4% Other). Most participants had at least 4 years of college education (47% obtained advanced or professional degrees, 36% completed 4 years of college, 10% completed 2 years of college, and 7% completed high school only). Their median household income was \$40,000 to \$60,000 per year. Couples had been married for 6 years on average ( $SD = 9$  years), and most did not have children (77% no children, 10% one child, 6% two children, and 7% three or more children).

### *Procedures and measures*

Couples attended a laboratory session where they engaged in an 8-min video-recorded discussion of a recent transgression in the marriage. Each participant was first asked to identify recent incidents when his or her spouse "broke the rules" of their marriage—that is, each participant identified incidents in which he or she was the victim and the partner was the perpetrator. Each partner described three such incidents from the past 4 months, providing simple ratings of each incident on 9-point scales (e.g., "How upsetting was it?"; 0 = *not upsetting at all* to 8 = *very upsetting*). To identify an incident for discussion, we randomly determined whether to use an incident described by the husband or the wife and selected an incident that was moderately upsetting, that was not fully resolved, and that the partners were willing to discuss. The experimenter read the description of the chosen incident to the couple and explained that they would have 8 min to discuss the incident and that their discussion would be video-recorded (for elaborated methods, see Hannon et al., 2010).

Following their discussion, partners were led to separate video monitors where they individually reviewed the videotaped discussion. The experimenter stopped the videotape at the end of each 2-min segment of the interaction, asking participants to rate their own and their partner's conciliatory behavior during that segment. We assessed victim forgiveness and perpetrator amends with the same six-item measure of conciliatory behavior ("I tried to comfort my partner," "I spoke gently/sympathetically to my partner," "I behaved

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1. Results from participants in this study were reported in a prior publication (Hannon, Rusbult, Finkel, & Kumashiro, 2010). That publication did not address blood pressure measures or dispositional forgiveness.

in a cold manner with my partner” [reverse scored], “I wanted to keep as much distance between us as possible” [reverse scored], “I raised my voice toward my partner” [reverse scored], “I wanted to cut off the interaction” [reverse scored]; 1 = *strongly disagree* to 9 = *strongly agree*;  $\alpha$ s ranged from .77 to .83 across the 2-min segments). We used the same scale of conciliatory behavior for three reasons. The first reason is that conciliatory behavior by victims represents the essence of forgiveness and conciliatory behavior by perpetrators represents the essence of amends (Hannon et al., 2010; McCullough, Worthington, & Rachal, 1997). The second is that we wanted to avoid alerting participants that we were studying forgiveness and amends, per se. The third and most important reason is that using the same measure for both constructs ensures that any differential effects of forgiveness and amends implicate differences in role (victim vs. perpetrator) rather than differences in measures. We averaged the ratings of victim conciliatory behavior across the four 2-min segments to produce an overall measure of *victim conciliatory behavior* (akin to forgiveness), and we averaged the ratings of perpetrator conciliatory behavior across the four 2-min segments to produce an overall measure of *perpetrator conciliatory behavior* (akin to amends).

After rating their behavior during the four segments, participants completed other study activities for approximately 40 min (other study activities included completing survey measures, an ego depletion manipulation in which participants were directed to express or suppress their emotions while watching film clips, and a discussion task with the partner<sup>2</sup>; these activities are not relevant to the present

article). At the end of these tasks, we assessed blood pressure noninvasively with an automatic oscillometric wrist blood pressure monitor. All participants were seated (completing survey measures) for at least 5 min prior to the blood pressure measures to ensure that they were at rest. Participants were seated at a table during the blood pressure readings; the experimenter placed the monitor on the table so that the participant’s wrist was at approximately heart level for the readings. Blood pressure was assessed twice in quick succession; at the end of cuff deflation, systolic and diastolic blood pressure were displayed on the monitor and recorded by the experimenter. Our dependent measures were systolic and diastolic blood pressure, each of which consisted of the average of the two assessments (test–retest correlations were .83 for systolic and .84 for diastolic blood pressure).

