

People Feel Worse about Their Forgiveness When Mismatches Between
Forgiveness and Amends Create Adaptation Risks

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Abstract

Building on principles of evolutionary psychology and sociometer theory, we propose that people feel worse about the extent to which they have forgiven when their forgiveness level increases their risk of exploitation or their risk of spoiling a valuable relationship. We predicted that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby heightening their risk of exploitation (Hypothesis 1). We also predicted that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk (Hypothesis 2). We conducted a longitudinal study of transgressions occurring in romantic relationships and two experiments to test these ideas. Hypothesis 1 was supported in two out of three studies; Hypothesis 2 was supported in all three. A mini meta-analysis indicated that both effects were reliable across the program of research. These results suggest that feelings about one's forgiveness level serve a functional purpose: Feeling bad about one's forgiveness level signals that the current combination of amends and forgiveness levels may be causing an adaptation risk.

Keywords: Amends, Evolutionary Psychology, Forgiveness, Happiness, Prosocial Behavior, Sociometer Theory

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Throughout human history, our ancestors have faced adaptation problems caused by other people. Lying, cheating, stealing, breaking promises, withholding resources or information, infidelity, and violence are but a few ways in which one person's actions can negatively affect another person's fitness (Buss & Duntley, 2008). Individuals can respond to these transgressions in a variety of ways, some of which more effectively minimize the fitness costs of being the victim of a transgression than others. Those who respond most effectively to interpersonal transgressions would be more likely to survive and reproduce, causing their adaptive response mechanisms to become widespread through natural selection (Petersen, Sell, Tooby, & Cosmides, 2010).

At first blush, one might suppose that revenge is the most adaptive way to respond to transgressions. Revenge can lead perpetrators to make up for the harm they caused and discourage them from repeating their transgressions (Burnette, McCullough, Van Tongeren, & Davis, 2012; McCullough, Kurzban, & Tabak, 2010; Petersen et al., 2010; Sell, Tooby, & Cosmides, 2009). In other words, seeking revenge would minimize one's exploitation risk, whereas forgiving—especially in the absence of evidence that the perpetrator is unlikely to repeat their transgression—would heighten one's exploitation risk. However, seeking revenge creates its own adaptation problems in that it estranges one from another person, harming a relationship from which one might gain fitness benefits such as cooperation or shared resources (Burnette et al., 2012; Petersen et al., 2010). In other words, seeking revenge—especially when the perpetrator has signaled that they are unlikely to repeat their transgression—would heighten

one's risk of spoiling a valuable relationship. Using this analysis, Burnette et al. (2012) proposed that a *forgiveness system* has evolved in humans (see also McCullough, 2008), inclining them to forgive when their risk of exploitation is low and the potential value of a continued relationship with their perpetrator is high. Across correlational and experimental studies examining hypothetical and actual offenses, they found that people were most likely to forgive when they perceived low exploitation risk combined with high relationship value (Burnette et al., 2012).¹

Although Burnette et al. (2012) examined perceptions of exploitation risk and relationship value, they did not identify specific cues that indicate the level of one's exploitation risk or potential value of a continued relationship with one's perpetrator. We posit that amends serves as a cue for both. Amends consists of accepting responsibility, offering sincere apology, and making genuine atonement for a transgression (Hannon, Rusbult, Finkel, & Kumashiro, 2010). Amends relates to exploitation risk in that forgiving when one has received weak (vs. strong) amends heightens one's risk of future exploitation. Amends relates to relationship value in that withholding (vs. granting) forgiveness when one has received strong amends heightens one's risk of spoiling a valuable relationship. It follows that the forgiveness system would incline people to forgive when they have received strong amends. It would also incline people to withhold forgiveness when they have received weak amends. Indeed, past research has shown

¹ Although psychologists continue to debate about what forgiveness is, they tend to agree about what forgiveness is not (Worthington, 2005). Forgiveness is not to be equated with condoning, excusing, pardoning, forgetting about, or denying an offense. Building on definitions of forgiveness proposed by McCullough and colleagues (McCullough, Pargament, & Thoresen, 2000; McCullough, Worthington, & Rachal, 1997), we conceptualize forgiveness as the reduction of negative motivations toward a perceived perpetrator, especially motivations to retaliate against and avoid the perpetrator. Forgiveness may also entail increases in positive motivations toward the perpetrator, such as having goodwill for the perpetrator or restoring the relationship with the perpetrator (see McCullough et al., 1998).

One should note that in the present research, forgiveness was either assessed with a single-item measure (Study 1) or experimentally manipulated (Studies 2 and 3). In all cases, participants were allowed to interpret "forgiveness" as they wished; we did not impose a definition on them. See Friesen and Fletcher (2007) and Kearns and Fincham (2004) for details on lay understandings of forgiveness.

that stronger amends predicts greater forgiveness (e.g., Hannon et al., 2010), particularly when the victim perceives the amends as sincere (Pansera & La Guardia, 2012).

Over evolutionary time, natural selection favors adaptive behavior (Petersen et al., 2010); Burnette and colleagues' (2012) analysis suggests that forgiving when exploitation risk is low and relationship value is high may be one such set of adaptive behaviors. But this time course is far too slow to change the behavior of an individual who has forgiven in the absence of amends or has withheld forgiveness despite having receiving strong amends. Might there be a more immediate signal that one has put oneself at risk by not forgiving in accordance with one's forgiveness system? Sociometer theory suggests that certain affective experiences can function as an alert for social adaptation risks (Leary & Baumeister, 2000; Leary, Tambor, Terdal, & Downs, 1995). Specifically, low self-esteem alerts an individual to potential social exclusion. Because having low self-esteem is unpleasant, it prompts people to build and strengthen relationships with others. In that way, self-esteem serves a functional purpose: helping people avoid the fitness costs of social exclusion.

In a parallel manner, we propose that feelings about the extent to which one has forgiven are an indicator of the degree to which one has forgiven in accordance with one's forgiveness system. Feeling regret or unhappy about one's forgiveness alerts an individual to the social adaptation risk caused by a mismatch between the extent to which one *should* forgive according to one's forgiveness system and the extent to which one actually *has* forgiven. We hypothesize that people feel the happiest about their forgiveness level when their risk of exploitation is minimized at the same time as their relational value is maximized. This would occur when both parties act in a prosocial manner such that one's perpetrator has made strong amends and one matches those amends by granting a high level of forgiveness.

In some cases, only one party acts in a prosocial manner. Two types of mismatches between amends and forgiveness would put one at risk and decrease one's happiness about one's forgiveness level. First, if one's perpetrator has made only weak amends but one grants a high level of forgiveness anyway, one is at heightened risk of exploitation. Forgiving an unapologetic or insincere perpetrator may lead to a continued, harmful relationship, rife with future hurt and exploitation. Therefore, we hypothesize that, when one has granted a high level of forgiveness, receiving weaker amends will have a negative effect on happiness about forgiveness. That is, we predict a significant simple effect of *amends* on happiness about forgiveness when forgiveness is high (Hypothesis 1). Second, if one's perpetrator has made strong amends but one withholds forgiveness, one is at risk of spoiling the value of one's relationship with the perpetrator. Failing to reengage with a person of relational value who has sufficiently taken responsibility and sincerely apologized is a significant relational and social loss. Therefore, we hypothesize that, when one has received strong amends, granting less forgiveness will have a negative effect on happiness about forgiveness level. That is, we predict a significant simple effect of *forgiveness* on happiness about forgiveness when amends are high (Hypothesis 2). Just as self-esteem serves a functional purpose by motivating people to avoid social exclusion, we suggest that the extent to which one feels happy about one's forgiveness level can serve a functional purpose, motivating people to forgive in alignment with their forgiveness system. When people regret their forgiveness or lack thereof, they may adjust their level of forgiveness in the future to lower their adaptation risks.

