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From Self-Reports of Personality to Perceptions of the Transgressor?s: Perceived Agreeableness as a Predictor of Post-Conflict Anxiety

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TRANSGRESSOR'S: PERCEIVED AGREEABLENESS AS A PREDICTOR OF
POST-CONFLICT ANXIETY

By

Benjamin A. Tabak

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<u>From Self Reports of Personality to Perceptions</u> (August 2008)
<u>of the Transgressor's: Perceived Agreeableness</u>
<u>as a Predictor of Post-Conflict Anxiety</u>

Abstract of a thesis at the University of Miami.

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Following interpersonal transgressions, victims' neuroticism and agreeableness have been previously associated with post-conflict anxiety and forgiveness. However, the perceptions that victims have about their transgressors' personalities have received little attention. The current investigation examined relationships between victims' neuroticism and agreeableness, their perceptions of their transgressors' agreeableness, and post-conflict anxiety and affiliative motivation measured via plasma cortisol and oxytocin as well as self-reports of post-conflict anxiety and forgiveness in premenopausal women. Victims who perceived their transgressors as more agreeable reported lower post-conflict anxiety, experienced less plasma cortisol reactivity following a simulated speech to the transgressor, and more self-reported forgiveness. Exploratory analyses also revealed that forgiveness was negatively associated with oxytocin reactivity.

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Chapter 1: Introduction

In humans and non-humans alike, interpersonal conflict and aggression cause psychological distress (Aureli, 1997; Bolger, DeLongis, Kessler, & Schilling, 1989; Koski, Koops, & Sterck, 2007; Suls, Martin, & David, 1998). Scientific work has been conducted to identify the behaviors of individuals in conflict, and the characteristics of their relationships, that can alter the effects of conflict and aggression (e.g., Aureli & de Waal, 2000). In humans, at least, certain personality traits appear to mitigate, or exacerbate, post-conflict distress (Gunthert, Cohen, & Armeli, 1999; Jensen-Campbell, Gleason, Adams, & Malcolm, 2003).

Two of the most important are agreeableness and neuroticism. The "Big Five" (John, 1990) or "Five-Factor" (McCrae & Costa, 1987) personality dimension of agreeableness, which measures generalized positive (vs. negative) orientation toward others (Costa & McCrae, 1985), has been identified as a reliable personality substrate of prosocial motivation (Graziano, Habashi, Sheese, & Tobin, 2007) that may help to moderate some of the negative consequences of interpersonal conflict (Ode & Robinson, 2007). Agreeableness is characterized by adjectives such as "warm," "kind," "appreciative," "cooperative," and "trusting." People with high levels of agreeableness have more friends, are more readily accepted by their peers, and are less frequently the targets of interpersonal aggression (Jensen-Campbell et al., 2002). Following interpersonal conflict, people high in agreeableness use more collaborative and accommodative conflict resolution tactics (Jensen-Campbell & Graziano, 2001; Jensen-Campbell, Graziano, & Hair, 1996; Park & Antonioni, 2007) are less prone to responding

aggressively (Meier, Robinson, & Wilcowski, 2006) and are more forgiving (McCullough, 2001; McCullough & Hoyt, 2002).

Neuroticism is another personality trait that appears to influence responses to conflict. Neuroticism is a personality-based tendency to experience negative affect and emotions (Costa & McCrae, 1985; Suls, Martin et al., 1998), and it has been associated with a wide range of negative outcomes (Widiger, Verheul, & van den Brink, 1999) including heightened reactivity to daily stressors (Suls, Green, & Hillis, 1998). In the face of interpersonal conflict, an increased reactivity to stressful events becomes even more problematic as people high on neuroticism are more likely to use negative appraisal strategies and less adaptive patterns of coping such as reacting with hostility (Bolger, 1990; Gunthert et al., 1999) and less forgiveness (Hoyt, Fincham, McCullough, Maio, & Davila, 2005; McCullough & Hoyt, 2002). In sum, whereas agreeableness seems to be adaptive in the aftermath of conflict and aggression, neuroticism has typically been viewed as a hindrance to positive responses.

<center>Perceived Transgressor Agreeableness and Forgiveness</center>

Although a considerable amount of research has evaluated how the personality traits of people who have experienced conflict and aggression are associated with measures of their own adaptation, very little research has examined how the personality traits of their antagonists—that is, the people who are perceived as the transgressors— influence victims' adaptation. This seems like an oversight because it is clear that a variety of social and interpersonal factors influence the resolution of interpersonal conflict (Exline, Baumeister, Zell, Kraft, & Witvliet, 2008; Koutsos, Wetheim, & Kornblum, 2008; Struthers, Eaton, Santelli, Uchiyama, & Shirvani, in press), and the

transgressor's personality seems like a contextual factor that deserves more consideration in its own right. Indeed, McCullough (2008) proposed that forgiveness following an interpersonal transgression was strongly related to the extent to which victims viewed their transgressors as safe, valuable, and worthy of care. Agreeableness is a reasonable summary of these characteristics at the level of personality (Costa & McCrae, 1995; John, 1990).

How might a transgressor influence a victim's perception of his or her agreeableness? Following an interpersonal transgression, apologies, affiliative physical contact, offers of compensation, and self-abasing gestures have been associated with the promotion of reconciliation and forgiveness (Boehm, 1987; Bottom, Gibson, Daniels, & Murnighan, 2002; 2006; Exline, DeShea, & Holeman, 2007; Hickson, 1986; Lazare, 2004). Transgressor behaviors such as these may be effective because they make transgressors seem desirable (i.e., safe, valuable, and worthy of care) as continuing relationship partners. Indeed, Tabak, McCullough, Root, Bono, and Berry (submitted) examined how conciliatory gestures such as sincere apologies and compensation offers may facilitate forgiveness and/or relationship repair after a transgression by influencing the extent to which the transgressor is viewed as agreeable. In three studies, Tabak et al. found that perceived transgressor agreeableness mediated the relationship between conciliatory gestures exhibited shortly after the transgression and forgiveness both cross-sectionally and over time. These authors speculated that conciliatory gestures facilitate forgiveness via perceived agreeableness because these conciliatory gestures provide information about a transgressor's desirability as a future relationship partner.

