

# Conciliatory Gestures Facilitate Forgiveness and Feelings of Friendship by Making Transgressors Appear More Agreeable

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**ABSTRACT** The authors examined how conciliatory gestures exhibited in response to interpersonal transgressions influence forgiveness and feelings of friendship with the transgressor. In Study 1, 163 undergraduates who had recently been harmed were examined longitudinally. Conciliatory gestures exhibited by transgressors predicted higher rates of forgiveness over 21 days, and this relationship was mediated by victims' perceptions of their transgressors' Agreeableness. Study 2 was an experiment including 145 undergraduates who experienced a breach in trust from an anonymous partner during an iterated prisoner's dilemma. When transgressors apologized and offered financial compensation, participants reported higher levels of forgiveness and feelings of friendship when compared to a control condition and an aggravating condition. The effects of apology/compensation on forgiveness and perceived friendship were mediated by victims' perceptions of their transgressors' Agreeableness. Results suggest that conciliatory gestures promote forgiveness in part by depicting transgressors as more sympathetic, considerate, fair, and just (i.e., agreeable).

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Animal behavior researchers have discovered that dozens of species of nonhuman mammals exhibit a tendency to engage in friendly gestures and behaviors following conflict and aggression, which is often called reconciliation (Aureli & de Waal, 2000). The behaviors used for reconciliation, known collectively as *conciliatory gestures*, differ widely across species, with some species using grooming, others using sexual contact, others using grunts and other vocal signals, and still others using physical proximity, play, or the mutual rubbing of horns or fins to facilitate reconciliation (e.g., Aureli & De Waal, 2000; Cools, Van Hout, & Nelissen, 2008; Cordoni & Palagi, 2008).

Conciliatory gestures occur more frequently in relationships that have fitness value to the interactants (Cords & Aureli, 1993; Kappler & van Schaik, 1992). The valuable relationships hypothesis (de Waal & Aureli, 1997; de Waal & Yoshihara, 1983) specifies that conciliatory behavior is more common between mutually valued social partners because disrupting those relationships—and exacerbating those disruptions through retaliation—reduces partners' access to fitness-relevant resources (McCullough, Kurzban, & Tabak, 2010; Preuschoft, Wang, Aureli, & de Waal, 2002). Evidence supporting the valuable relationships hypothesis has been obtained in several primate species through correlational studies (Cords & Aureli, 1993; de Waal & Yoshihara, 1983; Preuschoft et al., 2002), and even experimental manipulations of relationship value (Cords & Thurnheer, 1993). Other animal behavior researchers have developed a complementary hypothesis: that these conciliatory gestures have evolved because they signal the sender's benign intent toward the receiver (Silk, 1996).

### **Human Forgiveness, Valuable Relationships, and Agreeableness: The Role of (Perceived) Personality**

In humans, behaviors such as apologies, offers of compensation, and affiliative physical contact have been likened to nonhuman primates' conciliatory gestures (de Waal, 1989; Keltner, Young, & Buswell, 1997), and humans regularly use such behaviors to facilitate forgiveness and reconciliation following conflict (Bottom, Gibson, Daniels, & Murnighan, 2002; Hickson, 1986; Lazare, 2004; for review, see McCullough, 2008). McCullough, Kurzban, et al.

(2010) hypothesized that conciliatory gestures signal both relationship value *and* benign intent—that is, that they signal a transgressor’s willingness and ability to provide fitness-relevant benefits to the victim, as well as the transgressor’s unwillingness to impose costs upon the victim in the future.

For humans, an excellent personality-level summary of a transgressor’s relationship value and benign intent is his or her perceived Agreeableness—a higher-order personality dimension that emerges in many personality taxonomies. Agreeableness is well represented by trait labels such as *warm, kind, sympathetic, considerate, and generous*. When people perceive a relationship partner as highly agreeable, they feel more comfortable resolving conflicts (Jensen-Campbell et al., 2002) and are more inclined to solve conflicts through informal mechanisms (rather than including a third-party mediator; Morris, Leung, & Iyengar, 2004). Moreover, Tabak and McCullough (2010) found that victims who perceived their transgressors as highly agreeable experienced less postconflict HPA-axis reactivity (measured via cortisol) and greater forgiveness approximately one month after the transgression, which suggests that victims experienced less social threat when recalling transgressions committed by relationship partners whom they considered to be highly agreeable (Dickerson & Kemeny, 2004).

Agreeableness is a personality trait, which, by traditional definitions of personality, implies a high degree of trans-situational stability. However, relationship-specific effects explain nearly 20% of the variance in perceived Agreeableness in family relationships (Branje, van Aken, van Lieshout, & Mathijssen, 2003), nearly 30% in relationships formed through face-to-face group interactions (Paulhus & Reynolds, 1995), and more than 50% in zero-acquaintance, computer-mediated one-on-one interactions (Markey & Wells, 2002). Thus, perceivers form their judgments of people’s Agreeableness in no small measure upon observable behavior. The fact that dyadic factors are so important for judgments of Agreeableness, plus the fact that people are particularly motivated to form judgments about other people’s Agreeableness in situations in which the target individual would possess the ability to distribute benefits and costs to the perceiver (Ames & Bianchi, 2008), leads us to suspect that conciliatory gestures are so prevalent in human conflict resolution because they are communicative gestures, or signals (Maynard Smith & Harper, 2003), that carry information

about one's disposition to behave agreeably—that is, one's willingness to confer benefits and to refrain from imposing costs—vis-à-vis a former victim. Furthermore, by communicating information about the transgressor's Agreeableness, such conciliatory gestures increase the victim's likelihood of forgiving and motivation to resume prosocial interactions with the transgressor (Ohtsubo & Watanabe, 2009). Thus, even though it is plausible that agreeable people are more readily forgiven because they more readily perform conciliatory behaviors that promote forgiveness, it may also be the case that those gestures themselves make transgressors appear to be more agreeable.

### The Present Studies

From this background, and because our functional-evolutionary analysis of forgiveness has led us to hypothesize that humans possess mechanisms for signaling their willingness to emit benefits, and not costs, to a former victim—as well as mechanisms for evaluating former transgressors' likelihoods of distributing benefits (and not costs) to the self in the future (McCullough, Kurzban, et al., 2010), we conducted two studies to evaluate the hypothesis that conciliatory gestures facilitate forgiveness by increasing the transgressor's perceived Agreeableness. We also hypothesized that insofar as conciliatory gestures increase transgressors' perceived Agreeableness, their victims will also experience (a) a dissipation in negative interpersonal motivations, such as the desire to avoid or seek revenge against the transgressor, and (b) the return of goodwill and the desire to reconcile—which jointly constitute forgiveness (McCullough, Fincham, & Tsang, 2003)—as well as (c) increased feelings of friendship for the transgressor.

In Study 1, we evaluated these hypotheses in a longitudinal daily diary study by investigating whether Agreeableness appeared to mediate the link between conciliatory gestures and forgiveness. In Study 2, we examined whether an act of apology and compensation following a breach in trust by an anonymous partner in an iterated prisoner's dilemma game would (a) increase cooperation in comparison to not receiving the apology and compensation (a well-accepted behavioral measure of forgiveness; Axelrod, 1984) and (b) increase feelings of friendship toward the transgressor.

## STUDY 1

### Method

#### *Procedural Overview*

Upon enrolling, participants completed an initial packet of questionnaires that measured characteristics of participants' transgressors, characteristics about participants' relationships with their transgressors prior to the transgression, as well as information about the transgression (e.g., how painful it was to the participant). Participants were also given a booklet containing 21 daily questionnaires that measured interpersonal forgiveness. They were asked to complete one of these questionnaires each day for up to 21 consecutive days.

