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Trust after violations: Are collectivists more or less forgiving?

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Trust violations occur during social interactions, yet little research has studied trust in the aftermath of violations. In this study, we examine how trustors respond to trust violations differently, depending on their levels of collectivism and whether the violation is from an ingroup or outgroup member. We argue that although highly collectivistic individuals are forgiving after minor ingroup trust violations, when ingroup violations are severe, they will react negatively – lose trust easily and restore trust with much difficulty – effectively treating the ingroup member as an outgroup member. Individuals who are low on collectivism, by contrast, do not differentiate the severity of violations from ingroup and outgroup members. Two studies, one online attitudinal study using scenarios and one laboratory experiment using an iterated trust game, were conducted to test this hypothesis. Study 1 illustrated these effects, mediated by trustor anger. Study 2 replicated these findings with actual behaviour in a trust game and further showed that trustor's group identification exacerbated these effects.

Keywords: trust; violation; trust restoration; collectivism; ingroup/outgroup

As our global interdependence grows, interpersonal and institutional relations frequently cross national and cultural boundaries. Accordingly, increased research efforts have been geared towards understanding the intersection of culture and trust (see Saunders, Skinner, Dietz, Gillespie, & Lewicki, 2010 for a review). Studies have discovered important cultural variations in trust, such as lower generalised trust and relying on third-party ties to build trust among collectivists (Bohnet, Herrmann, & Zeckhauser, 2010; Chua, Morris, & Ingram, 2009; Gunia, Brett, Nandkeolyar, & Kamdar, 2011; Realo, Allik, & Greenfield, 2008). However, this growing body of research predominantly focuses on trust at one point in time, particularly during the initial trust formation. It neglects the effects of culture on trust after trust is established and when violations can occur. This is in sharp contrast with much of the theoretical work, which conceptualises trust as a dynamic process that evolves over time (Lewicki & Bunker, 1996; Rousseau, Sitkin, Burt, & Carmerer, 1998).

The present study begins to fill this void by examining how culture influences the dynamics of trust over time. Here, we focus on the effect of collectivism, a cultural dimension that has received the lion's share of research attention in the trust literature

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(Fulmer & Gelfand, 2012), and compare the dynamics of trust among high and low collectivists after violations. To trust, some scholars argue, is to take risks based on positive expectations of the trustee, thereby putting the trustor in a vulnerable position (e.g. Fulmer & Gelfand, 2012; Mayer, Davis, & Schoorman, 1995). Trust thus creates opportunities for violations (Granovetter, 1985), in which evidence arises that contradicts the positive expectations about the trustee, and prompts the trustor to question and redefine their relationship (Lewis & Weigert, 1985; Tomlinson, Dineen, & Lewicki, 2004). Accordingly, *trust dissolution* occurs immediately after violations when the trustor lowers trust in the trustee, while *trust restoration* occurs when trust stops declining and starts rebounding (Kim, Dirks, & Cooper, 2009; Kramer, 1999; Schoorman, Mayer, & Davis, 2007). We further differentiate the mean of trust as well as its trajectory to investigate the level and the rate at which trust changes dynamically over time.

In our examination of the effect of collectivism, we adopt a *culture-by-context perspective* and move beyond main effects of culture on trust dissolution and restoration (Gelfand & Cai, 2004; Gelfand et al., 2013; Hong, Morris, Chiu, & Benet-Martínez, 2000). It should be recognised that collectivism, denoting specific attitudes, beliefs, values and norms (Triandis, 1993), influences individuals' cognition, motivation and emotion, but is a dynamic construct which is affected by the situation. In this research, we examine collectivism as an individual difference proxy of culture (Gelfand, Leslie, & Fehr, 2008) and its effect on trust dissolution and restoration depending on two important situational features: the *nature of the relationship* between the parties (ingroup vs. outgroup) and the *nature of the trust violation* (mild or severe). Integrating research from culture (Markus & Kitayama, 1991; Triandis, 2001), social deviance (Marques, Yzerbyt, & Leyens, 1988; Platow & Van Knippenberg, 2001) and identity (Hutchison & Abrams, 2003; Jetten & Hornsey, 2014), we predict that individuals who are highly collectivistic are forgiving (e.g. have smaller and slower dissolution and larger and faster restoration) when ingroup violations are minor, but react harshly (e.g. have larger and faster dissolution and smaller and slower restoration) when ingroup violations are severe. We expect that the difference in trust responses after severe and minor violations will be smaller when violations are from an outgroup member or when trustors are low on collectivism.

The contribution of this research is threefold. First, it is among the first to examine the dynamics of trust over time, including changes in means and trajectories. Second, to our knowledge, it is the first study to examine culture and its interaction with the situation to predict trust trajectories following violations. Third, it looks beyond the prevailing assumption that highly collectivistic trustors should be forgiving towards their ingroups to render a more realistic picture concerning collectivism and ingroup trust.

In what follows, we first review the research on collectivism and trust, as well as on the relational contextual effect of whether the violator has an ingroup or outgroup relationship with the trustor. Integrating these two areas of research, we examine how collectivism interacts with violation severity and ingroup/outgroup relationship to predict dynamic trust patterns. Study 1 used an online attitudinal study based on scenarios, and Study 2 used a laboratory experiment with a trust game in which we examine trust over repeated exchanges through a discontinuous random-coefficient growth model (Bliese & Ployhart, 2002; Bliese, Wesensten, & Balkin, 2006).

Collectivism and trust after violations

Research has long found that collectivism has a powerful influence on individuals' self-construal, or how they view the self in relation to others (Markus & Kitayama, 1991; Triandis, 2001). Individuals high on collectivism perceive themselves 'not as separate from the social context but as more connected and less differentiated from others' (Markus & Kitayama, 1991, p. 227). This is in comparison with individuals low on collectivism, who perceive themselves as less connected to others. The difference in emphasis on social relationships has been shown to have wide-ranging effects on individuals' cognition, motivation and emotion (Markus & Kitayama, 1991). However, there has been no research to date examining how collectivists manage interdependence with others following trust violations. Will high collectivists be more or less forgiving than low collectivists?