The Present Study

In the present study, I wished to examine the role of transgressors' perceived agreeableness a predictor of several self-report and endocrine measures of post-conflict psychological functioning. In particular, I predicted that individual differences in transgressors' agreeableness would be associated with greater victim self-reported forgiveness, reduced self-reported post-conflict anxiety, and reduced cortisol reactivity. Psychological stress, particularly related to the perception of negative evaluation by others, can increase the secretion of cortisol (Dickerson & Kemeny, 2004) even without the presence of others (Dickerson, Mycek, & Zaldivar, 2008). Building on such findings, McCullough, Orsulak, Brandon, and Akers (2007) also found a positive within-persons association between rumination about nontraumatic psychologically painful interpersonal transgressions and salivary cortisol. McCullough et al. (2007) suggested that fear of the transgressor may result from an increased anticipation of negative interactions (i.e. increased social threat; Dickerson & Kemeny, 2004). Thus, it seems likely that perceiving a transgressor as more agreeable would reduce the level of perceived social threat when thinking about the transgressor, which would thereby lead to more forgiveness, less post-conflict anxiety, and reduced cortisol response when thinking about the transgressor.

In addition, I examined on an exploratory basis the possibility that oxytocin was also correlated with perceived transgressor agreeableness. Recently, the neuropeptide oxytocin has been researched extensively in regard to its potential association with the attenuation of stress through the hypothalamic-pituitary-adrenal (HPA) axis, and its potential to facilitate prosocial behavior, including trust (Bartz & Hollander, 2006). To

determine the ability of oxytocin to regulate stress in humans, Heinrichs, Baumgartner, Kirschbaum, and Ehlert (2003) found that participants receiving experimental provisions of social support and intranasally administered oxytocin had the lowest cortisol concentrations during a stress task, whereas participants who received no social support and placebo displayed the highest cortisol responses to stress.

Based on oxytocin's anxiolytic, stress-reducing, and prosocial effects, one might hypothesize that oxytocin would be involved with the re-establishment of positive, trusting relationships with individuals who have harmed them. However, other work suggests that individual differences in oxytocin are associated with social distress and/or isolation (Taylor et al., 2006; Turner, Altemus, Enos, Cooper, & McGuinness, 1999), and on this basis, one might hypothesize that oxytocin reactivity would be associated with poorer adaptation to negative interpersonal events.

Chapter 2: Methods

Participants

Participants were 39 female undergraduate psychology students (mean age =

19.31 years, *SD* = 3.45, range = 17-39 years) at the University of Miami. Students who

enrolled through their Introduction to Psychology courses received course credit for

participation, and all participants were paid between $60 and $100 on a *pro rata* basis for

completing various aspects of the study. The present study's sample size was comparable

to those of several other recent studies in which natural levels of plasma oxytocin were

measured in humans (Grewen, Girdler, Amico, & Light, 2005; Jansen et al., 2006; Tops,

van Peer, Korf, Wijers, & Tucker, 2007; Turner et al., 1999). All participants had

encountered a significant interpersonal transgression approximately 7 days (*M* = 4.64; *SD*

= 2.63) prior to enrollment.

Measures

Personality variables. Participants completed the 44-items Big Five Inventory

(John, Donahue, & Kentle, 1991) to describe their own self-reported personalities on five

broad dimensions: Agreeableness, Conscientiousness, Extraversion, Neuroticism, and

Openness. Internal consistencies generally exceed .75 for all five subscales, and 3-month

test-retest reliabilities typically exceed .80 (Benet-Martínez & John, 1998). Participants

also completed the items from the agreeableness subscale of the BFI to rate their

perceptions of their transgressors' personalities.

Forgiveness. McCullough and colleagues (McCullough, Fincham, & Tsang, 2003;

McCullough et al., 1998) defined forgiveness as a suite of prosocial motivational changes

whereby a victim of a transgression becomes less vengeful, less avoidant, and more

benevolent towards their transgressor. On the day prior to the laboratory visit when the

speech task was completed (see below), I measured participants' forgiveness of their

transgressors with the 18-item form of the Transgression-Related Interpersonal

Motivations (TRIM) Inventory (McCullough, Root, & Cohen, 2006). This self-report

measure (see Appendix A) consists of three subscales: The extent to which the victim (a)

is motivated to seek revenge against the transgressor (Revenge), (b) is motivated to avoid

the transgressor (Avoidance), and (c) harbors good will for the transgressor

(Benevolence). The Revenge subscale comprises 5 items that measure motivation to seek

revenge (e.g., "I'll make him/her pay"). The Avoidance subscale comprises 7 items that

measure motivation to avoid contact with a transgressor (e.g., "I live as if he/she doesn't

exist, isn't around"). Both the Revenge and Avoidance subscales have high internal

consistency (i.e., $\alpha \geq .85$), moderate test-retest stability (e.g., 8-week test-retest $rs =$

approximately .50), and evidence of convergent and discriminate validity (McCullough et

al., 1998, 2003). The Benevolence subscale comprises 6 items that measure the desire for

good to come to the transgressor (e.g., "Even though his/her actions hurt me, I have

goodwill for him/her"), and has also demonstrated high internal consistency ($\alpha \geq .90$),

and moderate test-retest stability (r = .52-.87) (McCullough et al., 2003; McCullough &

Hoyt, 2002). Items were rated on a 5-point Likert-type scale (1 = *strongly disagree, 5*

=strongly agree).