#### *Participants*

Participants were 163 undergraduate psychology students (112 female, 51 male;  $M$  age = 19.61,  $SD$  = 3.84) at the University of Miami. Data from this data collection effort have been analyzed elsewhere to shed light on the within-persons associations of rumination and forgiveness (see Study 3 in McCullough, Bono, & Root, 2007) and to identify the form of the forgiveness function during the 3 months following interpersonal transgressions (see Study 1, Data Set 3 in McCullough, Luna, Berry, Tabak, & Bono, 2010). Participants were recruited from their undergraduate psychology courses and through a posting on the online Introduction to Psychology research credit Web site. Participants were informed that only those who had recently experienced a significant interpersonal transgression in real life within approximately the past seven days ( $M$  = 4.37 days,  $SD$  = 1.85) were eligible to participate in the study. Further, participants were told that their transgressors had to be someone they knew, and the transgression had to be more significant than a misunderstanding that was easily resolved. Participants received course credit, and if they completed the tasks, \$20.

#### *Measures*

*Forgiveness.* We used the 18-item version of the TRIM inventory (McCullough, Root, & Cohen, 2006) to measure forgiveness. As in previous research (McCullough, Luna, et al., 2010) the TRIM's 18 items were combined into a single unidimensional measure using the rating scale version of the Rasch model (Fox & Jones, 1998). As described below, we used participants' rates of change in their TRIM scores over the 21-day measurement period to represent the rate at which they forgave their transgressors. Previous research shows that rates of change in people's

daily (or weekly) TRIM scores do perform with good construct validity as measures of forgiveness (McCullough et al., 2003; McCullough Luna, et al., 2010). As described in Study 3 of McCullough, Bono, and Root (2007), although the use of paper-and-pencil daily diaries presents certain limitations regarding diary compliance and timeliness, we are confident in the validity of these data time points for the following reasons (see also Green, Rafaeli, Bolger, Shrout, & Reis, 2006): (a) participants were contacted periodically during the 21-day diary period to increase compliance and proper completion of their diary entries, (b) participants were told that it was better to leave a day's entry blank than to provide a false response, and (c) participants received course credit and full payment regardless of whether all of the daily entries were completed. As shown in Figure 2 of McCullough et al. (2007), 109 participants (66.9%) completed all 21 daily diary entries, and only 9 participants (5.5%) did not complete 10 or more daily diary entries. On average, participants completed 76% of their 21 daily diaries (range = 33–93%), with their first entries completed 0–9 days post-transgression. However, relatively few participants provided data prior to 5 days after their transgressions, so to achieve model convergence, we modeled only the data collected 5–26 days post-transgression.

*Agreeableness.* We used the Agreeableness items from the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) to measure participants' perceptions of their transgressors' Agreeableness (e.g., I see the person who hurt me as someone who "is considerate and kind to almost everyone," "has a forgiving nature," and "likes to cooperate with others"). Three-month test-retest reliabilities typically exceed .80 for self-reported personality measurement (Benet-Martínez & John, 1998), and in the present study regarding participants' perceptions of their transgressors, internal consistency was also high ( $\alpha = .89$ ).

*Conciliatory gestures.* Participants completed a 19-item yes/no checklist called the Transgressor Appeasement and Reconciliation Checklist (TARC). The TARC asked participants to indicate which of 19 conciliatory gestures (e.g., "admitted regret," "apologized," and "tried to repair the harm or damage") their transgressors had exhibited in the days following their transgressions. See Appendix A for all 19 items.

Because Study 1 was the first use of the TARC, the response scale was modified in the middle of data collection on two different occasions. In TARC 1 ( $n = 93$ ), directions instructed participants to place a check mark next to any of 21 conciliatory behaviors exhibited by the transgressor. In TARC 2 ( $n = 24$ ), directions instructed participants to use a 6-point Likert-type scale to indicate the extent to which the transgressor exhibited

any of 22 conciliatory behaviors (1 = *very little*, 6 = *very much*), and in TARC 3 ( $n = 46$ ), participants were asked to place a check mark next to any of the same 22 conciliatory behaviors exhibited by the transgressor as in TARC 2, and also to rate the extent to which the transgressor exhibited each behavior on the same 6-point Likert-type scale that was used in the TARC 2.

Data from all three versions of the TARC were combined on the basis of their lowest common denominator: information about whether the transgressor did (rescored as 1) or did not (rescored as 0) exhibit each of the conciliatory behaviors on the 19 conciliatory behaviors that existed among all TARC versions. TARC 2 and TARC 3 included three items that were not on the TARC 1 version, and therefore these items were ignored (i.e., the original 22 items were reduced to 19 items in TARC 2 and TARC 3). In order to reduce the 21 items on the original TARC 1 to 19 items, related items (e.g., “initiated verbal contact” and “initiated communication”) were subsumed under “initiated communication” to coincide with this item on TARC 2 and TARC 3. If participants who completed TARC 1 indicated that their transgressor had exhibited one of these two behaviors, the item was coded as occurring. Thus, all 19 conciliatory behaviors were coded as either occurring or not occurring and the items were summed to create a total score for each participant.

In the analyses reported here, we statistically controlled for score differences that were attributable to these different response formats by regressing the TARC scores on two dummy-coded variables representing the version number with a score of zero on each dummy variable representing version 1 of the TARC (results omitted here and in Figure 1). Results reported are based on models that were run with these controls. These statistical controls essentially model the effects of the TARC on other variables as if all of the TARC data came from the 19 common TARC items. The scale based on the 0/1 scoring system demonstrated high internal consistency ( $\alpha \geq .92$ ). (Please contact the first author for details.)

*Relationship-specific variables.* Participants rated their perceived closeness and commitment to the offender before the transgression using two 7-point Likert-type scales and the Inclusion of Other in the Self Scale (Aron, Aron, & Smollan, 1992). Internal consistency of the three-item composite was adequate ( $\alpha = .85$ ).

*Perceived painfulness of the transgression.* Participants rated the perceived painfulness of the transgression on a 7-point Likert-type scale (0 = *Not at all painful*, 6 = *Worst pain I ever felt*).

*Procedure*

Upon enrolling, participants completed the BFI (John et al., 1991) to measure their perceptions of their transgressors' personalities (e.g., Hoyt, Fincham, McCullough, Maio, & Davila, 2005), the checklist of perceived conciliatory gestures exhibited by their transgressor (TARC; see Appendix A), the measure of perceived transgression painfulness, and the measure of participants' closeness and commitment to the transgressor before the offense occurred. After 3 weeks, participants returned these booklets to our laboratory, at which time participants completed some additional tasks not relevant to the present study.

**Results and Discussion***Descriptive Statistics*

Participants reported transgressions committed by boyfriends or girlfriends (50%); friends of the same gender (19%); relatives (13%); friends of the other gender (9%); husbands or wives (1%); and "others" (8%). Several types of transgressions were described by participants, including infidelity by a romantic partner or spouse (29%); insults by a friend or betrayals of confidence (20%); rejection, neglect, or insult by a family member (13%); termination of a romantic relationship (13%); neglect by a romantic partner, spouse, or ex-romantic partner (10%); rejection or abandonment by a friend or prospective relationship partner (10%); and insults by people other than family or friends (5%). At the beginning of the study, participants reported a mean level of transgression painfulness of 4.84 ( $SD = 0.88$ ) and a mean level of perceived transgressor Agreeableness of 4.78 ( $SD = 0.95$ ).