We were concerned that any association of conciliatory behavior with blood pressure could be caused by other factors, such as participants’ dispositional forgiveness. Given prior research showing that relationship commitment predicts higher levels of forgiveness (Finkel et al., 2002), we also wanted to control for participants’ commitment to their marriages. Therefore, we also assessed *dispositional forgiveness* (e.g., “I am able to make up pretty easily with friends who have hurt me in some way,”  $\alpha = .85$ ; Mauger et al., 1992) and general *relationship commitment* (e.g., “I want our marriage to last forever,”  $\alpha = .92$ ) with 15-item measures. The latter measure, which we developed for this study, was an extended version of a well-validated scale (Rusbult, Martz, & Agnew, 1998).

#### *Character of the transgression incidents*

Partners discussed transgression incidents that victims described as moderately to severely

2. Participants were randomly assigned at the individual level to express or suppress their emotions for the ego depletion task. Randomization for the ego depletion task was independent from randomization to the victim or perpetrator role for the discussion reported in this article. After the ego depletion task, all couples were asked to discuss a topic of mutual disagreement (we identified a topic that each partner reported as a source of disagreement; there was no victim or perpetrator role within this discussion). Participants’ effort to follow emotion expression/suppression instructions for the ego depletion task was not associated with any of their blood pressure measures, and including

their effort on this task in the confound analyses we performed did not alter the associations of victim conciliatory behavior with victim and perpetrator blood pressure. For all of the tasks between the transgression discussion and the blood pressure readings, couples’ interactions were limited to their videotaped discussions. Couples were in the same room while completing survey measures but were asked not to talk with each other while doing so.

**Table 1.** Means and standard deviations for key measures, 68 married couples

Variable	Victims		Perpetrators		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Systolic blood pressure	126.94	18.50	123.17	14.29	.18
Diastolic blood pressure	82.30	13.51	80.45	9.26	.34
Conciliatory behavior (0–8 scale)	6.30	1.15	6.43	1.27	.29
Dispositional forgiveness (0–8 scale)	5.21	1.16	4.88	1.32	.09
Relationship commitment (0–8 scale)	6.80	1.00	6.84	1.02	.72
Transgression severity (0–8 scale)	5.04	1.69	—	—	
Transgression resolution (0–8 scale)	4.97	2.54	—	—	

upsetting ( $M = 5.04$ ,  $SD = 1.69$ ) and not yet fully resolved ( $M = 4.97$ ,  $SD = 2.54$ ). Most of the transgressions were either violations of dependence norms (e.g., overspending after agreeing to save money, not doing fair share of the housework; 41%) or decency/etiquette norms (e.g., volunteering the partner for something without asking, 31%). The remaining transgressions included violations of privacy norms (e.g., discussing personal topics in front of family members or neighbors, 16%) and monogamy norms (e.g., not trusting the partner with people of the opposite gender, 5%); the remaining 7% of transgressions were other types of violations.

## Results

### Descriptive statistics

The mean values and standard deviations for key variables for victims and perpetrators are

presented in Table 1. We estimated multilevel models (victim and perpetrator nested within couple) to test whether there were significant differences between victims and perpetrators. Victims reported marginally higher levels of dispositional forgiveness compared to perpetrators ( $p < .09$ ); victims and perpetrators' reports on other key measures were not statistically different.

### Variable intercorrelations

The within-role and within-dyad correlations of key variables are presented in Table 2. As expected, within-dyad associations were positive and strong for conciliatory behavior and relationship commitment. Within victims, dispositional forgiveness was negatively associated with blood pressure. Victims' conciliatory behavior was significantly associated with dispositional forgiveness and marginally

**Table 2.** Within-dyad and within-role correlations among blood pressure, conciliatory behavior, dispositional forgiveness, and marital commitment

	1	2	3	4	5
1. Systolic blood pressure	<b>.19</b>	.86**	-.33**	-.22 <sup>†</sup>	-.10
2. Diastolic blood pressure	.76**	<b>.17</b>	-.30**	-.27*	-.14
3. Conciliatory behavior	-.08	-.12	<b>.58**</b>	.38**	.23 <sup>†</sup>
4. Dispositional forgiveness	.00	-.14	.34**	<b>.15</b>	-.13
5. Relationship commitment	-.18	-.17	.52**	.05	<b>.55**</b>

Note. Above the diagonal are correlations among victims, below are correlations among perpetrators. Along the diagonal, in bold, are within-dyad correlations (partial correlations were calculated to account for participant gender, another distinguishing variable for our couples).