The preceding analysis makes several novel contributions to the existing literature. First, it combines principles of evolutionary psychology (Buss & Duntley, 2008; Petersen et al., 2010; Sell et al., 2009), the forgiveness system analysis of Burnette et al. (2012), and ideas from

sociometer theory (Leary & Baumeister, 2000; Leary et al., 1995). Second, it identifies amends as a cue for both exploitation risk and relationship value, thereby extending prior analysis of the forgiveness system and connecting it to the literature on amends. Third, it builds on this theoretical framework to make specific predictions about the joint influence of forgiveness and amends on happiness about forgiveness. Fourth, it suggests that happiness about forgiveness is an important construct because it can serve a functional purpose, alerting one to an adaptation risk caused by a mismatch between the extent to which one should forgive according to one's forgiveness system and the extent to which one has actually forgiven.

To summarize, we predict that people would feel happiest about their forgiveness when they and their perpetrators act in a prosocial manner by forgiving and making amends, respectively. We derived two hypotheses about the circumstances under which people feel worse about their forgiveness level. Hypothesis 1 predicts a simple effect of *amends* on happiness about forgiveness when forgiveness is high. That is, it predicts that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby putting themselves at heightened risk of exploitation. Hypothesis 2 predicts a simple effect of *forgiveness* on happiness about forgiveness when amends are high. That is, it predicts that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk. It is helpful to note that these hypotheses are both simple effects, but they are not parallel simple effects. Instead, our hypotheses represent the two effects derived from the preceding theoretical analysis.

We conducted three studies to test these hypotheses. Study 1 was an intensive, 5-month longitudinal study of established romantic couples in which participants reported on

transgressions their partner had committed every two weeks. This study provided a preliminary test of our ideas in the context of transgressions occurring in ongoing relationships. Study 2 was a laboratory experiment in which participants' perceptions of their own forgiveness and a close relationship partner's amends for a past transgression were manipulated through false feedback; Study 3 was a preregistered, higher-powered online replication of Study 2. These experiments extended Study 1 by examining causal effects among model variables. Finally, we conducted a mini meta-analysis of our hypotheses to assess how reliably they were supported across the three studies.

Study 1

As an initial exploration of our hypotheses, we conducted a longitudinal study in which participants reported transgressions committed by their romantic partner at biweekly intervals over a 5-month period. Participants rated each transgression's severity, their partner's amends, their own forgiveness, and their happiness about their forgiveness level. By assessing these variables, we were able to examine whether (a) increasing one's risk of exploitation by forgiving when one has received only weak amends or (b) potentially spoiling one's valuable relationships by withholding forgiveness when one has received strong amends has a negative association with happiness about one's forgiveness level. If substantiated, these effects would suggest that feelings about one's forgiveness level serve a functional purpose by signaling that one is at risk of exploitation or at risk of spoiling a valuable relationship. Study 1's longitudinal research design, in which participants report actual transgressions shortly after they occur, provides an ecologically valid initial test of our hypotheses.

Method

Participants. Members of 104 heterosexual couples ($N = 208$) from the United States who were married or had been dating for at least six months were recruited through advertisements on community bulletin boards, a graduate student listserv, and Craigslist. Sample size was determined by the amount of grant funding available and the ability to recruit couples in a timely manner. Fourteen participants did not report any transgressions and were not included in this study. The final sample included 194 participants (101 women, 93 men) who were 26.87 years of age on average ($SD = 7.60$); 83% were White/Caucasian, 9% were Black/African American, 4% were Asian/Asian American, and 4% indicated another racial identity. Thirty-four percent of participants were married and had been married for an average of 5.55 years ($SD = 8.14$); 48% were dating and 17% were engaged and had been in their relationships for an average of 2.27 years ($SD = 1.85$). Participants were paid \$126 if they completed all parts of the study and a prorated amount if they did not.

Procedure. This study was part of a larger investigation of relationships that included ten online questionnaires: one every two weeks for five months, each lasting 10-15 min. On each questionnaire, participants reported whether their partner committed each of 20 specific transgressions (see Table 1). On average, participants reported 8.94 ($SD = 8.59$) transgressions over the course of the study. For each transgression, participants completed single-item measures assessing transgression severity (“How hurtful do you feel this behavior was?”; 1 = *not at all hurtful*, 5 = *very hurtful*), their partner’s amends (“To what extent did your partner try to make up for this hurtful behavior [for example, apologize]?”; 1 = *not at all*, 5 = *very much*), their own forgiveness (“To what extent have you forgiven your partner for this hurtful behavior?”; 1 =

strong unforgiveness, 6 = *strong forgiveness*), and their happiness about their forgiveness level (“How happy do you feel about your amount of forgiveness?”; 1 = *very sad*, 7 = *very happy*).²

² Although multiple-item measures typically are preferable to single-item measures, we used single-item measures in Study 1 for a few reasons. First, Study 1 participants reported on up to 20 transgressions on each of 10 different assessment waves, so very short measures were necessary to minimize burden on participants. Second, item response theory analyses on the 18-item Transgression-Related Interpersonal Motivations Inventory (TRIM) measure of forgiveness have shown that the TRIM can be conceptualized as a unidimensional construct of forgiveness (McCullough, Luna, Berry, Tabak, & Bono, 2010), which suggests that a face valid, single-item measure could adequately tap the primary component of forgiveness. Third, statistical investigations have shown that single-item measures of a variety of constructs such as job satisfaction, stress, and social identification serve as reasonable proxies for their full scales (e.g., Elo, Leppänen, & Jahkola, 2003; Wanous, Reichers, & Hudy, 1997; Woods & Hampson, 2005).

Table 1

Number of Participants Reporting and Total Number of Occurrences of Each Transgression (Study 1).

<u>Transgression</u>	<u>Number of Participants Reporting Transgression</u>	<u>Total Number of Occurrences of Transgression</u>
My partner was sexually unfaithful	1	1
My partner was emotionally unfaithful	11	16
My partner forgot something that is important to me	21	28
My partner flirted with someone else	18	33
My partner was physically aggressive towards me (hit, pushed, or slapped me, etc.)	21	40
My partner acted excessively clingy with me	29	40
My partner kept a secret from me	31	42
My partner lied to me	33	54
My partner did something that he/she knew I didn't want him/her to do	37	58
My partner engaged in behavior I don't respect	41	62
My partner was rude to (or about) one of my family members or friends	47	63
My partner was controlling of me	41	75
My partner was messy in a way that had a negative impact on me	41	81
My partner handled money poorly	45	83
My partner did not support me when I needed it	55	85
My partner was emotionally distant from me	53	100
My partner was disrespectful to me	90	172
My partner downplayed the importance of something I think is important	82	186
My partner made fun of me	108	232
My partner communicated with me in a negative way (spoke meanly or didn't listen to me, etc.)	115	264

Analysis strategy. Data had a four-level structure in which reports about transgressions were nested within transgression type within person within couple. We used multilevel data analytic strategies (Raudenbush & Bryk, 2002) for analyzing nested diary data (Bolger, Davis, & Rafaeli, 2003; Nezlek, 2001), which provide unbiased hypothesis tests by simultaneously examining variance associated with every level of nesting. All variables were grand-mean standardized ($M = 0$, $SD = 1$). To create Figure 1, in which happiness about one's forgiveness level is presented in its raw metric, we ran a second set of analyses in which the dependent variable was not standardized.

Results

We conducted a multilevel regression analysis predicting happiness about one's forgiveness level from forgiveness, amends, and transgression severity.