*Statistical Analysis*

Based on the notion that forgiveness is a process of change whereby people's thoughts and feelings about a transgressor become more positive and less negative over time (McCullough et al., 2003), we used multilevel growth curve models to operationalize forgiveness as longitudinal change in the TRIM scores over the 21-day measurement interval (McCullough & Root, 2005). Within-persons variation was specified with a two-parameter linear model:

$$\text{TRIM}_{ij} = \beta_{0j} + \beta_{1j}(\text{Time})_{ij} + r_{ij} \quad (1)$$



$TRIM_{ij}$  represents the TRIM score for person  $j$  on day  $i$ ,  $\beta_{0j}$  is the intercept on the TRIM scale for participant  $j$ , or the predicted TRIM value immediately after the transgression (i.e., when Time = 0).  $\beta_{1j}$ , which represents forgiveness, is the rate of linear change across the measured time interval for participant  $j$ . Time <sub>$ij$</sub>  is the number of days passed since the transgression on occasion  $i$  for person  $j$ . Lastly,  $r_{ij}$  is the occasion-specific residual for person  $j$ 's TRIM score on occasion  $i$ . The  $r_{ij}$  contains measurement error and time-specific error; therefore, the  $\beta$  estimates for person  $j$  are free of measurement and time-specific error (Singer & Willett, 2003). With one within-persons equation for each person, the initial status ( $\beta_{0j}$ ) and forgiveness ( $\beta_{1j}$ ) estimates can be modeled as

$$\beta_{0j} = \gamma_0 + u_{0j} \quad (2)$$

$$\beta_{1j} = \gamma_{1j} + u_{1j} \quad (3)$$

The parameter  $\gamma_0$  represents the expected initial status for the population, and  $\gamma_{1j}$  represents the expected rate of linear change for the population.  $u_{0j}$  and  $u_{1j}$  represent the difference of participant  $j$ 's estimated initial status and rate of linear change from the expected (or mean) population values. A preliminary analysis of these data that estimated Equations (1–3) using HLM 6 (Raudenbush, Bryk, & Congdon, 2004) indicated that the reliability of the initial status and linear change (i.e., forgiveness) estimates were .92 and .90, respectively.

We evaluated whether transgressors who exhibited more conciliatory gestures were also perceived by their victims as higher on Agreeableness, and whether the association of conciliatory gestures and perceived Agreeableness helped to explain the association of conciliatory gestures and forgiveness (controlling for pre-transgression closeness/commitment and transgression painfulness). We estimated structural equation models using Mplus version 6.0 (Muthén & Muthén, 1998–2010).

Full information maximum likelihood (FIML) was used to estimate model parameters so that participants with missing data contributed information for parameter estimation. This approach provides

unbiased parameter estimates based on valid statistical inference (Schafer & Graham, 2002). Forgiveness was modeled as linear change as in Equations (1–3) via a latent growth model. The mean value for initial status ( $\beta_1 = 59.24$ ,  $p < .01$ ) indicated that the typical participant would have been expected to have an initial score of 59.24 on the Rasch-based measure of forgiveness on the day of his or her transgression. The mean value for change in forgiveness over time ( $\beta_2 = -.54$ ,  $p < .01$ ) indicated that participants' scores on the Rasch-based forgiveness variable could be expected to decline by .54 units per day following the transgression. Both coefficients were significantly different from zero and varied significantly across participants ( $\sigma_0^2 = 164.4$ ,  $p < .01$ ;  $\sigma_1^2 = .54$ ,  $p < .01$ ). These findings accord well with previous research (McCullough et al., 2003; McCullough, Luna, et al., 2010).

According to the steps for mediation outlined by Shrout and Bolger (2002), Step 1 specifies that a significant relationship exist between X (the putative independent variable) and Y (the putative dependent variable), although some researchers have argued that this relationship does not need to be significant to identify mediation (e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). Step 2 requires that a significant relationship exist between X and M (the putative mediator). Step 3 requires that a significant relationship exist between M and Y while holding the path from X to Y constant. In Step 4, Shrout and Bolger (2002) recommend using the bias-corrected bootstrapping method to create 95% confidence intervals to test the significance of the specific indirect effects. This method improves statistical precision for non-normal sampling distributions associated with the indirect effects (e.g., MacKinnon, Lockwood, & Williams, 2004).

Using the steps proposed by Shrout and Bolger (2002) within a latent growth curve modeling context (Cheong, MacKinnon, & Khoo, 2003), we satisfied the requirements of Step 1: Conciliatory gestures (measured with the TARC) that transgressors exhibited in the first few days following their transgressions were positively associated with forgiveness ( $b = -.03$ ,  $SE = .08$ ,  $p < .01$ ; more conciliatory gestures was associated with steeper declines in people's TRIM scores, indicating more forgiveness), but not with initial status (preliminary analyses indicated that the regression of initial status on conciliatory gestures was not significant; therefore, this path was not included in the final model). In other words, people whose transgres-

sors had exhibited many conciliatory gestures after the transgression forgave to a greater extent over the 21-day measurement interval than did those whose transgressors had exhibited fewer conciliatory gestures, even though the number of conciliatory gestures exhibited was not associated with how forbearing (McCullough et al., 2003) participants appeared to be immediately after the transgression occurred. In addition to satisfying Step 1, the relationship between conciliatory gestures exhibited by the transgressor and increased forgiveness over time provides evidence for the construct validity of forgiveness measured as longitudinal change (see also McCullough, Luna, et al., 2010). Previous research has indicated that transgression severity (McCullough et al., 2003) and the level of closeness and commitment between victim and transgressor (Finkel et al., 2002) can influence the forgiveness process. Therefore, it is important to note that the results reported here include statistical controls for transgression severity and perceived closeness/commitment to the transgressor.

As shown in Figure 1, the criteria set forth in Shrout and Bolger's (2002) Steps 2–4 for testing statistical mediation were also met by two-tailed tests. We used the bias-corrected bootstrapping method

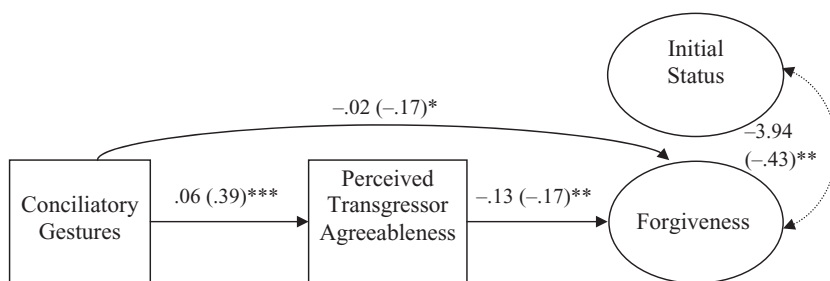


Figure 1

The effect of transgressor conciliatory gestures on forgiveness is partially mediated by the victim's perception of the transgressor's Agreeableness. Unstandardized path coefficients are displayed with standardized path coefficients reported in parentheses. Forgiveness was regressed on two control variables (transgression severity and perceived closeness/commitment). These variables and paths are not included in the figure to enhance readability. However, the path coefficients and standard errors reported here represent those from a model that includes these control variables.

\* $p = .05$ . \*\* $p < .05$ . \*\*\* $p < .001$ .

**Table 1**  
**Study 1: Mediation of the Effect of Conciliatory Gestures on Forgiveness Through Perceived Agreeableness**

	Point Estimate	Bias-Corrected Percentile 95% CI	
		Lower	Upper
Specific indirect effect			
Perceived Agreeableness	-0.008* (-0.067)	-0.019	-0.001
Direct effect	-0.021* (-0.169)	-0.044	-0.001

*Note.* Unstandardized point estimates are displayed with standardized point estimates in parentheses.

