ABSTRACT

Title of Document: DYNAMIC TRUST PROCESSES AFTER VIOLATION: TRUST DISSOLUTION AND RESTORATION

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Trust and violation go hand in hand in our everyday life. However, few studies have directly examined the effects of violation on trust and delineated the nonlinear patterns of trust changes after violation. In this research, I focused on trust dynamics in two phases after violation: *trust dissolution* and *trust restoration*. Specifically, I examined how the individual differences of collectivistic self-construal and group identification, in conjunction with the situational variables of violation magnitude and trustee's group membership (ingroup vs. outgroup), moderate the relationship between trust violation and changes in trust level and trajectory across the two phases. The study adopted an economic game methodology—the Investment Game (Berg, Dickhaut, & McCabe, 1995)—that allows repeated measures of trust. Results from discontinuous growth modeling indicated that the trust changes after violation, in dissolution and restoration, are a function of violation magnitude, collectivistic self-construal, ingroup and outgroup dynamics, and group identification. Further, the dynamic patterns revealed a black sheep effect. Individuals high on collectivistic self-construal and group identification exhibited a larger and faster trust decrease during dissolution and a slower increase during restoration after a large than a small ingroup violation. High collectivists high on group identification also showed slower trust restoration after a large ingroup violation than high collectivists low on group identification. However, the black sheep effect was absent when

collectivists experienced an outgroup violation or were low on group identification. Implications for future research and intercultural relations are discussed.

DYNAMIC TRUST PROCESSES AFTER VIOLATION:

TRUST DISSOLUTION AND RESTORATION

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Science
2010

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Acknowledgements

My advisor and mentor, Dr. Michele Gelfand, has been instrumental at each step of this research. Without her guidance and support, this project would not be possible. I draw on her passion in research and science daily. Additionally, I have relied greatly on Dr. Paul Hanges for his encouragement and patience, particularly during the analysis process. I have grown to share his enthusiasm for statistics. Dr. Arie Kruglanski has been equally inspirational. I have benefited from his sage advice and good humor. I am also grateful for the invaluable assistance from a number of wonderful research assistants, including Jon Sun Lu, Jessica Allanson, Jason Douglas, Megan Thorne, and Alexa Doerr. Most importantly, I thank my husband, Dr. Gavin Fulmer, for his unwavering understanding and support. He has been my steadfast anchor throughout this journey.

This research is based upon work supported by research funded by the U. S. Army Research Laboratory and the U. S. Army Research Office under grant number W911NF-08-1-0144.

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Chapter 1. Trust Violation and Trust Dynamics

I'm not upset that you lied to me, I'm upset that from now on I can't believe you.

—Friedrich Nietzsche

The act of trust implicitly allows the possibility of violations (Granovetter, 1985). Not surprisingly, trust violations have been shown not to be exceptions but common occurrences: Up to 55 percent of employees reported experiencing violation of trust in organizations (Hansson, Jones, & Fletcher, 1990; Jones & Burdette, 1993; Robinson & Rousseau, 1994). It is undeniable that the crisis of trust, declared fifteen years ago (Fukuyama, 1995), is a concern now more than ever. Given its prevalence, it is alarming that we know little about the effect of violation on trust dynamics. How exactly does violation change trust patterns? Does the trajectory of trust decrease vary as a function of violation magnitude as well as trustor's and trustee's characteristics?

Understanding the impact of violation is especially important given the potentially enormous benefits of trust. Trust, defined as "a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another" (Rousseau, Sitkin, Burt, & Camerer, 1998; p.395), has been linked to a myriad of constructive social-psychological outcomes. At the micro level, trust has been shown to facilitate interpersonal relationships (Rempel, Holmes, & Zanna, 1985), cooperation (Buchan, Croson, & Dawes, 2002), team work (Dirks, 1999; Lawler, 1992), organizational commitment (Kramer, 1999), citizenship behavior (McAllister, 1995; Podsakoff, MacKenzie, Moorman, & Fetter, 1990), leadership effectiveness (Dirks & Ferrin, 2002; Gillespie & Mann, 2004; Jung & Avolio, 2000), and negotiation and mediation success (Arnold & O'Connor, 2006; Olekalns & Lau, 2002; Valley, Moag, & Bazerman, 1998). At the macro level, scholars view trust as a driving force in conflict de-

escalation (Axelrod, 1984), a foundation for democracy (Putnam, 1993), and the key to national economic well-being (Fukuyama, 1995).

Regardless of the context, trust has been conceptualized as a dynamic process that spans across formation, violation, and beyond. Prior research has identified at least three unique trust phases: formation, dissolution, and restoration (e.g., Miles & Creed, 1995; Kim, Dirks, & Cooper, 2009; Rousseau et al., 1998). In this paper, I conceptualize *trust formation* as a progression in which individuals choose to trust others and increase their trust over time. *Trust dissolution* occurs when, after violation, individuals decide to lower their trust in others. Finally, *Trust restoration* occurs when trust stops declining after violation and starts to rebound, eventually being relatively stable.

Despite the recognition of multiple trust phases, the trust literature is limited by its predominant focus on trust formation (e.g., Mayer, Davis, & Schoorman, 1995; McKnight, Cummings, & Cummings, 1998). There has been a growing concern about the limited research and theory on trust after violation (Elangovan & Shapiro, 1998; Kim et al., 2009; Morris & Moberg, 1994; Robinson & Bennett, 1995). While some studies have directly examined trust repair (e.g., Kim, Dirks, Cooper, & Ferrin, 2006; McCullough, Worthington, & Rachal, 1997; Schweitzer, Hershey, & Bradlow, 2006; Tomlinson, Dineen, & Lewicki, 2004), the goal of this line of research tends to be identifying successful trust repair strategies. Relatively little is known about the impact of violation on interpersonal trust. The first goal of this study, therefore, was to uncover trust changes after violation, including the phases of dissolution, and restoration.

In addition to a lack of understanding on trust dynamics post violation, prior research tends to be phase-specific, limited to one trust phase or one point in time (Lewicki, Tomlinson, & Gillespie, 2006; Rousseau et al., 1998). Such a narrow focus

provides only a snapshot of the trust relationship as it naturally progresses. Interactions between individuals are continuous, and isolation of a single trust phase cannot provide a holistic picture of how trust patterns unfold over time. For example, after a trust violation, trust may plummet initially but rebound with repeated, consistent interactions (Rousseau et al., 1998; Schweitzer et al., 2006). The second goal of this study was to examine trust changes across multiple phases.

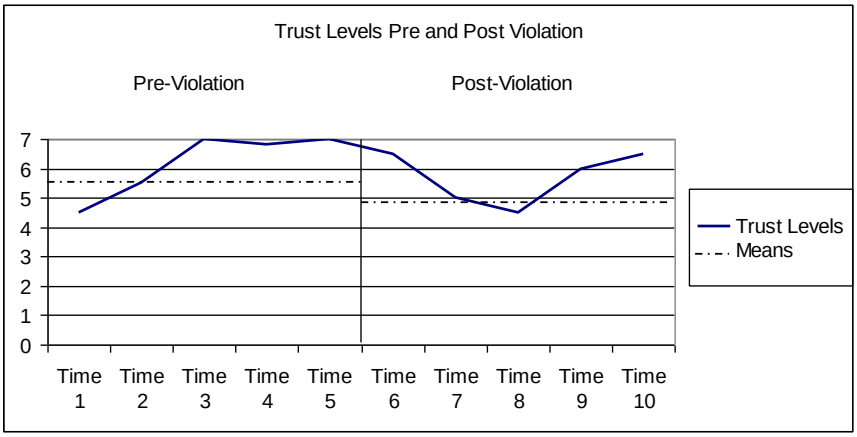

Figure 1. Hypothetical graph showing a high trustor pattern.

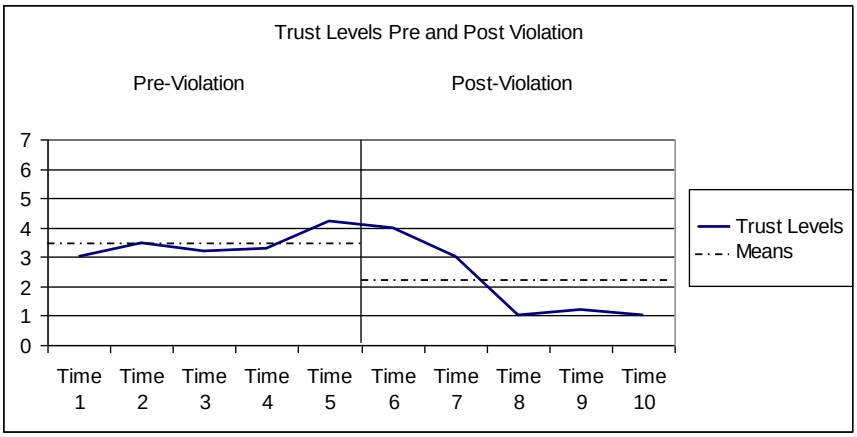

Figure 2. Hypothetical graph showing a high *dis*trustor pattern.

When considering multiple trust phases sequentially, different trust patterns arise. For example, some people (e.g., high trustors) may be fast to trust, slow to lower trust after violation, and fast to trust again, as demonstrated in Figure 1. In contrast, as shown

in Figure 2, other individuals (e.g., high *dis*trustors) may be slow to trust, fast to lower trust after violation, and slow to trust again. As can be seen in Figures 1 and 2, these differences in trust levels and trajectories change across different trust phases. Further, these trust patterns are subject to individual differences, situational variables, and interactions between the two. The literature on trust restoration has been criticized for its overemphasis of violator's actions and inattention to other factors, such as trustor's disposition (Kim et al., 2009) and situational variables. For example, collectivistic versus individualistic self-construal and ingroup/outgroup status has been shown to influence a multitude of psychological processes (Markus & Kitayama, 1991; Tajfel & Turner, 1986) and is expected to influence how individuals react to violation and change their trust across phases. Thus, the third goal of this study was to examine how individual differences of trustor, in combination with situational factors related to violation and trustee, affect the post-violation trust processes dynamically.