Recent analyses of the TRIM inventory based on Item Response Theory

suggested that the 18 items reflect a unidimensional latent variable (McCullough, Root,

Berry, Tabak, and Bono, submitted). Thus, I used the Rating Scale version of the Rasch

Model to estimate a forgiveness score based on participants' responses to the 18 items on

the TRIM inventory (Fox & Jones, 1998). The Rasch model conceptualizes each

individual's score on each questionnaire item as a function of a parameter representing the endorsability of the item (i.e., how much or how little of a construct one would have to possess to endorse the item at a given level), and a parameter representing the individual's standing on the psychological construct being measured (Fox & Jones, 1998). In a previous study using the same statistical methodology to estimate forgiveness scores with the TRIM inventory, model fit was excellent (person and item separations were 0.92 and 1.00, respectively) and the single unidimensional measure of forgiveness accounted for 83% of the item variance, with a yardstick-to-total noise ratio of 4.9:1 (McCullough, Root, Berry, Tabak, & Bono, submitted).

Post-conflict anxiety. Following the speech task, participants rated their current post-conflict anxiety toward their offenders with 14 items that they endorsed with a 7-point Likert-type scale (*1 = completely disagree, 6 = completely agree*). Items were written in both positive ("He/she doesn't intend to wrong me again") and negative ("I can't trust their intentions toward me") forms. Positively worded items were reverse-scored so that higher total scores indicated more post-conflict anxiety (see Appendix D). The mean of the 14 items demonstrated high internal consistency (α= .88), so I used the mean of the 14 items as a measure of post-conflict anxiety.

Perceived painfulness of the transgression. Upon enrollment, participants indicated how painful they perceived the transgression to be with a single item that read, "How painful is the offense to you right now?" using a 6-point Likert-type scale (0 = *not very painful at all,* 6= *worst pain I ever felt*). Participants also responded to two seven-point Likert-type scales indicating the extent to which their offender apologized and attempted to make amends for the transgression (see Appendix B).

Plasma hormone levels. After blood samples were collected in 6mL vacutainer tubes with EDTA, 0.38mL of Aprotinin reagent was added. Tubes were gently rocked, submerged into an ice bath, and centrifuged at 1600 g at 4 degrees Celsius for 20 minutes within 1 hour. Plasma was then frozen at −80 degrees C until time of assay. Plasma concentrations of cortisol were determined using a solid phase radioimmunoassay (RIA) method (Diagnostic Products Corp.). The antibody employed in the kit has high specificity for cortisol and the minimal detectable level is 0.2 μg/ml (5.5mM). The intra-assay coefficient of variability (CV) is < 4.3% and the interassay CV is 5.2%.

Plasma oxytocin was extracted by solid phase chromatography using Sep-Pak columns (Peninsula Laboratories, San Carlos, CA) and assayed by RIA (RK-051-01) from Phoenix Pharmaceuticals (Belmont, CA) following the manufacturer's methods. The plasma levels of progesterone (intra-assay CV is < 4.0% and the interassay CV is < 6.0%) and estradiol (intra-assay CV is < 5.4% and the interassay CV is 6.4%) were assessed via RIA method (Diagnostic Products Corp.). All analyses were performed at the Diabetes Research Institute at the University of Miami School of Medicine.

Procedure

Recruitment. Participants were recruited through flyers, mailings, and announcements in several undergraduate psychology courses regarding our interest in conducting an experiment about people who had recently incurred an interpersonal transgression within the past 7 days. Throughout several semesters we continued to visit courses to facilitate enrollment of eligible participants. We provided initial packets that included the BFI scales, and the measures of perceived transgression painfulness, pre-transgression closeness/commitment, and perceived apology and making amends.

Following the completion of the initial questionnaires, participants returned the

information. If they were deemed eligible for further study participation, they were

scheduled for future lab visits including the speech task described below.

Measurement of forgiveness by self-report. One day prior to their laboratory

visits, participants completed the TRIM inventory on a web site for the study.

Reactivity Task and Blood Draw Protocol. Approximately 28 days ($n = 38$, $M =$

28.37, $SD = 5.08$) after enrollment, participants completed a 90-minute laboratory session

consisting of baseline blood draws, a speech reactivity task, and subsequent post-task

blood draws and questionnaires.

Participants arrived between 6:00pm and 7:30pm to minimize diurnal fluctuations

in cortisol levels. We did not attempt to eliminate subjects due to typical exclusion

criteria (e.g., alcohol, smoking, contraceptive use, other medication use) because, as

undergraduate women, it was anticipated that the majority of participants would be using

contraceptives.[1] All participants reported themselves to be in good physical health.

Recent research on cortisol reactivity suggests that a failure to employ exclusion criteria

does not prohibit investigators' ability to find theoretically expected results in basically

healthy undergraduate samples (e.g., McCullough, Orsulak, Brandon, & Akers, 2007).

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[1]Although we did not ask participants about their use of oral contraceptives, research shows that oral contraceptive use does not correlate with plasma levels of oxytocin (Bell, Nicholson, Mulder, Luty, & Joyce, 2006; van London et al., 1997). Likewise, the fact that we did not control for menstrual cycle differences among women probably did not influence our results, as studies have shown that plasma oxytocin levels do not change over the course of the menstrual cycle (Stock, Bremme, & Uvnas-Moberg, 1991). Moreover, no significant correlations were found between baseline levels of oxytocin and baseline levels of progesterone ($r = -.05$; $p = .80$), or estradiol ($r = .15$, $p =.38$), suggesting that baseline oxytocin levels were not correlated with fluctuations in reproductive hormones that vary across the menstrual cycle.