The distinction of ingroup vs. outgroup has been found to be particularly relevant to collectivists (Triandis, 1995; Triandis, McCusker, & Hui, 1990; Yamagishi, 1988), and accordingly, we reason the answer to this question depends on the nature of the relationship between the trustor and trustee as well as the severity of the trust violation. Specifically, we propose that high collectivists would be tolerant of a trust violation from an ingroup when the violation is relatively minor. According to Social Judgment Theory, individuals have a *latitude of acceptance*, which can differ meaningfully across individuals in what they find acceptable (Sherif & Hovland, 1961). In the context of trust, people tend to perceive higher levels of trustworthiness from an ingroup member than from an outgroup member (Brewer & Kramer, 1985; Williams, 2001), and we expect the effect should be stronger for collectivists because of their close connection with their ingroups. High collectivists are thus more likely to confer idiosyncratic credit, an accumulation of positively disposed impressions (Hollander, 1958), to the ingroup member who commits a minor violation. The idiosyncratic credits afford the ingroup member some room for behaving in a counter-normative manner (Platow & Van Knippenberg, 2001). In other words, ingroup members with a minor violation would be more likely to be placed under 'pardons and paroles' by high collectivists in the interest of relationship continuation (Doz & Hamel, 1998).

In contrast, when a violation is severe, high collectivists are not expected to be tolerant of the ingroup violation and, in fact, would react very negatively. Although research has yet to examine how collectivists may be differentially sensitive across trust violations, research in other areas has found analogous evidence of a *black sheep effect* (Khan & Lambert, 1998; Marques & Paez, 1994; Marques et al., 1988) in which people are intolerant of ingroup members' failings when they are egregious and engage in denigration of the ingroup members. Such a strong reaction of ingroup members is used to enhance the ingroup (Hutchison & Abrams, 2003; Marques & Paez, 1994) and protect ingroup positivity and identity (Jetten & Hornsey, 2014), motives that are highly relevant to high collectivists. As large violations from an ingroup member jeopardise ingroup interdependence and cooperation, we reason that idiosyncratic credits would be no longer sufficient to maintain trust of high collectivists. Instead, high collectivists would find it difficult to overlook a severe violation from an ingroup member as they would with a minor violation. Indeed, the reaction after a large ingroup violation may be as negative as their default response towards an outgroup transgressor.

The above predictions of high collectivists' trust patterns are applicable to *ingroup* members. We do not expect markedly different responses after large and small violations among high collectivists after violation from *outgroup* members. The magnitude

of outgroup violations should not be as impactful to high collectivists because they do not have interdependence with outgroup members. Similarly, the trust responses after large and small violations from an ingroup and outgroup should be less differentiated among trustors low on collectivism, who have less pronounced distinctions between ingroups and outgroups. The different predictions we have for high collectivists in their responses towards ingroup and outgroup violations are consistent with prior research showing that high collectivists are particularistic, and tend to exhibit different standards towards their treatments of ingroups and outgroups (Leung & Bond, 1984; Redding & Wong, 1986). In contrast, low collectivists are more likely to adopt a universal, consistent approach in their treatments of others regardless of their group membership (Waterman, 1988). Based on the above discussion, we predict:

> *Hypothesis 1:* There will be an interaction among collectivism, violation severity and ingroup relationship on trust dissolution. High collectivists will exhibit larger trust dissolution after a large ingroup violation as compared to a small ingroup violation. By contrast, these trustors will not exhibit as much of a difference between large and small outgroup violations. Low collectivists will likewise not exhibit as much of a difference between large and small violations, regardless of whether the trustee is an ingroup or outgroup.

In addition to Hypothesis 1, it is important to examine the mechanism that explains the interaction among collectivism, violation severity and ingroup/outgroup relationship. We propose that trustor anger will mediate the level of trust after violations. Unreciprocated trust and cooperation have been found to elicit distress and anger (van den Bos, van Dijk, & Crone, 2012; Pillutla & Murnighan, 1996), which prompt the trustor to reassess the relationship with the transgressor and to lower trust (Dunn & Schweitzer, 2005; Tomlinson et al., 2004). Further, there is evidence suggesting that, in a group setting, people punish non-cooperative ingroup members more than non-cooperative outgroup members due to moral outrage (Shinada, Yamagishi, & Ohmura, 2004). Accordingly, we predict that when an ingroup member commits a large trust violation, high collectivists should experience a high level of anger. When the ingroup violation is small, high collectivists should experience lower anger because of the idiosyncratic credits (Hollander, 1958) they confer to the ingroup member. The positive credits allow members to deviate in small ways from the group norms (Platow & Van Knippenberg, 2001) and therefore should lessen the negative impact of a small trust violation for highly collectivistic trustors. Trustor anger should also be lower when a violation is from an outgroup member or when the trustor is low on collectivism, where the trustor does not have expectations of interdependence with the trustee, hence would experience less anger if trust is violated. We therefore predict that trustor anger will mediate the joint effect of the trustor's collectivism level, violation severity and ingroup/outgroup relationship with the trustee as proposed in Hypothesis 1:

> *Hypothesis 2:* Anger will mediate the interactive effect of collectivism, violation severity and an ingroup relationship with the trustee.

Study 1 method

Participants and procedure

An online scenario study was conducted with 106 adults (38% male; the mean of age = 33.18) recruited through Amazon Mechanical Turk for a nominal compensation of

10¢. Research on this service indicates similar performance with other online and traditional methodologies (e.g. Norton, Anik, Aknin, & Dunn, 2011; Paolacci, Chandler, & Ipeirotis, 2010), with more representative samples of noncollege population (Buhrmester, Kwang, & Gosling, 2011). The study had a 2 (ingroup vs. outgroup) × 2 (large vs. small violations) design. All participants were asked to take the role of the trustor in the scenario. Half of the participants were assigned to the condition with an ingroup trustee and the other half with an outgroup trustee. Within each condition, half were in the large violation condition while the other half in the small violation condition.

Trust scenario design

The trust scenarios were adapted from Tomlinson et al. (2004). All participants read that they were employees of a small but high-performing firm where they enjoyed working. Participants in the ingroup condition read about Pat being a colleague from the same firm, while participants in the outgroup condition read about Pat being a staff member in another firm. In the scenario, the participant and Pat agreed to work on a joint project and to split the cost of the supplies. However, Pat reneged on the agreement after the participants ordered the supplies. Participants in the small violation condition were informed that Pat would only pay 90% of what he originally agreed, but they were able to stay under the budget after covering the difference. Participants in the large violation condition learned that Pat would only pay 20% of what he originally agreed and, as a result, they went beyond their own budget. They had to use their own money to cover the difference and explain to the supervisor.