Preliminary results. All three main effects were significant. At the mean levels of the other two variables, both forgiveness and amends were positively associated with happiness about forgiveness level, whereas transgression severity was negatively associated with happiness about forgiveness level, $\beta = .58$, $t(770) = 23.30$, $p < .001$, 95% CI [.53, .63]; $\beta = .15$, $t(770) = 4.78$, $p < .001$, 95% CI [.09, .21]; and $\beta = -.25$, $t(770) = -7.88$, $p < .001$, 95% CI [-.31, -.18], respectively. The three-way interaction was also significant, $\beta = .06$, $t(770) = 3.20$, $p = .001$, 95% CI [.02, .10]. Therefore, we examined mild ($-1 SD$) and severe ($+1 SD$) transgressions separately with simple effects tests (Aiken, West, & Reno, 1991). As shown in the left panel of Figure 1, the forgiveness \times amends interaction was not significant for mild transgressions, $\beta = .02$, $t(770) = 0.50$, $p = .62$, 95% CI [-.05, .09]. For mild transgressions, stronger forgiveness predicted greater happiness about forgiveness, and amends did not moderate this association. However, as shown in the right panel, this forgiveness \times amends interaction was significant for

severe transgressions, $\beta = .14$, $t(770) = 6.20$, $p < .001$, 95% CI [.10, .19]. For severe transgressions, stronger forgiveness predicted greater happiness about forgiveness, and this association was more robust when amends were strong than when amends were weak. We decompose the forgiveness \times amends interactions into their relevant simple effects below.

Hypothesis 1 results. Hypothesis 1 predicted that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby heightening their risk of exploitation. Simple effects tests of amends supported this hypothesis, both for mild and severe transgressions. Among those granting relatively high (+1 *SD*) forgiveness for mild transgressions, receiving weaker amends was associated with feeling less happy about one's forgiveness level, $\beta = .13$, $t(770) = 3.63$, $p < .001$, 95% CI [.06, .21]. This was also the case among those granting relatively high forgiveness for severe transgressions, $\beta = .39$, $t(770) = 7.38$, $p < .001$, 95% CI [.28, .49]. Furthermore, the Hypothesis 1 effect was significantly stronger for severe transgressions than it was for mild transgressions, $\beta = .13$, $t(770) = 4.36$, $p < .001$, 95% CI [.07, .18]. These associations are illustrated by comparing the two points on the right side of each panel of Figure 1.

Hypothesis 2 results. Hypothesis 2 predicted that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk. Simple effects tests of forgiveness supported this hypothesis, both for mild and severe transgressions. Among those receiving relatively strong (+1 *SD*) amends for mild transgressions, granting less forgiveness was associated with feeling less happy about one's forgiveness level, $\beta = .79$, $t(770) = 8.97$, $p < .001$, 95% CI [.62, .96]. This was also the case among those receiving relatively strong amends for severe transgressions, $\beta = 1.04$, $t(770) = 17.84$, $p < .001$, 95% CI

[.93, 1.16]. Furthermore, the Hypothesis 2 effect was significantly stronger for mild transgressions than it was for severe transgressions, $\beta = .13$, $t(770) = 2.54$, $p = .011$, 95% CI [.03, .23]. These associations are illustrated by the solid line in each panel of Figure 1.³

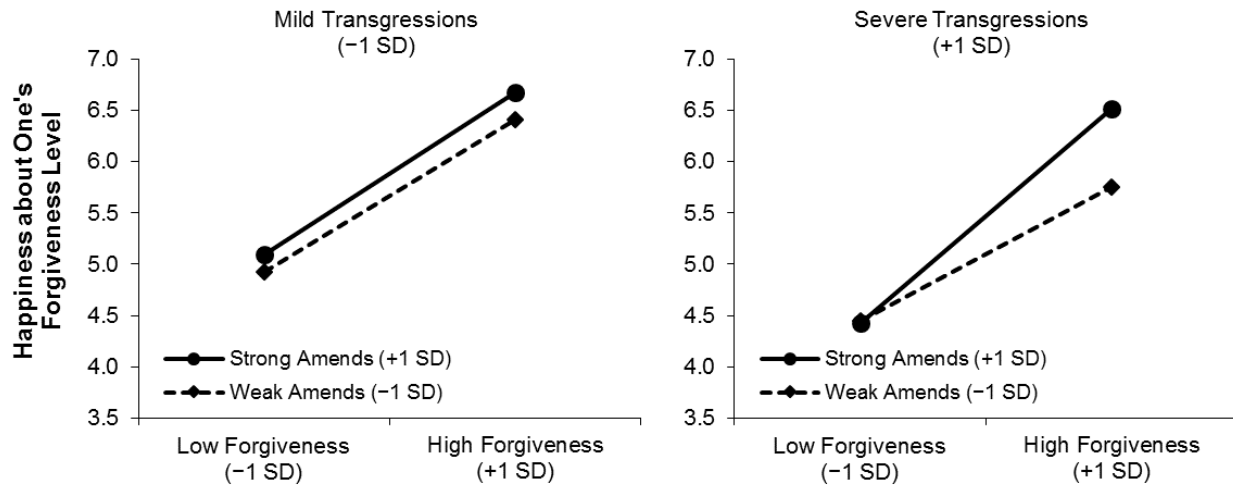


Figure 1. Happiness about one's forgiveness level as a function of forgiveness, amends, and transgression severity (Study 1).

Discussion

Study 1 examined the associations of forgiveness, amends, and transgression severity with happiness about one's forgiveness level following transgressions occurring in ongoing

³ Participant sex did not moderate the reported effects, all $ps > .20$. Relationship type (married vs. dating/engaged) moderated two of the reported effects. First, relationship type moderated the main effect of forgiveness, such that the association of forgiveness with happiness about forgiveness level was stronger among married participants than it was among dating/engaged participants, $\beta = -.22$, $t(763) = -2.82$, $p = .005$, 95% CI [-.37, -.07]. Second, relationship type moderated the forgiveness \times amends interaction for mild (-1SD) transgressions, $\beta = .24$, $t(763) = 2.09$, $p = .037$, 95% CI [.01, .47]. The forgiveness \times amends interaction for mild transgressions was not significant either among married participants or among dating/engaged participants. However, the two interactions were significantly different from one another. Among married couples, there was a trend such that the association of forgiveness with happiness about forgiveness was stronger when amends were weak, $\beta = -.18$, $t(234) = -1.80$, $p = .074$, 95% CI [-.38, .02]. Conversely, among dating/engaged couples, there was a trend such that the association of forgiveness with happiness about forgiveness was stronger when amends were strong, $\beta = .07$, $t(529) = 1.28$, $p = .203$, 95% CI [-.04, .18].

romantic relationships. Hypothesis 1 was supported in that receiving only weak amends when one has granted high forgiveness, which could increase one's risk of exploitation, was associated with less happiness about one's forgiveness level. Hypothesis 2 was supported in that withholding forgiveness when one has received strong amends, which could jeopardize the value of one's relationship, was also associated with less happiness about one's forgiveness level. Furthermore, both hypotheses were supported both when examining relatively mild offenses and when examining relatively severe offenses.

Strengths of Study 1 include its strong external validity, intensive longitudinal procedures examining processes in ongoing romantic relationships, and high statistical power. Together, these strengths provide evidence for the hypothesized associations in established, ongoing relationships. However, Study 1 has modest internal validity and cannot demonstrate causal relationships. We conducted Study 2 to address these limitations.

Study 2

To test our hypotheses further, we conducted a laboratory experiment in which we presented participants with false feedback regarding (a) the extent to which they forgave a perpetrator for a transgression that they had actually experienced and (b) the extent to which their perpetrator made amends for that transgression. By experimentally manipulating participants' perceptions of forgiveness and amends, we were able to test whether increasing participants' perception of their exploitation risk by leading them to believe they have forgiven when they received weak (vs. strong) amends has a negative effect on their happiness about forgiveness. We were also able to test whether increasing participants' perception of their risk of spoiling a valuable relationship by withholding (vs. granting) forgiveness when they have received strong amends has a negative effect on their happiness about forgiveness. These effects

would provide further evidence for the idea that feelings about one's forgiveness are important because they can signal that one has behaved in a way that heightens an adaptation risk. Study 2 compliments the strengths of Study 1 by providing an experimental design to examine the causal effects among model variables.

Method

Participants. Ninety-four undergraduates (59 women, 35 men) participated in Study 2. Sample size was determined by the number of participants from the participant pool that were allocated to the first author during the Spring 2011 academic term (before the psychology replication crisis began). Eight participants' data were excluded because they did not correctly recall the false feedback, did not report a transgression committed by a specific person, or reported suspicion. The remaining 86 participants (53 women, 33 men) were 19.05 years of age on average ($SD = 1.52$); 67% were White/Caucasian, 20% were Asian/Asian American, 7% were Hispanic/Latino/a, 4% were Black/African American, and 2% indicated another racial identity.