In sum, to begin to fill the theoretical and empirical gap about effects of violation on trust in literature, this study focused on examination of the dynamical nature of trust (Rousseau et al., 1998; Lewicki et al., 2006). Specifically, this research 1) focused on the dynamics of trust changes after violation, 2) measured trust continuously across multiple phases after violation to reveal these dynamics, and 3) examined the influences of individual differences on trust dynamics in conjunction with situational variables. To achieve these three goals, this study adopted the paradigm of the Investment Game (IG; Berg, Dickhaut, & McCabe, 1995). The IG affords collection of repeated measures that allow examination of changes in trust levels and trajectories across phases. I applied discontinuous growth modeling to analyze these nonlinear trust patterns. In reviewing current literature, no study was found using this paradigm and methodology. Therefore,

this research provides a unique opportunity to understand how violation affects the dynamic properties of trust across phases.

Theory and Hypotheses

This study builds on the theoretical framework of trust violation, collectivistic self-construal, ingroup and outgroup dynamics, and group identification. In the following sections, I review prior research on these four areas. For each area, I also describe how this study reflected the current literature and extends it.

Trust Violations

The inclusion of violation in examining trust dynamics is imperative, as to trust is to accept future uncertainty and risk (Bohnet, Herrman, & Zeckhauser, in press; Cook et al., 2005; Rousseau et al., 1998; Yamagishi, Cook, & Watabe, 1998). In fact, the very conditions that foster trust, and the existence of trust itself, allow for malfeasance (Granovetter, 1985). A trust violation arises when evidence contradicts one's positive expectations of the trustee, and prompts one to redefine one's view of the existing relationship with the person (Tomlinson, Dineen, & Lewicki, 2004). Trust violations vary in their degree; a delay in returning a book is obviously different from embezzling company funds. Small transgressions, therefore, should not have the same impact on trust changes as large breaches of trust. For example, Tomlinson and colleagues (2004) found that the magnitude of a violation moderated the relationship between the estimated likelihood of future violations and trust restoration. After a small trust breach, participants' willingness to reconcile is negatively related to probability of future violation. In contrast, after a large violation, participants' willingness to reconcile remained low, regardless of how unlikely future violations were. Tomlinson and

colleagues (2004) concluded that a large violation was so detrimental to participants' trust that they refused to consider any future interaction with the violator.

While it is reasonable to expect that a large trust violation will lead to greater trust decrease than a small trust violation, a key question is how individual differences and situational factors influence the post-violation trust pattern. By simultaneously examining the effects of trustor's collectivistic self-construal and group identification, as well as trustee's group membership and violation magnitude, this research adopted the interactionist perspective and is able to situate the findings on trust dynamics in a rich context that mirrors the complexity of real world phenomena (Mischel, 1990; Mischel & Shoda, 1995).

Collectivistic Self-Construal

People have divergent views about the self, others, and the relationship between the two (Markus & Kitayama, 1991; Triandis, 1989). Markus and Kitayama (1991) proposed that individual consciousness can focus primarily on the self or the relationships one has. Specifically, individuals with an individualistic self-construal endorse "a conception of the self as an autonomous, independent person" (p. 226). In contrast, individuals with a collectivistic self-construal view "the self and the relationship between the self and others . . . not as separate from the social context but as more connected and less differentiated from others" (p. 227). Markus and Kitayama (1991) posited that this difference is largely determined by individuals' cultural backgrounds and has influence on individual cognition, emotion, and motivation.

When individuals are high on collectivistic self-construal, their identity is deeply connected with others in their social context. As a result, collectivists have been shown to be more helpful and cooperative than individualists in group settings (Moorman &

Blakely, 1995; Wagner, 1995). Individuals high on collectivistic self-construal, therefore, may be more tolerant toward trust violations committed by others than those low on collectivistic self-construal. However, the resilience of collectivists' trust should not apply to all situations. Because of their close connection with their social relationships, it may be more difficult for high collectivists to overlook large violations, as compared to small violations. The damaging effect of a large violation can thus be stronger for individuals high rather than low on collectivistic self-construal. In addition to violation magnitude, the distinction of ingroup versus outgroup status of trustee is particularly relevant to collectivists (Triandis, 1995; Triandis, McCusker, & Hui, 1990). The effect of a large trust violation on trust changes may be moderated by trustee's group membership.

Ingroup and Outgroup Dynamics

Social categorization and identity theories assert that individuals construe their identity according to their social context (Taijel & Turner, 1979; Turner, 1987). Ingroup status exists when people share common group membership, such as belonging to the same university; whereas outgroup members refer to those individuals with dissimilar group membership. Once an individual's identity incorporates the group membership, individuals tend to exhibit ingroup favoritism, defined as positive perceptions, attitudes, and beliefs toward their ingroup and fellow members (Brewer, 1979). Individuals are motivated to maintain positive perceptions of their ingroup to maintain high self-esteem (Turner, 1987). As a result, when an ingroup member commits a trust violation, individuals should be more likely to discount them due to ingroup favoritism and the motivation to maintain a positive image of the ingroup members. Furthermore, because of the higher level of trustworthiness individuals perceive from an ingroup compared to an

outgroup member (Brewer & Kramer, 1985; Kramer & Brewer, 1984), trust with an ingroup member should be more tolerant toward trust violations and can be restored more easily than trust with an outgroup member.

When individuals are high on collectivistic self-construal, they view themselves closely connected with their social context. It is therefore reasonable to expect that the effect predicted by social identity theory, that people will maintain high self-esteem through positive perceptions of their ingroup (Taijel & Turner, 1979; Turner, 1987), would be stronger for high collectivists than low collectivists. Further, given the motivation to maintain high self-esteem and the expectation that ingroup members should be highly trustworthy, it would follow that a large trust violation from an ingroup member may be more personal to high collectivists than to a large trust violation from an outgroup member, particularly in cases when the collectivists identify strongly with their group.

Group Identification

As discussed in the previous section, trustee's group membership has an effect on individuals' level of trust, both generally due to social categorization and identity process and as an interaction with trustor's collectivistic self-construal. This relationship between trustee's group membership and trustor's collectivistic self-construal should also be moderated by the trustor's level of group identification, as not all groups are personally relevant to the trustor. While one may expect that high identification with a group would further bolster collectivists' trust for others who are also part of the group, this is not always the case. Evidence of a "black sheep effect" (Marques, Yzerbyt, & Leyens, 1988; Marques & Paez, 1994; Khan & Lambert, 1998) has demonstrated that people can be less tolerant of ingroup members' failings and engage in more denigration of ingroup

members than of outgroup members with the same shortcomings, particularly when the people closely identify with the group (Bègue, 2001; Branscombe, Wann, Noel, & Coleman, 1993). The combination of trustor's group identification and collectivistic self-construal thus can lead to perceptions of a large ingroup trust breach to be even more personally relevant, and the individual will attempt to distance the self from the violator by considerably decreasing their trust in this ingroup member. For example, research on racial categorization and ingroup polarization—defined as the phenomenon when judgments of ingroup members become more extreme such that favorable ingroups are perceived more favorably and unfavorable ingroups are perceived more unfavorably (Marques, 1990)—has found stronger effects among individuals with strong racial identification (Biernat, Vescio, & Billings, 1999). Both racial categorization and identification boost individuals' positive view of their ingroup and, at the same time, increase the likelihood that they would denigrate unfavorable ingroup members when this positive view is violated (Biernat et al., 1999). Note that these ingroup and outgroup dynamics are prevalent in many social situations, not restricting to racial or ethnic group identification.

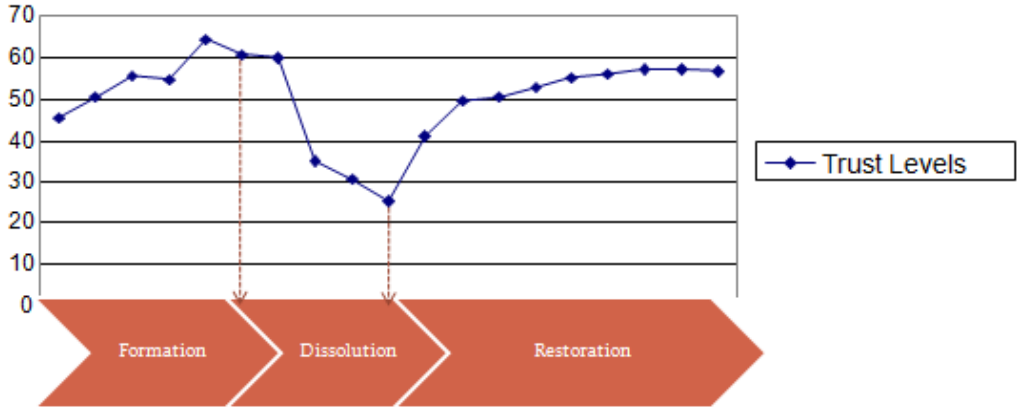

Figure 3. Dynamic trust patterns during formation, dissolution, and restoration.

Hypotheses

This study examined the effects of these four factors—violation magnitude, collectivistic self-construal, ingroup and outgroup dynamics, and group identification—on trust dynamics after violation. Specifically, I focused on trust changes in two phases: dissolution and restoration. Figure 3 illustrates a trust pattern across these phases. As can be seen, trust dissolution refers to the period during and immediately after violations, in which trust levels decrease sharply. Trust restoration occurs after trust dissolution, when trust levels stop declining in the absence of further violations, begin increasing, and gradually become relatively stable. Based on the rationale discussed in the previous sections, I predicted that the above four factors would jointly affect the post-violation trust levels and trajectories in dissolution and restoration.

In addition, I propose three sets of hypotheses that look at the four-way interaction more closely by focusing on specific sets of contrasts. The first set of hypotheses concerns the effects of the trustor's collectivistic self-construal on trust changes after violation. This set of hypotheses examines whether high collectivists and low collectivists react to a large ingroup violation and a small ingroup violation in divergent ways. Specifically, when high collectivists identify strongly with a group, a large ingroup violation should threaten the collectivists' positive image of the ingroup and trigger the black sheep effect, which causes them to display a lower level of trust during dissolution and restoration than a small ingroup violation. In addition to differences in trust means, high collectivists high on group identification should also exhibit a faster rate of trust dissolution and a slower rate of trust restoration after a large rather than a small ingroup violation. A violation from an ingroup member, regardless of its magnitude, should not be as relevant to low collectivists as to high collectivists, even

when the low collectivists are high on group identification. Low collectivists, therefore, are not expected to react as strongly to a large ingroup violation as high collectivists. Therefore, unlike the high collectivists, low collectivists may not exhibit as different trust patterns in dissolution and restoration after a large and a small ingroup violation.