Measures

Trust

Consistent with prior studies (e.g. Brockner, Siegel, Daly, Tyler, & Martin, 1997; Ferrin, Dirks, & Shah, 2006; Swaab, Maddux, & Sinaceur, 2011), trust was measured with a single item 'I trust Pat' before and after the trust violation on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The first assessment was obtained after participants first learned about the ingroup/outgroup membership of Pat. The second assessment was obtained after participants read that Pat reneged on the agreement. We conducted a parallel-forms reliability test between the one-item measure and the widely used Mayer and Davis (1999) scale with a separate sample.[1] The correlation between the two measures was high ($r = .81$, $p < .001$), providing support for measurement equivalency.

Anger

The mediator, anger, was measured using two items. Participants responded 'How angry are you at Pat?' and 'How much rage do you feel because of the incident?' on a 7-point scale (1 = *not at all*, 7 = *very much so*) after they read the scenario and rated their levels of trust in Pat. The two items form a scale with an alpha of .90.

Collectivism

We employed Singelis' (1994) interdependent self-construal scale, which has been widely used to assess individuals' collectivism (e.g. Gelfand et al., 2013; Sedikides,

Gaertner, & Toguchi, 2003). Participants answered the 12 items on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*), including 'I often have the feeling that my relationships with others are more important than my own accomplishments,' and 'It is important for me to maintain harmony within my group.' The alpha was .85. Although individualism and collectivism tend to be perceived as the opposite of each other, they are distinct dimensions that can coexist in a culture and in individuals, such that one may be high on both individualism and collectivism (Hwang & Francesco, 2010; Triandis, 1993). We focus on the effect of collectivism in this study, rather than a contrast between the two dimensions. Consistent with prior research on the effect of culture on attitudes and behaviours (e.g. Gelfand et al., 2008; Gelfand & Realo, 1999; Probst, Carnevale, & Triandis, 1999; Wagner, 1995), we assess levels of collectivism at the individual level, which takes into account within-cultural variations in collectivism and avoids possible cultural-level confounds, such as power distance, from cross-cultural comparisons (Ramamoorthy & Flood, 2002).

General trust

As individuals vary in their propensity to trust, a general trust scale (Yamagishi & Yamagishi, 1994) was included as a control variable in all analyses to take into account its effect on the dependent variable. Six items measured individuals' agreement with statements such as 'Most people are basically honest' and 'Most people are trustworthy,' on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The alpha was .84.

Study 1 results

Descriptive statistics and correlations

The manipulation check of violation severity and the relationship between the trustor and trustee were first conducted. Participants in the large violation condition rated the item 'I feel betrayed by Pat' significantly higher than participants in the small violation condition ($t[104] = -4.64$, $p < .001$). Likewise, participants in the ingroup condition rated the item 'I feel I can count on Pat' before violations significantly higher than participants in the outgroup condition ($t[104] = 6.25$, $p < .001$). Collectivism did not interact with either of the variables. These results indicated successful manipulation of the two predictors.

Table 1 presents the means, standard deviations and correlations of the study variables. As can be seen, the overall mean levels of trust decreased from the initial assessment to after Pat reneged on the agreement, further indicating that participants perceived the behaviour of Pat to constitute a trust violation. In addition, the correlations between general trust and initial and post-violation trust were significant ($r = .33$, $p < .01$ for both), supporting our decision to include general trust as a control variable.

Hierarchical regression

To test Hypothesis 1, a hierarchical regression was conducted. In the first step, initial trust was entered along with the control variable of general trust, followed by the main effects and two-way effects of collectivism, violation severity and the ingroup/outgroup membership of the trustee in the second step. In the third step, the three-way interaction term of the three factors was entered. By entering the initial trust first, it

Table 1. Means, standard deviations and correlations of the Study 1 variables.

	M	SD	1	2	3	4	5	6
1. General trust	4.53	1.07						
2. Pre-negotiation trust in Pat	4.22	1.48	.33**					
3. Post-negotiation trust in Pat	2.11	1.20	.33**	.45**				
4. Collectivism	4.75	0.89	.42**	.31**	.31**			
5. Ingroup relationship	1.50	0.50	.32**	−.38**	−.18	.08		
6. Violation severity	1.50	0.50	−.08	.02	−.26**	−.11	−.01	
7. Trustee anger	5.30	1.50	−.20*	.01	−.49**	−.08	−.05	.48**

Note. $N = 106$. For ingroup relationship, 1 = ingroup, 2 = outgroup. For violation severity, 1 = small, 2 = large.
*$p < .05$.
**$p < .01$.

allows examination of the relationship between the three predictors and the adjusted dependent variable after accounting for the initial trust (Cohen, Cohen, West, & Aiken, 2003).

As can be seen in Step 2, Table 2, the main effect for violation severity was significant ($\beta = -.58$, $p < .01$), with the severe violation leading to lower post-violation trust. In Step 4, the cross-product term among violation severity, collectivism and the ingroup status of the trustee accounted for an additional 2% of the variance in post-violation trust ($\beta = 1.03$, $p < .05$). Figure 1 displays the pattern of the interaction. As predicted, for high collectivists, post-violation trust was lower after a severe ingroup violation as compared to a minor ingroup violation. On the other hand, high collectivists showed smaller differences between small and large violations from an outgroup member and low collectivists also showed smaller differences across violation severity and group membership conditions.

Follow-up simple slope tests were next conducted. For high collectivists, there was a significant difference in the post-violation trust between the small and large ingroup violation conditions ($\beta = -.74$, $p < .05$), but not between the small and large outgroup violation conditions ($\beta = -.45$, n.s.). For low collectivists, the difference in the post-violation trust between the small and large violation conditions with an ingroup ($\beta = -.26$, n.s.) and an outgroup ($\beta = .28$, n.s.) was non-significant.