Procedure. Participants received instructions via computers in individual cubicles. Participants recalled and described a time a close other did something that hurt, angered, or upset them. They were instructed to choose a severe incident that has not been completely resolved. Participants then provided the perpetrator's first name, indicated their relationship to the perpetrator, and reported how long ago the incident had occurred. Then participants answered questions about their perpetrator's amends (e.g., "[Perpetrator] made amends for his/her behavior;" 1 = *strongly disagree*, 9 = *strongly agree*).

Manipulation of forgiveness. Participants read about the "forgiveness test," which would assess the extent to which they had forgiven their perpetrator. In reality, the forgiveness test was used to provide participants with false feedback about their forgiveness. We used the procedure

Luchies, Finkel, McNulty, and Kumashiro (2010) adapted from Karremans, Van Lange, Ouwerkerk, and Kluwer (2003). The forgiveness test was a version of the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998), which assesses implicit associations between target categories by comparing their reaction times in blocks of trials. The target categories were (a) the perpetrator's first name and filler first names and (b) words with positive valence and words with negative valence. For each block of trials, participants identified each word that appeared on the computer screen by pressing keys corresponding to the categories presented at the top of the screen. There were two critical blocks of trials. In one block, participants responded with the same key to positive words and the perpetrator's name. In the other block, participants responded with the same key to negative words and the perpetrator's name.

Next, participants read about the rationale of the forgiveness test, which was that when a person has forgiven, mental associations (measured through reaction times) between positive words and the name of the perpetrator would be stronger, but, when a person has not forgiven, associations between negative words and the name of the perpetrator would be stronger. Participants were randomly assigned to one of two forgiveness feedback conditions, ostensibly based on their reaction times. Participants in the high forgiveness condition read that they had responded faster when the perpetrator's name was paired with positive words. They read, "As your reaction times reveal, the associations between [Perpetrator] and positive words are stronger... you have largely forgiven [Perpetrator]." Participants in the low forgiveness condition read that they had responded faster when the perpetrator's name was paired with negative words. They read, "As your reaction times reveal, the associations between [Perpetrator] and negative words are stronger... you have not completely forgiven [Perpetrator]."

Manipulation of amends. Next, using the Luchies et al. (2010) procedure, participants were randomly assigned to one of two amends feedback conditions, ostensibly based on their responses to the questions concerning amends. Participants were told that their responses to the amends questions had been compared to the responses of other participants. Participants in the weak amends condition read that their perpetrator's amends was in the 17th percentile, meaning that "83% of other offenders made more amends than [Perpetrator]. According to these results, [Perpetrator] has made only weak amends." Participants in the strong amends condition read that their perpetrator's amends was in the 83rd percentile, meaning that "83% of other offenders made less amends than [Perpetrator]. According to these results, [Perpetrator] has made quite strong amends."

Assessment of feelings about one's forgiveness level. Participants reported how happy, sad, good, bad, satisfied, and dissatisfied they felt about the extent to which they had forgiven their perpetrator (e.g., "How happy are you about the extent to which you forgave [Perpetrator]?"; 1 = *not at all happy*, 9 = *extremely happy*; $\alpha = .92$). The negatively-valenced items were reverse-scored before averaging all six items to create a composite measure.

Manipulation and suspicion checks. Participants reported whether the forgiveness test had indicated that they had forgiven, that they had not forgiven, or that the test was inconclusive. They also reported the extent to which they felt that they had forgiven their perpetrator (1 = *not at all forgiven*, 9 = *completely forgiven*). Then, participants recalled their perpetrator's amends by reporting the percentile the computer had calculated. They also reported the extent to which they felt that the perpetrator had made amends (1 = *very weak amends*, 9 = *very strong amends*). Participants reported what hypothesis they thought the study was testing and how they thought it

was tested. Finally, participants were debriefed to ensure that they understood that the feedback was determined by random assignment.

Results

Descriptive analyses. Participants reported transgressions committed by friends (47%), current or former romantic partners (28%), family members (23%), and others (2%). Participants reported a variety of transgressions, including negative communication/lies (29%), lack of communication/secrets (26%), disrespectful/rude behavior (18%), breakups (10%), unfaithfulness/flirtation (7%), irresponsible behavior (6%), and lack of support/emotional distance (4%). Transgressions occurred an average of 7.70 months before the study ($SD = 14.69$).

Manipulation checks. Between-subjects t -tests showed that the manipulations were successful. Participants in the high forgiveness condition reported that they had forgiven to a greater extent ($M = 6.89$, $SD = 1.64$) than those in the low forgiveness condition ($M = 4.76$, $SD = 1.91$), $t(84) = 5.57$, $p < .001$, $d = 1.20$, 95% CI [.74, 1.66]. Participants in the strong amends condition reported that the perpetrator had made stronger amends ($M = 4.58$, $SD = 2.28$) than those in the weak amends condition ($M = 3.19$, $SD = 1.79$), $t(84) = 3.16$, $p = .002$, $d = 0.68$, 95% CI [.24, 1.11].

Primary analysis of the experimental effects. We conducted a 2 (forgiveness: low vs. high) \times 2 (amends: weak vs. strong) between-subjects ANOVA on feelings about forgiveness level, followed by simple effects tests to examine our hypotheses. Results are presented in Figure 2.

Preliminary results. The main effect of forgiveness feedback condition was significant, indicating that, when collapsing across amends feedback conditions, participants who were led to believe that they had forgiven reported feeling better about their forgiveness level ($M = 6.34$, SD

= 1.81) than those who were led to believe that they had not forgiven ($M = 4.57$, $SD = 1.63$), $F(1, 82) = 22.99$, $p < .001$, $\eta^2_p = .22$, 90% CI [.10, .34]. The main effect of amends feedback condition was not significant, indicating that, when collapsing across forgiveness feedback conditions, there was not a reliable difference in happiness about forgiveness level between participants who were led to believe that they had received strong amends ($M = 5.87$, $SD = 2.01$) and those who were led to believe that they had received weak amends ($M = 5.12$, $SD = 1.80$), $F(1, 82) = 2.63$, $p = .109$, $\eta^2_p = .03$, 90% CI [.00, .11]. The forgiveness \times amends interaction was significant, $F(1, 82) = 4.86$, $p = .03$, $\eta^2_p = .06$, 90% CI [.003, .15].

Hypothesis 1 results. Hypothesis 1 predicted that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby heightening their risk of exploitation. A simple effects test of amends supported this hypothesis. Among those in the high forgiveness feedback condition, participants who were led to believe that they had received weak amends reported feeling worse about their forgiveness level ($M = 5.60$, $SD = 1.83$) than those who were led to believe that they received strong amends ($M = 6.99$, $SD = 1.55$), $F(1, 82) = 7.68$, $p = .007$, $\eta^2_p = .09$, 90% CI [.01, .19]. This effect is illustrated by comparing the two points on the right side of Figure 2.

Hypothesis 2 results. Hypothesis 2 predicted that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk. A simple effects test of forgiveness supported this hypothesis. Among those in the strong amends feedback condition, participants who were led to believe that they had granted less forgiveness reported feeling worse about their forgiveness level ($M = 4.46$, $SD = 1.60$) than those who were

led to believe that they had granted more forgiveness ($M = 6.99$, $SD = 1.55$), $F(1, 82) = 24.33$, $p < .001$, $\eta^2_p = .23$, 90% CI [.11, .35]. This effect is illustrated by the solid line in Figure 2.^{4, 5}

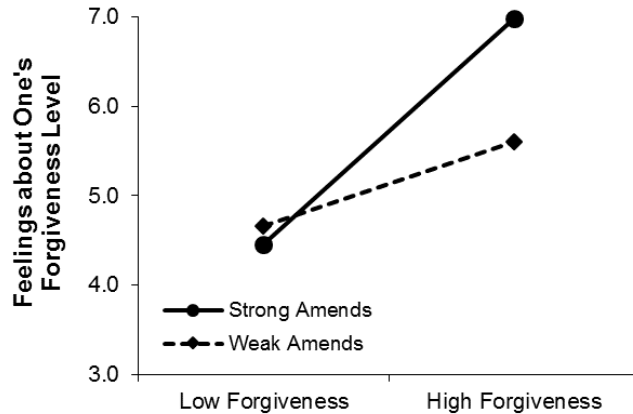


Figure 2. Feelings about one's forgiveness level as a function of forgiveness and amends feedback conditions (Study 2 primary analysis of the experimental effects).