Hypothesis 1a: High collectivists who highly identify with the group and interact with an ingroup will exhibit a larger and faster decrease in trust dissolution and a smaller and slower in trust restoration after a large than a small violation.

Hypothesis 1b: By contrast, low collectivists in this condition will exhibit less differentiation between a large and a small violation than high collectivists.

The second set of hypotheses also concerns the effects of trustors' collectivistic self-construal on trust changes after violation. However, different from the first set of hypotheses that focuses on ingroup violations, this second set of hypotheses focuses on outgroup violations. In particular, they examine whether high collectivists and low collectivists react to a large outgroup violation and a small outgroup violation differently. While ingroup violations are especially relevant to high collectivists high on group identification, it is possible that outgroup violations are less meaningful to these high collectivists. Furthermore, high collectivists high on identification may not differentiate large and small outgroup violations as much as low collectivists high on identification do. For exploratory purposes, this set included an additional hypothesis: low collectivists may respond to a large outgroup violation more negatively than a small outgroup violation, showing less trust in dissolution and restoration as well as faster dissolution and slower restoration.

Hypothesis 2a: High collectivists who highly identify with the group and interact with an outgroup will exhibit less differentiation between a large and a small violation than low collectivists.

Hypothesis 2b: By contrast, low collectivists in this condition will exhibit a larger and faster decrease in trust dissolution and a smaller and slower increase in trust restoration after a large than a small violation.

The final and third set of hypotheses centers on trustor's group identification and examines the responses high collectivists and low collectivists with different levels of group identification have toward a large ingroup violation. This set of analyses will shed light on how group identification interacts with collectivistic self-construal. The first hypothesis in this final set directly compares the different responses high collectivists high versus low on group identification have toward a large ingroup violation. The combination of high group identification and high collectivistic self-construal should intensify the black sheep effect among collectivists toward a large ingroup violation. Therefore, after experiencing such a violation, high collectivists high on group identification should exhibit a larger and faster decrease during trust dissolution and a smaller and slower increase during trust restoration than high collectivists low on group identification. For exploratory purposes, I propose an additional hypothesis within this set that focuses on the different responses low collectivists—high versus low on group identification—have toward a large ingroup violation. In particular, low collectivists may display the opposite patterns from those of high collectivists. In the absence of a high level of collectivistic self-construal, the shared group membership between the trustor and trustee should lead low collectivists high on group identification to tolerate and forgive a large ingroup violation better than high collectivists high on group

identification. Low collectivists high on group identification should therefore exhibit a smaller and slower decrease during trust dissolution and a larger and faster increase during trust restoration than low collectivists low on group identification

Hypothesis 3a: Among the high collectivists who have experienced a large ingroup violation, high identifiers will exhibit a larger and faster decrease in trust dissolution and a smaller and slower increase in trust restoration than low identifiers.

Hypothesis 3b: Among the low collectivists who have experienced a large ingroup violation, high identifiers will exhibit a smaller and slower decrease in trust dissolution and a larger and faster increase in trust restoration than low identifiers.

Chapter 2. Method

Design and Participants

The present study examined how the magnitude of trust violation (small vs. large), participants' collectivistic self-construal (high vs. low), partner's group membership (ingroup vs. outgroup), and participants' group identification (high vs. low) jointly affect the trust levels and trajectories across the dissolution and restoration phases after violation. Participants were randomly assigned to the four conditions (two violation levels x two partner's group membership levels) using a double-blind procedure. A total of 72 undergraduate students in the University of Maryland participated in the study in exchange for course credit. Participants were recruited through an online experiment sign-up system available in the university's psychology department. Among the participants, 33% were male and 67% were female. In addition, 61% were White, 8% were African American, 6% were Hispanic, 19% were Asian American, and 6% selected "other" or declined to answer. The mean age was 19.50 (SD=1.14).

The Investment Game

I conducted laboratory experiments using a variant of the Trust Game—the Investment Game (IG; Berg, Dickhaut, & McCabe, 1995). The IG is ideal for this study for a number of reasons. First, the design of IG affords social exchanges that mirror real-world interactions. Second, the structure of IG allows observation of how violations, occurring during a trust relationship, changes individuals' trust in their partner. Finally, an iterated IG (Cochard, Nguygen-Van, & Willinger, 2004) is suitable for examining nonlinear trust patterns because it permits repeated measures of trust. In the experimental procedure section, I describe the game structure and specific steps involved in detail.

Pilot Study

Prior to the present study, a pilot study was conducted to ensure the smooth functioning of the computerized IG program, to determine the logistics of the game (e.g., the number of rounds needed), and to assess the credibility of the manipulation (i.e., trust violation and trustee's ingroup/outgroup status). Thirty-three undergraduate students in the University of Maryland participated in the pilot study in exchange for course credit. The trust pattern obtained in the pilot study provided initial support for the present study, as trust levels lowered after violations (see Figure 2). I used the results and feedback from participants to determine the final number of rounds in IG, balancing the time per round and the total number of rounds necessary to observe the dynamic trust patterns. The programmed partner's response time and the percentages of coins the programmed partner keeps during violation were also adjusted. Finally, participants reported that the experimental setting and the game were sufficiently credible.

Experimental Procedure

In each experimental session, participants played the IG on computers in individual rooms. Each session typically lasted 30 minutes and included between 2 to 6 participants. Upon starting the experiment, participants were informed that they would engage in multiple rounds of brief interactions with another participant. They were informed that the experiment was part of a multi-university research initiative and that their partner would be a student from either their own university or a different university (see Figure 4). Depending on random assignment, the participants in the ingroup trustee condition were assigned a partner from the University of Maryland; while the participants in the outgroup trustee condition were assigned a partner from North Carolina State University. North Carolina State University was selected as the outgroup institution

based on interviews with four University of Maryland undergraduate students. These students provided a consensus that two universities share similar undergraduate academic and sports status, without a strong rivalry between them. Regardless which partner participants were assigned, in actuality, participants played the IG with the computer-programmed partner.

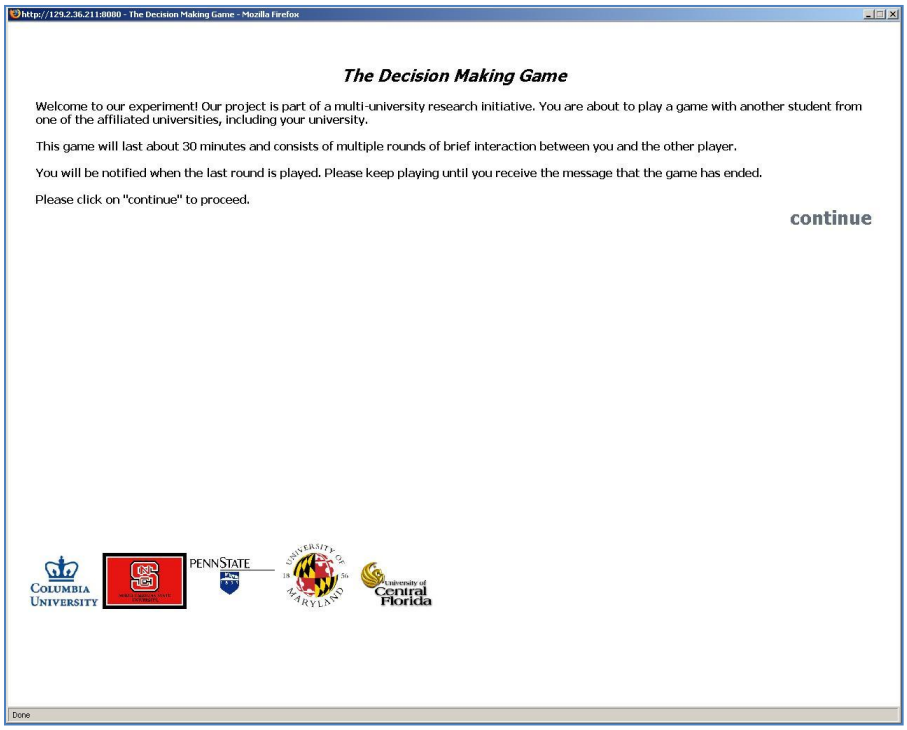

Figure 4. The welcome screen of the computerized Investment Game.

Each IG involves two players, a trustor and a trustee. In this study, all participants were assigned to the role of trustor and the computer-programmed partner was the trustee. In the beginning of each round, participants (the trustor) were given 100 coins and asked to entrust a proportion of the coins, between 0 and100, to their partner (the trustee). This decision revealed how much participants trusted the partner.

The amount participants sent to the partner was then tripled by the program. Depending on the pre-programmed responses, the programmed partner sent a portion of

the tripled coins back to the participants. The game constituted of 19 such rounds. The first four rounds of the IG were non-violation rounds; the programmed partner returned approximately half of the tripled coins with small random variations during each round. Trust violations occurred in the 5th, 6th, and 7th rounds, when the programmed partner violated participants' positive expectation by keeping the majority of the tripled coins (see Figure 5). During these three violation rounds, the programmed partner kept between 90 and 95 percent of the tripled coins in the large violation condition and between 70 and 75 percent of the tripled coins in the small violation condition, depending on random assignment. The exact percentage the programmed partner kept in each round varied randomly. Violations occurred during the 5th-7th rounds because the timing was between early and middle in the game. Violations occurred in the beginning of a relationship can lead to irreversible damage to trust (Lount, Zhong, Sivanathan, & Murnighan, 2008). The 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).