Upon arrival, participants were brought into a laboratory room. A research assistant explained the voluntary blood draw protocol, and consenting participants discussed the procedure with a phlebotomist. Participants were fitted with a plastic intravenous (IV) catheter into their nondominant arm. Then, a first baseline blood sample was drawn into two 6mL vacutainer tubes with EDTA (this type of tube was used for all subsequent draws). The catheter remained in each participant's arm for the remainder of the procedure. Participants were instructed to relax and wait patiently for 10 minutes while the research assistant set up for the next part of the experiment. This period was designed for catheter habituation. Ten minutes later, a second baseline was drawn into a 6mL tube. Following the second baseline draw, participants were instructed to spend 4 minutes preparing a short speech that they would like to give to their transgressor as if the video camera was the person/persons who harmed them. Participants received the following scripted instructions:

> For this task, we really want you to relax and "get into" the task so that you can express your feelings to this person without holding anything back—as if you were really talking to this person… Specifically, we would like you to spend a few minutes preparing some thoughts about what you would say to the person who hurt you, focusing on:
>
> a)   What you would like to say about the hurtful event
> b)   How you are currently feeling about the individual who harmed you as a person
> c)   How you feel like acting toward that individual
>
> You will have four minutes to prepare anything that you would like. Feel free to take notes if you would be more comfortable. After the preparation time, you will be asked to give this speech into the video recorder.

After the preparation time, participants delivered the 4-minute speech to the camera. Two, five, seven, and ten minutes following the conclusion of the speech, four

additional 6mL tubes of blood were drawn. After the fourth post-speech blood draw, the catheter was removed. Participants then complete the measure of post-conflict anxiety and several other questionnaires not relevant to this study.

Research has suggested that oxytocin and cortisol reactivity may peak at different times (Light, Grewen, & Amico, 2005). As a result, we wanted to ensure that blood draws occurred early enough after stressor offset for measuring OT reactivity, but also long enough after the stressor offset that we could also measure cortisol reactivity. Since our participants had four minutes to prepare their speeches, two minutes between preparation and delivery, and four minutes for speech delivery (for 10 minutes total), we determined that blood draws 12 minutes, 15 minutes, 17 minutes, and 20 minutes after the beginning of the preparation period would enable us to capture any stress-induced cortisol increases that our task induced, which peak approximately 20 minutes after stressor onset (Dickerson & Kemeny, 2005), while also giving us time to measuring the much faster pulsatile releases of oxytocin that our laboratory task might have created in some participants (Light, Grewen, & Amico, 2005).

Statistical Analysis

Baseline levels of all hormones were estimated from the mean of the two baseline values. Four measurements of changes in plasma cortisol and oxytocin concentrations after the speech task were estimated by subtracting baseline levels of each respective hormone from the concentrations measured at 12, 15, 17, and 20 minutes. Cortisol levels were natural-log transformed, and oxytocin levels were square root transformed to better approximate normal distributions (Light, Grewen, & Amico, 2005; McCullough, Orsulak, Brandon, & Akers; 2007).

Relationships of self-reported personality traits and perceptions of transgressors' agreeableness with forgiveness, post-conflict anxiety, cortisol reactivity, and oxytocin reactivity were explored with Pearson correlations, and subsequently, with multiple regression.

I examined the potential confounding influence of transgression severity and found that this did not alter the results substantially, so this variable was not considered beyond exploratory analysis.

Chapter 3: Results

Descriptive Statistics

Participants reported that their transgressions had been committed by girlfriends/boyfriends (53.7%), same gender friends (16.7%), casual dating partners (11.1%), other-gender friends (9.3 %), "others" (5.6%), and relatives (3.7%). Transgressions involved romantic partner/spouse infidelity (23.1%), insults or betrayals by a friend (17.9%), termination of a romantic relationship (17.9%), insults by people other than family or friends (10.3%), rejection or abandonment by a friend of potential relationship partner (10.3%), "other" (10.3%), neglect by a romantic partner/spouse or ex-romantic partner (7.7%), and neglect or insult by a family member (2.6%). Mean level of pain reported by participants on the 7-point scale was 5.05 ($SD = 0.85$). Recall that scores ranged from 0-6, with 6 signifying "the worst pain I ever felt," so participants clearly felt that the interpersonal transgressions they had experienced where quite painful. One participant did not complete the item for measuring the painfulness of the transgression.

Correlations between Major Study Variables

Means and standard deviations of major study variables appear in Table 1, correlations of the major study variables appear in Table 2, correlations of oxytocin reactivity and major study variables appear in Table 3. As shown in Table 2, there was a significant negative correlation between participants' self-reported neuroticism and their self-reported agreeableness ($r = -.41; p < .05$). In addition, there was a negative association between post-conflict anxiety and forgiveness ($r = -.66; p < .01$) indicating that more unforgiving people also had felt more post-conflict anxiety.

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Does Perceived Transgressor Agreeableness Predict Variables Associated with Post-conflict Anxiety?

Table 2 also shows a significant negative correlation of perceived transgressor agreeableness with post-conflict anxiety ($r = -.34$; $p < .05$) and a positive correlation with forgiveness ($r = .43$; $p < .01$). Figure 1 shows a nearly significant correlation of perceived transgressor agreeableness with cortisol reactivity at Time 3 ($r = -.34$; $p = .06$) and Time 4 ($r = -.35$, $p = .06$). These correlations led us to examine the unique contribution of perceived transgressor agreeableness to the prediction of these variables using multiple regression analyses, which enabled us to control for victim self-reported agreeableness and neuroticism.