\* $p < .05$ .

for testing the significance of the specific indirect effect (Shrout & Bolger, 2002). As shown in Table 1, perceived transgressor Agreeableness appeared to mediate the relationship between conciliatory gestures and forgiveness, as indicated by the fact that the two-tailed 95% confidence interval does not include zero for either the specific indirect effect or the direct effect. The percentage of the total association between conciliatory gestures and forgiveness (the total effect;  $\beta = -.24$ ) that appeared to be mediated by perceived Agreeableness (the indirect effect;  $\beta = -.07$ ) was 29.17%.

Results were likewise unaffected by controlling transgression severity and perceived closeness/commitment to the transgressor (not shown in Figure 2). Overall model fit was poor,  $\chi^2(412) = 1342.28$ ,  $p < .01$ ; CFI = 0.86; RMSEA = 0.12; and SRMR = 0.12, but such poor fit is commonplace when the fit statistics developed for between-persons analyses are used to evaluate multilevel models such as these, even when parameter estimation is good overall (Coffman & Millsap, 2006).

The cross-sectional measurement of conciliatory gestures and perceived Agreeableness meant that other plausible models could conceivably fit our data, so we examined an alternative model to evaluate whether the association of perceived Agreeableness and forgiveness was mediated by conciliatory gestures (controlling for pre-transgression closeness/commitment and transgression painfulness). Perceived Agreeableness significantly predicted conciliatory

gestures ( $b = 2.37$ ,  $SE = .45$ ,  $p < .01$ ), conciliatory gestures nearly significantly predicted forgiveness ( $b = -.02$ ,  $SE = .01$ ,  $p = .06$ ), and perceived Agreeableness did not significantly predict forgiveness when controlling for conciliatory gestures ( $b = -.08$ ,  $SE = .08$ ,  $p = .27$ ). According to the steps outlined by Shrout and Bolger (2002), Step 2 (i.e., the relationship between conciliatory gestures and forgiveness) was not satisfied. However, Zhao, Lynch, and Chen (2010) argued that only a significant bootstrap test of the indirect effect is needed to establish mediation, and analysis examining the statistical significance of the indirect effect using the bias-corrected bootstrapping method (Shrout & Bolger, 2002) suggested that significant mediation was present (unstandardized point estimate =  $-.047$ , bias-corrected percentile 95% CI =  $-.114$  to  $-.002$ ). Model fit was once again poor,  $\chi^2(407) = 1323.09$ ,  $p < .01$ ; CFI = 0.86; RMSEA = 0.12; and SRMR = 0.12. These latter results indicate that a causal model in which agreeable people are more likely to emit high numbers of conciliatory gestures, which in turn compels people to forgive them, is also plausible.

To summarize, Study 1 revealed evidence for a positive relationship between conciliatory gestures and forgiveness, which appeared to be partially mediated by perceived transgressor Agreeableness. These results, based on participants who had incurred recent transgressions, and based on the longitudinal measurement of forgiveness, which enabled us to depict forgiveness as a process of change in real time (McCullough & Root, 2005), suggested that perceived transgressor Agreeableness merited further consideration as a possible mediator of the association of conciliatory gestures with forgiveness. However, an alternative model that specified that transgressors who were perceived as highly agreeable also tended to engage in high numbers of conciliatory gestures, which in turn caused them to be forgiven, also fit the data. In part to address the inferential limitations of Study 1, we designed a second study to experimentally examine whether the relationship between conciliatory gestures and forgiveness was causal, whether it could be obtained among anonymous partners interacting in the laboratory, and whether it applied to behavioral measures of forgiveness (rather than exclusively to self-report measures of forgiveness of the sort that we used in Study 1). We also wanted to investigate whether the effects of conciliatory gestures on perceived transgressor Agreeableness influenced feelings of friendship toward the transgressor.

## STUDY 2

The iterated prisoner's dilemma game (PDG) is a tool that researchers often use to study the development of cooperation in social interactions (Axelrod & Hamilton, 1981). In the iterated PDG, players are "paired" with another player and told that they have two choices: cooperate or defect. Partners make their selections independently (and in our paradigm, anonymously), and partners are awarded a certain number of points (later converted to real money) depending on their joint choices in each round of play. Because each player can only cooperate or defect, there are four potential outcomes per round: Both players cooperate (CC), Player A cooperates and Player B defects (CD), Player A defects and Player B cooperates (DC), or both players defect (DD). Each joint outcome corresponds to a different number of points: DC represents the maximum payoff for Player A and zero payoff for Player B (3,0), CC represents equal payoff for both partners (2,2), CD represents zero payoff for Player A and the maximum for Player B (0,3), and DD represents a minimum equal payoff for both partners (1,1).

In Study 2, participants played an iterated PDG with an anonymous partner who first behaved in a trustworthy fashion for multiple rounds and then inexplicably began to defect against participants for multiple rounds (thereby creating a breach in trust that also reduced participants' desire to cooperate). Depending on the condition to which participants were assigned, the partner (which was actually one of three computer strategies) then either offered a conciliatory gesture (an apology and an offer of financial compensation; the conciliation condition), offered a personal message that aggravated the situation (the aggravating condition) or sent a neutral, innocuous message (the control condition). Afterward, participants continued playing more rounds of the PDG with the anonymous partner, who had resumed playing with a cooperative strategy. At several points throughout the experiment, participants had the opportunity to rate their impressions of their (computerized) partner, and at the end, participants completed self-report items about their overall impressions of their partners. This study therefore enabled us to examine the effects of conciliatory gestures on a behavioral measure of forgiveness (amount of cooperation following a string of defections by one's partner; see Axelrod, 1984) and a self-report measure of motivation to pursue a relationship with the

offender outside of the laboratory context—and whether the effects of conciliatory gestures on these variables were mediated by their effects on transgressors' perceived Agreeableness.

## Method

### *Participants*

Participants were 160 undergraduate psychology students at the University of Miami. As in Study 1, participants were recruited from their undergraduate psychology courses and through a posting on the online Introduction to Psychology research credit Web site. During the post-experiment debriefing, seven participants stated that they did not believe they had been playing against another person. Their data were removed from analyses. Eight other participants were removed because they responded noncooperatively in two of the first three rounds. Removing such participants ensures that all participants approach the game in a mutually trustworthy fashion, thereby allowing us to cleanly manipulate the trust breach (see also Lount, Zhong, Sivanathan, & Murnighan, 2008). Excluding these eight participants did not substantially influence the present results. The resulting sample included 145 participants (80 female, 65 male;  $M$  age = 19.18 years,  $SD$  = 2.10, range = 17–37). All participants were recruited from undergraduate psychology courses and received course credit and \$7–\$10 depending on their performance in the PDG. As described above, participants played against a preprogrammed computer strategy that participants believed was a human partner. They were randomly assigned to one of three conditions (conciliation, control, and aggravating) that differed in how they behaved after they committed a series of provocative actions (see Procedure below).

### *Procedure*

Upon arrival, participants were told they would be playing 20–40 rounds of a decision-making game on a computer with a randomly assigned partner in the room. In fact, participants all played against one of three preprogrammed computer programs, detailed below. To increase motivation, participants were told that they would be paid one tenth of their total points in dollars when the game was over. Groups ranged in size from 6 to 24 participants in each experimental session, and each participant sat in his or her own cubicle. Participants followed along while the experimenter read aloud a 10-minute tutorial (modified from Rilling et al., 2002) about how to play the PDG. To enhance uniformity, the same experimenter conducted all sessions. Participants were told to ask questions throughout the tutorial if anything was unclear, and the experimenter did not proceed

until the group members verbally confirmed that they understood how to play. Following completion of the PDG, participants completed self-report questionnaires. Afterward, they were debriefed about the experiment and paid.