The remaining rounds, from the 8th to the 19th, were non-violation rounds. The programmed partner returned approximately half of the tripled coins with small random variations. At the end of the 19th round, the game stopped. As knowledge of the end of social exchanges tends to decrease cooperation (Murnighan, 1981), participants did not know how many rounds remained during the game before the end. After completing the IG, participants filled out a number of questionnaires, including the independent and interdependent self-construal scale (Singelis, 1994), a general trust scale (Yamagishi & Yamagishi, 1994), and measures on ingroup identification adapted from Doosje, Ellemers, and Spears (1995).

Figure 5. The Investment Game screen showing a large trust violation.

Measures

Collectivistic self-construal. Twelve items from Singelis' (1994) independent and interdependent self-construal scale measured the degree of participants' collectivistic self-construal. Participants answered the questionnaire on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). Sample items were, "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 for this scale was .68.

Group identification. Four questions 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 were adapted from Doosje, Ellemers, and Spears (1995): "I identify myself with other students from this university," "I see myself as a

student from this university," "I am glad to be a student of this university," and "I feel strong ties with students from this university." The alpha was .78.

Trust. The behavioral measure of trust constituted the dependent variable in this study. It was represented by the number of coins, ranging from 0 to 100, that participants allocated to their partner at the beginning of each round during the IG. A total of 19 trust measures were collected from each participant.

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. Six items measured individuals' agreement with statements such as, "Most people are basically honest," and "I am trustful" on a 7-point scale (1 = *strongly disagree*, 7 = *strongly agree*). The alpha was .90 for this scale.

Chapter 3. Results

Data Analysis

All analyses were conducted in the open-source statistical software environment R (R Development Core Team, 2008) and with the nonlinear and linear mixed effect model (NLME) package for R (Pinheiro & Bates, 2000). I employed discontinuous growth modeling to analyze the data, following recommendations made by Bliese and Ployhart (2002) and Bliese, Wesensten, and Balkin (2006). Because trust violation and restoration led to abrupt changes in trust patterns, linear models such as traditional growth modeling cannot capture these nonlinear and dynamic properties of the post-violation trust patterns. As a newly developed technique, discontinuous growth modeling affords researchers opportunities to understand discontinuities within longitudinal data and their relationship with individual differences and situational factors (Bliese, Chan, Ployhart, 2007; Singer & Willet, 2003). In this study, a discontinuous growth model was able to provide estimates of changes in trust levels and trajectories during the dissolution and restoration phases and revealed how these estimates were affected by violation magnitude, collectivistic self-construal, ingroup and outgroup dynamics, and group identification.

Means, standard deviations, and intercorrelations among the study variables are listed in the table.

Table

Means, Standard Deviations, and Intercorrleations of the Study Variables

	M	*SD*	1	2	3	4	5
1. Violation	0.50	0.50					
2. Partner's group membership	0.50	0.50	0.00				
3. Collectivistic Self-Construal	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, 1=large, 0=small; for partner's group membership, 1=outgroup, 0=ingroup.
* p <.05. ** p <.01

After examining the overall trust patterns, three trust phases were identified: formation (rounds 1-4), dissolution (rounds 5-9), and restoration (rounds 10-19). The trust phases were determined using a data driven approach, dividing the trust phase based on the total number of rounds in the IG and the timing of the violations. This partition is consistent with prior research (Miles & Creed, 1995; Kim, Dirks, & Cooper, 2009; Rousseau et al., 1998). The trust formation phase occurred at the beginning of the game and before violations took place; the dissolution phase consisted of the three violation rounds and two rounds immediately afterward. The restoration phase included ten rounds after the dissolution phase, in which trust levels began to rise and became gradually stable. To examine changes in both the means and slopes in these phases, my discontinuous growth model included five parameters: an overall slope that spanned all 19 rounds, a dissolution transition, a dissolution slope, a restoration transition, and a restoration slope (Singer & Willett, 2003, p. 198).

Specifically, a given transition parameter compares the mean level of trust in that phase to the mean level of trust in the prior phase. For example, the dissolution transition compares trust means between the dissolution and formation phases, and the restoration transition compares trust means between the dissolution and restoration phases. A given slope refers to the steepness of a line formed by multiple instances of trust measurement within a trust phase. Compared to an even slope, a steep slope indicates that the multiple instances of trust measurement showed more changes. A steep slope thus signifies a faster rate of change than an even slope. Further, a positive slope indicates that trust levels have increased, while a negative slope indicates that trust levels have decreased.

The model I conducted was a nested, linear mixed-effects model. I set violation condition, collectivistic self-construal, group identification, and partner's group membership as fixed effects, while allowing for random variation in intercepts and slopes at the individual level. These predictors were entered into the discontinuous growth model, similar to moderator variables in normal regression analysis. The model included two levels. Level-2, between participants, consisted of experimental manipulation (violation condition and partner's group membership) and individual differences (participants' collectivistic self-construal and group identification). Level-1, within participants, consisted of trust measured over time. The model would thus reveal how changes in individuals' trust levels and trajectories are a function of environmental factors and personal characteristics. Finally, as individuals' dispositional propensity to trust was significantly correlated with all outcomes, general trust was included as a control variable in the model.

Model Fitting

To determine the structure of the model, I 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, as well as two level-2 experimental predictors (violation condition and partner's group membership). The ICC estimated value was 0.68, indicating a moderately high level of trust changes were due to individual differences (Bliese, 2000). An examination of the intra-individual error structure indicated significant lag 1 serial autocorrelation and heteroscedasticity. The model was modified to control for these two conditions. Subsequent model comparisons showed that these corrections significantly improved model fit ($p<.01$).

Level-2 Effects

After accounting for lag 1 serial autocorrelation and heteroscedasticity in the model, I examined the effects of the level-2 predictors—including both the experimental factors of violation magnitude and partner's group membership and individual differences of participants' collectivistic self-construal and group identification—on the variances in the five transition and slope parameters. The results showed the effect of four-way interaction was significant for all of the five parameters: the overall slope ($t=-2.01$, $p<.05$), the dissolution transition ($t=2.48$, $p<.05$), the dissolution slope ($t=2.77$, $p<.01$), the restoration transition ($t=2.68$, $p<.01$), and the restoration slope ($t=2.11$, $p<.05$). Figure 6 shows the dynamic trust patterns across these two trust phases as a function of the four level-2 predictors. Because Hypotheses 1-3 focus on the comparisons between various cells in Figure 6, a series of contrast analyses that examined trust

changes during dissolution and restoration were conducted. For each hypothesis, results for the dissolution transition (the mean differences between formation and dissolution) and the dissolution slope are first presented, followed by results for the restoration transition (the mean differences between dissolution and restoration) and the restoration slope.

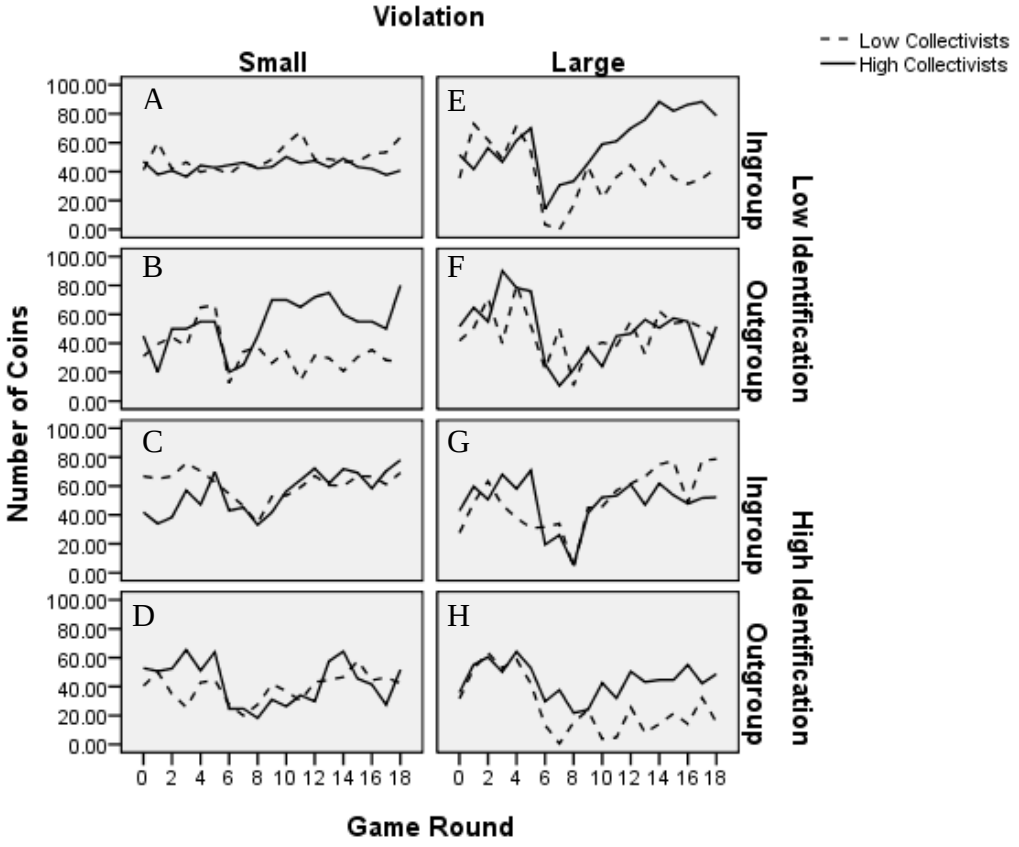

Figure 6. The dynamic trust patterns, including formation (rounds 1-4), dissolution (rounds 5-9), and restoration (rounds 10-19), as a function of violation magnitude, trustors' collectivistic self-construal, trustors' group identification, and trustees' group membership.

Hypotheses Set 1. The first set of hypotheses looks at whether trustors' levels of collectivistic self-construal affect trust changes after violation. In particular, will high

collectivists, when they are high on group identification, react differently toward an ingroup violation than low collectivists who are also high on group identification?