Auxiliary analysis with manipulation checks as predictors. To explore the associations among forgiveness, amends, and feelings about forgiveness further, we conducted a regression analysis predicting participants' feelings about their forgiveness level from their perceptions of their forgiveness and their perpetrators' amends as assessed on the manipulation checks. We standardized all variables before analysis. Then, to create Figure 3, in which feelings about one's forgiveness level is presented in its raw metric, we ran a second regression analysis in which the dependent variable was not standardized.

This analysis did not provide additional support for Hypothesis 1. Among participants who reported high (+1 *SD*) forgiveness, reporting weaker amends was not reliably associated

⁴ We repeated our analyses using data from all 94 participants. Results for both Hypothesis 1 and Hypothesis 2 were similar across samples, $p < .001$ and $p = .008$, respectively.

⁵ Neither participant sex nor relationship to the perpetrator moderated the reported effects, all $ps > .26$.

with feeling worse about one's forgiveness level, $\beta = .12$, $t = 0.90$, $p = .37$, 95% CI [-.15, .39].

However, this analysis did provide additional support for Hypothesis 2. Among participants who reported strong (+1 SD) amends, reporting less forgiveness was associated with feeling worse about one's forgiveness level, $\beta = .70$, $t = 3.87$, $p < .001$, 95% CI [.34, 1.06]. This association is illustrated by the solid line in Figure 3.

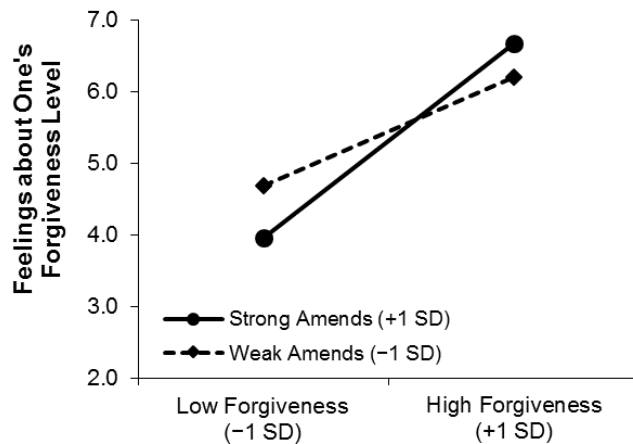


Figure 3. Feelings about one's forgiveness level as predicted from the forgiveness and amends manipulation check measures (Study 2 auxiliary analysis).

Discussion

Study 2 used false feedback to manipulate participants' perceptions of their own forgiveness and their perpetrators' amends for a severe transgression to examine the effects of forgiveness and amends on feelings about one's forgiveness level. Both hypotheses were supported in the primary analysis. Hypothesis 1 was supported in that, among those who were led to believe that they had offered high forgiveness, participants who were led to believe that they had received only weak amends reported feeling worse about their forgiveness than did participants who were led to believe that they had received strong amends. Hypothesis 2 was

supported in that, among those who were led to believe that they had received strong amends, participants who were led to believe that they had offered low forgiveness reported feeling worse about their forgiveness than did participants who were led to believe they had offered high forgiveness. However, in auxiliary analyses using the manipulation check assessments of forgiveness and amends as predictors, Hypothesis 2 received additional support but Hypothesis 1 did not. Nonetheless, the controlled laboratory setting and experimental manipulations in Study 2 give it strong internal validity, lending support for the causal effects of forgiveness and amends on feelings about one's forgiveness.

It is important to note that Study 2 was conducted in early 2011, before the replication crisis in psychology began and when social psychologists frequently used relatively small samples, which were often determined by factors such as the number of participant pool subjects available in a given academic term. We now know that an *N* of 94 (86 after exclusions) is quite small for a 2×2 between-subjects design. For this reason, we conducted a higher-powered, preregistered replication of Study 2.

Study 3

Study 3 was a preregistered replication of Study 2. To procure a much larger sample, we switched the testing context from the laboratory to Mechanical Turk (MTurk). As in Study 2, the experimental design allowed us to examine the causal effects of forgiveness and amends on happiness about forgiveness. Specifically, we were able to test whether combinations of forgiveness and amends that would increase one's risk of exploitation or risk of spoiling a valuable relationship have a negative effect on happiness about forgiveness. Such effects would suggest that feelings about one's forgiveness serve a functional purpose by signaling that one has not forgiven in accordance with one's forgiveness system, thereby creating an adaptation risk.

Method

Power analysis. We conducted an *a priori* power test using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the required sample size for an adequately powered test of our hypotheses. We set the parameters at a “small to medium” effect size f of .2, error probability of .05, power to .95, numerator df of 1, and number of groups to 4. Given these parameters, the required total sample size is 327. We expected approximately 15% of participants to meet one or more of the exclusion criteria listed in the study’s preregistration (i.e., the participant did not describe a specific transgression incident, did not list a specific offender name, provided an offender name that was used as a filler name, did not complete the dependent variable and manipulation checks, did not correctly recall forgiveness test false feedback, did not recall amends false feedback with 10 percentile points, and/or expressed suspicion). Therefore, we recruited 388 participants, expecting approximately 329 participants’ data for analysis.

Participants. Three hundred eighty-eight Mechanical Turk workers (226 women, 161 men, 1 other) participated in Study 3. A higher-than-expected number of participants met one or more of our exclusion criteria (136 participants, or 35% of the sample). The remaining 252 participants (166 women, 85 men, 1 other) were 35.06 years of age on average ($SD = 11.69$); 77% were White/Caucasian, 7% Black/African American, 6% Hispanic/Latino/a, 4% Asian/Asian American, 6% multiracial, and 1% other. Participants received \$1.

Procedure. All procedures were identical to Study 2 with the following three exceptions. First, Study 2 participants were undergraduates, whereas Study 3 participants were MTurk workers. Second, Study 2 took place in a laboratory with an experimenter present, whereas Study 3 took place wherever the participants completed the survey without an experimenter present. Third, Study 2 was programmed using MediaLab and DirectRT, whereas Study 3 was

programmed using Qualtrics. The feelings about one's forgiveness level measure exhibited good reliability ($\alpha = .90$).

Preregistration. This study's preregistration (https://osf.io/83gk5/?view_only=ea9d2a82f543454797a48dbfb9ace54e) included materials related to data collection (i.e., Qualtrics survey file) and data analysis (i.e., code for statistical analysis). As is often the case, we updated the theoretical framework and made corresponding changes to our hypotheses during this paper's review process. Therefore, the statistical analysis code in the preregistration was designed to test two hypotheses based on a previous version of the theoretical framework. Specifically, we originally predicted a main effect of forgiveness and a forgiveness \times amends interaction effect, such that the effect of forgiveness on happiness about forgiveness would be dampened when amends were weak. The first hypothesis was supported whereas the second was not—much like Hypothesis 1 was supported whereas Hypothesis 2 was not in the results reported below. It should be noted that the data analytic strategy reported here was not included in this study's preregistration but is available in a subsequent registration for the same project (https://osf.io/4q7xr/?view_only=d6be51a65b26491993ba08e2c8a14cd1).