In Study 2, we modified Rilling and colleagues' (2002, 2007) iterated PDG program with E-prime software (Psychology Software Tools, Pittsburgh, Pennsylvania). Table 2 shows a step-by-step ordering of events that took place during the PDG within each of the three conditions, along with the messages sent by the computer to participants in each of the three experimental conditions. As shown in Table 2, in Round 1 the computer always cooperated in all three conditions. From Rounds 2–12, the computer always cooperated if the participant cooperated, and if the participant defected, the computer responded with defection in the next round 50% of the time (referred to hereafter as the generous tit-for-tat strategy). Following the first eight rounds of generous tit-for-tat, a message, "lets keep cooperating" (sic), was sent to participants in all three conditions from their anonymous partner. Based on the work of Bottom et al. (2002), who found that late breaches in trust were more likely to reduce levels of cooperation and increase negative emotional responses, the computer always defected during Rounds 13–19. Following Round 19, a condition-specific message was once again sent to participants from their anonymous partners (see Table 2 for detailed messages).

The message sent in the conciliation condition, based on the key elements of apology discussed by Schlenker and Darby (1981), was a modified version of the "large penance" manipulation in Bottom et al. (2002). The message read, "sorry for doing that. i wanted to make more money but now i feel like an ass. i won't do it agin. you press 'd' for the next 7 rounds and I'll pres 'c' so you can make your money back" (words in all messages were intentionally misspelled and lowercase to simulate the messaging style of undergraduates). The control condition was intended to communicate a neutral message that would neither induce forgiveness nor increase the participants' anger. It read, "this takes more concentration than i thought it would. at least its more interesting than the one i did last week." The message sent in the aggravating condition read, "sorry thats just how you play the game. i'm just trying to make as much money as i can." The intention of this message was to aggravate participants' sense of betrayal in such a way that would substantially reduce subsequent levels of cooperation.

In Round 20, the computer always cooperated. In the conciliation condition, the computer always cooperated during Rounds 21–27 and played generous tit-for-tat during Rounds 28–34. In the aggravating and control conditions, the computer played generous tit-for-tat during



**Table 2**  
**Study 2: Round-by-Round Schedule of the Preprogrammed Computer Strategies, Ratings of Participants' Perceptions of Their Partners, and Measurement of Participants' Reactions During the Iterated Prisoner's Dilemma**

Round	Conciliation	Control	Aggravating	Round	Conciliation	Control	Aggravating
1	100% C	100% C	100% C	20	100% C	100% C	100% C
2-7	G t-for-t	G t-for-t	G t-for-t	21-25	<b>100% C</b>	G t-for-t	G t-for-t
Ratings of perceptions and emotions				Ratings of perceptions and emotions			
8-12	G t-for-t	G t-for-t	G t-for-t	26	<b>100% C</b>	G t-for-t	G t-for-t
Message: "lets keep cooperating"				27	100% C	100% C	100% C
13-18	100% D	100% D	100% D	28-32	G t-for-t	G t-for-t	G t-for-t
Ratings of perceptions and emotions				Ratings of perceptions and emotions			
19	100% D	100% D	100% D	33-34	G t-for-t	G t-for-t	G t-for-t
Condition-specific message: (see below)							

*Note.* C = cooperation; D = defection; G t-for-t = generous tit-for-tat. 100% C in bold illustrates the conciliation-specific computer strategy. **Message in conciliation condition:** sorry for doing that. i wanted to make more money but now i feel like an ass. i won't do it agin. you press "d" for the next 7 rounds and I'll pres "c" so you can make your money back.

**Message in aggravating condition:** sorry thats just how you play the game. i'm just trying to make as much money as i can.

**Message in control condition:** this takes more concentration than i thought it would. atleast its more interesting than the one i did last week.

Rounds 21–26, always cooperated in Round 27, and continued to play generous tit-for-tat during Rounds 28–34.

### *Measures*

*Initial rates of cooperation.* During the first 12 rounds of the iterated PDG, the computer-simulated player implemented the highly cooperative “generous tit-for-tat” strategy (Nowak & Sigmund, 1992). Further details regarding the generous tit-for-tat strategy used in the present study can be found above in the Procedure section. We used participants’ rates of cooperation during this 12-round regime as an individual difference variable to control for individual differences in initial rates of cooperation.

*Perceived Agreeableness.* During the PDG, following Round 7 and Round 25, participants rated their perceptions of their “partners’” Agreeableness on four adjective-based descriptors (“sympathetic,” “considerate,” “honest,” and “fair and just”) from the NEO-FFI (Costa & McCrae, 1992), the Big Five Inventory (BFI; John et al., 1991), and research examining ideal personality traits among different types of potential relationship partners (Cottrell, Neuberg, & Li, 2007). Responses were made on a 7-point Likert-type scale (1 = *not at all*, 7 = *extremely*). All adjectives were presented in random order and included randomly ordered distracter adjectives that were not examined in the present study. The mean of the four items demonstrated high internal consistency on both measurement occasions (Time 1 and Time 2  $\alpha$ s = .89). The initial measurement of perceived Agreeableness was included to enable us to control for individual differences in initial perceptions of Agreeableness during cooperative play.

*Forgiveness.* Forgiveness was conceptualized as the degree to which participants returned to playing cooperatively following a breach in trust (and, in the conciliation condition, after seven rounds during which the partner allowed the participant to recoup earnings). Thus, the mean percentage of cooperation that occurred during the five consecutive rounds following the breach in trust was calculated in the control and aggravating conditions, and the mean percentage of cooperation that occurred during the five consecutive rounds following the breach in trust *and* the seven rounds during which the computer unconditionally cooperated as a gesture to allow the participant to win back earnings lost due to the partner’s previous string of defections (i.e., the conciliatory gesture) was calculated in the conciliation condition.

*Feelings of friendship.* After finishing the PDG, participants rated the extent to which they perceived that their partner was likely to be a suitable

friend outside of the laboratory context (e.g., “Although we did not meet, I feel a sense of friendship with him/her,” and “I feel as though we could be friends, if the opportunity ever presented itself”). Responses were made on a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). For preliminary analyses, we used the mean of these two items ( $\alpha = .72$ ). In structural equation models, the two items were used to specify a single latent variable.

**Results and Discussion**

*Descriptive Statistics*

Table 3 displays means and standard deviations for major study variables. All three groups contained approximately 50 participants (conciliation,  $n = 49$ ; aggravating,  $n = 46$ ; control,  $n = 50$ ). As shown in Table 3, one participant in the conciliation group and one participant in the control group did not have complete data throughout the PDG task. Initial rates of cooperation in the first 12 rounds of the PDG were high (Grand  $M = 85.92\%$ ,  $SD = .21$ ) and did not differ among conditions,  $F(2, 142) = .07, p = .93$ . Similarly, initial ratings of perceived Agreeableness (Grand  $M = 5.68$ ,  $SD = 1.3$ ) did not differ significantly among conditions,  $F(2, 142) = 1.3, p = .28$ . Thus, we were able to successfully elicit high levels of cooperation and the

**Table 3**  
**Study 2: Means and Standard Deviations for Major Study Variables**

Measure	Conciliation Mean (SD) $n = 48-49$	Control Mean (SD) $n = 45-46$	Aggravating Mean (SD) $n = 50$
% Cooperation in Rounds 1–12	86.56 (.21)	86.17 (.21)	84.96 (.22)
% Cooperation in Rounds 13–19	39.36 (.21)	47.43 (.21)	42.86 (.24)
% Cooperation in five rounds post defection/conciliation	86.25 (.25)	72.40 (.35)	42.17 (.37)
Initial rating of perceived Agreeableness	5.40 (1.33)	5.79 (1.21)	5.52 (1.50)
Second rating of perceived Agreeableness	4.72 (1.32)	4.29 (1.12)	3.30 (1.25)
Perceived friendship question 1	2.90 (1.03)	2.28 (1.03)	2.30 (1.03)
Perceived friendship question 2	3.31 (.87)	2.94 (.87)	2.83 (.97)

perception that participants' partners were highly agreeable across conditions before the breach in trust occurred. In addition, rates of cooperation during the seven consecutive rounds of defection (Grand  $M = 43.25\%$ ,  $SD = .22$ ) did not differ significantly among conditions,  $F(2, 142) = 1.68$ ,  $p = .19$ , indicating that participants in all three conditions exhibited similar rates of cooperation during the breach in trust.