To test the mediation effect of trustor anger predicted in Hypothesis 2, we ran a bias-corrected bootstrapping procedure on 5000 samples, using an SPSS macro developed by Preacher and Hayes (2008). In the model, collectivism, violation severity and ingroup/outgroup were entered as the predictors, with post-violation trust as the outcome, trustor anger as the mediator, and pre-violation trust and general trust as the covariates. The bootstrapping procedure is recommended and frequently used in recent years over traditional methods that assume multivariate normality (MacKinnon, Lockwood, & Williams, 2004). Results indicated a significant indirect effect of trustor anger in the proposed model with a 95% confidence interval that excluded zero (95% CI [−.48, −.21]). Consistent with our prediction, anger mediated the effects of collectivism, violation severity and relationship between the trustor and trustee on trust after violation.

In sum, the results from Study 1 supported Hypotheses 1 and 2. High collectivists had significantly lower trust after an ingroup member committed a large violation than a small violation, whereas this pattern between large and small violations was

Table 2. The effect of violation severity, collectivism and ingroup relationship on post-violation trust.

Variable	β	SE
Step 1		
(Constant)	−.22	.48
General trust	.23*	.10
Pre-negotiation trust	.31**	.07
R^2	.24**	
Step 2		
(Constant)	.72	.73
General trust	.24*	.12
Pre-negotiation trust	.23**	.09
Violation severity	−.58**	.20
Ingroup relationship	−.36	.25
Collectivism	.16	.13
R^2 Δ	.09**	
R^2	.33**	
Step 3		
(Constant)	−7.47*	3.32
General trust	.25*	.11
Pre-negotiation trust	.26**	.08
Violation severity	3.75**	1.38
Ingroup relationship	.53	1.40
Collectivism	1.69*	.64
Severity × ingroup	−.25	.39
Severity × collectivism	−.83**	.26
Ingroup × collectivism	−.09	.25
R^2 Δ	.07*	
R^2	.40*	
Step 4		
(Constant)	−19.15**	6.72
General trust	.24*	.11
Pre-negotiation trust	.26**	.08
Violation severity	10.68**	3.74
Ingroup relationship	8.57*	4.27
Collectivism	4.10**	1.37
Severity × ingroup	−5.19*	2.51
Severity × collectivism	−2.26**	.77
Ingroup × collectivism	−1.75*	.87
Severity × ingroup × collectivism	1.03*	.52
R^2 Δ	.02*	
R^2	.42*	

Note: $N = 106$. For violation severity, 1 = small, 2 = large. For ingroup relationship, 1 = ingroup, 2 = outgroup.
*$p < .05$.
**$p < .01$.

not found when the violation was from an outgroup member and among low-collectivistic trustors. Further, we found in Study 1 that the mediator for these effects is trustor anger. When an ingroup member committed a large violation, highly collectivistic trustors felt more anger as a result, and subsequently exhibited much lower post-

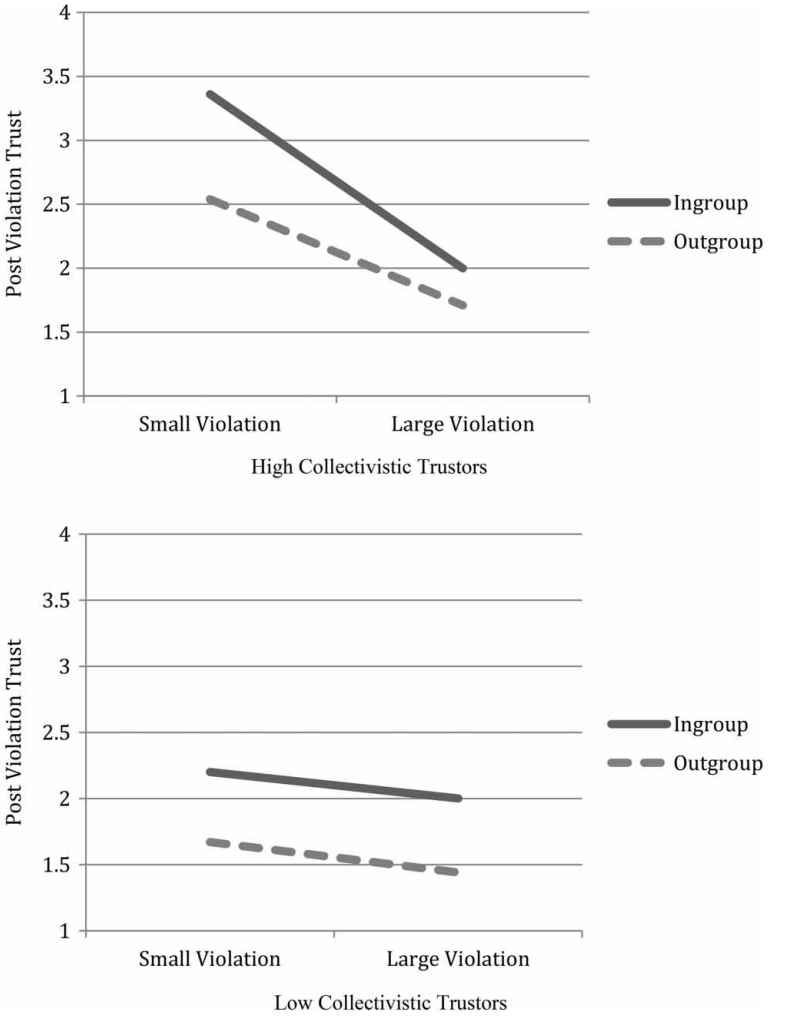

Figure 1. The three-way interaction among violation severity, collectivism (mean-split) and ingroup vs. outgroup relationship on post-violation trust in Study 1.

violation trust as compared to after a small ingroup violation. This suggests that high collectivists are not always forgiving towards their ingroups; in fact, they are sensitive to highly negative behaviour, which can eliminate the benefits of collectivism and ingroup relationship between the trustor and trustee.

Study 2

Study 2 expanded upon Study 1 in a number of important ways. First, Study 1 used a static approach with a single measurement in its examination of post-violation trust and focused on immediate trust decrease in trust dissolution. Trust in social relationships is dynamic and fluctuating (e.g. Rousseau et al., 1998; Schweitzer, Hershey, & Bradlow, 2006). In addition to trust dissolution, it is important to examine the phase of *trust restoration*, or the process through which the trustor trusts the trustee again. After trust decreases post-violation, it may rebound but how much trust is

restored and how fast it takes can be highly variable. To examine the amount and rate of trust changes after violations, repeated measures of trust in both dissolution and restoration phases are needed. We conducted Study 2 using an iterated trust game to replicate and extend the findings from Study 1 and to include trust restoration. Following the theoretical logic from Study 1, we expected that highly collectivistic trustors who were victims of large ingroup violations (as compared to small ingroup violations) would have not only larger and faster trust dissolution, but also smaller and slower trust restoration. We tested this hypothesis with discontinuous growth modelling, as discussed more at length in the Study 2 method section. To the best of our knowledge, this is the first study to examine the effect of collectivism on trust over multiple phases and repeated interactions.