Hypothesis 1a. Hypothesis 1a predicts that, because of the black sheep effect, high collectivists who are also high identifiers will respond more negatively after a large ingroup violation than a small ingroup violation, showing a larger and faster trust decrease in dissolution and a smaller and slower trust increase in restoration. For reference, Hypothesis 1a compares the solid lines, representing high collectivists, in Cells C (small ingroup violation) and G (large ingroup violation) in Figure 6. As expected, the significant contrast results for the dissolution transition ($t=-1.62$, $p<.05$) showed that high collectivists high on group identification showed a larger trust decrease in means from formation to dissolution after a large than a small ingroup violation (see Figure 7). In addition to the difference in the dissolution transition, high collectivists high on group identification also exhibited a faster trust decrease during dissolution after a large than a small ingroup violation, as indicated by the significant results for the dissolution slope ($t=-1.91$, $p<.05$). Figure 8 displays the results for the dissolution slope.

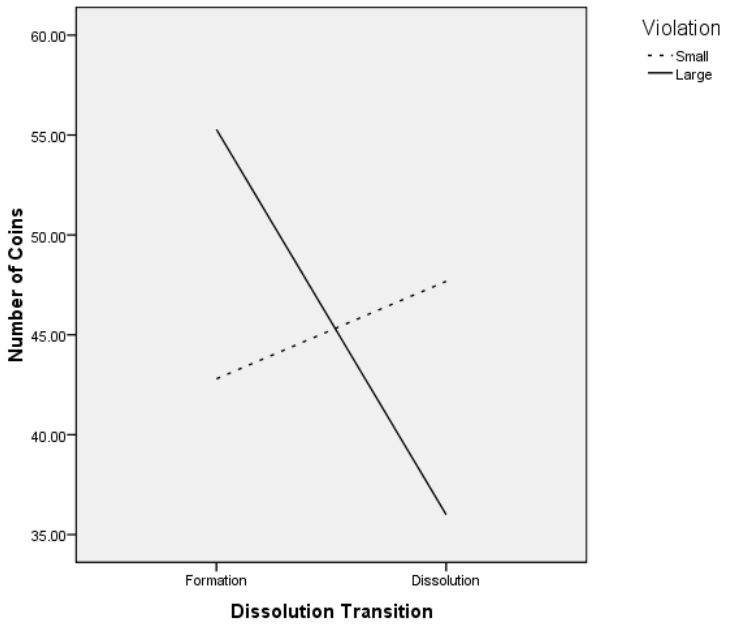

Figure 7. The changes in trust means from formation to dissolution as a function of violation magnitude for high collectivists high on group identification after experiencing an ingroup violation.

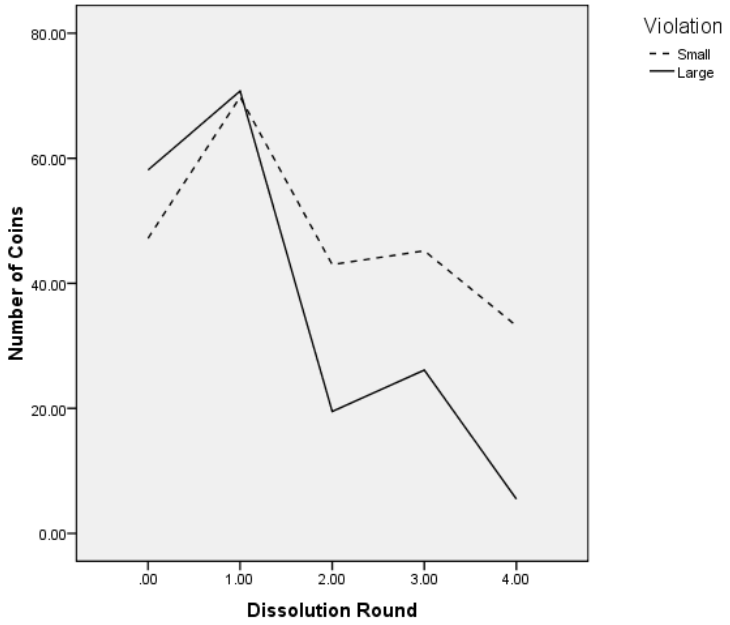

Figure 8. The trust slopes during dissolution as a function of violation magnitude for high collectivists high on group identification after experiencing a violation.

Further, during trust restoration, high collectivists high on group identification also showed a slower trust increase after a large than a small ingroup violation, as indicated by the marginal results for the restoration slope ($t=-1.80$, $p<.10$; see Figure 9). The difference between the mean levels of trust from dissolution to restoration, as represented by the restoration transition, was non-significant between a large and a small violation. Therefore, as predicted, high collectivists high on group violation responded more negatively after a large ingroup violation than a small ingroup violation. Overall, Hypothesis 1a—that high collectivists who highly identify with the group and interact with an ingroup will exhibit a larger and faster decrease in trust dissolution and a smaller and slower in trust restoration after a large than a small violation—was partially supported.

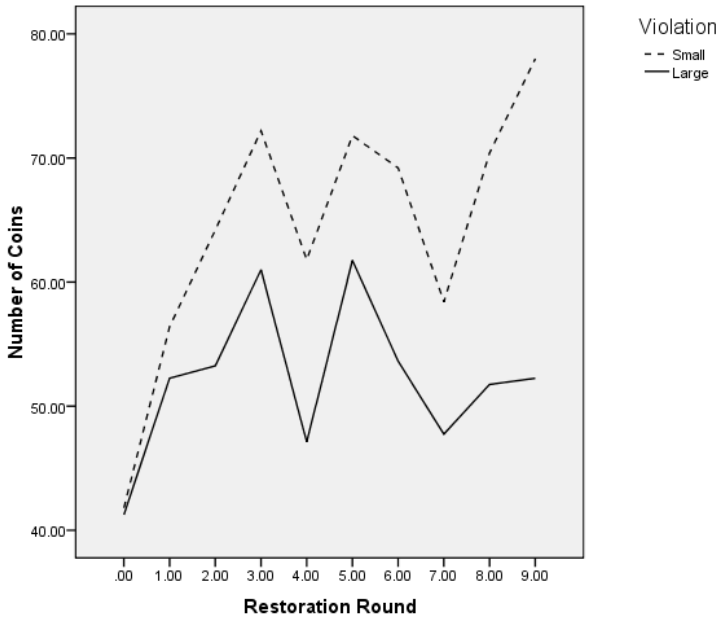

Figure 9. The trust slopes during restoration as a function of violation magnitude for high collectivists high on group identification after experiencing an ingroup violation.

Hypothesis 1b. To compare with Hypothesis 1a, which focuses on high collectivists high on group identification, Hypothesis 1b focuses on low collectivists high on group identification. Will low collectivists, when they are high on group identification, react differently after an ingroup violation depending on a large versus a small violation? Hypothesis 1b predicts that, unlike high collectivists high on group identification, low collectivists will not differentiate between a large ingroup violation and a small ingroup violation in dissolution and restoration. Therefore, Hypothesis 1b compares the dotted lines, representing low collectivists, in Cells C (small ingroup violation) and G (large ingroup violation). First, the dissolution transition and slope were examined. Supporting Hypothesis1b, the contrast results were non-significant, showing that low collectivists did not show differences in the means and slopes during dissolution between a large and a small ingroup violation. Unlike high collectivists, low collectivists did not differentiate between a large and a small ingroup violation during dissolution.

However, I found that the restoration transition ($t=2.03$, $p<.05$) was significant. The results for the restoration transition indicated that the mean levels of trust in dissolution and restoration were different after a large and a small violation. As can be seen in Figure 10, low collectivists exhibited a larger increase from dissolution to restoration after a large ingroup violation than a small ingroup violation. It is possible that, in the absence of a high level of collectivistic self-construal, low collectivists high on group identification were able to forgive more after a large than a small violation. The results for the restoration slope were non-significant, indicating low collectivists did not show different rates of trust increase during restoration after a large and a small violation. Because of the non-significant findings for the dissolution transition, dissolution slope, and restoration slope, Hypothesis 1b—that, in contrast with high collectivists, low

collectivists will exhibit less differentiation between a large and small violation than high collectivists—was largely supported.

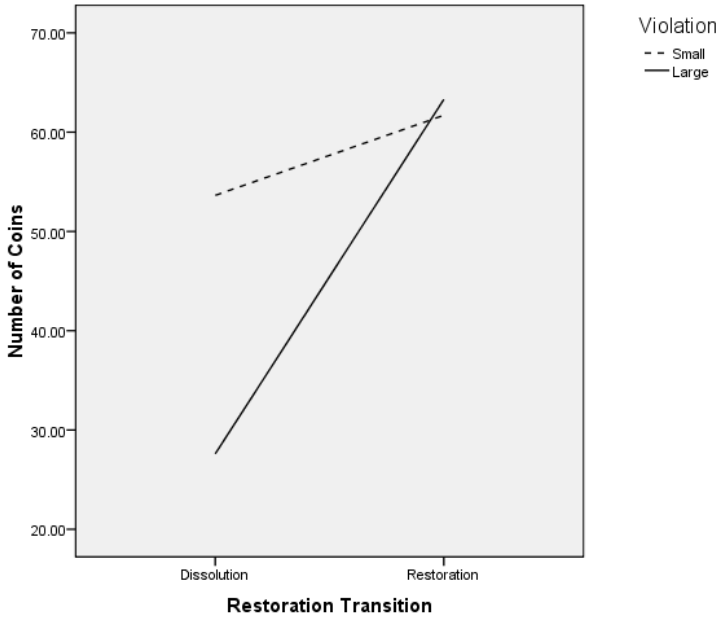

Figure 10. The changes in trust means from dissolution to restoration as a function of violation magnitude for low collectivists high on group identification after experiencing an ingroup violation.

To further understand how high collectivists and low collectivists, both high on group identification, respond to a large ingroup violation, a follow-up analysis was conducted. For reference, the analysis compares the solid line and the dotted line in Cell G in Figure 6. The results for the dissolution transition and slope were non-significant. High collectivists and low collectivists high on group identification did not respond to a large ingroup violation differently during dissolution. The results for the restoration dissolution were also non-significant. However, the results for the restoration slope were significant ($t=-2.16$, $p<.05$), indicating that high collectivists high on group identification

exhibited a slower trust increase during restoration than low collectivists high on group identification.