Results

Descriptive analyses. Participants reported transgressions committed by current or former romantic partners (38%), family members (33%), friends (22%), and others (6%). Participants reported a variety of transgressions, including negative communication/lies (28%), disrespectful/rude behavior (21%), irresponsible behavior (14%), lack of communication/secrets (13%), unfaithfulness/flirtation (10%), lack of support/emotional distance (7%), breakups (4%), and other transgressions (3%). Transgressions occurred an average of 9.10 months before the study ($SD = 29.80$).

Manipulation checks. Between-subjects *t*-tests showed that the manipulations were successful. Participants in the high forgiveness condition reported that they had forgiven to a greater extent ($M = 5.69$, $SD = 2.52$) than those in the low forgiveness condition ($M = 3.75$, $SD = 2.22$), $t(250) = 6.46$, $p < .001$, $d = 0.81$, 95% CI [.56, 1.07]. Participants in the strong amends condition reported that the perpetrator had made stronger amends ($M = 4.22$, $SD = 2.71$) than those in the weak amends condition ($M = 2.26$, $SD = 1.86$), $t(250) = 6.61$, $p < .001$, $d = 0.84$, 95% CI [.58, 1.09].

Primary analysis of the experimental effects. We conducted a 2 (forgiveness: low vs. high) \times 2 (amends: weak vs. strong) between-subjects ANOVA on feelings about forgiveness level, followed by simple effects tests to examine our hypotheses. Results are presented in Figure 4.

Preliminary results. The main effect of forgiveness feedback condition was significant, indicating that, when collapsing across amends feedback conditions, participants who were led to believe that they had forgiven reported feeling better about their forgiveness level ($M = 6.08$, $SD = 2.05$) than those who were led to believe that they had not forgiven ($M = 4.67$, $SD = 1.88$), $F(1, 248) = 32.87$, $p < .001$, $\eta^2_p = .12$, 90% CI [.06, .18]. The main effect of amends feedback condition was not significant, indicating that, when collapsing across forgiveness feedback conditions, there was not a reliable difference in happiness about forgiveness level between participants who were led to believe that they had received strong amends ($M = 5.57$, $SD = 2.09$) and those who were led to believe that they had received weak amends ($M = 5.17$, $SD = 2.08$), $F(1, 248) = 2.82$, $p = .094$, $\eta^2_p = .01$, 90% CI [.00, .04]. The forgiveness \times amends interaction was not significant, $F(1, 248) = 0.01$, $p = .909$, $\eta^2_p = .00$, 90% CI [.00, .001].

Hypothesis 1 results. Hypothesis 1 predicted that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby heightening their risk of exploitation. A simple effects test of amends did not provide support for this hypothesis. Among those in the high forgiveness feedback condition, participants who were led to believe that they had received weak amends did not report feeling worse about their forgiveness level ($M = 5.88$, $SD = 2.06$) than those who were led to believe that they received strong amends ($M = 6.27$, $SD = 2.03$), $F(1, 248) = 1.24$, $p = .267$, $\eta^2_p = .01$, 90% CI [.00, .03].

Hypothesis 2 results. Hypothesis 2 predicted that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk. A simple effects test of forgiveness supported this hypothesis. Among those in the strong amends feedback condition, participants who were led to believe that they had granted less forgiveness reported feeling worse about their forgiveness level ($M = 4.88$, $SD = 1.91$) than those who were led to believe that they had granted more forgiveness ($M = 6.27$, $SD = 2.03$), $F(1, 248) = 16.72$, $p < .001$, $\eta^2_p = .06$, 90% CI [.02, .12]. This effect is illustrated by the solid line in Figure 4.^{6,7}

⁶ An additional 30 participants pressed the spacebar during one or both of the two critical blocks of trials in the Forgiveness Test IAT before being directed to do so; they did not complete the two blocks upon which the false feedback was supposedly based. We repeated our analyses using data from (a) all 388 participants and (b) the 222 participants who were not excluded based on the original exclusion criteria and who completed the critical blocks of the IAT. Results were similar across samples: Hypothesis 1 $p = .497$ (all 388 participants) and $.163$ (222 participants) and Hypothesis 2 $p < .001$ for both samples.

⁷ Participant sex did not moderate the reported effects, all $ps > .19$. The type of relationship between the participant and the perpetrator (romantic partner vs. other family or friend) did moderate the forgiveness \times amends interaction, $F(1, 244) = 6.32$, $p = .013$, $\eta^2_p = .03$, 90% CI [.003, .07]. The forgiveness \times amends interaction was not significant either among those who reported a transgression committed by a romantic partner or among those who reported a transgression committed by another family member or friend. However, the two interactions were significantly different from one another. Among those reporting about a romantic partner, there was a trend such that the effect of forgiveness on happiness about forgiveness level was stronger when amends were strong, $F(1, 89) = 3.25$, $p = .075$, $\eta^2_p = .04$, 90% CI [.00, .12]. Conversely, among those reporting about another type of close relationship, there was a trend such that the effect of forgiveness on happiness about forgiveness was stronger when amends were weak, $F(1, 155) = 3.11$, $p = .080$, $\eta^2_p = .02$, 90% CI [.00, .07].

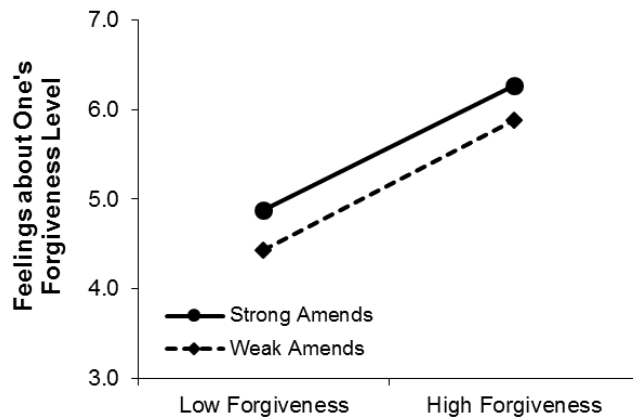


Figure 4. Feelings about one's forgiveness level as a function of forgiveness and amends feedback conditions (Study 3 primary analysis of the experimental effects).

Auxiliary analysis with manipulation checks as predictors. To explore the associations among forgiveness, amends, and feelings about forgiveness further, we conducted a regression analysis predicting participants' feelings about their forgiveness level from their perceptions of their forgiveness and their perpetrators' amends as assessed on the manipulation checks. We standardized all variables before analysis. Then, to create Figure 5, in which feelings about one's forgiveness level is presented in its raw metric, we ran a second regression analysis in which the dependent variable was not standardized.

This analysis provided marginal support for Hypothesis 1. Among participants who reported high (+1 *SD*) forgiveness, reporting weaker amends was marginally associated with feeling worse about one's forgiveness level, $\beta = .07$, $t = 1.91$, $p = .058$, 95% CI [-.005, .28]. This analysis also provided additional support for Hypothesis 2. Among participants who reported strong (+1 *SD*) amends, reporting less forgiveness was associated with feeling worse about one's

forgiveness level, $\beta = .83$, $t = 7.39$, $p < .001$, 95% CI [.61, 1.05]. This association is illustrated by the solid line in Figure 5.

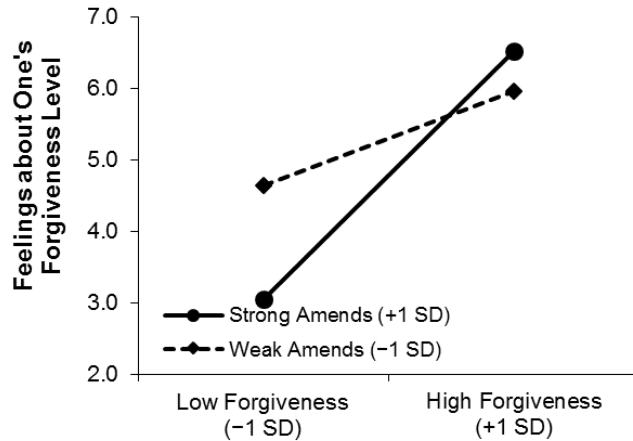


Figure 5. Feelings about one's forgiveness level as predicted from the forgiveness and amends manipulation check measures (Study 3 auxiliary analysis).