<sup>†</sup>  $p < .10$ . \*  $p < .05$ . \*\*  $p < .01$ .

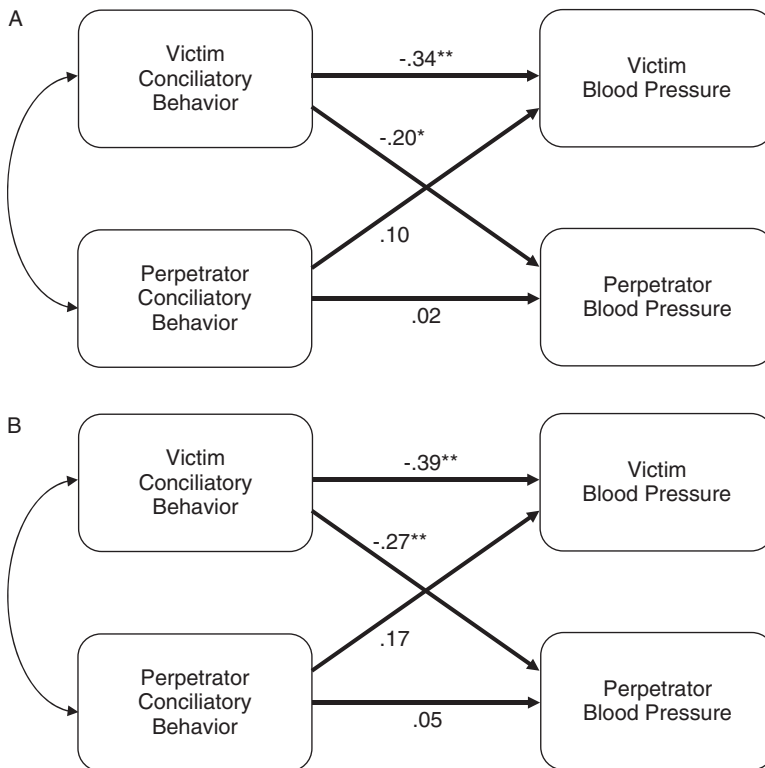
associated with relationship commitment. Perpetrators' conciliatory behavior was significantly associated with both dispositional forgiveness and relationship commitment.

#### Primary hypothesis tests: APIM

We conducted APIM analyses to examine the associations of victim and perpetrator conciliatory behavior with victim and perpetrator blood pressure. Each partner's self-rated behavior was used in all analyses (i.e., all ratings of victim conciliatory behavior were provided by victims and all ratings of perpetrator conciliatory behavior were provided by perpetrators). APIM analyses control for the effects of one partner's behavior when examining the effects of the other partner's behavior. This approach provides conservative hypothesis tests because a given predictor

(e.g., victim conciliatory behavior) can only reach statistical significance if it accounts for unique variance beyond the other predictor in the model (e.g., perpetrator conciliatory behavior). Therefore, significant effects suggest that conciliatory behavior *in a given role* (victim or perpetrator) predicts blood pressure. Models were estimated using the two-intercept procedure for distinguishable dyads outlined by Kenny and colleagues (2006). All analyses controlled for main effects of participant gender, as men had significantly higher blood pressure than women (auxiliary analyses revealed that participant gender did not moderate any of the key effects). All analyses employed multilevel modeling and were conducted using SAS 9.2 (SAS Institute, 2008).

As depicted in Figure 1, victim conciliatory behavior predicted lower systolic (Panel



**Figure 1.** Actor-partner interdependence models linking victim and perpetrator conciliatory behavior to systolic (Panel A) and diastolic (Panel B) blood pressure.

Note. Numbers represent standardized regression coefficients.

\*  $p < .05$ . \*\*  $p < .01$ .

A) and diastolic (Panel B) blood pressure for both victims and perpetrators (standardized  $\beta$  values ranged from  $-.20$  to  $-.39$ , all  $ps < .05$ ). These effects were robust beyond the effects of perpetrator conciliatory behavior. In contrast, all links between perpetrator conciliatory behavior and blood pressure were nonsignificant controlling for the effects of victim conciliatory behavior. Given that participants were randomly assigned to the victim or the perpetrator role, it is unlikely that the differential effects of victim and perpetrator conciliatory behavior are due to individual difference or stable relationship variables.