### *Effects of Conciliation on Forgiveness*

We first examined the effects of conciliation on forgiveness by conducting a one-way (condition: conciliation, aggravating, control) ANCOVA including initial rates of cooperation as a covariate to control for individual differences in levels of overall cooperativeness (see Figure 2A). Forgiveness differed significantly among the three conditions,  $F(2, 140) = 2.3$ ,  $p < .01$ ,  $\omega^2 = .22$ . Fisher's LSD post hoc comparisons indicated that participants in the conciliation condition ( $M = 86.25$ ,  $SD = .25$ ) were significantly more forgiving than were participants in both the control ( $M = 72.4$ ,  $SD = .35$ ,  $p < .05$ , Cohen's  $d = .43$ ) and aggravating ( $M = 42.17$ ,  $SD = .37$ ,  $p < .01$ , Cohen's  $d = 1.36$ ) conditions. Also, control condition participants were significantly more forgiving than were participants in the aggravating condition ( $p < .01$ , Cohen's  $d = .93$ ). Results did not change substantively when the covariate (cooperation rates during Rounds 1–12) was removed.

### *Effects of Conciliation on Feelings of Friendship*

Once again, we conducted a one-way (condition: conciliation, aggravating, control) ANCOVA including initial levels of cooperation and initial levels of perceived Agreeableness as covariates to examine the effects of conciliation on perceived suitability of the partner as a future friend (see Figure 2B). Feelings of friendship differed significantly among the three conditions,  $F(2, 140) = 4.57$ ,  $p < .01$ ,  $\omega^2 = .07$ , and participants in the conciliation condition ( $M = 3.1$ ,  $SD = .86$ ) felt more friendship toward their partners than did participants in the control ( $M = 2.61$ ,  $SD = .83$ ,  $p < .01$ , Cohen's  $d = .61$ ) and aggravating ( $M = 2.57$ ,  $SD = .86$ ,  $p < .01$ , Cohen's  $d = .64$ ) conditions. No significant difference was found between participants in the control or aggravating conditions (Cohen's  $d = .03$ ). Conclusions based on results did not change when the two covariates were omitted.

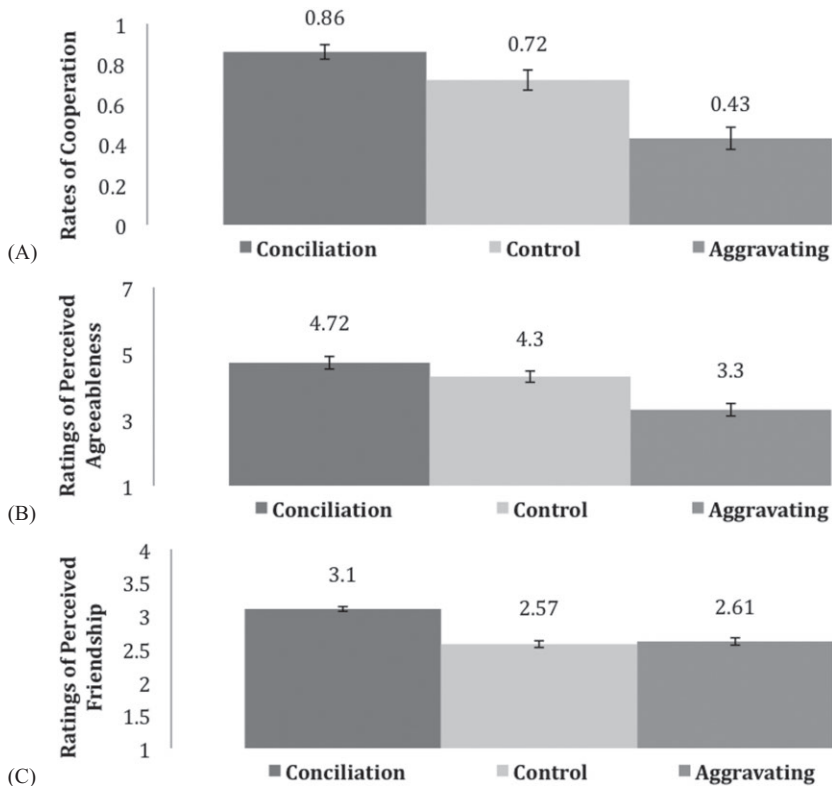


Figure 2

(A) Rates of cooperation by condition, (B) ratings of perceived Agreeableness by condition, and (C) ratings of perceived friendship suitability by condition. Numbers atop each bar represent means for each condition. Error bars represent standard errors.

*Effects of Conciliation on Perceived Agreeableness*

We conducted a final one-way (condition: conciliation, aggravating, control) ANCOVA including initial levels of cooperation and initial levels of perceived Agreeableness as covariates (see Figure 2C). Perceived Agreeableness following the breach in trust differed significantly among the three conditions,  $F(2, 139) = 17.11, p < .01, \omega^2 = .18$ . Participants in the conciliation condition ( $M = 4.72, SD = 1.32$ ) rated their partners as significantly higher on perceived Agreeableness than did participants in both the control ( $M = 4.3, SD = 1.2, p < .05, \text{Cohen's } d = .34$ ) and aggravating ( $M = 3.3, SD = 1.25,$

$p < .01$ , Cohen's  $d = 1.19$ ) conditions. In addition, participants in the control condition rated their partners significantly higher on perceived Agreeableness than did participants in the aggravating condition ( $p < .01$ , Cohen's  $d = .76$ ). When removing the two covariates, participants in the conciliation condition rated their partners marginally significantly higher on perceived Agreeableness than did those in the control condition ( $p = .09$ , Cohen's  $d = .35$ ). Differences between the control and aggravating conditions were largely unchanged ( $p < .01$ , Cohen's  $d = .81$ ). Thus, effects were slightly stronger after statistically equating participants on the covariates that were measured prior to the experimental manipulation, but even without controlling for those individual differences, the experimentally induced differences among the three conditions were at least marginally statistically significant and in the hypothesized directions.

### *Testing for Mediation*

As indicated above, our results satisfied Steps 1 and 2 of Shrout and Bolger's (2002) steps for mediation by demonstrating that the conciliation condition increased forgiveness, feelings of friendship, and perceived Agreeableness (and that the aggravating condition reduced them). We then used Mplus version 6.0 (Muthén & Muthén, 1998–2010) to evaluate with structural equation models whether the effects of the conciliation condition on forgiveness and feelings of friendship were mediated by its effects on perceived Agreeableness (see Figure 3). As in Study 1, FIML was used to estimate missing data. The effects of the experimental conditions were represented with two dummy variables (conciliation vs. control; aggravating vs. control).