Discussion

Study 3 was a preregistered, higher-powered replication of Study 2. In this study, Hypothesis 1 was not supported in the primary analyses examining of the experimental effects, but it received marginal support in the auxiliary analysis using the manipulation check measures as predictors. Hypothesis 2 was strongly supported in both the primary and auxiliary analyses.

Given the seemingly trivial differences between Study 2 and Study 3, what might explain why Hypothesis 1 was supported in Study 2 but not in Study 3? Although we cannot answer this question definitively, it is instructive to examine the methodological attributes of the two studies and consider how these differences resulted in different strengths and weaknesses. Study 2 had a sample of 94 undergraduates who completed the experiment in a laboratory setting with an experimenter present. Study 2 was programmed using the MediaLab and DirectRT software

programs. Study 3 had a sample of 388 MTurk participants who completed the experiment online without an experimenter presenter. Study 3 was programmed using Qualtrics, which allowed participants to skip a portion of the IAT forgiveness test by pressing the spacebar before being instructed to do so. As illustrated in Figure 6, these methodological differences resulted in Study 2’s strengths of greater experimental control, greater internal validity, and a lower exclusion rate than Study 3. The differences also resulted in the Study 3’s strength of higher statistical power than Study 2. Each study’s unique strengths and weaknesses may have contributed to their differing Hypothesis 1 results.

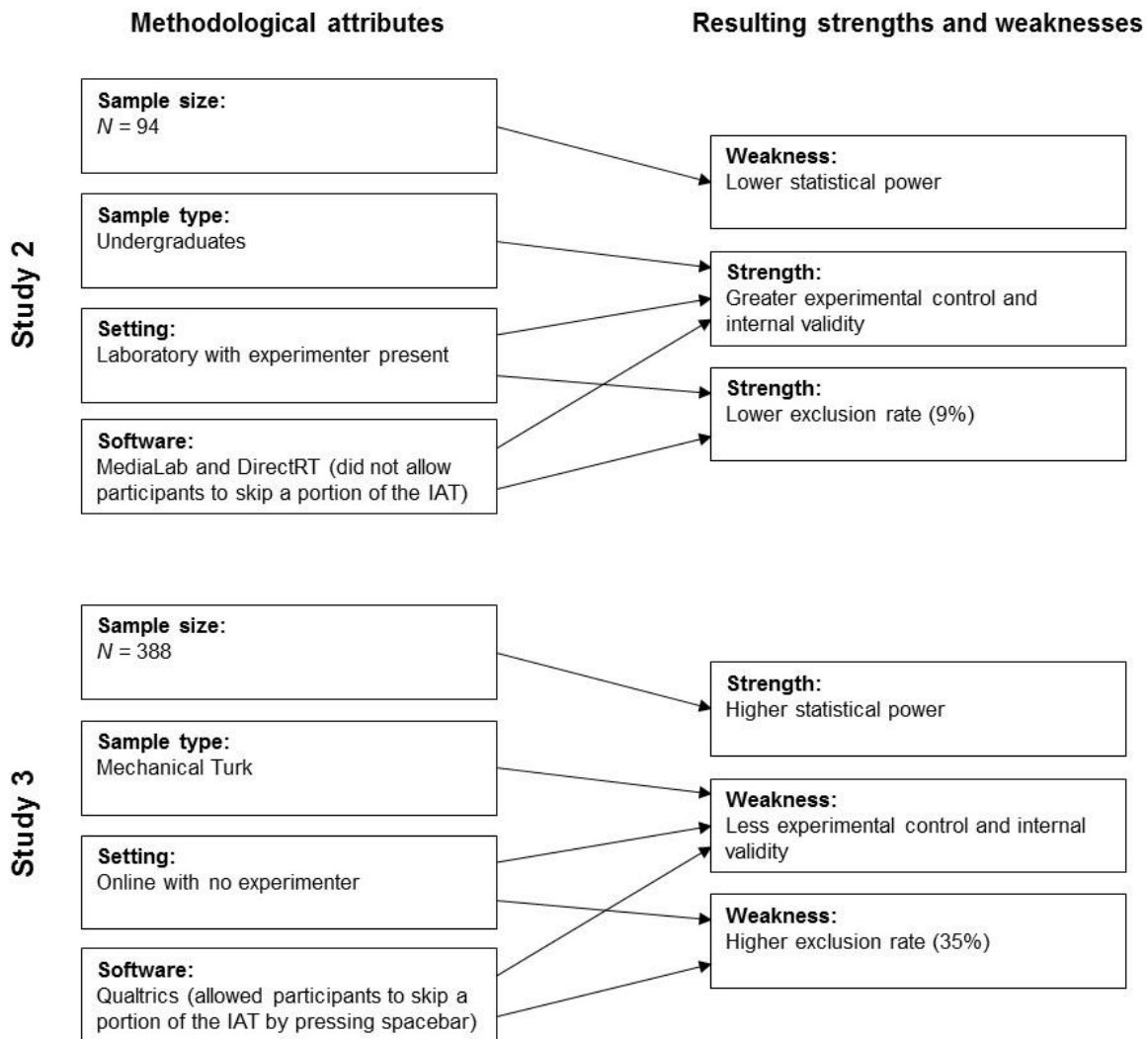


Figure 6. Methodological attributes and resulting strengths and weaknesses of Studies 2 and 3.

Which study, then, provides the more definitive results regarding Hypothesis 1? That is a difficult question to answer in general terms (Finkel, Eastwick, & Reis, 2017). For example, if the issue surrounds estimating the likely replicability of the experimental results, Study 3 should probably carry more weight than Study 2. Study 3's large sample and preregistered procedures give particularly strong confidence in the precision of the central p -values. In addition, even in the most optimistic interpretation, Study 3 puts major boundary conditions on the generality of the Study 2 findings. If the issue surrounds evaluating the internal validity of the results, Study 2 should probably carry more weight than Study 3 because of the greater experimental control afforded by laboratory studies versus MTurk studies. Our own interpretation vis-à-vis Hypothesis 1 is that the correlational results (Study 1) provide reasonably strong support, but the experimental results (Studies 2 and 3) provide weak support.

Mini Meta-Analysis

Given that Hypothesis 1 was supported in two of the three studies in this program of research, we conducted a small meta-analysis of our studies to assess the overall reliability of the hypothesized effects (Goh, Hall, & Rosenthal, 2016). We calculated four meta-analytic effects across the three studies. We calculated the first pair of effects using results from the primary hypothesis tests of the experimental manipulations in Studies 2 and 3. We calculated the second pair of effects using results from the auxiliary analyses using the manipulation checks as predictors in Studies 2 and 3. Because Study 1 supported both hypotheses both when examining mild transgressions and when examining severe transgressions, we collapsed across transgression severity, thereby calculating a single Study 1 effect for each hypothesis.

We standardized all predictor and outcome variables in all analyses. To calculate each meta-analytic beta, we weighted the beta for each effect from each study by the inverse of its variance. To calculate each meta-analytic standard error, we took the square root of the reciprocal of the sum of the weights. To conduct hypothesis tests on our meta-analytic effects, we divided the meta-analytic beta by the meta-analytic standard error, which yielded a z statistic. This approach is flexible enough to allow us to calculate meta-analytic effects across our studies and their analytic methods (i.e., multilevel analyses of nested longitudinal data in Study 1 and regression analyses and ANOVAs of experimental effects in Studies 2 and 3).

Hypothesis 1 was strongly supported when using the primary hypothesis tests of the experimental manipulations in Studies 2 and 3. Across the three studies, when participants granted a relatively high level of forgiveness, receiving weaker amends was associated with feeling worse about one's forgiveness level, $\beta = 0.16$ $z = 5.64$, $p < .001$. The meta-analysis also supported Hypothesis 2. Across the three studies, when participants received relatively strong amends, granting less forgiveness was associated with feeling worse about one's forgiveness level, $\beta = 0.86$ $z = 21.56$, $p < .001$. We obtained similar results for both hypotheses when using results from the auxiliary analyses in Studies 2 and 3, $\beta = 0.16$ $z = 5.49$, $p < .001$ and $\beta = 1.01$ $z = 23.39$, $p < .001$, respectively.