Nonetheless, we conducted two follow-up analyses to rule out potential confounds. In the first follow-up analysis, we added own relationship commitment, partner relationship commitment, own dispositional forgiveness, and partner dispositional forgiveness to the APIM models described above (as in the original models, all predictors were self-reported by each partner). All four key effects remained significant. In the second follow-up analysis, we added two additional variables to the model described for the first follow-up analysis; victims' ratings of transgression severity and betrayal resolution (rated prior to the discussion; perpetrators did not complete these measures). Victims' ratings of transgression severity and betrayal resolution were significantly associated with their conciliatory behavior ( $rs = -.49$  and  $.37$  respectively, both  $ps < .01$ ). In this particularly rigorous analysis, three of the four key effects remained significant, and the fourth (the association of victim behavior with perpetrator systolic blood pressure) was marginally significant ( $p < .08$ ).

## Discussion

The present research tested the effects of both victim and perpetrator conciliatory behavior during a discussion of a recent, real transgression on married partners' blood pressure. Participants rated their own conciliatory behavior moments after discussing an unresolved transgression with their spouse, and each partner's blood pressure was measured 40 min after the interaction. All participants

were able to identify recent transgressions in their marriages, suggesting that marriage is full of opportunities for granting—or withholding—forgiveness.

Several studies have shown that *granting forgiveness* predicts positive physiological functioning, and our study replicated these findings: Victims who enacted conciliatory behaviors had lower blood pressure than did victims who did not. More importantly, this study provides the first evidence we are aware of suggesting that *receiving forgiveness* also predicts positive physiological functioning: Perpetrators who received more conciliatory behavior (as reported by victims) had lower blood pressure than did perpetrators who received less. All of these effects of victims' conciliatory behavior were robust beyond any effects of (a) perpetrator conciliatory behavior, (b) both partners' dispositional forgiveness, (c) both partners' relationship commitment, (d) victims' ratings of transgression severity, and (e) victims' ratings of transgression resolution prior to the discussion. Each of the four confounding variables we explored in our follow-up analyses was significantly associated with victim and/or perpetrator conciliatory behavior but did not change the overall pattern of findings. It seems likely that being (or being married to) a dispositionally forgiving, committed person would be generally beneficial for health but that behavior during specific interactions may be more predictive of short-term physiological measures, such as blood pressure. Future research could examine whether these personality and relationship characteristics are associated with lower general blood pressure levels (outside the context of partner interactions) or other health measures among married couples.

In contrast to these robust effects of victim conciliatory behavior, perpetrator conciliatory behavior failed to predict either partner's blood pressure. What might account for this asymmetry? Though perpetrator amends facilitate forgiveness (Hannon et al., 2010; McCullough et al., 1998), amends alone cannot positively resolve or close a transgression. Indeed, there is no guarantee that the victim's response will be positive (Exline, Deshea,

& Holeman, 2007; Hodgins & Liebeskind, 2003). Victim forgiveness—foregoing or releasing a grudge—appears to be the key to helping both victims and perpetrators alleviate the physiological tension that emerges when discussing unresolved transgressions. Perpetrators may increase their odds of receiving that forgiveness by making amends, but the power to grant forgiveness (and its benefits) rests with victims.

### *Limitations and Strengths*

The most important limitation of the present work is that we only assessed blood pressure once—40 min after the transgression discussion. We did not include a baseline assessment before the transgression discussion, nor did we include a series of assessments in the minutes and hours after it. As such, we cannot know for sure that the results depicted in Figure 1 are due to conciliatory behavior during the discussion, nor can we draw conclusions about the time-course of blood pressure reactivity in the wake of conciliatory behavior. In addition, we cannot assess whether our findings were due to an increase in blood pressure among couples who experienced less victim conciliatory behavior, a decrease in blood pressure among couples who experience more victim conciliatory behavior, or both.