We controlled for baseline levels of cooperation and perceived Agreeableness by regressing forgiveness, feelings of friendship for the transgressor, and perceived Agreeableness following the breach in trust on initial levels of cooperation and initial perceived Agreeableness. Initial levels of cooperation significantly predicted both forgiveness ( $b = .40$ ,  $SE = .19$ ,  $p < .05$ ) and perceived Agreeableness following the breach in trust ( $b = -1.40$ ,  $SE = .53$ ,  $p < .01$ ). In addition, initial ratings of perceived Agreeableness significantly predicted perceived Agreeableness following the breach in trust ( $b = .25$ ,  $SE = .09$ ,  $p < .01$ ). No other significant relationships were found among control variables. For simplicity, none of the control

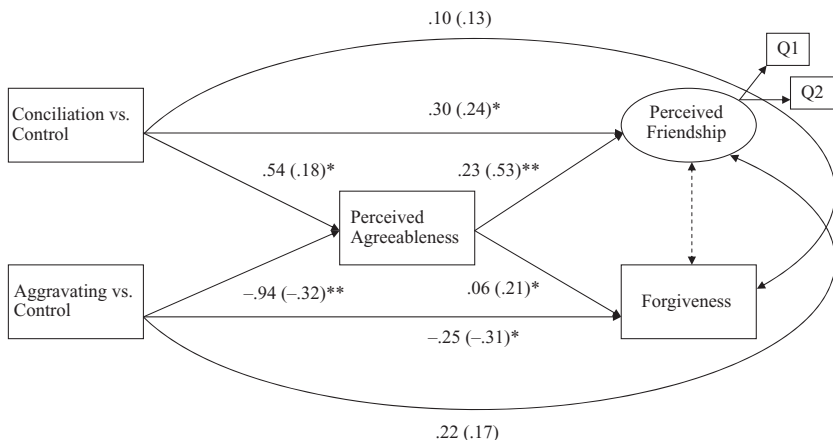


Figure 3

For both Conciliation versus Control as well as Aggravating versus Control, the effect of transgressor conciliatory gestures on forgiveness and perceived suitability of the transgressor as a future friend is mediated by the victim's perception of the transgressor's Agreeableness. Unstandardized path coefficients are displayed with standardized path coefficients reported in parentheses. The three dependent variables (perceived Agreeableness following a breach in trust, forgiveness, and perceived suitability as a future friend) were regressed on two control variables (initial levels of cooperation and initial ratings of perceived Agreeableness). These variables and paths are not included in the figure to enhance readability. However, the path coefficients reported here represent those from a model that includes these control variables. \* $p < .05$ . \*\* $p < .01$ .

variables are shown in Figure 3. Figure 3 shows that perceived Agreeableness post-transgression significantly predicted forgiveness ( $b = .06$ ,  $SE = .02$ ,  $p < .05$ ) and feelings of friendship ( $b = .23$ ,  $SE = .07$ ,  $p < .01$ ), thus satisfying Step 3 of mediation (Shrout & Bolger, 2002). As in Study 1, in Step 4, we evaluated the statistical significance of the indirect effects using the bias-corrected bootstrapping method (e.g., Shrout & Bolger, 2002).

As shown in Table 4, perceived transgressor Agreeableness mediated the effect of conciliatory gestures on forgiveness (relative to participants in the control condition), and the percentage of the total association between conciliatory gestures and forgiveness (the total effect;  $\beta = .17$ ) that appeared to be mediated by perceived

**Table 4**  
**Study 2: Medication of the Effect of Conciliatory Gestures on Forgiveness and Perceived Suitability of the Transgressor as a Future Friend Through Perceived Agreeableness (Results From Structural Equation Models)**

Dependent Variable: Forgiveness (i.e., Percentage Cooperation After Trust Breach)										
Forgiveness			BC Percentile 95% CI			Forgiveness			BC Percentile 95% CI	
<i>Conciliation vs. Control</i>	Point Estimate	Lower	Upper	<i>Control vs. Aggravating</i>	Point Estimate	Lower	Upper	Point Estimate	Upper	
Specific indirect effects	0.030* (0.038)	0.002	0.087	Specific indirect effects	-0.053* (0.066)	-0.121	-0.011			
Direct effect	0.099 (0.127)	-0.026	0.228	Direct effect	-0.247* (0.309)	-0.389	-0.102			
Dependent Variable: Perceived Suitability of the Transgressor as a Future Friend										
Perceived Friendship			BC Percentile 95% CI			Perceived Friendship			BC Percentile 95% CI	
<i>Conciliation vs. Control</i>	Point Estimate	Lower	Upper	<i>Control vs. Aggravating</i>	Point Estimate	Lower	Upper	Point Estimate	Upper	
Specific indirect effects	0.124* (0.098)	0.016	0.327	Specific indirect effects	-0.216* (0.168)	-0.434	-0.075			
Direct effect	0.303* (0.239)	0.075	0.612	Direct effect	0.223* (0.173)	0.005	0.542			

*Note.* BC = bias-corrected. Unstandardized point estimates are displayed with standardized point estimates in parentheses.

\* $p < .05$ .



Agreeableness (the indirect effect;  $\beta = .04$ ) was 23.53%. Also shown in Table 4, perceived transgressor Agreeableness mediated the effect of the aggravating condition on forgiveness (relative to the control condition), and the percentage of the total association between conciliatory gestures and forgiveness (the total effect;  $\beta = -.38$ ) that appeared to be mediated by perceived Agreeableness (the indirect effect;  $\beta = -.07$ ) was 18.42%.

In addition, perceived transgressor Agreeableness mediated the effect of the conciliation condition on feelings of friendship for the transgressor (relative to the control condition; see Table 4), and the percentage of the total association between conciliatory gestures and perceived suitability of the transgressor as a future friend (the total effect;  $\beta = .34$ ) that appeared to be mediated by perceived Agreeableness (the indirect effect;  $\beta = .10$ ) was 29.41%. Similarly, perceived transgressor Agreeableness mediated the effect of the aggravating condition on perceived suitability of the transgressor as a future friend (relative to the control condition). The percentage of the total association between conciliatory gestures and perceived suitability of the transgressor as a future friend (the total effect;  $\beta = .005$ ) that appeared to be mediated by perceived Agreeableness (the indirect effect;  $\beta = -.17$ ) was -3400%. However, estimating the percentage of the total association mediated when the total effect is nearly zero and nonsignificant can yield highly nonsensical results (Hayes, 2009), as appears to have been the case here. Overall model fit was excellent (Kline, 2005),  $\chi^2(6) = 8.04$ ,  $p = .15$ ; CFI = 0.98; RMSEA = 0.07; and SRMR = 0.02.

In summary, the results from Study 2 build on those from Study 1 by showing experimentally that conciliatory gestures promote forgiveness by exerting an intermediate influence on perceptions of offenders' Agreeableness. Study 2 also demonstrated that when suffering a transgression from an anonymous partner, conciliatory gestures increase the extent to which victims feel a sense of friendship with their partners. Thus, it is partially by altering perceptions of transgressors' Agreeableness that conciliatory gestures accelerate forgiveness and influence feelings of friendship.

## GENERAL DISCUSSION

Studies of many nonhuman animals have shown that conciliatory gestures are common behaviors that promote relationship repair

(Aureli & de Waal, 2000; Cools et al., 2008; Cordoni & Palagi, 2008) and the return to preconflict levels of affiliation (Koyama, 2001). Theorists have proposed that these conciliatory gestures work by signaling relationship value (de Waal & Aureli, 1997) or the benign intent of the sender toward the receiver (Silk, 1996). From this vantage point, McCullough and colleagues (McCullough, 2008; McCullough, Kurzban, et al., 2010) proposed that human conciliatory gestures facilitate forgiveness by signaling to victims that their transgressors are both valuable (i.e., willing and able to share fitness-relevant resources) and safe (i.e., unwilling to harm the victim again in the future).