Hypotheses Set 2. The second set of hypotheses concerns how high collectivists and low collectivists, both high on group identification, react to a violation from an outgroup differently, depending on a large versus a small vioaltion. Instead of focusing on the ingroup violation as in Hypotheses 1a and 1b, Hypotheses 2a and 2b focus on trust changes after an *outgroup* violation.

Hypothesis 2a. Hypothesis 2a concerns high collectivists who strongly identify with the group. Do these high collectivists respond differently after a large versus a small outgroup violation? Hypothesis 2a predicts that high collectivists high on group identification will not differentiate between a large and a small outgroup violation. For reference, this contrast analysis examines the difference between the two solid lines, representing high collectivists, in Cells D (small outgroup violation) and H (large outgroup violation) in Figure 6. The results for the dissolution transition and slope were non-significant, indicating that high collectivists did not demonstrate a difference in their trust decrease, whether in levels or slopes, during dissolution after a large outgroup violation and a small outgroup violation. Likewise, the results for the restoration transition and the restoration slope were non-significant. These results indicated that high collectivists did not differentiate between a large and a small violation in means and slopes during dissolution and restoration. Hypothesis 2a—that high collectivists who highly identify with the group and interact with an outgroup will exhibit less differentiation between a large and a small violation than low collectivists—was supported.

Hypothesis 2b. While Hypothesis 2a focuses on high collectivists high on group identification, Hypothesis 2b focuses on *low* collectivists high on group identification. This analysis was conducted for exploratory purposes. Specifically, Hypothesis 2b predicts that these low collectivists will differentiate between a large outgroup violation and a small outgroup violation, showing a larger and faster trust decrease in dissolution and a smaller and slower trust increase in restoration after a large than a small outgroup violation. In Figure 6, Hypothesis 2b compares the dotted lines, representing low collectivists, in Cells D (small outgroup violation) and H (large outgroup violation). The contrast analysis results for the dissolution transition and slope were non-significant. They indicate that low collectivists high on group identification did not react differently during dissolution, regardless of a large and a small outgroup violation.

The results for the restoration transition ($t=-2.32$, $p<.05$) and slope ($t=-2.04$, $p<.05$), however, were significant. As shown in Figure 11, low collectivists high on group identification showed a smaller trust increase from dissolution to restoration after a large than a small outgroup violation. Likewise, low collectivists high on group identification also showed a slower trust increase in restoration after a large than a small outgroup violation (see Figure 12). Based on these results, Hypothesis 2b—that, in contrast to high collectivists, low collectivists will exhibit a larger and faster decrease in trust dissolution and a smaller and slower increase in trust restoration after a large than a small violation—was partially supported.

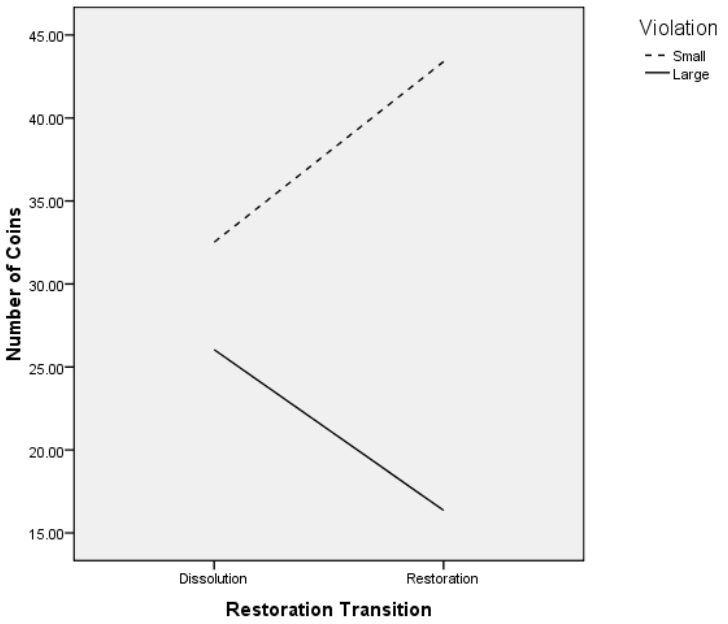

Figure 11. The changes in trust means from dissolution to restoration as a function of violation magnitude for low collectivists high on group identification after experiencing an outgroup violation.

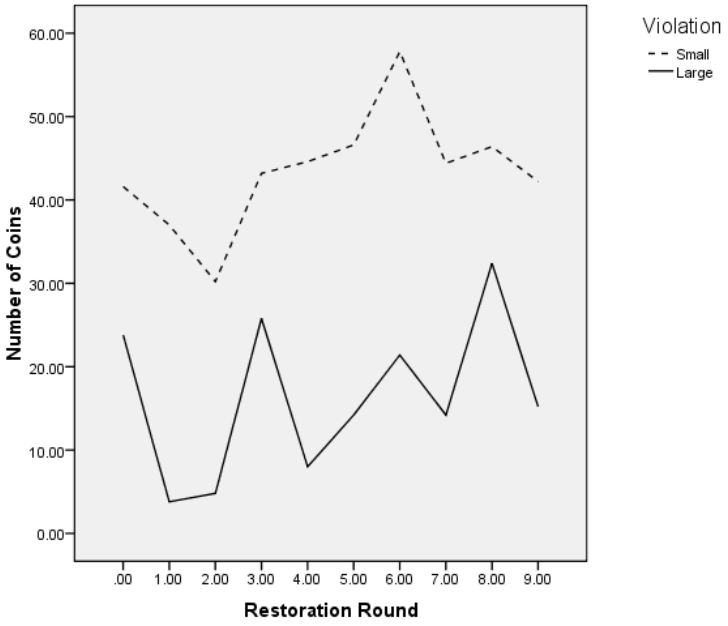

Figure 12. The trust slopes during restoration as a function of violation magnitude for low collectivists high on group identification after experiencing an outgroup violation.

Hypotheses Set 3. The third set of hypotheses shifts gears and focuses on the effects of group identification on high and low collectivists. To further understand the effects of group identification on trust changes after violation, these two hypotheses examine the how trustors' identification interacts with collectivistic self-construal to affect trust dissolution and restoration after a large ingroup violation.

Before examining Hypotheses 3a and 3b, I first compare trust changes in dissolution and restoration for high collectivists low on group identification after a large and a small ingroup violation. This analysis differs from Hypotheses 1a in that it focuses on individuals *low* on group identification instead of high on group identification. It is possible that high collectivists low on group identification will respond more strongly after a large than a small ingroup violation. In particular, these individuals may exhibit little trust change after a small ingroup violation. Therefore, after a large ingroup violation, high collectivists low on group identification will display a larger and faster decrease in trust dissolution than a small ingroup violation; however, they would also exhibit a larger and faster increase in trust restoration after a large than a small violation due to the lack of trust dissolution after a small violation. For reference, in Figure 6, this contrast analysis compares the solid lines, representing high collectivists, in Cells A (small ingroup violation) and E (large ingroup violation). The results for the dissolution transition were non-significant, indicating that high collectivists low on group identification did not exhibit different mean levels of trust from formation to dissolution after a large and a small ingroup violation. However, the results for the dissolution slope were significant ($t=-2.15$, $p<.05$), indicating that high collectivists low on group identification showed a faster trust decrease during dissolution after a large than a small ingroup violation (see Figure 13).

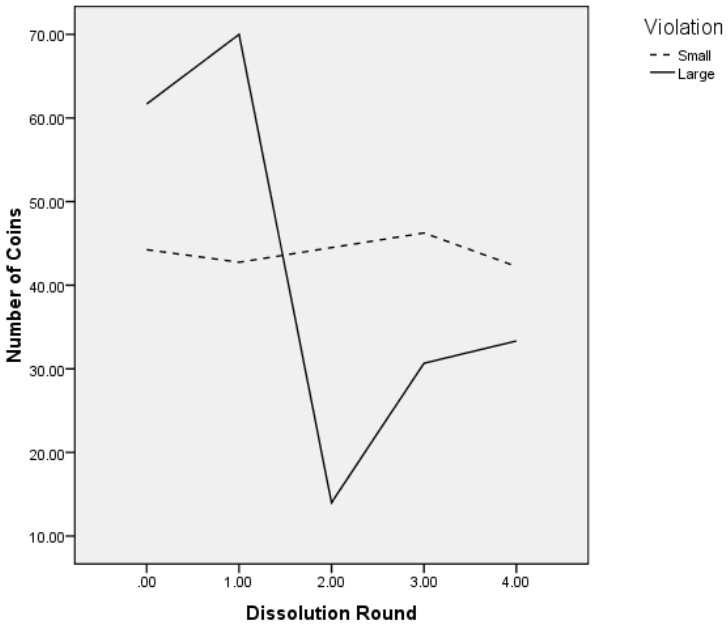

Figure 13. The trust slopes during dissolution as a function of violation magnitude for high collectivists low on group identification after experiencing an ingroup violation.

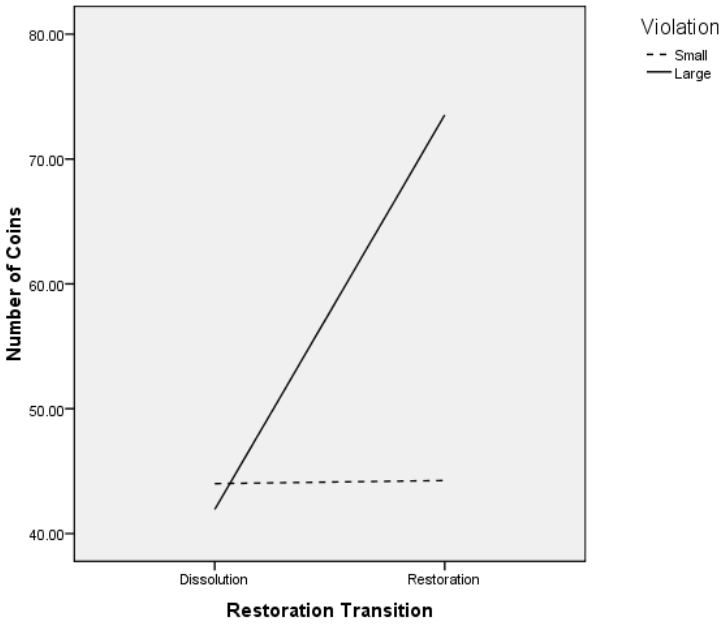

Figure 14. The changes in trust means from dissolution to restoration as a function of violation magnitude for high collectivists low on group identification after experiencing an ingroup violation.