Second, we also examined a potentially important moderator of the effects found in Study 1, namely *group identification*. Expanding on our culture-by-context perspective, we reasoned that not all ingroups are created equal to high collectivists; they may identify with some groups more strongly than with other groups. Group identification can thus act as a critical moderator in the interaction among violation severity, trustor collectivism and ingroup/outgroup relationship found in Study 1. In other words, we expect that the three-way interaction will be amplified when a highly collectivistic trustor strongly identifies with the group to which he or she and the trustee belong.

Consistent with this notion, research has found that identification boosts individuals' positive view of their ingroups (Doosje & Ellemers, 1997; Tajfel & Turner, 1979) and, at the same time, increases the likelihood that they denigrate the unfavourable ingroup members who violated the positive expectations (Biernat, Vescio, & Billings, 1999; Branscombe, Wann, Noel, & Coleman, 1993). For highly collectivistic trustors who are strongly identified with the group, a large ingroup violation should be particularly egregious and impactful, and rebuilding trust for them should be more difficult than for highly collectivistic trustors less identified with the group. Therefore, these high collectivists will respond to a large ingroup violation with substantial and fast trust dissolution and limited and slow trust restoration. However, if high collectivists are weakly identified with the group, an ingroup violation should be less impactful, leading them to be less sensitive to the severity of the violation.

> *Hypothesis 3*: High collectivists who are strongly identified with the group will exhibit larger and faster trust dissolution and smaller and slower trust restoration after large than small ingroup violations. By contrast, these trustors will not exhibit as much of a difference between large and small outgroup violations. High collectivists who are weakly identified with the group will likewise not exhibit as much of a difference between large and small violations, regardless of whether the trustee is an ingroup or outgroup member.

Study 2 method

Participant and procedure

A total of 72 undergraduate students from a large Mid-Atlantic university participated in Study 2 in exchange for course credits (33% male; mean age = 19.50). Participants were randomly assigned to two violation severity conditions (large vs. small) and to two group membership conditions (ingroup vs. outgroup). Collectivism and group identification were included as within-subject factors. As compared to research with between-subjects factors, research with within-subject factors requires fewer participants

(Nestor & Schutt, 2014; Vogt, Gardner, & Haeffele, 2012). The number of participants required is also reduced because our trust game employed repeated measures (Cohen, 2013; Ryan, 2013). Using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009), the power analysis showed that the sample has power between 81% and 99% for our research design, above the 80% threshold recommended by Cohen (1988) and Mazen, Hemmasi, and Lewis (1987) for psychological and organisational research.

The trust game

Study 2 extended the classic trust game (Berg, Dickhaut, & McCabe, 1995) to be iterated, affording the collection of repeated measures of trust that mirror real-world interactions and allow observation of how violations, occurring during interactions, change individuals' trust in the trustee. The trust game collects behavioural measures of trust (i.e. amounts of coins sent to the trustee), which are commonly used by economists (e.g. Bohnet & Zeckhauser, 2004; Schelling, 1960), game theorists (e.g. Axelrod, 1984; Berg et al., 1995) and some sociologists (e.g. Granovetter, 1985; Yamagishi, Cook, & Watabe, 1998). The behavioural measure complements and enables us to examine whether the attitudinal results from Study 1 can be replicated.

Procedure

Upon starting the experiment, participants were placed in individual rooms. They were informed that the experiment was part of a multi-university research initiative and they would engage in multiple rounds of brief interactions online with another participant from either their own university (ingroup condition) or a different university with a similar academic and sports status, but without a strong rivalry (outgroup condition). In actuality, participants engaged in the trust game with a computer-programmed partner. Further, all participants were given the role of trustor and the computer-programmed partner was the trustee. In the beginning of each of the 19 rounds, participants were given 100 coins and asked to entrust a proportion, between 0 and 100, to their partner. The amount of coins revealed how much participants trusted the partner.

The coins were then tripled by the game programme in each round. Depending on the preprogrammed responses, the programmed partner sent a portion of the tripled coins back to the participants. As violations in the beginning of a relationship can lead to irreversible damages to trust (Lount, Zhong, Sivanathan, & Murnighan, 2008), the first four rounds were non-violation rounds in which the programmed partner returned approximately half of the tripled coins with small random variation, a practice consistent with prior trust research (e.g. Haselhuhn, Schweitzer, & Wood, 2010). Trust violations occurred in the fifth, sixth and seventh rounds, when the programmed partner kept 90–95% of the tripled coins in the large violation condition and 70–75% of the tripled coins in the small violation condition, both with a small random variation. Three rounds of violations were designed so that participants would not perceive the violations as an isolated incident, which they might discount and keep trust unaffected (Sitkin & Roth, 1993). After the violation rounds (i.e. starting in the eighth round), the programmed partner resumed returning half of the tripled coins with small random variation through the remaining of the game. Participants did not know how many rounds remained until the end, as knowledge of the end of social exchanges tends to decrease cooperation (Murnighan, 1981). After completing the trust game, participants filled out the measures.

Measures

Trust

The number of coins that participants allocated to their partner in each round, ranging from 0 to 100, represents the behavioural measure of trust. Each participant provided 19 trust measures total.

Collectivism

The same measure from Study 1 was used. The alpha in Study 2 was .72.

Group identification

Four questions adapted from Doosje, Ellemers, and Spears (1995) measured participants' identification with their ingroup – their own university in this study – on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The items included 'I identify myself with other students from this university,' and 'I feel strong ties with students from this university.' The alpha was .78.

General trust

The same measure from Study 1 was included as a control variable in all analyses. The alpha was .90.