Perceived transgressor agreeableness and post-conflict anxiety. As predicted, victims who perceived their transgressors as higher on agreeableness showed less self-reported post-conflict anxiety, *beta* $= -.34$, $p = .04$. This relationship remained significant even when including victim self-reported agreeableness and neuroticism (see Table 4).

Perceived transgressor agreeableness and forgiveness. Likewise, victims who perceived their transgressors as higher on agreeableness reported more forgiveness, *beta* $= .43$, $p = .01$. This relationship remained significant even when including victim self-reported agreeableness and neuroticism (see Table 5).

Perceived transgressor agreeableness and cortisol reactivity. As shown in Figure 1, perceived transgressor agreeableness was negatively associated with all four measures of cortisol reactivity. For two of those measures of cortisol reactivity, the negative associations of perceived transgressor agreeableness and cortisol reactivity were approaching statistically significance ($p = .06$), suggesting that people who perceived

their transgressors as highly agreeable experienced lower cortisol reactivity 17 and 20 minutes after the onset of the laboratory speech task (see Figure 1).

On the basis of these nearly significant correlations of perceived transgressor agreeableness and cortisol reactivity at those two time points, I proceeded to examine whether perceived transgressor agreeableness was associated with cortisol reactivity at Time 3 and Time 4 while simultaneously controlling for participants' self-reports of agreeableness and neuroticism.

Transgressor agreeableness was a significant predictor of cortisol reactivity at Time 3, *beta* = -.44, *p* = .04, in models that simultaneously controlled for self-reported agreeableness and neuroticism (see Table 6). Likewise, a negative association between perceived transgressor agreeableness and cortisol reactivity was found for cortisol reactivity at Time 4, in models that simultaneously controlled for self-rated agreeableness and neuroticism, *beta* = -.37, but this association fell below conventional criteria for statistical significance, *p* = .10.

Correlates of Oxytocin Reactivity

On an exploratory basis, I evaluated the associations of perceived transgressor agreeableness and the other measures with baseline oxytocin and oxytocin reactivity. Baseline oxytocin and baseline cortisol were positively related ($r = .39$; $p < .05$). Also, as Table 3 shows, oxytocin reactivity at Time 2 was negatively and significantly correlated with forgiveness ($r = -.43$, $p < .05$). Post-conflict anxiety was positively correlated with oxytocin reactivity at Time 2 ($r = .34$; $p = .07$), and at Time 4 ($r = .36$; $p = .06$), though both of these associations were just below conventional criteria for statistical significance.

A multiple regression analysis was conducted including oxytocin reactivity at Time 2 as the criterion variable, and post-conflict anxiety and baseline cortisol as the predictors (we also controlled for baseline cortisol, given its moderate correlation with baseline oxytocin). As shown in Table 7, victims who were less forgiving showed significantly greater oxytocin reactivity at Time 2 even when controlling for baseline levels of cortisol (β = -.43; p <.02). Victims who experienced more post-conflict anxiety also demonstrated greater oxytocin reactivity at Time 2 (β = .34), though this association was below standard criteria for statistical significance (p =.07) (see Table 8).

Thus, oxytocin reactivity appears to be negatively related to forgiveness, as well as with increased post-conflict anxiety, rather than with more forgiveness and less post-conflict anxiety. These results harken to previous work that has suggested that oxytocin may be a biomarker for interpersonal distress (Taylor et al., 2006; Turner et al., 1999).

Chapter 4: Discussion

Several studies have shown that dimensions of people's personalities influence their responses to interpersonal stressors and transgressions (Graziano, Jensen-Campbell, & Hair, 1996; Gunthert et al., 1999; Hoyt et al., 2005; McCullough, 2001; McCullough & Hoyt, 2002; Suls, Martin et al., 1998). However, relatively little is known about how the perceived personalities of the perpetrators of injustices themselves might influence victims' post-transgression responses. On the basis of previous work, I hypothesized that perceived agreeableness would be a particularly important predictor of how the victims of interpersonal transgressions respond in the aftermath of those transgressions (Exline et al., 2008; Koutsos et al., 2008; Struthers et al., 2008). I examined the association of perceived transgressor agreeableness with self-reported post-conflict anxiety, self-reported forgiveness, and cortisol and oxytocin reactivity. I hypothesized that perceiving transgressors as high on agreeableness would be associated with lower post-conflict anxiety, more forgiveness, and lower cortisol reactivity. Results largely supported these hypotheses. Following an interpersonal transgression, victims who perceived their transgressors as more agreeable reported lower post-conflict anxiety and more forgiveness, and they experienced less cortisol reactivity, than did those who perceived their transgressors as less agreeable. These associations remained significant even when controlling for participants' (i.e., the transgression recipients') own self-reported agreeableness and neuroticism.

Following interpersonal conflict, agreeableness is associated with less negative emotional reactivity (e.g., hostility and anger; Jensen-Campbell, Gleason, Adams, & Malcolm 2003), whereas neuroticism has been found to exacerbate negative emotional

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responses (Ode, Robinson, & Wilkowski, 2007). Also, studies have shown that when

people are believed to be highly agreeable, the people with whom they are in a conflict

are more willing to settle their disputes through informal, interpersonal mechanisms

(Morris, Leung, & Iyengar, 2004). The expectation that conflict with highly agreeable

people will be resolved productively and relatively easily may explain why people appear

to feel more comfortable and spontaneous when resolving conflicts with highly agreeable

partners, which in turn may contribute to more constructive conflict resolution (Jensen-

Campbell, Gleason, Adams, & Malcom, 2003). The present results join these previously

published findings to suggest that when people have been harmed by people whom they

perceive as highly agreeable, those transgressions are more readily forgiven and lead to

less post-conflict anxiety (measured both by self-report and in terms of cortisol reactivity)

in victims. The associations of perceived agreeableness with lower cortisol reactivity is

particularly noteworthy because it suggests that perceptions of agreeableness do not

correlate solely with other measures obtained from self-reports, but also, with

neuroendocrine measures that reflect perceived social threat (Dickerson & Kemeny,

2004) and/or lingering fear of interpersonal transgressors (McCullough et al., 2007).