General Discussion

A longitudinal study and two experiments examined the joint influence of forgiveness and amends on people's happiness about their forgiveness level. We predicted that people would feel happiest about their forgiveness when they and their perpetrators act in a prosocial manner by forgiving and making amends, respectively. We derived two hypotheses about the circumstances under which people feel worse about their forgiveness. Hypothesis 1 predicted

that people would feel worse about their forgiveness level when they grant a high level of forgiveness to a perpetrator who has made weak (vs. strong) amends, thereby heightening their risk of exploitation. Hypothesis 1 was supported in Study 1, in the primary analysis in Study 2, and marginally in the auxiliary analysis in Study 3. It was not supported in the auxiliary analysis in Study 2 or in the primary analysis in Study 3. Despite these inconsistencies, a meta-analysis of the three studies indicated that the Hypothesis 1 effect was reliable when considering the research program as a whole. Hypothesis 2 predicted that people would feel worse about their forgiveness level when they grant a low (vs. high) level of forgiveness to a perpetrator who has made strong amends, thereby putting the value of their relationship with the perpetrator at risk. Hypothesis 2 was supported across all three studies and in the meta-analysis.

Strengths and Limitations

This program of research has a number of methodological strengths. First, we used both correlational and experimental methods, providing convergent support for our hypotheses. Second, we conducted a preregistered replication, which replicated Hypothesis 2 but not Hypothesis 1, and a meta-analysis to provide evidence for both hypothesized effects. Third, our participants included a community sample of dating, engaged, and married couples in Study 1; university students in Study 2; and MTurk workers in Study 3. Finally, because we investigated a range of transgressions committed by several types of relationship partners, our findings seem to generalize across a variety of interpersonal transgression situations.

At the same time, this program of research has several limitations that one should consider when interpreting its findings. First, we used artificial manipulations of forgiveness and amends in Studies 2 and 3. Although these manipulations affected participants' perceptions of forgiveness and amends as designed, we do not know how the magnitude of these manipulations

aligns with naturally-occurring variations of forgiveness and amends. Accordingly, we should not assume that the effect sizes found in these experiments reflect real-life effect sizes. Study 1, which examined actual transgressions, provides a better basis for inferring effect sizes. The Hypothesis 1 effect sizes were $\beta = .163, .370, \text{ and } .093$ for Studies 1, 2, and 3, respectively. The Study 1 effect size was in between the Study 2 and 3 effect sizes, suggesting that the actual Hypothesis 1 effect size may be in that range. The Hypothesis 2 effect sizes were $\beta = 1.089, .658, \text{ and } .334$, respectively. The Study 1 effect size was the largest of the three, suggesting both that the actual Hypothesis 2 effect may be larger than the experimental studies suggest and that the Hypothesis 2 effect may be substantially larger than the Hypothesis 1 effect.

However, a second consideration may also affect interpretation of effect sizes: Both the measure of forgiveness and the measure of happiness about forgiveness are about forgiveness. As such, it may be unsurprising that the two measures are highly correlated. The size of Hypothesis 2 effect, which examines the simple effect of forgiveness on happiness about forgiveness, may be artificially inflated given that both of these measures are about forgiveness. Another explanation of the large Hypothesis 2 effect is that because people tend to view forgiveness positively, they tend to feel good about themselves when they forgive.

A third consideration is that we asked participants in Studies 2 and 3 to recall a severe and unresolved transgression. We would expect that severe transgressions highlight exploitation risk because being the victim of a severe transgression could be more costly than being the victim of a mild transgression. On the other hand, we would expect that mild transgressions highlight the risk of spoiling a valuable relationship because failing to forgive someone for a mild transgression, especially when they have made amends, may seem unreasonable to others and put the relationship on unstable ground. If our speculations are correct, our instructions to

recall a severe offense may have skewed the results by artificially inflating the Hypothesis 1 effect, which is about exploitation risk, at the expense of the Hypothesis 2 effect, which is about the risk of spoiling a valuable relationship. Consistent with these ideas, Study 1 results showed that the Hypothesis 1 effect was stronger for severe transgressions than it was for mild transgressions, although it was significant for both. Future research could explore the role of severity in emphasizing exploitation risk vs. relationship value.

Contributions, Implications, and Directions for Future Research

This program of research makes several innovative contributions, both because of its theoretical framework and because of its practical implications. We combined principles of evolutionary psychology (Buss & Duntley, 2008; Petersen et al., 2010; Sell et al., 2009), the forgiveness system analysis of Burnette et al. (2012), and ideas from sociometer theory (Leary & Baumeister, 2000; Leary et al., 1995). Combining these theoretical frameworks enabled us to derive novel hypotheses about the joint influence of forgiveness and amends on happiness about forgiveness. Specifically, evolutionary psychology and Burnette et al.'s forgiveness system analysis indicate that people are most likely to forgive when their adaptation risks are low, that is, when exploitation risk is low and relationship value is high. Sociometer theory adds to this by suggesting that affective experiences can function as an alert for social adaptation risks. Building on this idea from sociometer theory, we proposed that feelings about the extent to which one has forgiven are an indicator of the degree to which one has forgiven in accordance with one's forgiveness system. Feeling unhappy or regret about one's forgiveness could prompt one to follow their forgiveness system more closely in the future. In other words, evolutionary psychology and the forgiveness system analysis identify *when* people are most likely to forgive, whereas sociometer theory indicates *what happens* when people forgive in alignment or

misalignment with their forgiveness system. Neither theoretical approach alone does both of these things. In addition to integrating these theoretical approaches, we identified amends as a cue for both exploitation risk and relationship value, thereby extending prior analysis of the forgiveness system and connecting it to the literature on amends.

Another contribution is that we examined happiness about forgiveness—a construct that, to our knowledge, has not been examined in prior research. Together, this paper’s theoretical framework and findings suggest that happiness about forgiveness is an important construct because it can serve a functional purpose. Feeling unhappy or regret about one’s forgiveness could alert one to an adaptation risk caused by a mismatch between the extent to which one should forgive according to one’s forgiveness system and the extent to which one has actually forgiven. Future research could test the functional value of happiness about forgiveness by examining whether feeling badly about one’s forgiveness of one transgression predicts an adjustment in one’s forgiveness level and a corresponding change in happiness about forgiveness for a subsequent transgression. It could also be fruitful to identify and explore the potential functional role of feelings about other behaviors that affect one’s fitness and adaptation risks.

Finally, given the different Hypothesis 1 results between Study 2 and Study 3, a broader direction for future research is to examine the circumstances under which the results from studies using laboratory and MTurk samples and procedures are and are not generalizable. This is especially important given that the replication crisis has led many scholars to prioritize large samples which are easily recruited via MTurk. Although some types of studies may be unaffected by having participants hurry through a survey or simple procedures—perhaps as part of a multi-hour study binge—the more complex procedures of Study 3, which included an IAT

and false feedback manipulations, may not be as amenable to MTurk samples. This speculative suggestion seems like a worthwhile topic for future research.

Conclusion

Psychologists have known that people are more likely to forgive when they have received strong amends or perceive the combination of low exploitation risk and high relationship value (e.g., Burnette et al., 2012; Hannon et al., 2010; Pansera & La Guardia, 2012). Until now, however, psychologists have not known much about what happens when people do not follow this pattern. In this paper, we have theorized that when people forgive despite not having received strong amends, they heighten their exploitation risk; when people do not forgive despite having received strong amends, they heighten their risk of spoiling a valuable relationship. In both cases, we have shown that people tend to feel worse about their forgiveness level than if they received strong amends and matched those amends with a high level of forgiveness. Thus, it takes the prosocial behavior of both parties—victims and perpetrators—to create the situation in which victims can forgive without experiencing a decrement in their happiness about doing so.

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