The results for the restoration transition (t=2.82, p<.01) and slope (t=4.28, p<.001) were also significant. As can be seen in Figure 14, high collectivists low on group identification showed a larger trust increase from dissolution to restoration after a large than a small ingroup violation. In addition, Figure 15 shows that high collectivists low on group identification also showed a faster trust increase during restoration after a large than a small ingroup violation. These results, compared to those for Hypothesis 1a, suggest that high collectivists high and low on group identification were equally affected by a large ingroup violation. However, high collectivists low on group identification were able to restore trust, while high collectivists high on group identification continued to show a black sheep effect and were unable to restore trust.

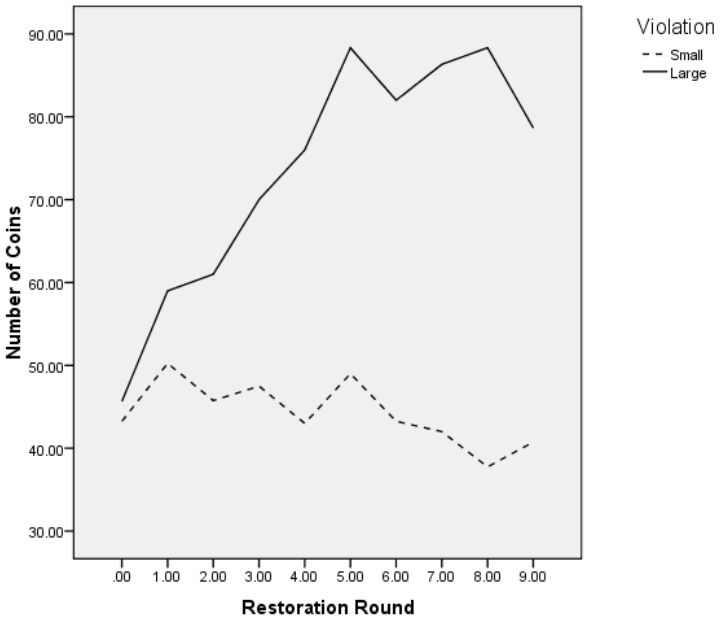

Figure 15. The trust slopes during restoration as a function of violation magnitude for high collectivists low on group identification after experiencing an ingroup violation.

Hypothesis 3a. Does a high level of group identification, in combination with a high level of collectivistic self-construal, exacerbate the black sheep effect for

collectivists after a large ingroup violation? Hypothesis 3a focuses on the trust changes of high collectivists high versus low on identification after a large ingroup violation. It examined whether a high level of group identification would lead to a black sheep effect on trust changes during dissolution and restoration among high collectivists. It predicts that, after a large ingroup violation, high collectivist high on group identification will exhibit a larger and faster trust decrease in dissolution and a smaller and slower trust increase in restoration than high collectivists low on group identification. For reference, this hypothesis compares the solid lines, representing high collectivists, in Cells E (large ingroup violation for low identifiers) and G (large ingroup violation for identifiers). Results for the dissolution transition and the dissolution slope were non-significant, indicating that, during dissolution when the large ingroup violation has just occurred, high collectivists high and low on group identification did not respond to the violation differently in means and slopes.

Results for the restoration transition were also non-significant. High collectivists did not show a smaller increase from dissolution to restoration when they have high rather than low group identification. However, the results for the restoration slope ($t=-2.57$, $p<.01$) were significant. As Figure 16 displays, high collectivists exhibited a faster trust increase during restoration when they are low rather than high group identification. Hypothesis 3a—that, among the high collectivists who have experienced a large violation from an ingroup, high identifiers will exhibit a larger and faster decrease in trust dissolution and a smaller and slower increase in trust restoration than low identifiers—was partially supported.

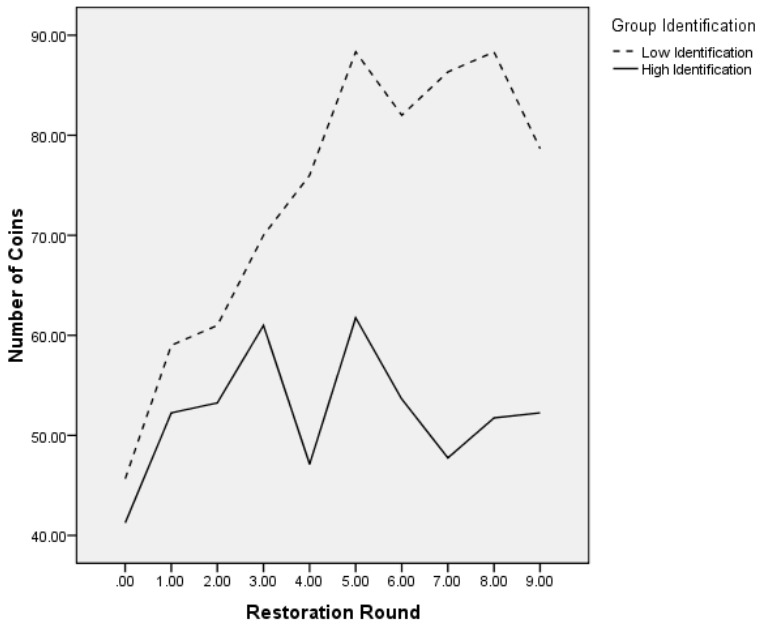

Figure 16. The trust slopes during restoration as a function of trustors' group identification for high collectivists after experiencing a large ingroup violation.

Hypothesis 3b. In contrast to Hypothesis 3a, which focuses on high collectivists, Hypothesis 3b focuses on low collectivists after a large ingroup violation. This analysis was conducted for exploratory purposes. While low collectivists tend not to differentiate between a large and a small ingroup violation, their levels of group identification may affect how they respond to these violations. Hypothesis 3b predicts that low collectivists low on group identification would exhibit a larger and faster trust decrease in dissolution and a smaller and slower trust increase in restoration after a large ingroup violation. This hypothesis thus compares the dotted lines, representing low collectivists, in Cells E (large ingroup violation for low identifiers) and G (large ingroup violation for high identifiers). However, the results for the dissolution transition and the dissolution slope were non-significant. Low collectivists high and low on group identification did not respond to a large ingroup violation differently during dissolution in means or slopes.

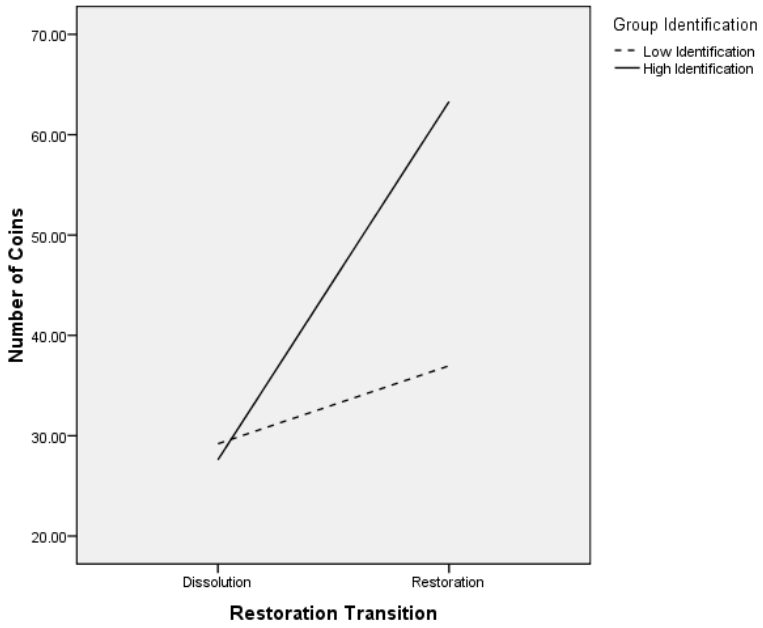

Figure 17. The changes in trust means from dissolution to restoration as a function of trustors' group identification for low collectivists after experiencing a large ingroup violation.

Results for the restoration transition ($t=1.74$, $p<.10$) and slope ($t=1.88$, $p<.10$), on the other hand, suggesting a trend. Compared to low collectivists low on group identification, low collectivists high on group identification showed a larger trust increase from dissolution to restoration (see Figure 17), and a faster trust increase during restoration (see Figure 18). Hypothesis 3b—that, among the low collectivists who have experienced a large violation from an ingroup, high identifiers will exhibit a smaller and slower decrease in trust dissolution and a larger and faster increase in trust restoration than low identifiers—was partially supported. Furthermore, an examination of the results for Hypotheses 3a and 3b indicates that the difference in responses toward a large ingroup violation between trustors high and low on group identification was more pronounced in the restoration phase than in the dissolution phase, suggesting that the

effect of trustors' group identification became progressively stronger as the trust interactions continued.

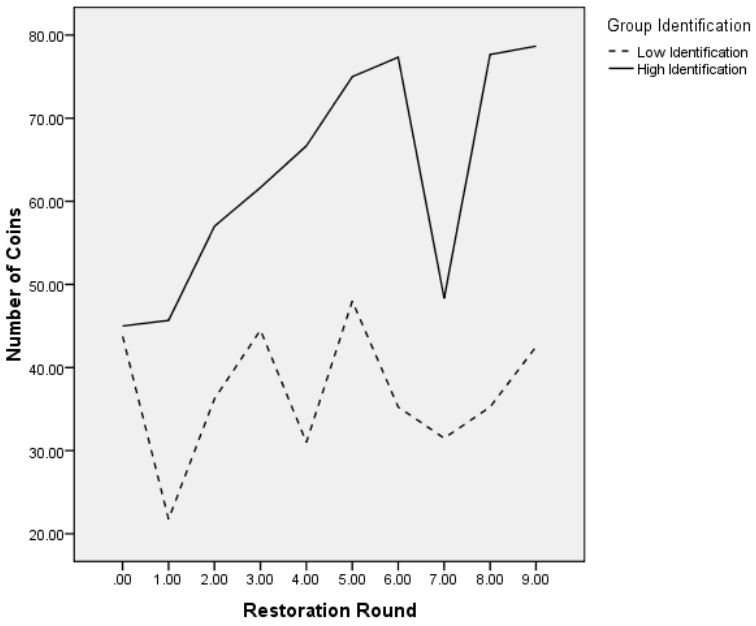

Figure 18. The trust slopes during restoration as a function of trustors' group identification for low collectivists after experiencing a large ingroup violation.