Research has begun to highlight the importance of contextual factors, such as

characteristics of the transgressor, that are associated with the resolution of interpersonal

conflict (Exline et al., 2008; Koutsos et al., 2008; Struthers et al., 2008). For example,

how much the victim values the relationship following the offense (Koutsos et al., 2008),

the attribution of transgressor intent (Struthers et al., 2008), and the ability of the victim

to perceive his or her self as similar to the transgressor (Exline et al., 2008). These recent

findings comport well with McCullough's (2008) notion that people forgive transgressors

whom they perceive to be safe, valuable, and worthy of care—traits that seem well summarized, at the level of personality, by the agreeableness dimension of the Big Five or Five-Factor personality systems (John, 1990; Costa & McCrae, 1995). By perceiving transgressors as agreeable, victims are more likely to view those transgressors as desirable future relationship partners. Indeed, Tabak et al. (submitted) recently discovered that conciliatory gestures such as apologies, expressions of contrition, offers of compensation, and non-verbal expressions of shame, guilt, and remorse are effective at quelling revenge and facilitating forgiveness precisely because they make transgressions seem more agreeable—that is, higher in the generalized personality trait that is associated with trustworthiness, cooperativeness, and a generally prosocial orientation toward others. Taken together, the present findings give strong encouragement to further research on how the perceived agreeableness of interactants in conflict may help to determine the outcomes of those conflicts, as well as further research on the behaviors that people consider when they make judgments about their transgressors' agreeableness.

In exploratory analyses, I also investigated the association of oxytocin reactivity and perceived transgressor agreeableness. Based on oxytocin's associations in previous research with stress reduction and prosocial behavior (Bartz & Hollander, 2006), I also hypothesized that oxytocin reactivity would be associated with the resolution of interpersonal conflict, and thus, with measures of forgiveness and post-conflict anxiety.

Contrary to hypotheses, oxytocin reactivity was not related to perceived transgressor agreeableness. However, oxytocin reactivity measured 15 minutes after the onset of the stressor was associated with lower forgiveness and, with statistical near-significance, with lower post-conflict anxiety. Although several studies have identified

oxytocin as a correlate (and, in studies in which oxytocin has been experimentally administered intranasally, a cause) of prosocial behavior (Bartz & Hollander, 2006), the evidence to date regarding the influence of oxytocin on stress is mixed. One study found that oxytocin in addition to social support may attenuate stress (Henrichs et al., 2003), but other studies have not found this association (Ditzen et al., 2007).

In addition, two previous studies found naturally occurring levels of oxytocin to be associated with social distress (Taylor et al., 2006; Turner et al., 1999). The present results contribute to the evidence that elevated plasma oxytocin in women may be a biological marker for relationship distress by showing increased oxytocin reactivity among women who have not forgiven their transgressors, and among those women who report relatively high anxiety about their transgressors intentions toward them after the transgression occurred. Thus, despite oxytocin's apparent effects in increasing trust (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005) and generosity (Zak, Stanton, & Ahmadi, 2007), it appears increasingly likely that naturally occurring levels of oxytocin may serve as markers of social difficulty in women.

Limitations and Future Directions

There are several limitations to this study that should be addressed in future research. First, this study was non-experimental, which limits conclusions about causality. Our method of studying real-life transgressions rather than hypothetical transgressions, or transgressions between strangers that can be engineered in the laboratory, improves external validity; however, experimental research would help to clarify the causal relations among the variables I have examined here. Second, forgiveness and post-conflict anxiety were only measured on one occasion—

approximately 30 days after victims had been harmed. Longitudinal research measuring these variables on multiple occasions would enable researchers to clarify the influence of perceived transgressor agreeableness on changes in these variables over time, and therefore, could also improve our understanding of the causal nature of these associations.

Third, the fact that I examined only women limited this study's ability to draw conclusions about how these processes might operate for men. It is perhaps worth noting that on an exploratory basis, I did examine the associations among the variables studied herein in a sample of 12 men, and no significant correlations emerged. However, these non-findings may have been due to sample size constraints. Alternatively, as McCullough, Orsulak, Brandon, and Akers (2007) suggested, some of the associations of cortisol and post-transgression adjustment may apply only to women. Future research that incorporates men in larger numbers would help immensely in addressing this issue.

Fourth, the measurement intervals with which I sampled blood for assaying cortisol and oxytocin were inadequate for evaluating both reactivity and recovery. Future work might extend the blood assays for another 30-60 minutes so that the return to baseline levels of cortisol could be examined as well as reactivity (Ditzen et al., 2007).

Conclusion

The present study contributes to and integrates several lines of research, including: (a) research on the role of perceived transgressor agreeableness in the resolution of interpersonal conflict (Tabak et al., submitted), (b) research identifying the importance of characteristics of the transgressor in the promoting forgiveness (Exline et al., 2008; Koutsos et al., 2008; Struthers et al., 2008), (c) research on cortisol reactivity in

paradigms concerning social threat (Dickerson & Kemeny, 2004; Dickerson, Mycek, & Zaldivar, 2008; McCullough et al., 2007), and (d) oxytocin's potential to act as a biomarker for interpersonal distress (Taylor et al., 2006; Turner et al., 1999). These results in general suggest that following interpersonal conflict, perceptions of transgressors' personalities—particularly, how agreeable they seem—may communicate unique information about their potential value as relationship partners that has tremendous implications for how interpersonal transgressions, which are ubiquitous in human social life, are resolved.