However, because we randomly assigned participants to the victim or the perpetrator role, it seems unlikely that our results are attributable to factors other than the behavior during the transgression discussion, especially given that we statistically controlled for participant gender, transgression severity, transgression resolution prior to the discussion, dispositional forgiveness, and relationship commitment.<sup>3</sup> In addition, although future research could fruitfully map the precise time-course of blood pressure

following forgiveness and amends (ideally including at least one prediscussion baseline assessment), the present results remain informative even in the absence of such mapping. Whether the time-course of blood pressure following forgiveness and amends is linear or quadratic, whether high forgiveness reduces blood pressure or low forgiveness increases it, the fact remains that a full 40 min after the transgression discussion, victims' conciliatory behavior still predicts substantial and unique variance in blood pressure. Over countless transgression-related interactions during a marriage, such effects could eventually influence cardiovascular functioning. Several studies have shown that low marital satisfaction is associated with a host of poor health outcomes, including high blood pressure, and in one sample of participants with mild hypertension, a positive association between spousal contact and blood pressure among those who were dissatisfied with their marriages (Baker et al., 1999; Kiecolt-Glaser & Newton, 2001). Transgression interactions and blood pressure reactivity may be steps along the path from poor marital satisfaction to impaired health.

Another limitation is that we only examined blood pressure; although this measure has advantages (e.g., it has clear links to health outcomes; it is not subject to social desirability concerns), it is not a comprehensive measure of health or well-being. Future research should employ a broader range of health measures, including physical symptoms, well-being, and health-related behaviors. These additional health measures would shed light on the relationship between forgiveness and overall health, and could help explain the mechanisms underlying the relationship between forgiveness and physiological measures.

A third limitation is that this study included only married couples who volunteered to participate in a laboratory study. The couples in this study reported high levels of relationship commitment and most were White, relatively young, well educated, and had been married less than 10 years; they are not representative of all married couples. Therefore, we do not know if our findings generalize to all married

3. We conducted two additional analyses to determine whether victims and perpetrators differed on health and well-being. Victims and perpetrators did not significantly differ on the number of health symptoms they reported prior to the transgression task (measured with Cohen & Hoberman's 1983 health symptoms checklist), nor did they differ in life satisfaction (measured with Diener, Emmons, Larsen, and Griffin's 1985 scale).



couples, or to other relationship types. Studies of other types of close relationships (such as parent–child relationships) have demonstrated positive associations between victim forgiveness and victim health and physiological functioning (Lawler-Row, Hyatt-Edwards, Wuensch, & Karremans, in press; Lawler-Row, Karremans, Scott, Edlis-Matityahou, & Edwards, 2008). It is not clear whether the victims' forgiveness in these studies also benefited their relationship partners (in these cases, their parents), but our reasoning suggests that it might, to the extent that these were close and committed relationships.

Finally, the laboratory setting in which the interactions took place could be experienced as artificial. However, the laboratory setting also allowed us a great deal of experimental control. Participants focused on a specific, unresolved transgression in their relationship and provided concrete ratings of each person's behavior during each 2-min segment of their interaction, substantially reducing the potential for recall biases or for partners to rate self-report measures by calling to mind different aspects of transgression interactions that occurred in the past.

A major strength of this study is that we were able to examine the short-term impact of conciliatory behavior on victim and perpetrator blood pressure in the context of their discussions of real transgressions in real relationships. Furthermore, we were able to collect multiple transgression incidents from all participants and then (a) randomly assign partners to victim and perpetrator roles and (b) select a specific incident for each couple to discuss, lowering the chances of biases stemming from participants choosing incidents or roles. We used each partner's assessment of their own behavior and yet found across-partner effects on an objective measure of physiological functioning, blood pressure. Thus, this study's methods avoid many of the pitfalls common in forgiveness research, including the use of retrospective accounts or hypothetical incidents, reliance on self-reported outcomes of forgiving behavior, and lack of assessment of perpetrator behavior.

Another strength is the clarity and consistency of the results; victim conciliatory

behavior predicted reduced blood pressure in all analyses (even those controlling for plausible confounds), whereas perpetrator conciliatory behavior did so in none. In the wake of a transgression, victims often feel abused and powerless; they may ruminate continuously about the transgression and feel unable to stop (Fincham, 2000; McCullough, Bono, & Root, 2007). Yet, our findings suggest that, at least in the context of transgressions within marriage, forgiveness offers the victim significant and unique power to close the transgression and alleviate the tension that the couple experiences when dealing with the transgression.