Study 2 results

Data analysis

All analyses were conducted in R (R Development Core Team, 2008) with the nonlinear and linear mixed effect model (nlme) package (Pinheiro et al., 2008). We employed discontinuous growth modelling to analyse the data, following the recommendations made by Bliese and Ployhart (2002) and Bliese et al. (2006). Because trust violation and restoration led to abrupt changes in trust patterns, traditional growth modelling cannot capture these nonlinear post-violation patterns. Further, as the model was nested, we set collectivism, violation severity, ingroup relationship and group identification as level-2 fixed effects, while allowing for random variation in intercepts and slopes in the level-1 repeated trust measures. The model is parameterised as in the following:

$$
\begin{aligned}
(\text{Trust})_{ij} = {} & \pi_{0i} + \pi_{1i}\,(\text{overall slope})_{ij} + \pi_{2i}\,(\text{dissolution transition})_{ij} \\
& + \pi_{3i}\,(\text{dissolution slope})_{ij} + \pi_{4i}\,(\text{restoration transition})_{ij} \\
& + \pi_{5i}\,(\text{restoration slope})_{ij} + \varepsilon_{ij} \\
\pi_{1i} = {} & \gamma_{10} + \gamma_{11}\,(\text{violation})_i + \gamma_{12}\,(\text{ingroup})_i + \gamma_{13}\,(\text{collectivism})_i \\
& + \gamma_{14}\,(\text{identification})_i + u_{1i} \\
& \vdots \\
\pi_{5i} = {} & \gamma_{50} + \gamma_{51}\,(\text{violation})_i + \gamma_{52}\,(\text{ingroup})_i + \gamma_{53}\,(\text{collectivism})_i \\
& + \gamma_{54}\,(\text{identification})_i + u_{5i}.
\end{aligned}
$$

A pilot study was first conducted to determine the number of rounds necessary to observe the trust patterns across phases indicated in prior literature (e.g. Kim et al., 2009; Schoorman et al., 2007). The data showed that the trust-building phase occurred in the beginning of the game and before violations took place (rounds 1–4). The dissolution phase consisted of the three violation rounds and the two rounds immediately following (rounds 5–9). The restoration phase included 10 rounds after the dissolution phase (rounds 10–19). To examine changes in both the means and slopes in these phases, the discontinuous growth model included five parameters: an overall slope that spanned all rounds, a dissolution transition, a dissolution slope, a restoration transition and a restoration slope (Singer & Willett, 2003, p. 198). Specifically, the *dissolution transition* compares trust means between the formation and dissolution phases, and the *restoration transition* compares trust means between the dissolution and restoration phases. The *dissolution slope* refers to the rate of negative trust changes during dissolution (i.e. how fast trust falls) and the *restoration slope* refers to the rate of positive trust changes during restoration (i.e. how fast trust rebounds).

Model fitting

To determine the structure of the model, we first conducted a null random-coefficient model (Raudenbush & Bryk, 2002) to estimate the intra-class correlation coefficient (ICC) – differences in trust measures due to individual difference – conditional of the experimental design (Bliese et al., 2006). The null model included the five level-1 parameters that reflect the transitions and slopes across phases, and two level-2 experimental predictors (violation and ingroup conditions). The estimated ICC value was 0.38, indicating that a high level of trust changes was due to individual differences (Bliese, 2000). Because trust was assessed using repeated measures, lag 1 serial autocorrelation was controlled. Heteroscedasticity in responses was also controlled and model comparisons showed significantly improved model fit ($p < .01$).

Level-2 effects

Means, standard deviations and correlations among the level-2 study variables are listed in Table 3. We examined the effects of the level-2 predictors – including both the experimental factors of violation severity and ingroup relationship and trustor characteristics of collectivism and group identification – on the variances in the five transition and slope parameters. The results showed that the expected four-way interaction was significant for all of the five parameters: the overall slope ($t[1216] = 2.01$,

Table 3. Means, standard deviations and correlations of the Study 2 level-2 variables.

	M	SD	1	2	3	4	5
1. Violation severity	0.50	0.50					
2. Ingroup relationship	0.50	0.50	0.00				
3. Collectivism	4.92	0.65	–0.02	0.03			
4. Group identification	5.69	0.92	–0.11	0.01	0.40**		
5. General trust	4.59	1.05	–0.09	0.36	0.22	0.19	

Note: $N = 72$. For violation severity, 0 = small, 1 = large; for ingroup relationship, 0 = ingroup, 1 = outgroup.
**$p < .01$.

$p < .05$), the dissolution transition ($t[1216] = 2.48$, $p < .05$), the dissolution slope ($t[1216] = 2.77$, $p < .01$), the restoration transition ($t[1216] = 2.68$, $p < .01$) and the restoration slope ($t[1216] = 2.11$, $p < .05$).[2]

Hypothesis 3 stated that high collectivists who were strongly identified with the group would exhibit larger and faster trust dissolution and smaller and slower trust restoration after large ingroup violations, as compared to small ingroup violations. To test this hypothesis, we performed a series of a-priori contrast analyses to examine trust changes in dissolution and restoration among highly collectivistic trustors in the ingroup condition, using the mean-split approach for the collectivism and group identification variables. We first examined the decrease in trust from the formation rounds (before violation) to the dissolution rounds (immediately after violation), and this dissolution transition was significant ($t = 2.02$, $p < .05$; see Figure 2). As can be seen, the mean number of coins decreased from the formation rounds to dissolution rounds was larger after large ingroup violations than after small ingroup violations. The change in coins after small ingroup violations from the formation rounds to the dissolution rounds was non-significant ($t = .54$, $p > .10$). The contrast results were also significant for the *dissolution slope*, indicating a faster trust decrease during the five dissolution rounds immediately after the violations ($t = 2.10$, $p < .05$). As can be seen in Figure 3, the steeper slope of coins per round after large ingroup violations indicates a faster rate of trust decrease than after small ingroup violations. While these trustors did not differ in the restoration slope for the rate of trust increase during restoration rounds between large and small ingroup violations, they showed a