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Tables

Table 1

Means and Standard Deviations for Major Study Variables

Measure	n	M	SD
Perceived Transgressor Agreeableness	39	2.91	.86
Participant Self-Reported Agreeableness	32	3.71	.70
Participant Self-Reported Neuroticism	32	3.15	.88
Forgiveness (TRIM-18)	38	43.7	18.53
Post-Conflict Anxiety	37	3.66	1.11
Cortisol Baseline (μg/dL)	39	18.0	7.61
Cortisol Time 1 (μg/dL)	36	18.8	8.88
Cortisol Time 2 (μg/dL)	33	19.4	8.41
Cortisol Time 3 (μg/dL)	32	19.21	8.82
Cortisol Time 4 (μg/dL)	30	18.99	9.17
Oxytocin Baseline (pg/mL)	35	1.61	2.81
Oxytocin Time 1 (pg/mL)	30	1.71	2.89
Oxytocin Time 2 (pg/mL)	30	1.45	2.21
Oxytocin Time 3 (pg/mL)	29	1.30	2.04
Oxytocin Time 4 (pg/mL)	30	1.48	2.6
Progesterone Baseline (ng/mL)	39	1.19	2.14
Estradiol Baseline (pg/mL)	39	44.7	52.64

Note. TRIM = Transgression Related Interpersonal Motivations Inventory.

Table 2

Correlations of Major Study Variables

	1	2	3	4	5
Perceived Transgressor Agreeableness (1)	-				
Participant Self-Reported Agreeableness (2)	.31	-			
Participant Self-Reported Neuroticism (3)	-.12	-.41*	-		
Forgiveness (TRIM-18) (4)	.43**	-.12	-.12	-	
Post-Conflict Anxiety (5)	-.34*	.06	.15	-.66**	-

Note. TRIM = Transgression Related Interpersonal Motivations Inventory.
*p < .05; **p < .01

Table 3

Correlates of Oxytocin Reactivity

	BaseOT	OT1	OT2	OT3	OT4
Perceived Transgressor Agreeableness	-.03	.12	-.27	-.04	.06
Participant Self-Reported Agreeableness	.29	.07	.05	-.05	-.03
Participant Self-Reported Neuroticism	.18	-.29	-.06	-.03	-.04
Forgiveness (TRIM-18)	.06	-.04	-.43*	-.27	-.28
Post-Conflict Anxiety	.11	.17	.34[a]	.24	.36[b]

Note. BaseOT = Oxytocin at Baseline; OT1 = Oxytocin reactivity at Time 1; OT2 = Oxytocin reactivity at Time 2; OT3 = Oxytocin reactivity at Time 3; OT4 = Oxytocin reactivity at Time 4; TRIM = Transgression Related Interpersonal Motivations.
[a] $p = .07$; [b] $p = .06$; *$p < .05$

Table 4

Predictors of Post-Conflict Anxiety

_____

Predictor	B	SE	Beta
Perceived Transgressor Agreeableness	-.55	.24	-.41*
Participant Self-Reported Agreeableness	.42	.24	.20
Participant Self-Reported Neuroticism	.25	.07	.28

_____

Note. $R^2 = .19$.
*$p < .05$

Table 5

Predictors of Forgiveness

_____

Predictor	*B*	*SE*	*Beta*
Perceived Transgressor Agreeableness	8.0	3.34	.43*
Participant Self-reported Agreeableness	7.70	4.47	.33
Participant Self-reported Neuroticism	3.67	3.62	.19

_____

Note. $R^2 = .22$.
*$p < .05$

Table 6

Predictors of Cortisol Reactivity at Time 3

_____

Predictor	B	SE	Beta
Perceived Transgressor Agreeableness	-.16	.07	-.44*
Participant Self-reported Agreeableness	.05	.09	.11
Participant Self-reported Neuroticism	.02	.07	.07

_____

Note. $R^2 = .19$.
*$p < .05$.

Table 7

Predictors of Oxytocin Reactivity at Time 2

_____

Predictor	*B*	*SE*	*Beta*
Forgiveness (TRIM-18)	-.01	<.01	-.43*
Baseline Cortisol	.20	.15	.02

_____

Note. R^2 = .18; TRIM = Transgression Related Interpersonal Motivations.
* $p < .05$

Table 8

Predictors of Oxytocin Reactivity at Time 2

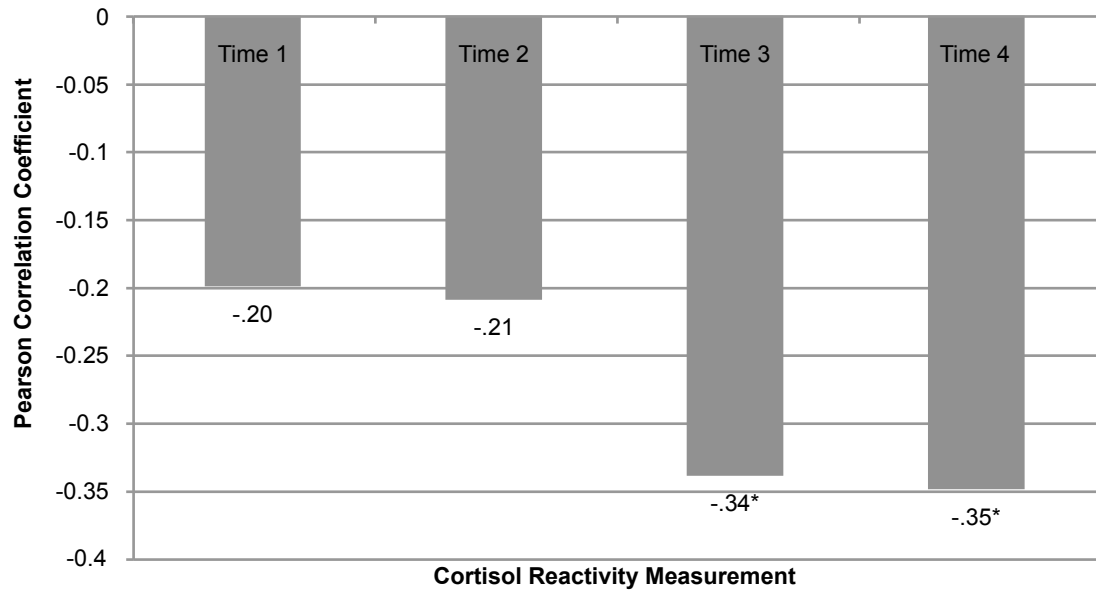| Predictor	B	SE	Beta
Post-Conflict Anxiety	.11	.06	.34[a]
Baseline Cortisol	.05	.15	.06