Consequently, we predicted that conciliatory gestures would influence forgiveness and feelings of friendship by exerting an intermediate effect on perceptions of transgressors' Agreeableness. Of all of the Big Five, Agreeableness carries most of the information that is relevant to evaluating relationship value. For instance, highly agreeable people are highly motivated to keep on good terms with others (Graziano, Jensen-Campbell, & Hair, 1996); they are viewed as generous, warm, kind, and sympathetic; and they tend to be more generous and grateful with relationship partners (Wiggins, 1991). Ben-Ner, Kong, and Putterman (2004) also found that agreeable people send more money to their partners when assigned the role of dictator in the Dictator Game.

Agreeableness also carries information about benign intent. Agreeable people are effective at regulating their negative thoughts following interpersonal conflict so that aggressive behavior does not result (Ode & Robinson, 2007), and Agreeableness is a good indicator that one is averse to aggressive means for solving conflicts that do arise (Suls, Martin, & David, 1998), as well as to conflict in general (Tobin, Graziano, Vanman, & Tassinary, 2000). In addition, people impute social responsiveness and prosocial motivation to others whom they view as highly agreeable (Jensen-Campbell, Gleason, Adams, & Malcolm, 2003; Morris et al., 2004), and perceived transgressor Agreeableness predicts smaller physiological stress (i.e., cortisol) responses when people imagine interactions in the laboratory with relationship partners who have recently harmed them (Tabak & McCullough, 2011).

In both studies presented here, conciliatory gestures predicted victims' ratings of transgressors' Agreeableness: Transgressors who apologized, tried to make amends, and attempted to compensate

their victims were viewed by their victims as highly agreeable. Moreover, mediational analyses indicated that conciliatory gestures increased self-report and behavioral measures of forgiveness, as well as feelings of friendship, by virtue of their ability to make transgressors seem more agreeable. It is important to note that these results were independent of time since the transgression, pre-transgression closeness/commitment between victim and transgressor, and transgression painfulness. In addition, the experiment conducted in Study 2 suggested that the effects of conciliatory gestures on perceived Agreeableness, forgiveness, and feelings of friendship are indeed causal, and that manipulations of conciliatory gestures may facilitate forgiveness and feelings of friendship precisely because they make transgressors appear more agreeable.

These findings fit well with hypotheses about the role of Agreeableness in humans' evolutionarily shaped preferences for relationship partners (Buss, 1996). Perceptions of warmth are primary judgments made by humans when forming relationships (Fiske, Cuddy, & Glick, 2006), and cooperation and trustworthiness are highly valued characteristics of nonsexual relationship partners (Cottrell et al., 2007). The traits subsumed by Agreeableness (sympathetic, considerate, fairness, empathic) make one a desirable partner for reciprocal altruism, the evolution of which was a milestone in human social evolution. Trivers (1971) himself suggested that Agreeableness-linked traits such as honesty, sympathy, gratitude, and generosity were important to the psychological system underlying human reciprocal altruism. Therefore, we believe that the efficacy of conciliatory gestures in fostering forgiveness via perceived Agreeableness stems from the fact that these conciliatory gestures signal the transgressor's desirability as a future relationship partner and also signal low risk that the transgressor will be a threat in the future, thereby modifying the computations of costs and benefits that the human mind has evolved to conduct when people are choosing among revenge, forgiveness, reconciliation, and other potential responses to interpersonal transgressions (McCullough, 2008; McCullough, Kurzban, et al., 2010).

#### *Limitations and Future Directions*

The present findings support the hypothesis that conciliatory gestures facilitate forgiveness by making transgressors appear more

agreeable. However, several limitations suggest directions for future research. First, the transgressions examined in both studies were relatively minor (e.g., they did not involve violence or physical abuse). Nonetheless, it is important to note that in Study 1 we examined real-life harms incurred by participants that were perceived to be moderately to highly painful (average painfulness ratings of 4.84,  $SD = 0.88$  in Study 1 on a 7-point scale), and in Study 2 transgressions were experimentally manipulated. The fact that our results replicated across both contexts suggests that the present findings might generalize across a variety of relationship and transgression contexts. Nevertheless, future research would benefit from the examination of more severe transgressions.

Second, our studies were conducted on American undergraduates. Replications with people from other age groups or nations would help to establish the generalizability of these findings, which is important to do because researchers have suggested that apologies and offers of compensation are species-typical ways of promoting forgiveness (e.g., McCullough, 2008; McCullough, Kurzban, et al., 2010).

Third, relationship value (i.e., the ability to confer fitness-relevant resources) and safety (or, conversely, exploitation threat) are distinct. Transgressors can possess high relationship value (i.e., a high ability to confer fitness-relevant resources to an individual), for instance, while remaining serious threats (i.e., they can continue to possess the ability or willingness to harm the victim again in the future). Perceptions of these two characteristics could ideally be measured distinctly as well. Future research would benefit from developing distinct measurements of these perceptions rather than relying exclusively on dimension-level measurements of perceived Agreeableness.

Fourth, future research should consider the importance of costs in the effectiveness of conciliatory gestures. One account for the efficacy of conciliatory gestures, based on signaling theory (Maynard Smith & Harper, 2003), is that their costliness to the sender ensures their reliability (see also Bottom et al., 2002). In a simulation study that examined the evolution of strategies for cooperation in the context of the prisoner's dilemma, Okamoto and Matsumura (2001) discovered that strategies can evolve in which the cost of an apology conveys reliable information about a sender's willingness to return to cooperation. Therefore, future researchers may wish to investigate how

different levels of cost associated with conciliatory gestures influence their effectiveness in real-life human interaction, and whether the costliness of individual conciliatory gestures is associated with either the transgressor's relationship value or benign intent vis-à-vis the victim for whom those signals are presumably intended.

## CONCLUSION

The two studies reported herein are among the first intensive efforts to isolate how personality (or, at least, perceived personality) influences transgressors' forgivability, and to determine how it does so. We think the reported findings are a meaningful step forward in using evolutionary theorizing to link human forgiveness and reconciliation with what is known about reconciliation in nonhuman mammals, with what is known about the pervasiveness and cross-cultural typicality of conciliatory gestures in humans, and with what is known about the types of people who seem to be most forgivable (McCullough, 2008). Finally, we believe that these findings illustrate in general the promise of applying evolutionary theorizing to questions of traditional interest to personality psychology.

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## APPENDIX A

**Transgression Appeasement and Reconciliation Checklist**

Please read through the following list of behaviors and place a check in the right box of any of the ones that you have recently observed in the partner who hurt you.

1. Started physical contact	
2. Started communication	
3. Expressed shame	
4. Admitted regret	
5. Showed remorse	
6. Showed submissiveness or inhibited speech	
7. Showed modesty or humility	
8. Admitted or explained his/her responsibility	
9. Apologized	
10. Offered you a gift or favor (e.g., food or help with something)	
11. Showed concern for your condition (e.g., was responsive to your needs)	
12. Showed concern for the relationship	
13. Tried to repair the harm or damage	
14. Asked for forgiveness	
15. Explained or expressed that the harm or hurt was unintentional	
16. Showed embarrassment	
17. Assured you that he/she is trustworthy	
18. Showed politeness	
19. Made fun of themselves or put themselves down about it	