### Conclusions

The association of victim conciliatory behavior with victim and perpetrator blood pressure suggests that people who hold grudges—and their spouses—may be at risk for impaired cardiovascular health over time. Indeed, victim grudge holding (vs. forgiveness) may be an important mechanism by which partners in high-conflict (vs. low-conflict) marriages exhibit poorer health outcomes (Gottman & Levenson, 1992). Long-term research testing this mediational hypothesis could point the way to forgiveness interventions for close relationships with the potential to improve both partners' health.

### References

- Baker, B., Helmers, K., O'Kelly, B., Sakinofsky, I., Abelson, A., & Tobe, S. (1999). Marital cohesion and ambulatory blood pressure in early hypertension. *American Journal of Hypertension*, *12*, 227–230.
- Baumeister, R. F., Stillwell, A. M., & Heatherton, T. F. (1995). Personal narratives about guilt: Role in action control and interpersonal relationships. *Basic and Applied Social Psychology*, *17*, 173–198.
- Baumeister, R. F., Stillwell, A., & Wotman, S. R. (1990). Victim and perpetrator accounts of interpersonal conflict: Autobiographical narratives about anger. *Journal of Personality and Social Psychology*, *59*, 994–1005.
- Campbell, L., & Kashy, D. A. (2002). Estimating actor, partner, and interaction effects for dyadic data using PROC MIXED and HLM: A user-friendly guide. *Personal Relationships*, *9*, 327–342.
- Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., . . . Roccella, E. J. (2003). Seventh report of the joint national