Note. $R^2 = .12$.
[a]$p = .07$

Figures

Figure 1. Correlations between perceived transgressor agreeableness and cortisol reactivity at Time 1 (n = 36), Time 2 (n = 33), Time 3 (n = 32), and Time 4 (n = 30). *p = .06

Appendices

Appendix A

TRIM-18

For the following questions, please circle the number that best indicates your current thoughts and feelings about the person who hurt you; that is, we want to know how you feel about that person TODAY.

	Strongly Disagree 1	Disagree 2	Neutral 3	Agree 4	Strongly Agree 5
1. I'll make him/her pay.	1	2	3	4	5
2. I am trying to keep as much distance between us as possible.	1	2	3	4	5
3. Even though his/her actions hurt me, I have goodwill for him/her.	1	2	3	4	5
4. I wish that something bad would happen to him/her.	1	2	3	4	5
5. I am living as if he/she doesn't exist, isn't around.	1	2	3	4	5
6. I want us to bury the hatchet and move forward with our relationship.	1	2	3	4	5
7. I don't trust him/her.	1	2	3	4	5
8. Despite what he/she did, I want us to have a positive relationship again.	1	2	3	4	5
9. I want him/her to get what he/she deserves.	1	2	3	4	5
10. I am finding it difficult to act warmly toward him/her.	1	2	3	4	5
11. I am avoiding him/her.	1	2	3	4	5
12. Although he/she hurt me, I am putting the hurts aside so we could resume our relationship.	1	2	3	4	5
13. I'm going to get even.	1	2	3	4	5
14. I forgive him/her for what he/she did to me.	1	2	3	4	5
15. I cut off the relationship with him/her.	1	2	3	4	5
16. I have released my anger so I can work on restoring our relationship to health.	1	2	3	4	5
17. I want to see him/her hurt and miserable.	1	2	3	4	5
18. I withdraw from him/her.	1	2	3	4	5

Appendix B

Now, we'll ask you a few questions about how you feel <u>RIGHT NOW.</u>

1. How painful is the offense to you right now (circle one number)?

Not at all painful 0	1	2	Somewhat Painful 3	4	5	Worst Pain I Ever Felt 6

Appendix C

HOW YOU FELT BEFORE THE OFFENSE

Now, we would like to know some things about your relationship with this person. Please indicate below how you felt about this person BEFORE he/she committed the action you described above.

1. On a scale from 0 to 6, please indicate how **close** you were to the person who hurt you BEFORE THE OFFENSE (circle one number).

Not at all close 0	1	2	Neutral 3	4	5	Extremely close 6

2. On a scale from 0 to 6, please indicate how **committed** you were to the person who hurt you BEFORE THE OFFENSE (circle one number).

Not at all committed 0	1	2	Neutral 3	4	5	Extremely committed 6

4. Using the diagrams below, please indicate which picture best described your relationship with the person BEFORE THE OFFENSE.

Please circle the picture below which best describes your relationship
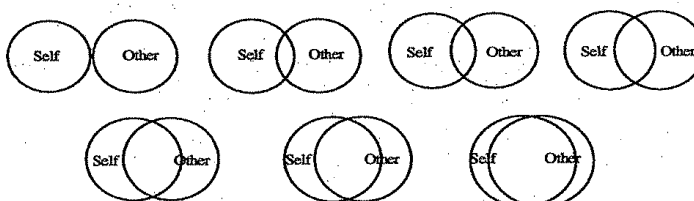

Figure 1. The Inclusion of Other in the Self (IOS) Scale.

Appendix D

Please read each item below and indicate how much you agree that the statement represents your CURRENT beliefs about the person who hurt you; that is, what you believe about that person RIGHT NOW.

	Completely Disagree						Completely Agree
He/she doesn't mean me any harm.	1	2	3	4	5	6	7
He/she wants to get back to being on good terms with me.	1	2	3	4	5	6	7
I can't trust their intentions toward me	1	2	3	4	5	6	7
He/she doesn't intend to wrong me again.	1	2	3	4	5	6	7
He/she still has a problem with me.	1	2	3	4	5	6	7
It's safe for me to let my guard down around him/her.	1	2	3	4	5	6	7
He/she is waiting for the next good chance to hurt me.	1	2	3	4	5	6	7
He/she doesn't want to jeopardize the relationship we have.	1	2	3	4	5	6	7
He/she intends to be nice to me.	1	2	3	4	5	6	7
I don't expect any problems to arise the next time we're together.	1	2	3	4	5	6	7
He/she wants to our conflict to be over.	1	2	3	4	5	6	7
I'm worried about what they'll do next.	1	2	3	4	5	6	7
He/she wants our relationship to be peaceful.	1	2	3	4	5	6	7
He/she wants bad things to happen to me.	1	2	3	4	5	6	7