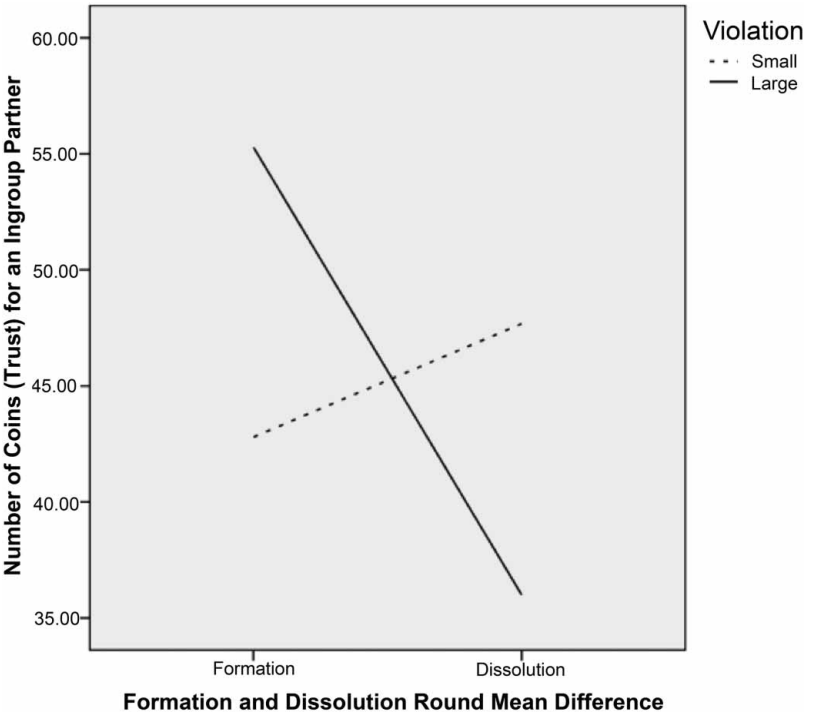

Figure 2. Mean number of coins for formation rounds (before violations) and dissolution rounds (immediately after violations) for high collectivists who are strongly identified with the group (mean-split for both) after violations from an ingroup member.

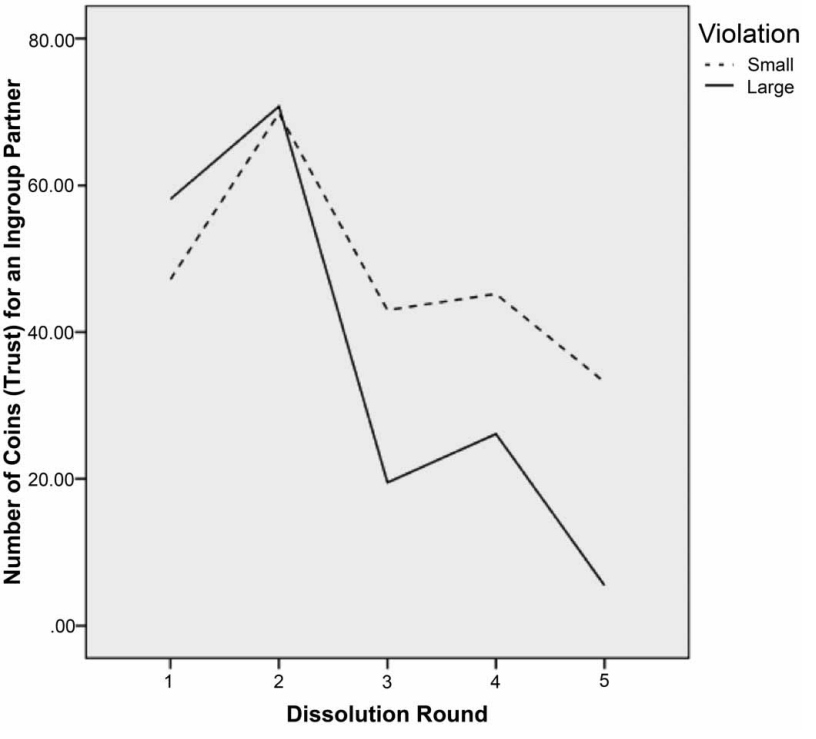

Figure 3. Dissolution rounds (immediately after violations) for high collectivists who are strongly identified with the group (mean-split for both) after violations from an ingroup member.

significantly different *restoration transition* ($t = 1.76$, $p < .10$). The mean number of coins increased from the dissolution rounds to the restoration rounds was smaller after large ingroup violations as compared to small ingroup violation.

Further, the differences in responses after a large and small violation were smaller and non-significant when the violations were from an outgroup member (t-values between .15 and .38, $p > .10$ for all) or when high collectivists were weakly identified with their group, regardless of whether the violation was from an ingroup (t-values between .31 and .97, $p > .10$ for all) or outgroup member (t-values between .50 and 1.20, $p > .10$ for all). In sum, the results supported our predictions – high collectivists strongly identified with the group responded more negatively after large than small ingroup violations, showing a larger and faster trust decrease immediately after violations during dissolution and a smaller trust increase as the game continued in trust restoration. This contrasts with the smaller differences between large and small violations from an outgroup member and when the trustor was low on group identification.

General discussion

While there is increasing attention to trust formation among collectivists and their counterparts, little research has examined the influences of collectivism on trust dynamics after violations. In this study, we focused on the relationship among trustor collectivism, the severity of trust violations and the nature of the relationship

between the trustor and trustee. Across two studies using divergent methodology, we found consistent support for our predicted patterns that high collectivists are able to maintain and restore trust after a small ingroup violation, but they react much more negatively after a large ingroup violation. Further, such differences are absent when interdependence between the trustor and trustee is low, as with an outgroup trustee or a trustor low on collectivism.

Theoretical implications

Our study extends the trust literature in a number of important ways. First, we examined multiple trust phases with a focus on post-violation trust. While trust scholars have long called for a dynamical approach to trust and trust violation (Lewicki, Tomlinson, & Gillespie, 2006; Rousseau et al., 1998), there have been growing concerns about the limited theory and research on trust after violations (Elangovan & Shapiro, 1998; Kim et al., 2009). With repeated measurements of trust after violations in Study 2, we differentiated between changes in trust means and trust trajectories. The results showed that violations can have both an immediate effect on the trust mean and trajectory during the dissolution phase, and a longer-term effect on the trust mean during the trust restoration phase. Together, these findings highlight the value of shifting the focus beyond trust building by investigating multiple phases sequentially and exploring the nuanced dynamics of trust changes.

Second, trust research has consistently overlooked the role of trustor characteristics and the social context (Kim et al., 2009; Li, 2012). In this research, we examined the joint effect of the collectivism level of the trustor, the relationship with the trustee and the nature of the trust violation. Rather than focusing on main effects, we believe that considerations of these types of culture-by-context interactions better approximate how trust unfolds in reality, proffering a more precise theoretical perspective on the relationship between trust and violations.