- committee on prevention, detection, evaluation, and treatment of high blood pressure. *Hypertension*, *42*, 1206–1252.
- Cohen, S., & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, *13*, 99–125.
- DeSteno, D. (2010). Mismeasuring jealousy: A cautionary comment on Levy and Kelly. *Psychological Science*, *21*, 1355–1356.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, *49*, 71–75.
- Eastwick, P. W., & Finkel, E. J. (2008). Sex differences in mate preferences revisited: Do people know what they initially desire in a romantic partner? *Journal of Personality and Social Psychology*, *94*, 245–264.
- Exline, J. J., Deshea, L., & Holesman, V. T. (2007). Is apology worth the risk? Predictors, outcomes, and ways to avoid regret. *Journal of Social & Clinical Psychology*, *26*, 479–504.
- Fincham, F. D. (2000). The kiss of the porcupine: From attributing responsibility to forgiving. *Personal Relationships*, *7*, 1–23.
- Finkel, E. J., Rusbult, C. E., Kumashiro, M., & Hannon, P. A. (2002). Dealing with betrayal in close relationships: Does commitment promote forgiveness? *Journal of Personality and Social Psychology*, *82*, 956–974.
- Gottman, J. M. (1998). Psychology and the study of marital processes. *Annual Review of Psychology*, *49*, 169–197.
- Gottman, J. M., & Levenson, R. W. (1992). Marital processes predictive of later dissolution: Behavior, physiology, and health. *Journal of Personality and Social Psychology*, *63*, 221–233.
- Gottman, J. M., & Levenson, R. W. (1999). What predicts change in marital interaction over time? A study of alternative models. *Family Processes*, *38*, 143–158.
- Hannon, P. A., Rusbult, C. E., Finkel, E. J., & Kumashiro, M. (2010). In the wake of betrayal: Perpetrator amends, victim forgiveness, and the resolution of betrayal incidents. *Personal Relationships*, *17*, 253–278.
- Hodgins, H. S., & Liebeskind, E. (2003). Apology versus defense: Antecedents and consequences. *Journal of Experimental and Social Psychology*, *39*, 297–316.
- Karremans, J. C., & Van Lange, P. A. M. (2008). Forgiveness in personal relationships: Its malleability and powerful consequences. *European Review of Social Psychology*, *19*, 202–241.
- Karremans, J. C., Van Lange, P. A. M., Ouwkerk, J. W., & Kluwer, E. S. (2003). When forgiving enhances psychological well-being: The role of interpersonal commitment. *Journal of Personality and Social Psychology*, *84*, 1011–1026.
- Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York: Guilford.
- Kiecolt-Glaser, J. K., & Newton, T. L. (2001). Marriage and health: His and hers. *Psychological Bulletin*, *127*, 472–503.
- Lawler-Row, K. A., Hyatt-Edwards, L., Wuensch, K. L., & Karremans, J. C. (in press). Forgiveness and health: the role of attachment. *Personal Relationships*.
- Lawler-Row, K. A., Karremans, J. C., Scott, C., Edliss-Matityahou, M., & Edwards, L. (2008). Forgiveness, physiological reactivity, and health: the role of anger. *International Journal of Psychophysiology*, *68*, 51–58.
- Lawler, K. A., Younger, J. W., Piferi, R. L., Billington, E., Jobe, R., Edmondson, K., & Jones, W. H. (2003). A change of heart: Cardiovascular correlates of forgiveness in response to interpersonal conflict. *Journal of Behavioral Medicine*, *26*, 373–393.
- Levenson, R. W., & Gottman, J. M. (1983). Marital interaction: Physiological linkage and affective exchange. *Journal of Personality and Social Psychology*, *45*, 587–597.
- Levenson, R. W., & Gottman, J. M. (1985). Physiological and affective predictors of change in relationship satisfaction. *Journal of Personality and Social Psychology*, *49*, 85–94.
- Mauger, P. A., Perry, J. E., Freeman, T., Grove, D. C., McBride, A. G., & McKinney, K. E. (1992). The measurement of forgiveness: Preliminary research. *Journal of Psychology and Christianity*, *11*, 170–180.
- McCullough, M. E., Bono, G., & Root, I. M. (2007). Rumination, emotion, and forgiveness: Three longitudinal studies. *Journal of Personality and Social Psychology*, *92*, 490–505.
- McCullough, M. E., Rachal, K. C., Sandage, S. J., Worthington, E. L., Brown, S. W., & Hight, T. L. (1998). Interpersonal forgiving in close relationships: II. Theoretical elaboration and measurement. *Journal of Personality & Social Psychology*, *75*, 1586–1603.
- McCullough, M. E., Worthington, E. L., & Rachal, K. C. (1997). Interpersonal forgiving in close relationships. *Journal of Personality and Social Psychology*, *73*, 321–336.
- Robles, T. F., & Kiecolt-Glaser, J. K. (2003). The physiology of marriage: Pathways to health. *Physiology and Behavior*, *79*, 409–416.
- Rusbult, C. E., Martz, J. M., & Agnew, C. R. (1998). The investment model scale: Measuring commitment level, satisfaction level, quality of alternatives, and investment size. *Personal Relationships*, *5*, 357–391.
- Rusbult, C. E., Verette, J., Whitney, G. A., Slovick, L. F., & Lipkus, I. (1991). Accommodation processes in close relationships: Theory and preliminary empirical evidence. *Journal of Personality and Social Psychology*, *60*, 53–78.
- SAS Institute. (2008). SAS (Version 9.2) [Computer software]. Cary, NC: Author.
- Witvliet, C. V. O., Ludwig, T. E., & Bauer, D. J. (2002). Please forgive me: Transgressors' emotions and physiology during imagery of seeking forgiveness and victim responses. *Journal of Psychology and Christianity*, *21*, 219–233.
- Witvliet, C. V. O., Ludwig, T. E., & Vander Laan, K. L. (2001). Granting forgiveness or harboring grudges: Implications for emotion, physiology, and health. *Psychological Science*, *12*, 117–123.

- Worthington, E. L., & Scherer, M. (2004). Forgiveness is an emotion-focused coping strategy that can reduce health risks and promote health resilience: Theory, review, and hypotheses. *Psychology and Health, 19*, 385–405.
- Worthington, E. L., Witvliet, C. V. O., Pietrini, P., & Millner, A. J. (2007). Forgiveness, health, and well-being: A review of the evidence for emotional versus decisional forgiveness, dispositional forgivingness, and reduced unforgiveness. *Journal of Behavioral Medicine, 30*, 291–302.
- Yovetich, N. A., & Rusbult, C. E. (1994). Accommodative behavior in close relationships: Exploring transformation of motivation. *Journal of Experimental Social Psychology, 30*, 138–164.