Chapter 4. General Discussion

Prior studies have conceptualized the trust process to consist of multiple distinct phases (Miles & Creed, 1995; Rousseau et al., 1998). At the same time, researchers have noted the prevalence of trust violations (Elangovan & Shapiro, 1998; Morris & Moberg, 1994). In this study, I examined trust levels and trajectories in two post-violation trust phases: dissolution and restoration. Adopting the longitudinal approach, I was able to address erroneous theoretical assumptions (i.e., trust is static and linear) and inadequate methodology (i.e. a single measurement of trust) in some of the prior research. In addition, I investigated whether individual differences interacted with situational factors in affecting the trust dynamics across these phases. Results from the discontinuous growth modeling revealed a significant four-way interactive effect among violation magnitude, collectivistic self-construal, group identification, and partner's group membership on the post-violation trust means and slopes in trust dissolution and restoration.

Specifically, I found that collectivistic trustors display divergent patterns after a violation depending on the magnitude of trust violation, trustee's group membership and the trustors' own group identification. Hypothesis 1a predicts that high collectivists who highly identify with the group and interact with an ingroup will respond more negatively after a large than a small violation. Indeed, high collectivists high on group violation showed a larger and faster decrease in dissolution and a slower increase in restoration after a large than a small violation, indicating that the large ingroup violation triggered the black sheep effect while the small ingroup violation did not. Further, Hypothesis 1b predicts that, in contrast with high collectivists, low collectivists will exhibit less

differentiation between a large and a small ingroup violation than high collectivists. The results showed that low collectivists were less sensitive to an ingroup violation, and for the most part, did not differentiate between a large and small ingroup violation during dissolution and restoration.

In addition to the responses high and low collectivists have toward an ingroup violation, I also examine the responses high and low collectivists have toward an outgroup violation. Hypothesis 2a predicts that high collectivists who highly identify with the group and interact with an outgroup will not differentiate between a large and small violation. The non-significant results for the transitions and slopes during dissolution and restoration supported this hypothesis. Like low collectivists after an ingroup violation, high collectivists high on group identification did not differentiate between a small and a large violation if it is from an outgroup. In contrast, low collectivists high on group identification were sensitive toward outgroup violations. For exploratory purposes, Hypothesis 2b predicts that low collectivists will exhibit a larger and faster decrease in trust dissolution and a smaller and slower increase in trust restoration after a large than a small violation. I found that while they did not differentiate a large and a small violation during dissolution, they exhibited a smaller and slower trust increase after a large than a small violation. These results suggest that low collectivists could be affected by a large outgroup violation more than high collectivists.

Moreover, I also examined how trustors' group identification interacts with their levels of collectivistic self-construal to affect their trust after violation. Hypothesis 3a predicts that, among the high collectivists who have experienced a large violation from an ingroup, high identifiers will exhibit a larger and faster decrease in trust dissolution and a

smaller and slower increase in trust restoration than low identifiers. Results showed that, during dissolution when a large ingroup violation has just occurred, high collectivists high on group identification did not react to the violation differently from high collectivists low on group identification. However, during dissolution, the two groups of trustors displayed divergent patterns. High collectivists high on group identification showed a small and slow trust increase in restoration, whereas high collectivists low on group identification showed a large and fast trust increase. These results suggest that the combination of high levels of collectivistic self-construal and group identification leads to the black sheep effect. As a result, high collectivists high on group identification exhibited low tolerance toward large ingroup violations and engaging in negative trust behaviors toward the ingroup member.

For exploratory purposes, I also looked at whether low collectivists high and low on group identification react to a large ingroup violation differently. Hypothesis 3b predicts that, among the low collectivists who have experienced a large violation from an ingroup, high identifiers will exhibit a smaller and slower decrease in trust dissolution and a larger and faster increase in trust restoration than low identifiers. I found that, during dissolution, low collectivists high and low on group identification did not react differently after a large ingroup violation. However, there was a trend that low collectivists high on group identification were more forgiving during trust restoration than low collectivists low on group identification. These findings—that the differences between high and low identifiers were absent in dissolution but present in restoration—suggest the possibility that the impact of trustors' group identification may not take effect

immediately after a violation. Consequently, the black sheep effect for high collectivists high on group identification may grow stronger over time after a violation.

The contributions of this study are three-fold. First, in response to concerns about limited research on post-violation trust (e.g., Schoorman, Mayer, & Davis, 2007), the present research focused on dynamic trust patterns after violations. Second, this study was among the first to examine multiple trust phases sequentially. The findings support the notion that trust is dynamic, as suggested by other scholars in the field (Rousseau et al., 1998). By focusing on the nonlinear and dynamic changes of trust across multiple phases, I sought to provide a more holistic picture of this important phenomenon. Finally, this study included both the individual difference of self-construal and group identification and the situational variables of violation magnitude and partner's group membership as antecedents of trust changes after violation.

Limitations

Despite these findings, the present study is not without limitations. I examined trust processes in an experimental setting, instead of real world exchanges. As one of the first few studies that use an economic game to examine trust dynamics, however, laboratory experiments such as the one conducted in the present study have important values in that they provide researchers with a controlled environment. Further, research on game theory has proven experimental games effective in studying economic theories (Nash, 1950) and demonstrating generalizable phenomena, such as the boundary conditions for individual rationality and interpersonal interactions (e.g. Bohnet & Zeckhauser, 2004; Haselhuhn, Schweitzer, & Wood, 2010).

In addition, the present study measured participants' levels of collectivistic self-construal and group identification. The current results can be further strengthened if the study had experimentally manipulated these two predictors. Finally, this study targeted specific sets of contrasts based on theoretical consideration. Therefore, not all possible comparisons among the eight cells in Figure 6 were examined. For instance, the contrast between trust changes of low and high collectivists high on group identification after a large outgroup violation were not theoretically relevant to the present study and was excluded.

Future Research Directions

Because of this study's use of laboratory experiment, replications of the present findings in a field study are needed. Further, the illuminating results on the joint effects of trust violation, collectivistic self-construal, ingroup and outgroup dynamics, and group identification suggest that researchers need to take both individual and situational factors into account to explore fully the complexity of trust relationships. Additional trust research that uses similar approaches and methodologies to examine other contextual factors is warranted. In particular, research should examine different outgroups that span a range of social distance from an ingroup. The ingroup and outgroup in the present study may have a relatively small social distance, which can lead to different trust patterns compared to an ingroup and outgroup with a large social distance. It would be interesting to examine how a large social distance elicits strong motivational and emotional reactions from the trustors and affects their trust changes after violation. Future research could also examine additional situational factors, such as time pressure and public versus private situation. Research should also use the paradigm to examine

other individual difference factors, such as need for closure, locomotion/assessment, and other personality variables, to predict the dynamical nature of trust. Prior research has highlighted the importance to understand individuals' characteristics that influence their propensity to trust formation and restoration (Kim et al., 2009).

The present research focused on the effects of violation on trust. An extension is to examine the effects of different post-violation strategies that a violator can employ on trust changes. For example, how do admission, apologies, and denial affect the dynamic trust patterns after violation? As a number of studies have identified both successful and unsuccessful trust repair tactics (e.g., Kim et al., 2006; McCullough et al., 1997), it would be fruitful to examine the effects of these tactics on differences in trust levels and trajectories during trust restoration.

Moreover, future research needs to examine the effect of culture on dynamic trust processes. This study included the individual variable of collectivistic self-construal, a construct that is largely influenced by individuals' cultural backgrounds. Markus and Kitayama (1991) suggest that collectivists are common in many Asian countries, while individualists are common in Europe and the U.S. Results on the collectivists' complex trust behavior from cross-cultural studies can potentially yield insight for international collaboration and negotiation. As our global interdependence grows, interpersonal and institutional relations frequently cross national and cultural boundaries. However, there are surprisingly few empirical studies on trust in relation to culture (Schoorman et al., 2007; for notable exceptions, see Bohnet, Herrman, & Zeckhauser, in press; Yamagishi et al., 1998). Understanding how culture affects trust is critical. It is unlikely that the trust process is universal, especially when many fundamental psychological phenomena have

been shown to exhibit cultural specificity (Markus & Kitayama, 1991). Both trust and culture are increasingly important in determining our societal well-being. A dynamical approach to trust formation and restoration, combined with rigorous and appropriate methodology, should provide scientists better understanding of this important construct and make an impact on our field and our global community.

Conclusion

In his book *Bowling Alone*, Putnam (2000) proposes that trust in government and economy is a bottom-up process that begins with trust relationships we form with one another in everyday life. Fukuyama (1995) similarly contends that trust in fundamentally interpersonal. With the recent poll by the Pew Research Center (2010) showing that Americans' trust in government is at a historic low and a long string of highly publicized failures in Wall Street, it is more urgent than ever to understand how violation affects the dynamic patterns of interpersonal trust relationships.

The present study uses the iterated investment game and discontinuous growth modeling to examine the effect of violation on trust changes across two trust phases: dissolution and restoration. Trust scholars have long called for a dynamical approach that encompasses multiple trust stages and measures trust patterns over time (Rousseau, et al., 1998; Lewicki et al., 2006). This research expands the current trust literature by examining how the interaction among trust violation, collectivistic self-construal, ingroup and outgroup dynamics, and group identification affects trust dynamics after violation. By focusing on the volatile and nonlinear changes of trust over time, I hope to provide a more holistic picture of this important phenomenon and generate a new wave of research that examines social and psychological processes through the dynamical lens.

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