Our research also has implications for the literature on cross-cultural psychology and organisational behaviour. A large body of research has documented the positive attitudes and behaviours collectivists have towards their ingroup members (e.g. Earley, 1989; Triandis, 1995; Wagner, 1995). However, as our findings show, collectivism is a complex construct with effects that are not static but are dynamically affected by the context in which individuals are embedded. While high collectivists tend to be forgiving after a minor violation from an ingroup, this study documents that when the ingroup violation is severe, the benefits of collectivism and ingroup membership disappear and high collectivists react as negatively as they would with an outgroup transgressor. Much research portrays collectivists as being unconditionally cooperative and helpful (Wagner, 1995; Wong & Hong, 2005), less confrontational during conflict (Cai & Fink, 2002; Riaz, Zulkifal, & Jamal, 2012) and more likely to sacrifice themselves on behalf of their ingroups (Chen, Peng, & Saparito, 2002; Triandis, 1995). Our findings show that these findings need to be reexamined in contexts of high trust violations. Future research should continue taking a more balanced and contextualised approach to fully understand when collectivists will be forgiving and cooperative with their ingroups.

This study also departs from past research on trust across cultures by moving beyond the effect on trust development to trust after violations. It contributes to the growing literature on the relevance of collectivism and social context in forgiveness in interpersonal conflicts (e.g. Fehr & Gelfand, 2010; Haselhuhn et al., 2010). Our

findings suggest that the ingroup and outgroup distinction is not fixed, as the benefits of ingroup status are drastically reduced with a large trust violation for collectivistic trustors. Finally, our findings highlight the importance of considering identification in addition to the collectivism level of the trustor and the ingroup or outgroup relationship between the trustor and trustee.

Practical implications

Either intentionally or unintentionally, violations of trust can be inevitable in relationships. Given the prevalence of violations in our daily life (Elangovan & Shapiro, 1998; Morris & Moberg, 1994), knowledge about how they alter trust is critical. Findings from this study are informative for individuals who seek to restore trust. They highlight the importance to consider the characteristics of the trustor, collectivism in particular, in conjunction with the context of the relationship and nature of the trust violation when seeking to address the damages caused by trust violations and to rebuild trust. Trust is a subjective experience (Dirks & Ferrin, 2001; McKnight, Cummings, & Chervany, 1998), and the findings of this study clearly indicate that the same 'objective' violation is highly subjective in its impact across individuals with varying levels of collectivism. Thus, it is essential to be aware of how the same trust violation can have different meanings and elicit different responses across people and relationships. Practical recommendations can then be developed accordingly in the aftermath of trust violations.

Limitations and future directions

Despite these positive findings, this study is not without limitations. We examined trust processes in experimental settings, instead of real-world exchanges. Experiments offer control and precision that are difficult to achieve in the field (Shadish, Cook, & Campbell, 2002), which are particularly valuable in this study as it represents an early effort to investigate post-violation trust changes. Although our trust game was conducted in an individualistic culture, where exchanges in coins may arguably be more likely to be construed as behavioural trust, similar economic game paradigms have been examined in a wide range of cultures (e.g. Bohnet et al., 2010; Henrich et al., 2001). Nevertheless, future research should examine whether the game in general and manipulations of ingroup/outgroup and degrees of violations in particular are generalisable to different cultures. A related limitation is that, in Study 2, participants in the trust game received preprogrammed responses, even though the responses were determined by their actions. Research has proven games effective in demonstrating generalisable phenomena, such as the boundary conditions for interpersonal interactions (e.g. Bohnet & Zeckhauser, 2004; Haselhuhn et al., 2010). Further, because of the iterated game design of Study 2, large numbers of participants were not required to afford sufficient statistical power. Nevertheless, field studies are needed to replicate these patterns.

Additional research that examines other trustor characteristics and contextual factors is also warranted. Following prior research on the effects of culture on individual behaviours (e.g. Gelfand et al., 2008; Wagner, 1995), we examined cultural differences among trustors at the individual level. Future research should examine whether similar patterns are observed by comparing trustors from different cultures. Further, as violations are particularly impactful in new relationships (Lount et al., 2008;

Wang & Huff, 2007), the trustor and trustee in this study were selected to be acquaintances or strangers with common membership in an organisation. Future research can examine interactions between parties in a well-established relationship to understand whether and how the trust dynamics differ. Furthermore, the ingroup and outgroup in this study may have a relatively small social distance. Research can examine different outgroups that span a range of social distances from an ingroup.

As this study focuses on the impact of violations on trust, a natural extension is to examine different types of trust violations, such as competence-based and integrity-based violations (Kim, Dirks, Cooper, & Ferrin, 2006; Kim, Ferrin, Cooper, & Dirks, 2004). It is possible that trust changes in dissolution and restoration may vary across violation types. Another extension is to examine the effects of different trust repair strategies that a violator can employ. For example, how do admission, apologies and denial affect post-violation trust? As a number of studies have identified a range of repair tactics (e.g. Kim et al., 2006; Maddux, Kim, Okumura, & Brett, 2011), it would be fruitful to examine their effects on both the amount and rate of trust changes during restoration.

Conclusion

A wealth of literature has documented the link between collectivism and positive attitudes and behaviours towards ingroup members. This study revealed that, while trustors high on collectivism are forgiving after a minor violation from an ingroup member, this is not the case when an ingroup member commits a severe trust violation. Because of the anger experienced by high collectivists, they experience a much larger trust dissolution after a large violation than a small violation. High collectivists also exhibit faster trust dissolution and smaller trust restoration after a large ingroup violation, particularly when they strongly identify with the ingroup. These results point to complexities in trust changes after violations, which have thus far received little research attention. Our findings provide a more nuanced and contextualised understanding of the relationship among collectivism, ingroup relationship, trust and violation.

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Notes

1. A different sample of 102 working adults (mean age = 36.45, SD = 13.73) from multiple industries were recruited through Amazon Mechanical Turk for a nominal compensation of 10¢. The participants responded to the one-item trust measure and Mayer and Davis (1999) four items in a random order.
2. The three-way interaction without group identification was also significant for the five parameters.

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